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REVIEW ARTICLE

Rereading Kuhn

Jouni-Matti Kuukkanen

Thomas Kuhn's 'Linguistic Turn' and the Legacy of Logical Empiricism: Incommensurability, Rationality and the Search for Truth

STEFANO GATTEI

Aldershot, Ashgate, 2008

xiv + 277 pp., ISBN 9780754661603, £60.00 (hardback)

Kuhn's 'The Structure of Scientific Revolutions'

JOHN PRESTON

London, Continuum, 2008

viii + 126 pp., ISBN 9780826493750, £50.00 (hardback); 9780826493767, £11.99 (paperback)

Thomas Kuhn has been back in vogue for some time in philosophy of science. Since the mid-1990s we have seen a flow of re-assessments of his philosophy. This has provided a welcome balance to the somewhat one-sided rationality debate that preceded these recent works. Admittedly, the old irrationalist Kuhn who 'killed logical empiricism' received company two decades ago from the Kantian Kuhn (Hoyningen-Huene 1993), but has subsequently been supplemented by at least the conservative Kuhn (Fuller 2000), the last logical empiricist Kuhn (Bird 2000, 2004; Friedman 2003; Irzik and Grünberg 1995; Earman 1993; also Reisch 1991), the cognitive science Kuhn (Andersen 2001; Andersen, Barker, and Chen 1996; Barker, Chen, and Andersen 2003; Chen, Andersen, and Barker 1998) and the Wittgensteinian Kuhn (Sharrock and Read 2003). And, of course, there has been the sociological Kuhn (e.g. Barnes 1982) all along too. These images are not necessarily mutually incompatible, but the central organising idea is importantly different in each.

This situation prompts three observations. First, it is evident that Kuhn has officially entered the history of philosophy of science and the battle over his legacy is now seriously raging. Second, Kuhn is still seen as a figure so important that one wants to portray him either as an ally in one's preferred research tradition or as an enemy in a tradition that is characterised in negative terms. Third, Kuhn is truly an elusive chameleon-like

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figure who takes quite unexpected forms. In fact, one wonders whether all these images can be justified.

If philosophers can be divided into two groups, those who predominantly create and those who systematise what has been created, Kuhn clearly belongs to the former. One cannot but be struck by Kuhn's numerous attempts to redraft and re-characterise his philosophical positions in his writings from the 1950s to the 1990s. New concepts emerge and old ones receive new definitions during the evolution of Kuhn's thinking. What Kuhn did not do was stop and pin down all the details of his concepts and assumptions in the fashion of an analytic philosopher. This is to say that the elements underpinning the current pluralism are there in Kuhn, and therefore, up to a point, we can tolerate the multifaceted Kuhn as long as all readings are justified in the context of Kuhn's thinking. There is continuity on the level of themes of interest, specifically the focus on the dynamics of scientific change, but I don't think it is possible to claim that there is only one narrative that captures Kuhn's whole intellectual life and conclusively excludes all other perspectives. Kuhn left space for others to take his philosophy in new directions although he would likely have rejected most of them; his reaction to the sociological development of his work is telling (cf. Kuhn 2000, 91, 110).

There are now two new portrayals of Kuhn and his work that exemplify this state of affairs in their own ways. John Preston's *Kuhn's 'The Structure of Scientific Revolutions'*, designed primarily for an undergraduate readership, is a critical commentary of Kuhn's most important book. *Structure* naturally received the status of 'classic' a while ago, but perhaps it is yet a new milestone that even this relatively short book is thought to need a reading guide. When shall we get *The Cambridge Companion to Kuhn*? Stefano Gattei's *Thomas Kuhn's 'Linguistic Turn' and the Legacy of Logical Empiricism* is a book-length argument for seeing Kuhn as part of the extended logical empiricist tradition. It argues that Kuhn in his linguistic turn failed to provide an alternative to foundationalism, something that fell to the hero of Gattei's book, Popper, to accomplish.

Preston's book is a fair interpretation of Kuhn's *Structure*. The main body of the book is composed of sections that comment on each chapter of *Structure*. At the end of each, there are a number of well-formulated and useful study questions. My only reservation is about the practical utility of the book for educational purposes. It would be ideal literature in a course on Kuhn's *Structure*, but I am not sure that there are many courses devoted even to Kuhn's whole philosophy. And given that *Structure* is very readable and inspiring to most students, why not to use it instead? Nevertheless, any student who is genuinely interested in the philosophical views of *Structure* will find Preston's book a useful supplement.

Preston's focus is on Kuhn's 'general picture of science' and not on his historical work. The reasonable assumption behind this focus is that, for Kuhn, history of science was a means to a philosophical end. However, according to Preston, one of the main obstacles in this interpretative project is a tension in Kuhn's work between the continental historicist approach on the one hand, and a framework stemming from analytic philosophy on the other hand. Preston's solution is to reconstruct and present *Structure* as forming as coherent a philosophical picture as possible.

The set-up of Preston's book rules out dealing with Kuhn's philosophy after *Structure*, although later writings make their appearance frequently in the text to explain Kuhn's philosophical positions. This retrospective explanatory strategy stems from Preston's attempt to rationally reconstruct Kuhn's *Structure*. The underlying assumption must be that the themes of interest stayed invariant during Kuhn's intellectual life and were clarified in later texts. In Kuhn's case, this may be justified in many cases, but the orientation also has its dangers in that it may conceal important changes in Kuhn's thinking. More problematically, this practice runs the risk of either undermining the narrow focus of the book or calling this kind of reconstructionist approach into question. Fortunately, Preston generally manages to strike a balance between interpreting *Structure* and Kuhn's subsequent writings, either by using Kuhn's own commentary of his earlier ambitions, expressed in an interview, or by clearly signalling when he is talking about Kuhn's later intellectual developments.

Preston's aim to reconstruct also leads to some 'improvement' of Kuhn when he highlights elements that need development and that need to be rejected altogether. Any assessment will probably inevitably involve this kind of judgemental treatment, but at some points the author's own interest is too prominent in the text, something that could be said to apply to Gattei's book in even stronger form, as we shall see. Kuhn's idea of *Gestalt* switches and world changes can certainly be illuminated with the help of Wittgensteinian philosophy, but it is not clear that Kuhn was influenced by Wittgenstein on this issue so much that it merits an extended examination of Wittgensteinian intrigues on the subject—especially when it turns out that a main motivation for the approach is a suggestion by Stanley Cavell, without much textual evidence from Kuhn being presented (Preston 2008, 66n22). Indeed, Preston is forced to conclude that 'it may be ... that he's simply talking about a somewhat different phenomenon from Wittgenstein' (72). Something that Preston ignores in his otherwise excellent survey of recent Kuhn literature (there is an overview at the end of the book) is the cognitive interpretation by Andersen, Barker, and Chen. Their reading may offer a third alternative to interpreting Kuhn as saying either that the world literally changes or that only an interpretation of data changes in revolutions. Andersen, Barker, and Chen have correctly emphasised that Kuhn thought that there is a pre-linguistic mental model or neural pre-conditioning which makes the world and observations intelligible. In scientific change, it is this 'phenomenal world' that changes.

Preston correctly stresses that Kuhn chose the notion of 'paradigm' because it implies modelling and practice which may not be directly articulable and which assume priority over explicit rules (35–36). In this sense, as sociological readings of Kuhn emphasise, training forms the arational (not irrational) foundation of science. But then it also makes sense to balance this reading by pointing out that Kuhn defined himself in a rather old-fashioned way as an 'internalist' (Kuhn 2000, 287). Preston remarks that Kuhn saw mature science or scientific communities as relatively isolated from their social milieu, which meant that it was not necessary to take 'external' factors into account in explanations of the development of scientific ideas (47). It is also appropriate to remind the reader that when Kuhn suggested that 'faith' plays a role in theory choice he was talking about belief in future problem-solving capability, not faith as

opposed to reason. The elements of rationalist readings are there in Kuhn although it is less clear exactly what type of rationality is implied by his texts. Preston quite correctly suggests that, in the absence of an algorithm of scientific method, Kuhn referred to reasons and the reasonable behaviour of individual scientists guided but not determined by generally shared cognitive values (90).

For a long time, it was taken for granted that the early Kuhn's target of criticism was logical empiricism, probably best seen in the influential proceedings of the 1969 Illinois symposium, *The Structure of Scientific Theories* (Suppe 1977). This interpretation is problematic if taken literally, because, as Kuhn himself later recognised, he was reacting against a 'sort of everyday image of logical positivism' (Kuhn 2000, 306). One of Gattei's main arguments in his book, on which he is in agreement with various other recent assessments of Kuhn's philosophy, is that Kuhn should be seen as being in agreement with logical empiricism on a number of fundamental issues rather than as its enemy. 'The implicit presuppositions and the stated principles of Kuhn's philosophy are not very different from those of the logical positivists or logical empiricists he was determined to reject' (x).

Gattei's book is unique among recent Kuhn assessments in that it is based on extensive archival research of unpublished materials. This makes the book undoubtedly a valuable contribution to our understanding of this interesting period in the history of philosophy of science. Gattei's research can be seen especially well in chapter 2 where he retraces the developments that led to the 1965 conference at Bedford College, London, and to the subsequent publication of the now famous *Criticism and the Growth of Knowledge* (Lakatos and Musgrave 1970). Gattei's long and numerous footnotes also testify to his mastery of the philosophy of this period. The footnotes are sometimes very enlightening, a true treasure trove of historical knowledge of philosophy, but they also raise the question whether the level of detail displayed is always necessary. Reading them all distracts from the flow of the main narrative. The same problem is sometimes seen in the main text as well. For example, it is not entirely clear why, in this book, we need to learn of the 'precedents' of incommensurability in thinkers, such as Eugenio Frola, who had no proven connection with Kuhn, or even with Feyerabend.

After Kuhn has been connected to logical empiricism, Gattei claims that 'Kuhn wrote *The Structure of Scientific Revolutions* having Popper's model in mind' (10n36). Further, Gattei states that Kuhn implicitly addresses Popper already in his *The Copernican Revolution* (Kuhn 1957), and that this observation can be used to understand the philosophical view that underlies Kuhn's historical work. These reasons allegedly substantiate the claim that 'the critical reference of Kuhn's philosophy has always been Popper's falsificationism, not Logical Positivism or Empiricism' (53–54n137). This is an overstatement at best and an error at worst. In contrast to what Gattei claims, although Popper's William James lectures at Harvard in 1950 must have influenced Kuhn, there is no evidence that they proved to be uniquely important for Kuhn's philosophical development. It is an exaggeration to say that Kuhn wrote *Structure* as a response to Popper's philosophy and that it was a major factor in the writing of *The Copernican Revolution*.¹ Kuhn's implicit reference to Popper in *Structure*, to which

Gattei directs our attention, brings forward the point that response to crisis is not like 'the methodological stereotype of falsification' (Kuhn 1970, 77). Kuhn thus considered the falsificationist model in a restricted context, i.e. as a potential response in a scientific revolution. It was not the main critical object of the book.

Preston's interpretation of the critical target of Kuhn's philosophy is more fruitful. He says that, in *Structure*, Kuhn was reacting against a certain view of the history of science and not against any specific philosophical model. It is true that Kuhn's explicit target could no more have been logical empiricism *per se* than Popper's philosophy, but he was nevertheless reacting against the image that may be said to have arisen mainly from the previous tradition. His target was a specific 'ideological' history of science found in textbooks or 'a very naïve cumulativism' where hero scientists accumulate knowledge by ever continuing discoveries of facts and reductions of older theories to new ones. He considered the everyday image of logical positivism to be part of this 'ideology of scientists' (14–15, 19; Kuhn 2000, 282, 306, cf. 106).

Gattei's reasonable idea that there were two scientific revolutions in the history of philosophy of science, one by logical positivism and the other by historical philosophers (1), sits uncomfortably with the central historical thesis of the book, i.e. that Kuhn, the central figure of the latter tradition, can actually be seen as having continued the former tradition. More generally, the popular tendency to highlight parallels between Kuhn and logical empiricism and positivism is problematic. First, this line of interpretation devalues Kuhn's historical experiences, specifically his Aristotle experience which can be proven to have significantly influenced his thinking (Kuukkanen 2008, 51–55). More important, it is one thing to identify similarities between traditions, and quite another to count them as being somehow part of the same tradition. It is relatively easy to find parallels, but the claim that two scholars with seemingly different philosophies are part of one and the same extended philosophical orientation requires something more: an argument that they shared more with one another than they shared with other closely related traditions, that there was some identifiable positive historical connection of influence between them, and that the similarities between them are more significant than their differences. Given this, it is not enough to point to parallels between Kuhn and the later Carnap (which Kuhn himself recognised), because the latter's thinking had already evolved to quite a different mode from early logical positivism. Second, it is possible to identify parallels which go in all directions. The late Carnap and Kuhn shared the ideas of theory-ladenness of meaning, untranslatability, and language or conceptual scheme changes in science, but Popper and Kuhn shared the idea of theory-ladenness of observation and belief in some kind of evolutionary epistemology. Then again, as is widely known, logical empiricism and Popper were interested in the logical analysis of scientific theories and in finding *the* normative scientific method, while Kuhn shifted the attention to the dynamics of scientific change, to the role of historical data in philosophical theories, and to the cultural embeddedness of science. I think the most viable interpretation of the relationship between logical empiricism and historical philosophers of science is the one that highlights continuity via their shared belief in the central roles of observation and meaning. In this narrative, the thesis of theory-ladenness of observation and of observation language manages to turn the image of the

scientific language of positivism upside down. While observation was the ultimate bedrock of all knowledge in logical positivism, everything is at the mercy of theory in historical philosophers' models.

Gattei's observation that the semantic version of incommensurability uncovers a properly metaphysical dispute between Kuhn and realists is valuable (128–129). The question of the preservation of reference in theory transitions is not merely a problem of how and with what kind of theory to determine reference. There is a genuine disagreement between realists, who commit to a stable mind-independent ontology and natural kinds, and anti-realists for whom the existence of these is dependent on human thought. This may strike one as trivial, but the discussion on meaning change following the rise of the causal theory of reference shows that it is not. The debate simplified matters too much and found sometimes too easy solutions via the postulation of referential continuity. In accordance with this, Gattei correctly observes that Kuhn's philosophy is a challenge more to realism than to rationalism. However, it is not clear why Popper is uniquely taken to have managed to show that knowledge can be objective without being certain and why he alone is assumed to have saved philosophy from the foundationalist bankruptcy of logical empiricism and from the menacing threat of relativism. According to Gattei, the foundationalist mistake was to equate rationality in science with foolproof justification, which has turned out to be impossible to achieve. We are told that the consequence of this is not that knowledge is unjustified or irrational, nor that we need to accept Kuhn's idea that all knowledge and justification are relative to dogmatic paradigms. Popper's employment of deduction can allegedly be used to reveal inconsistent and invalid or mutually contradictory arguments although deduction cannot show us which theory is true or force us to choose one. Therefore, 'for Popper *rationality is not so much a property of knowledge, as a task for humans*' (210; emphasis in the original). This idea sounds very sensible, but is nevertheless a poor characterisation of scientific rationality and of Kuhn's position in the debate. If Gattei is right about Popper, Kuhn and Popper are closer on rationality than has been realised, with the difference that Kuhn characterises more precisely the role of rationality in human behaviour. Indeed, Kuhn's epistemic values do not determine theory choice either, but at least they give us some idea of the criteria that guide scientists in their theory choices.

It is laudable that Gattei pays so much attention to Kuhn's later philosophy, and he succeeds in introducing numerous aspects of it very well. Interestingly, Gattei's comments on Kuhn's so far unpublished book manuscript makes a potentially significant claim that the linguistic aspect was to dominate the book (138n2). However, it later becomes evident that even Gattei had to rely on secondary accounts of the book, not having read the manuscript himself (163n119). His thesis is that at the end of his career Kuhn was preoccupied 'almost exclusively [by] the linguistic and semantic aspects of scientific theories and conceptual dynamics.' Gattei sees in the late Kuhn's talk of structured lexicons a 'sort of post-Darwinian linguistic neo-Kantianism' (138–139). I think Gattei gets this essentially right although he should have spelled out the implications more clearly. Kuhn's linguistic turn hides yet another 'turn', a sort of neo-Kantian cognitive turn emphasised by Andersen, Barker, and Chen. It is true that 'the mentalist description' in the form of *Gestalt* switches disappears in Kuhn's later philosophy, but

it is taken over by another kind of mentalist discourse. Kuhn repeatedly outlined a theory, the central notions of which were mental or their public counterparts, such as 'lexicon', 'lexical structure', 'mental module', or 'neural mechanism'. Although the publicly observable outcomes of these were assumed to be manifested in linguistic forms, they themselves are something pre-linguistic, something that organises experience and makes the world understandable for us. This cognitive reading fits well with Kantianism that attracted Kuhn. Gattei discusses this and writes, for example, that 'lexicons function in the constitution of the phenomenal world' or that concepts in a structured lexicon 'bear an essentially pre-linguistic nature' (149–150). Ironically, Gattei draws our attention to these kinds of key passages but fails to recognise what they imply, i.e. the neo-Kantian cognitivist view of science.

These two books leave us with the observation that there are currently two main deficiencies in the Kuhn literature. The first is a need for a proper intellectual biography of Kuhn that would offer us a profound analysis of Kuhn's intellectual context. Of the two books under discussion, I don't think either gets this quite right. Preston emphasises probably too much Kuhn's 'continentalism', while Gattei ties him all too tightly to logical empiricism. As already mentioned, others connect Kuhn inherently to the Wittgensteinian tradition, and so on. There are now so many differing (usually short) accounts or allusions to thinkers and traditions which either directly or indirectly influenced Kuhn that someone should study this background in detail.

The other shortage is a general assessment of Kuhn's later philosophy. Gattei can be thanked for introducing this extensively. He rightly emphasises that Kuhn changed his view on a number of issues since the publication of *Structure* and he throws light on some changes in the meanings of basic terms (although I do not agree that there was 'a radical impoverishment of Kuhn's earlier insights', 164, 121). But even his treatment does not form a synthesis or a balanced general view of the later period. The problem is that Kuhn's early views and specifically *Structure* dominate too much of our image of his philosophy. This is understandable, because his cyclical model of scientific development is a powerful and memorable abstraction of the dynamics of science. But given that practically all the central concepts of his earlier philosophy disappear, e.g. 'paradigm', change their content, e.g. 'incommensurability' (scope restricted), 'revolution' (gradual speciation), 'meaning' (restricted to kind terms), and new ones emerge, e.g. 'lexicon', 'lexical structure', 'mental module', 'speciation', or receive a much greater role, e.g. 'evolution', it is time to look more closely at the rich view that arises out of this last period. The idea that scientific development should be seen as gradual and evolutionary becomes especially important in the late Kuhn, promising a significant change when contrasted with the earlier model of wholesale radical revolutions. This view is only reinforced when we learn that the intended final title of Kuhn's unfinished book was *The Plurality of Worlds: An Evolutionary Theory of Scientific Development*.

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Notes

- [1] ‘Though I had read none of Sir Karl’s work before the appearance in 1959 of the English translation of his *Logic der Forschung* (by which time my book [*Structure*] was in draft), I had repeatedly heard a number of his main ideas discussed ... These circumstances do not permit me to detail an intellectual debt to Sir Karl, but there must be one’ (Kuhn 1977, 267n2). Further, Kuhn says that he and Popper ‘saw a little bit of each other’ ‘at a fairly early stage’. Kuhn’s foremost thought then was that Popper’s idea that the later theories embrace earlier ones was not viable, as it was ‘too positivist’ (Kuhn 2000, 286). This kind of reductionist view was not at all rare at the time among philosophers of science, and fits well with the philosophy of logical empiricism.

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