

R E V I E W

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VINCENT F. HENDRICKS

*Mainstream and Formal Epistemology*

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Knowledge, its nature and grounds, are perennial philosophical issues. In the contemporary philosophical landscape, the topic is located in two places. One is the more traditional discussion, with a constant look over the shoulder at the pursuing skeptic. Such discussions do not, characteristically, apply the techniques of formal logic. The other is a suburb of modern logic, and approaches the notion via the construction of epistemic logics, and the deployment of other formal tools. As Hendricks observes in the preface of his book, these two engagements have been carried out largely in isolation from each other. An aim of the book is to engineer some sort of rapprochement.

The key notion in this is what Hendricks calls ‘forcing’. He links this (pp. 1–2) with the sort of construction used to provide independence results in set-theory (and in connection with intuitionist logic), but as he admits in a footnote, his use of the word really has nothing to do with this. Forcing, as he uses the term, is a technique for dealing with the skeptic. He explains as follows (p. 2):

[W]henver skeptics cite possibilities of error as arguments against knowledge claims, the strategy is to show that, although they are possibilities of error, they fail to be *relevant* possibilities of error. Some possibilities of error are simply not genuine—they are too remote, too speculative, or too much. These possibilities may accordingly be *forced* out and are henceforth not to be considered during the knowledge acquisition process. If the agent can succeed over the possibilities deemed relevant, then that is good enough for knowledge—knowledge will, or should, exhibit all the classical characteristics under forcing.

The book unfolds as follows. Chapter 1 provides a brief overview. Chapter 2 gives a background for what is to come: skepticism, Gettier problems, and a

survey of the contemporary lie of the land for addressing their challenges. After that, the book falls into two parts. The first concerns non-formal discussions of knowledge. Chapter 3 discusses the varieties of reliabilism, such as Goldman's. Chapter 4 discusses various counter-factual accounts of knowledge, such as Nozick's and Dretske's. Chapter 5 concerns contextualist accounts of knowledge, such as Lewis'. The chapter also leads us into the second part of the book. This part concerns the deployment of the techniques of formal logic in the service of epistemology. Chapter 6 gives an overview of the fundamentals of epistemic logic, including non-monotonic epistemic logic, the problems of logical omniscience, multi-agent logics, and a bit of game-theory. Chapter 7 provides an overview of 'computational epistemology', that is, strategies for epistemic problem-solving and the various criteria for their success. Chapter 8 is devoted to what Hendricks calls 'modal operator epistemology'—essentially logical systems containing a combination of modal, tense, and epistemic operators. Finally, in Chapter 9, Hendricks pulls the various threads of the book together—though what emerges is not so much one coherent picture, as 'let 100 flowers bloom'.

Overall, the book is clear, knowledgeable, thoughtful, and would make a good text for a course on formal epistemology—though teachers might have to go over some of the technical details more slowly for students who do not have the appropriate technical background.

Hendricks says (p. ix) that forcing is a 'trendy way of defeating the skeptics'. Trendy, perhaps; a way of defeating the skeptic, I doubt. Suppose, for the sake of illustration, that what is at issue is whether you have two hands, and the skeptic uses a brain-in-a-vat argument.

According to reliabilism (Chapter 3), to be knowledge, something must be produced by a method that has a disposition to give the right results, and which, moreover, rules out 'all serious or "relevant" alternatives in which the belief would be false', as Hendricks says, quoting Goldman (p. 38). (Such worlds are forced out of consideration.) So far so good; but, surely, it is not enough that the method be reliable. We should at least have good grounds—for example, of an inductive kind—to suppose it to be reliable. (Consider the case in which a belief is produced by the first application of a method, about which you know nothing of its reliability. You would not call this knowledge.) Now, we may believe that we have two hands because we can perceive them, and perception is, let us grant, generally reliable. Do we know it to be so? It is not reliable if we are brains in vats. Thus, to suppose it to be reliable is to beg the question against the skeptic. As Hendricks effectively points out (p. 47), we do not know a priori that we are in the world of common sense, where perception is reliable.

According to counter-factualism (Chapter 4), to know that you have two hands, it must be the case that:

- (1) If you had not had two hands, you would not have believed that you do.

In assessing the conditional (1), we do not consider all worlds at which you do not have two hands, but only the most similar worlds at which you do not. (The others are forced out of consideration.) But again, from a skeptical point of view, the brain-in-a-vat world is arguably similar to our own: it could actually *be* our own. Thus, there are similar worlds where you do not have two hands, but where you do believe that you do; and so (1) is false. To claim otherwise is again to beg the question against the brain-in-a-vat skeptic.

For contextualism (Chapter 5), to know that you have two hands, it has to be the case that you have two hands in all the epistemic alternatives that the context requires you to consider. (The others are forced out of consideration.) Which worlds are those? When deciding how many gloves to buy, we do not have to consider the possibility that we are brains in vats. In the epistemology classroom, we do. But surely (as Hendricks in effect says, p. 76), this gives too much away to the skeptic. A knowledge that disappears as soon as the skeptic enters the room is one that would not trouble them at all. Finding epistemic solace in ignoring skeptical possibilities would seem to be no better than Hume's solace (*Treatise*, Book I, Part IV, Section VII):

Most fortunately it happens, that since reason is incapable of dispelling these clouds, nature herself suffices to that purpose, and cures me of this philosophical melancholy and delirium, either by relaxing this bent of mind, or by some avocation, and lively impression of my senses, which obliterate all these chimeras. I dine, I play a game of backgammon, I converse, and am merry with my friends . . .

In the second part of the book, the forcing construction appears canonically in the truth-at-a-world conditions for the epistemic operator. Thus, we read  $\Box\alpha$  as 'it is known that  $\alpha$ ', and the worlds come furnished with a binary accessibility operator,  $R$ , where  $wRw'$  means something like: given the information at  $w$ ,  $w'$  is an epistemically possible situation. The truth conditions for  $\Box$  are then the familiar:

- (2)  $\Box\alpha$  is true at  $w$  iff for all  $w'$  such that  $wRw'$ ,  $\alpha$  is true at  $w'$

The relation  $R$  serves to rule in (and coordinately, force out), certain epistemic alternatives.

There is much of formal interest in this part of the book, such as theorems concerning the relationship between conceptions of knowledge and the strengths of the modal systems which these justify (e.g., p. 141). The skeptic, though, largely disappears in this part of the book. Hendricks says briefly (p. 87) that 'modal epistemic axioms and systems may be viewed as measures of infallibility and replies to skepticism'. Doubtless, various principles can be deployed to block certain skeptical arguments. But there is certainly more to matters than this. Any modal/epistemic logic that has, as part of its very set up, logical truths of the form  $\Box\alpha$  does not answer skeptics, but simply rules them

out by fiat. For according to the skeptic, nothing of the form  $\Box\alpha$  is true, let alone logically true. All normal modal logics, which validate the Rule of Necessitation (if  $\vdash \alpha$  then  $\vdash \Box\alpha$ ), have logical truths of this form. Even the non-normal systems, which do not have the rule, have logical truths of this form. Thus, in the weakest non-normal system,  $S0.5$ , if  $\alpha$  is any truth-functional tautology,  $\Box\alpha$  is a logical truth. (See, e.g., Priest [2008], Section 4.4a)

To construct a modal/epistemic logic that does not stack the cards against the skeptic, we need a logic that has no logical truths of the form  $\Box\alpha$ . There are a couple of ways of constructing such a logic. One is to use neighbourhood semantics (which rate a brief mention on p. 112). According to these, a world,  $w$ , comes furnished with a set of sets of worlds  $N_w$  (roughly, the set of propositions that are necessarily true at  $w$ ), and

- (3)  $\Box\alpha$  is true at  $w$  iff  $[\alpha] \in N_w$ ,

where  $[\alpha]$  is the set of worlds at which  $\alpha$  is true. If there are worlds where  $N_w = \emptyset$  (worlds which, according to the skeptic, are ours), then for no  $\alpha$  will  $\Box\alpha$  be a logical truth. If such worlds can be ‘forced out’ of the interpretation, then skepticism will be defeated. But at least the model itself does not beg the question against the skeptic; we will have to deploy non-formal (philosophical) considerations. And these must not beg the question either—which, as we have already seen, they are in danger of doing.

The neighbourhood semantics still endorses some versions of logical omniscience (in particular the principle that if  $\vdash \alpha \leftrightarrow \beta$  then  $\vdash \Box\alpha \leftrightarrow \Box\beta$ ), which is obviously undesirable in any realistic sense of knowledge. To obtain a semantics that does not have any logical truths of the form  $\Box\alpha$ , and also does not validate any version of logical omniscience, we need to deploy techniques from the semantics of relevant logic. Specifically, we need to invoke the mechanism of impossible worlds. Worlds are of two kinds, possible and impossible, and we arrange things in such a way that for any  $\alpha$  there are worlds, maybe impossible, at which  $\alpha$  fails. (There are several ways of doing this. See Priest [2005], Chapter 1) Given the usual truth conditions for  $\Box$  (2), nothing of the form  $\Box\alpha$  will then be a logical truth. Skepticism can be defeated if the impossible worlds can be ‘forced’ out. But again, this must be by philosophical considerations. Hendricks does consider this kind of construction very briefly, but declares impossible worlds a rather curious strategy from a forcing perspective (p. 100): they are even worse than evil-demon worlds, which are, after all, at least logically possible. But this sells skepticism short. For real skeptics, one of the things one does not know to be true are logical truths. There must, then, according to them, be epistemic alternatives where such truths fail. This is exactly what a logically impossible world is. Privileging logic is a cheap way of defeating the skeptic.

In either of the ways indicated, then, we can construct a skeptical epistemic logic—or at least a formal semantics that does not beg the question against the skeptic. Indeed, we can construct semantics that verify the ‘skeptical schema’:  $\neg \Box \alpha$  (for all  $\alpha$ ). Of course, formal methods are never, of themselves, going to solve substantive philosophical issues. (With formal methods, and a little ingenuity, one can construct almost anything. The question will always be a philosophical one: why those constructions?) Nonetheless, formal methods serve to put into focus, sharpen, and suggest novel, philosophical questions. Hendricks’ book is a very welcome reminder of this important methodological point.

### References

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