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STUDIES IN SCIENTIFIC REALISM

André Kukla: *Studies in Scientific Realism*, New York & Oxford: Oxford University Press, 1998, pp. viii + 176, ISBN 0-19-511865-0, Hardback UK£ 35.00; US$ 67.50

The recent debate around scientific realism has taken an epistemic turn. The issue is no longer whether theoretical discourse is or is not assertoric (truth-valuable), nor whether theoretical discourse can be reduced to observational discourse. All sides of the present debate have left behind traditional instrumentalism and reductive empiricism. Instead, they endorse semantic realism which suggests that theoretical discourse (that is, statements about theoretical entities) should be understood literally and be taken to be assertoric and irreducible. In this setting, the philosophical reaction to realism challenges the grounds for the realists' belief in the existence of the unobservable entities posited by theories and in the truth of the assertions made about them. This reaction can take different shapes. But the dominant one, coming from van Fraassen's constructive empiricism, is that an empiricist cannot be rationally forced to be a scientific realist. In his view, an empiricist can understand scientific theories literally but remain agnostic as to the truth (or falsity) of their theoretical assertions. Besides, if an empiricist decides to accept a theory he accepts it not as true but as empirically adequate.

Studies in Scientific Realism is an important addition to the realism literature. Kukla tries to take a bird's-eye-view of the debate and to assess its overall potential. His project is both negative and positive. On the negative side, he tries to make a case for the thesis that the differences between scientific realists and anti-realists are irreconcilable: there are no non-question-begging arguments that either side can offer such that they can rationally persuade adherents of the rival position to switch sides. So, the corollary of Kukla's

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negative thesis is that the debate has reached a stalemate. On the positive side, he argues that, nonetheless, the rival positions in the realism debate are irreproachable: none of them can be faulted with errors of logic or fact. So, none of them is subject to compelling criticism which should force their adherents to abandon them. A corollary of his positive thesis is Kukla's search for an epistemology which allows for 'irreproachable irreconcilabilities'; hence, for an epistemology which, despite the stalemate of the debate, leaves space for philosophical business as usual.

Kukla takes epistemic scientific realism to be the very weak position that "it's logically and nomologically possible to attain a state that warrants belief in a theory" (p. 11). Thus put, however, scientific realism seems trivially correct. There are neither logical nor nomological reasons to exclude the *possibility* of attainment of a state of warranted belief in a theory. In particular, the negation of Kukla's scientific realism, viz. the thesis that it is logically or nomologically *impossible* to attain a state that warrants belief in a theory, requires that it is an *a priori truth* that the laws of logic and the laws of nature cannot license a state that warrants belief in a theory. But I think this is absurd. The anti-realist arguments which purport to undercut realism are neither logical truths nor nomological ones. Is, then, Kukla's characterisation of scientific realism a slip? The sure thing is that Kukla's characterisation of 'epistemic antirealism' is *not* the negation of epistemic scientific realism as defined by him. He takes epistemic antirealism to be the position that "we can never have adequate grounds for believing in any theory" (p. 11). Of course, 'we can never have adequate grounds for believing in any theory' does not imply 'there are no adequate grounds for believing in any theory', nor that 'having adequate grounds for believing in any theory is logically and nomologically impossible'. So, as defined by Kukla, the two rival positions are in fact consistent with each other. To put my reaction to all this in a positive way, I do not think that the scientific realism debate is about the (logical or nomological) possibility or impossibility of states of warranted belief in theories. Rather, I take it to implicate the following two questions: Given a literal understanding of theories, (a) under what circumstances, if at all, is it warranted to believe in their truth? and (b) can we have an adequate philosophical image of science if we leave the issue of

warranted belief in truth altogether out of the picture? Scientific realists respond to (a) that there are (actual) circumstances that warrant belief in theories and offer a negative answer to (b), whereas anti-realists (at least of van Fraassen's type) have shifted their position from stressing a negative answer to (a) to offering a positive answer to (b).

Having as the negative side of his programme to establish the irreconcilability thesis, Kukla examines in some detail well-known arguments in favour of each of the rival positions in order to show that each and every one of them begs the question against its opponent. So, Chapter 2 examines the argument from the success of science. Roughly put, the realist claim is that mature and predictively successful theories should be accepted as approximately true because their approximate truth offers the best explanation of their success. Anti-realists counter either that there are alternative non-realist explanations of the success of science (e.g. that the theory is empirically adequate) or that the realist argument, being an instance of a contentious mode of reasoning (Inference to the Best Explanation) is circular and begs the question against them. Kukla reviews this debate in some detail (and with new insights) in order to conclude that "the success of science fails to do the job it was designed for" (p. 26), viz. to shift the balance in favour of one of the two rival positions. A similar strategy is deployed in Chapter 3, which discusses the argument from scientific practice. Here Kukla casts some new light on the famous 'conjunctive argument for realism', i.e., that the practice of conjoining different theories, or theories with auxiliary assumptions, makes sense only under a realist approach. He acknowledges that constructive empiricism is damaged by this argument (pp. 29–30) and offers a new position, 'conjunctive empiricism', which is supposed to overcome this problem. However, I have argued elsewhere (*Scientific Realism: How Science Tracks Truth*, Routledge, 1999, pp. 208–211) that Kukla's alternative faces important problems. Chapter 4 applies the 'question begging' strategy to the argument from unification, first proposed by Friedman, and Chapters 5 and 6, to the argument from the underdetermination of theories by evidence. Kukla is forthright about his overall strategy: "it's a pretty close repetition of what I've had to say about dozens of arguments on both sides of the realism

debate: they are question-begging and redundant. I apologise for being tedious. But my material demands it" (p. 89).

But does it really? That depends on how one approaches a philosophical debate. If we leave aside all considerations of plausibility, and if we are only satisfied by a *proof* that a philosophical position is correct or incorrect, then we can easily reach a stalemate in any philosophical dispute. In particular, it is relatively easy to make adjustments to any philosophical position whatsoever such that it is rendered immune to disproof. Unless these adjustments are themselves open to philosophical criticism, based largely on considerations of plausibility, there can be, by default, little philosophical progress. Let's take an example. On more than one occasion, Kukla argues that certain moves that an anti-realist should make in reply to criticism are open to the charge of 'arbitrariness' (cf. pp. 26, 84, 89, 97). Take, for instance, his discussion of the so-called 'Vulnerability Criterion of Belief (VCB)' in Chapter 7, which Kukla attributes to van Fraassen. According to this criterion, if two hypotheses T1 and T2 are equally vulnerable (if, that is, there is no possible observation that disconfirms one of them but not the other), then if T1 is logically stronger than T2, we should not believe T1 (cf. p. 98). On this criterion, when faced with a choice between belief in the truth of a theory and belief in its empirical adequacy, we should not believe in its truth. But, by the very same token, when faced with a choice between belief in empirical adequacy and belief in the theory's being unrefuted, we should not believe in the empirical adequacy. So, van Fraassen's own recommendation of belief in empirical adequacy seems arbitrary, since weaker beliefs would be licensed by VCB. Kukla discusses all this, but he is not impressed by the charge of 'arbitrariness': "arbitrariness is not, by itself, a decisive counterargument against a philosophical position" (p. 26). Certainly, being arbitrary is not a logical fault of a position. But philosophical criticism cannot be only about logical faults, on pain of losing all its excitement.

As noted above, the positive side of Kukla's programme is to establish that both realism and anti-realism are irreproachable positions. Take two positions (e.g. scientific realism and anti-realism) which (a) are internally consistent and (b) cannot be proved to be false by deductive arguments with premises that both sides accept.

For Kukla, such positions would be ‘irreconcilable’. (This emerges from his discussion of irreconcilability on pp. 151–152.) But does that mean that none of them can be reproached? For him, a position is irreproachable if its endorsement involves no “mistake of fact or logic” (p. 153). I will not discuss here some putative problems of this understanding of ‘irreproachability’. For I want to note something more important. In his last chapter, Kukla embarks on an engaging project to outline what features an epistemology might have in order to allow ‘irreproachable irreconcilabilities’ between rival positions. He frames his investigation in terms of van Fraassen’s (*Laws and Symmetry*, Oxford: Clarendon Press, 1989, p. 178) identification of four basic epistemic theses:

(I) There can be no independent justification to continue to believe what we already find ourselves believing.
(II) It is irrational to maintain unjustified opinion.
(III) There can be no independent justification for any ampliative extrapolation of the evidence plus previous opinion to the future.
(IV) It is irrational to ampliate without justification.

For van Fraassen, endorsement of all four positions amounts to scepticism. He denies that his own Constructive Empiricism is scepticism because he endorses I and III but rejects II and IV. This mixture of theses is the kernel of what van Fraassen has called ‘New Epistemology’. Orthodox Bayesianism endorses I, III and IV and traditional epistemology endorses II and IV while denying I and III. Kukla notes that both the ‘New Epistemology’ and orthodox Bayesianism allow for ‘irreproachable irreconcilabilities’, whereas traditional epistemology does not (pp. 154–156). This last claim is contentious, I think, but can be left to the one side. What is important is that Kukla proposes another epistemology – he calls it “Epistemology X” – which endorses theses I and IV, and denies II and III. His motivation for this is that Epistemology X allows for ‘irreproachable irreconcilabilities’, while it ‘represents a less drastic departure from the traditional epistemology than does the new epistemology’ (p. 159). What, however, should be noted is that, as stated, Epistemology X is inconsistent. Epistemology X adopts I and IV and rejects II and III (i.e. it accepts not-II and not-III.) But IV together with not-III imply not-I. So, since Kukla accepts that ampliation requires

justification (IV), and also accepts that there can be independent justification of at least some ampliative extrapolation of the evidence plus previous opinion to the future (not-III), then he must accept that *there can* be independent justification to continue to believe what we already find ourselves believing (not-I). *Proof*: Given IV, it is irrational to ampliate without justification. Hence, Epistemology X requires justification for ampliation. The denial of III (i.e., not-III) asserts that there can be independent justification of at least some ampliative extrapolation of the evidence plus previous opinion to the future. Take those beliefs which have been formed by means of ampliative extrapolations for which there can be independent justification. Call them (collectively) J-type beliefs. Clearly, there can be independent justification for continuing to hold J-type beliefs, this being that they have been arrived at by justifiable extrapolations (better, by ampliative rules or methods that can be justified). So, there can be at least some independent justification to continue to believe what we already find ourselves believing (not-I). Hence, IV and not-III imply not-I. *QED*

One might object here that the foregoing proof would fail if Kukla were to restrict the range of the beliefs that principle I covers, viz., the beliefs for which there can be no justification, to those which are "gained at [our] mother's knees" (cf. van Fraassen, *Laws and Symmetry*, p. 178). Let's call them 'mother-knee' beliefs. If, the objection goes on, we take these 'mother-knee' beliefs to rely on the application of no rule of inference, then my foregoing counter-example, viz. J-type beliefs which are formed by means of ampliation based on evidence and previous opinion, is simply irrelevant to the scope of I. Plausible though it may sound, this objection rests on an ad hoc distinction between 'mother-knee' beliefs – which are supposed to be ampliation-free – and other beliefs – which are supposed to involve ampliation. But even if we were to grant such a distinction, it seems impossible to say exactly which beliefs should count as 'mother-knee' beliefs. And even if we succeeded in this and just deemed 'mother-knee' beliefs exactly those beliefs that have been formed or acquired without any kind of reasoning, it is extremely doubtful that they would provide anything but a very slender basis for building upon them anything else we come to believe. Besides, in formulating thesis I Van Fraassen speaks of

beliefs that "tradition and ourselves of yesterday tell us" to have (cf. ibid.). Hence, it is not clear at all – nor does Kukla seem to imply – that the beliefs covered by I are just the 'mother-knee' beliefs. Rather, it seems clear that most – if not all – of the beliefs licensed by 'tradition and ourselves of yesterday' have been the products of previous applications of ampliative reasoning. So, I think, the foregoing proof of inconsistency in Kukla's Epistemology X stands intact.

Having said this, Kukla's Epistemology X may be modified to assert just IV (and hence to reject I, II and III). But this – let's call it Epistemology X′ – does not come to much. IV and not-III do not logically imply II. So, Epistemology X′ is consistent and weaker than traditional epistemology, while it allows for 'irreproachable irreconcilabilities'. Yet, there is a kind of tension (though not a logical inconsistency) among IV, not-III, not-II and not-I (that is, within Epistemology X′). For if (IV) ampliation requires justification *and* (not-III) there can be independent justification for ampliation *and* (not-I) there can be independent justification to continue to believe what we already find ourselves believing, then it becomes a big mystery how (not-II) it is *rational* to maintain unjustified opinion. To be sure, an opinion P is not necessarily the product of reasoning. One may just come to hold P for no reason at all, nor via any method. So, there are circumstances in which one may come to hold an unjustified opinion P. But surely, *if* we accept that (IV) ampliation requires justification *and* that (not-III) there can be independent justification for ampliation *and* that there can be independent justification to continue to hold an opinion, then under the circumstances mentioned above, we would be inclined to say that holding an *unjustified* opinion P is *not* rational. For, IV, not-III and not-I imply that there *can* be justification for holding P, and hence the rational attitude would be to seek for this justification of P and not just to maintain P without justification. So, even if a weaker Epistemology X′ is consistent, theses IV, not-III and not-I do not sit particularly well with not-II.

To sum up, Kukla's 'Epistemology X' fails. Epistemology X′ – its possible substitute I have suggested – though weaker than traditional epistemology in the letter, is not so in the spirit. In accepting II, traditional epistemology sets a prohibition against maintaining

unjustified opinion. Epistemology X′ does not officially accept II, but unofficially it might well have to do it. These remarks leave Kukla with a pressing problem. If traditional epistemology leaves no space for irreproachable irreconcilabilities, and if Epistemology X′ is not sufficiently different from traditional epistemology, then his positive programme, viz., the search for an epistemology which allows for irreproachable irreconcilabilities, might betray his intentions and collapse to either van Fraassen's voluntarism or to orthodox Bayesianism.

I have been critical in my review of Kukla's book. But this is, for me, an indirect way to show my admiration of *Studies in Scientific Realism*. It is dense and provocative. The argumentation is rigorous and detailed throughout. It is not an easy read, but the reader's perseverance is amply rewarded in the end. Kukla makes a strong case for his irreproachable irreconcilabilities in the scientific realism debate. Even if this case is not, in the end, persuasive, all interested in the realism debate will appreciate Kukla's effort.

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