Is there a good epistemological argument against platonism?

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One important disagreement within the philosophy of mathematics is over the existence of mathematical objects such as numbers. *Platonists* assert that mathematical objects exist, whereas *nominalists* deny their existence. According to platonists, mathematical objects are abstract: in other words, platonists think of mathematical objects as neither causally active nor spatially located. Nominalists tend to agree that if there were mathematical objects, then they would be abstract. But they claim that there are no mathematical objects.

Nominalists have various ways of arguing against platonism. For instance, they can try to provide nominalist accounts of mathematics which provide better explanations of the phenomena than the platonist competition. Nominalists also argue against platonism more directly. Of recent direct attacks on platonism, Hartry Field's (1988, 1989) is perhaps the strongest, and has certainly been the most-discussed.[1] As we shall see, it is – broadly speaking – epistemological in character. In their recent article 'Nominalism reconsidered' (2005: 520-523), John Burgess and Gideon Rosen contend that there is no good epistemological argument against platonism. They propose a dilemma, claiming that epistemological arguments against platonism either (i) rely on a dubious epistemology, or (ii) resemble a dubious sceptical argument concerning perceptual knowledge. I take it that impalement on either horn of the dilemma would seriously weaken Field's argument. In what follows, I will defend Field's argument by showing that it escapes both horns. I begin by reviewing Field's argument; then I take on (i) and (ii) in turn.

1. Field's argument against platonism

According to Field, platonists have no way of explaining the reliability of mathematicians' mathematical beliefs. He begins by claiming that platonists must accept that many of the mathematical beliefs held by mathematicians are true. (Mathematicians occasionally acquire false mathematical beliefs, when they are presented with a compelling but fallacious proof for

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[1] Important discussions of Field include Hale 1994, Burgess and Rosen 1997: 41-49, and Divers and Miller 1999. Szabó 2003 provides an illuminating survey of arguments for nominalism.

instance, but such beliefs are rare.) Field (1989: 26) maintains that this phenomenon 'is so striking as to demand explanation'. However, it looks difficult for the platonist to satisfy this demand. According to platonism, mathematical beliefs concern abstract mathematical objects. How, then, is the platonist to explain why so many of mathematicians' mathematical beliefs are true? As Field (1988: 230-1) emphasises, the acausal character of mathematical objects precludes any causal explanation of this phenomenon, but it is very hard to see what shape a convincing non-causal explanation could have.

Field does not argue that current platonist accounts of mathematics fail to explain the phenomenon: that would only show that there are no currently acceptable platonist accounts of mathematics. Instead, Field's point is that since mathematical objects are abstract, it seems *impossible* for platonists to come up with a theory which manages to explain the phenomenon. Every platonist theory of the nature of mathematics will make it mysterious why such a high proportion of the mathematical beliefs of mathematicians are true. And that is an objection, not to current platonist theories, but to platonism itself.

2. Field's argument does not rely on a dubious theory of knowledge

It is tempting to think that if mathematical objects were abstract, they would be beyond the reach of human cognition. One strategy for turning this nebulous idea into an argument against platonism is to propose necessary conditions for knowledge, or some other 'key epistemic notion', and then use these conditions to argue that we cannot know how abstract mathematical objects stand (see Burgess and Rosen 2005: 521). These arguments have a common structure:

(1)   For all propositions *p*, one cannot know *p* unless X.

(2)   For no mathematical proposition is it the case that X.

(3)   Therefore one cannot know any mathematical proposition.

Since platonists want to assert that we do know some mathematical propositions – for instance, that seventeen is a prime number – (3) is problematic. But can nominalists establish (3)? Burgess and Rosen point out that the difficulty is to come up with a suitable replacement for X. In Burgess and Rosen's view, any constraint on knowledge will have to be implausibly strong if it is to successfully rule out knowledge of mathematical entities.

We can illustrate this problem by looking at an earlier epistemological argument against platonism put forward (though perhaps not endorsed) by Paul Benacerraf. Benacerraf's argument assumes a causal theory of knowledge, specifically, that 'for *X* to know that *S* is true

requires some causal relation to obtain between *X* and the referents of the names, predicates, and quantifiers of *S*' (1973: 22). Since abstract objects are causally inactive, no causal relation can obtain between an abstract mathematical object and a knower; it follows that every claim that refers to a mathematical object is unknowable. Benacerraf's argument clearly has the structure I have just outlined. These days, Benacerraf's argument has little force, since causal theories of knowledge are no longer taken very seriously (see Maddy 1990: 41-48). Burgess and Rosen (2005: 521) are presumably referring to Benacerraf's argument when they write: 'The principle that one cannot justifiably believe in objects unless they exert a causal influence on oneself … is too strong and has consequences the nominalist does not want, such as the impossibility of knowledge of the future'.[2] If causal theories of knowledge are dubious, then *this* argument against platonism relies on a dubious theory of knowledge.

Whereas Benacerraf assumes a causal theory of knowledge, Field assumes no theory of knowledge at all. As we have seen, Field does not appeal to any constraint on what can be known; he invokes no principle governing *knowledge* – or any other 'key epistemic notion', for that matter. Instead, Field simply argues that platonists are unable to explain the accuracy of mathematicians' mathematical beliefs. What is being appealed to here is the doctrine that if an account of mathematics renders us unable to explain this phenomenon, it ought to be rejected – and that is not a theory of knowledge. Indeed, there is no need even to use the word 'knowledge', or any other term of epistemological evaluation, in framing Field's challenge.

Field is aware of the danger of relying on dubious epistemological assumptions: he mentions that 'almost no one' believes the epistemological premisses of Benacerraf's argument (1989: 25), and points out (1988: 233) that his own argument 'does not depend on any assumption about necessary and sufficient conditions for knowledge'. Field's argument cannot invoke a dubious epistemological theory, because it invokes no epistemological theory at all.

Burgess and Rosen 2005 recognise that not all epistemological arguments against platonism involve proposing necessary conditions for a 'key epistemic notion'. So they recognise that there are some epistemological arguments against platonism that do not rely on mistaken analyses of epistemic concepts. But sometimes philosophers claim that *any* epistemological argument against platonism has to be built on a dubious epistemological theory. For instance, Stephen Yablo writes:

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[2] Burgess and Rosen refer the reader to their 1997, where they cite Benacerraf explicitly.

> At one time ... [w]e had, or thought we had, good philosophical arguments to show that [numbers] did not exist, or could not be known about if they did. ... That form of argument is dead and gone, it seems to me. It requires very strong premisses about the sort of entity that can be known about, or that can plausibly exist; and these premisses can always be exposed to ridicule by proposing the numbers themselves as paradigm-case counterexamples. (Yablo 2001: 87, footnote omitted)

And even Rosen, in an earlier paper, claims that:

> There have been many attempts to undermine our pre-philosophical commitment to abstract entities. But in each case the argument may be shown to rest on one or another dubious claim in epistemology – typically, some version of the causal theory of knowledge. (Rosen 2001: 71, footnote omitted)

By showing that Field's argument does not rely on any theory of knowledge, we have shown that these claims are untrue. There is at least one epistemological argument against platonism which does not rest on any dubious epistemological claim.

3. Field's argument is not a sceptical argument

Burgess and Rosen 2005 sketch an epistemological argument against platonism which, they concede, does not rely on a dubious epistemology. The argument begins with the observation that mathematicians deduce their theorems from axioms via a chain of intermediate results. The opponent of platonism then asks: 'Now has anyone shown that the kind of process by [which] the axioms were arrived at is a reliable one, tending to lead to *true* axioms? Have the axioms been justified?' (Burgess and Rosen 2005: 522). Hardly anyone discusses these questions; and the mathematicians and philosophers who do discuss them disagree with each other over what the right answers are. The conclusion of the argument is that platonism is epistemologically problematic.

Platonists could respond by trying to come up with an account of how mathematical beliefs are justified. However, Burgess and Rosen favour a different strategy. They claim that the argument rests on the premiss that 'our basic mathematical assumptions require some sort of positive defence' (Burgess and Rosen 2005: 522) – an assumption which Burgess and Rosen try to defeat. Their argument against it relies on a parallel with the philosophy of perception: they

maintain that the corresponding principle concerning perceptual judgements generates a dubious sceptical argument.

Burgess and Rosen point out that scientists rely on ordinary perceptual judgements: for instance, they reckon quantities by inspecting measuring instruments. Burgess and Rosen then ask: '[H]as anyone shown that the kind of process by [which] ordinary perceptual judgements are arrived at is a reliable one, tending to lead to *true* judgements? Have ordinary perceptual judgements been justified?' (2005: 522). They point out that the philosophers of perception, who are the only people who investigate the epistemology of perceptual judgements, disagree with each other over how these judgements are justified (Burgess and Rosen 2005: 523). Nevertheless, it is unreasonable to ask us to suspend our faith in our perceptual judgements because the epistemology of perception remains unresolved. The sceptical argument 'We should suspend our perceptual beliefs because there is no consensus on what justifies ordinary perceptual judgements' is a bad argument. In Burgess and Rosen's view, it is no more plausible to think that we should suspend belief in our best mathematical theories because of the current state of the epistemology of mathematics.

Although Burgess and Rosen do not cite Field explicitly, it is clear that Field's argument against platonism is their target here.[3] I will now argue that Burgess and Rosen's criticism fails because it confuses issues of reliability with issues of justification.

We should begin by distinguishing two quite separate explanatory projects:

(a)   explaining how our beliefs come to be justified; and
(b)   explaining how our beliefs come to be reliable.[4]

Burgess and Rosen's formulation of Field's argument conflates these different projects. The question 'Have ordinary perceptual judgements been justified?' is quite different from the question '[H]as anyone shown that the kind of process by [which] ordinary perceptual judgements are arrived at is a reliable one, tending to lead to *true* judgements?'. The first of these belongs to project (a) whereas the second belongs to project (b).

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[3] Compare the discussion of Field's argument in Burgess and Rosen 1997: 41-49.

[4] These projects are distinct even if being justified is the same thing as being formed by a reliable process. For even if these are the same, then to explain how a belief comes to be justified, we have to do more than explain how it came to be reliably formed: we have to add the assertion that being reliably formed suffices for justification. Without this extra assertion, it will be a mystery why the nature of the belief-forming process is relevant.

The parallel Burgess and Rosen draw with the case of perception is faulty. The dubious sceptical argument concerning perception treats our failure to complete project (a) as reason to suspend our perceptual beliefs. The counterpart of this in the mathematical case would run as follows: 'Philosophers of mathematics have failed to explain what justifies our mathematical beliefs. Therefore we should suspend these beliefs.' That argument is, admittedly, not very good. But it is not Field's argument. As we have seen, his argument is not about justification: indeed, it can be mounted without using any 'key epistemic notion'. So Field's argument has nothing to do with project (a). Instead, Field presses the platonist to explain why our mathematical beliefs are reliable. This demand belongs to project (b). The current state of project (a) in the perceptual case is simply irrelevant to Field's argument. His argument only looks like a sceptical argument if we ignore the difference between the two explanatory projects.

To finish, let me explain what the true counterpart of Field's argument is in the perceptual case. Suppose that a certain philosophical account of perception made it mysterious how we could ever explain the reliability of our perceptual beliefs. Then the counterpart of Field's argument would conclude that this account of perception should be rejected. This argument does nothing to lead us towards scepticism. Its conclusion is that we should reject a particular philosophical theory – not that we should junk our perceptual beliefs. This accurately reflects Field's argument, which is directed against platonism, not against the claim that our mathematical beliefs are true.[5]

4. Envoi

I conclude that Burgess and Rosen have failed to show that there is no good epistemological argument against platonism. Field's argument escapes their dilemma, since it neither invokes a dubious epistemology, nor resembles the dubious sceptical argument to which Burgess and Rosen compare it.[6]

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[5] Field does indeed think that many of our mathematical beliefs are untrue. But he offers independent reasons for this stance: it is not the conclusion of the argument of his that I have been discussing here.

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