Published paper
Shalkowski, S. and Bueno, O. (2000) *A Plea for a Modal Realist Epistemology,* Acta Analytica**,** Volume 15.1 (24), 175 - 193.

A Plea for a Modal Realist Epistemology

(Abstract)

David Lewis's genuine modal realism postulates the existence of concrete possible worlds that are spatio-temporally discontinuous with the concrete world we inhabit. How, then, can we have modal knowledge? How can we know that there are possible worlds and how can we know the characters of those worlds?

In this paper we examine Lewis's attempts to provide an epistemology of modality and we argue that he fails to provide an account that properly weds his metaphysics with an epistemology that explains the knowledge of modality that both he and his critics grant. We argue that neither the appeals to acceptable paraphrases of ordinary modal discourse nor parallels with platonistic theories of mathematics suffice. We conclude that no proper epistemology for modal realism has been provided and that one is needed.

A Plea for a Modal Realist Epistemology*

Otavio Bueno

Scott A. Shalkowski

1. Introduction

One major problem for David Lewis's genuine modal realism is epistemological. How can we have knowledge of concrete objects that are spatio-temporally isolated from us? This question should be disambiguated as follows. How can we know that there are any concrete objects that are spatio-temporally isolated from us? How can we have the modal knowledge that we do, e.g., knowledge that there could have been blue swans or talking donkeys, if modal reality is as the modal realist claims?

Lewis is not unaware of epistemological concerns and he provides some reasons for believing in the existence of concrete possible worlds. Our aim in this paper is to clarify those reasons and to argue that they are insufficient to answer either of the epistemological questions posed. If we are correct, Lewis has done nothing to wipe the incredulous stares off the faces of his critics. In fact, to the extent that he succeeds in showing that modal realism is not paradoxical and is more satisfying than its rivals, his critics should still have a stare of incredulity, but now at the incredibly bad misfortune of having been shown the extraordinary virtues of a theory in which there is no reason to believe.

2 The Paraphrastic Argument

The first argument advanced by Lewis for believing that there are possible worlds is the paraphrastic argument *Counterfactuals*.

> I believe that there are possible worlds other than the one we happen to inhabit. If an argument is wanted, it is this. It is uncontroversially true that things might be otherwise than they are. I believe, and so do you, that things could have been different in countless ways. But what does this mean? Ordinary language permits the paraphrase:

---

* We are grateful to the audience at the 1999 Bled Conference on Epistemology for illuminating discussion.[1]
On the Plurality of Worlds, p. vii.

> there are many ways things could have been besides the way they actually are. On the face of it, this sentence is an existential quantification. It says that there exist many entities of a certain description, to wit ‘ways things could have been’. I believe that things could have been different in countless ways; I believe permissible paraphrases of what I believe; taking the paraphrase at its face value, I therefore believe in the existence of entities that might be called ‘ways things could have been’. I prefer to call them possible worlds.

This argument seems to show that modal concepts must be analysed by appealing to concrete possible worlds. Later he admits that other proposals might work for modal discourse, but fail on other counts. Modal realism is supposed to have the virtue of a kind of explanatory economy, even at extra ontological cost. Furthermore, one might grant that the language of possible worlds may be used to provide reasonable and illuminating paraphrases for our modal locutions but deny that this paraphrase commits one to the ontology of concrete possible worlds. There are at least three non-realist options available: the structuralist, non-cognitivist, and error theorist options. Modal fictionalism is a form of structuralism which embodies an acceptance of the possible worlds paraphrase of modal discourse without a realist attitude about those worlds. A non-cognitivist might permit the paraphrase as harmless but think that the original modal discourse, as well as the worlds paraphrase, have little to do with truth or objective reality. An error theorist might cheerfully accept the paraphrase as accurate and ontologically committing, but infer that all direct use of modal discourse and worlds paraphrases in assertions commits one to falsehoods, given the non-existence of the modal realist’s worlds. Worse, even if the main principles of the paraphrastic argument go unchallenged, the strongest conclusion that may be inferred is that there are, indeed, possible worlds. There are plenty who agree with Lewis that there are possible worlds but who also disagree with him over the natures of those worlds. Majority opinion among possible worlds theorists has been on the side of the ‘ersatz’ worlds regardless of the virtues of the paraphrastic argument. This argument, then, is unable to provide a good basis for believing in concrete worlds in the context of Lewis’s general philosophical strategy.

3. Pragmatic Reasons

Epistemological problems arise for modal realism because genuine worlds are concrete, spatio-temporal entities that are spatio-temporally isolated from all other worlds. If spatio-temporally isolated from each other, then all worlds are spatio-temporally separated from us and, so, causally separated from us.

In the 1960s and 70s epistemology was dominated by the thought that knowledge and epistemic justification had a causal component. To know something was to be or to have been in some causal contact with the truthmaker for the known truth bearer. Causal theories are somewhat out of fashion now, but a remaining element is that knowledge and justification require that the knower be in some relation to the known that explains the knower's reliability with respect to the known. For easy reference, let 'causal epistemologies' cover any epistemology that builds in some requirement of connectedness and reliability into knowledge and justification. *Ex hypothesi* we are not in spatio-temporal relations with genuine possible worlds so, according to causal epistemologies, there is no way to have justified belief in the existence of such worlds, much less justified beliefs about what such worlds are like or how many of them there are.

Fortunately for the modal realist there is another well-known case of a theory involving objects that are spatio-temporally isolated from us. Mathematics. A typical mathematician, it might be argued, thinks that mathematicians have knowledge of mathematics and that mathematical theories are about numbers, sets, functions, groups and the like. Mathematicians do not expect to find numbers, sets, functions or groups as they tour around their living quarters. They treat them as objects that are known by the rational examination of mathematical axioms and by deducing the logical consequences of those axioms, a procedure very unlike those used to gain knowledge about spatio-temporally located objects. Lewis takes heart in the work of mathematicians and thinks that there is a page out of mathematical epistemology that may be lifted for the sake of the modal realist.

In foreshadowing the structure of his defence of modal realism, Lewis says:

> I begin the first chapter by reviewing the many ways in which systematic philosophy goes more easily if we may presuppose modal realism in our analyses. I take this to be a good reason to think that modal realism is true, just as the utility of set theory in mathematics is a good reason to believe that there are sets. …Finally I consider the

> sheer implausibility of a theory [modal realism] so much at variance with commonsensical ideas about what there is; I take this to be a fair and serious objection, but outweighed by the systematic benefits that acceptance of modal realism brings.[1]

The basic structure of the defence is clear. We should think that modal realism is true because its assumption is useful in the construction of a philosophically fruitful theory. Granted this indication of his overall argumentative strategy is presented in a preface where one would not demand a detailed defence of its key elements. Nowhere else is a defence given, though. Lewis takes the detailed structure and its virtues to be obvious. Neither is.

Realists of various stripes are saddled with a common problem. They make ontological claims, and perhaps semantic claims, that they contend in some way 'transcend' the relevant epistemological facts of the case. Realists about physical objects might object to a phenomenalist thesis that such objects are the permanent possibilities of sensations. Realists about electrons might contend that 'Electrons exist' is not adequately analysed in purely observational terms alone.

These realists, though, must provide some reason to think that their favoured objects exist. By their own lights, they are not permitted to say that the obtaining of a sufficient set of epistemic conditions constitutes the existence conditions of these objects. Typically, though, they do invoke certain internal, epistemic criteria against which competing theories invoking different entities and their properties may be compared. If all the competing theories meet some minimum standards of coherence and verification, for instance, then the theory that fares best when compared to these standards is the one, at least for the moment, that we should believe to be true. Virtues invoked are typically those of consistency, coherence, simplicity, informativeness, explanatory power and the like.

An empiricist or an anti-realist about the objects in question might well query the point of invoking these theoretical virtues by the realist. An empiricist may be happy enough to grant that these are, indeed, theoretical virtues and that our best theory should have a good balance of them while at the very same time wondering why the realist should be entitled to appeal to such standards *in justifying the realist claim* that a theory is true, or that the objects exist and not merely as useful fictions. What, precisely, do coherence, simplicity, informativeness and the like have to do with truth? What is worse is that as informativeness increases the likelihood of the theory decreases. A more informative theory says more, makes more commitments, and is thereby more likely to get things wrong somewhere when compared with a less informative theory with fewer commitments. This is a general problem for realists who appeal to theoretical virtues.

Both realist and non-realist might well, also, wonder whether there is not a general conflation of pragmatic and epistemic reasons. Surely realists are not, simply by virtue of being realists, committed to turning all pragmatic reasons into epistemic reasons. Particularly a realist who holds out for a robust ontology, a substantial truth relation, or an explanation relation that is not merely pragmatic should want to admit theoretical space for pragmatic reasons for adopting a theory—for carrying on as though a theory is true—when one does not think that there is adequate epistemic reasons to think that the theory is, indeed, true. This admission is partly constitutive of many classic realisms. Thus, the form of Lewis's argument is problematic for the modal realist. Given the gap that the realist wishes to leave between epistemic considerations and truth, between epistemic conditions and existence, there should be corresponding gaps between pragmatic considerations and truth and existence as well as between pragmatic reasons and epistemic reasons. In short, why should anyone, particularly the realist, think that making our theoretical lives easier is a sign of truth?

Of course, for all we have said so far it is possible that the classes of pragmatic and epistemic reasons overlap. There is nothing in the definitions of such reasons that rules this out. What Lewis must provide, though, is some argument for thinking that this particular pragmatic reason is also an epistemic reason or else he must provide a general argument for thinking that all pragmatic reasons are epistemic, contrary to the intuitive demands of his realism.

Pragmatic arguments like the one used by Lewis are typically situated in the context of scientific realism, where the causal properties of postulated entities are held to explain, at the least, the observable phenomena. Submerged is the assumption that for a given domain of inquiry no false theory is as likely to present data that is systematisable in a manner that is as elegant and simple as a true one. However tendentious this assumption might be in the context of scientific realism, it is thoroughly unavailable to the modal realist, given the causal isolation of one world from another. What the modal realist must guard against when using an argument of the form 'We have most reason to believe T because it is the most useful theory we have' is the objection that modal realism is an instance of theft over honest toil, that there are a number of philosophical jobs that need to be done and the modal realist simply postulates worlds with certain characteristics to do these jobs.

It is easy to construe some objections to modal realism in this way. Lewis says that propositions are sets of worlds and that properties are sets of individuals. Basic insights into the natures of propositions and properties suffice to show us that the modal realist's story here must be wrong. Whatever propositions are, they are bearers of truth value and objects of belief. According to Lewis, propositions are sets of worlds, but worlds or sets thereof are not bearers of truth or objects of belief. To think otherwise is to think nonsense. Furthermore, I am not acquainted with innumerably many discrete concrete worlds when I believe that snow is white or that the Balkans is in turmoil. Another example. Whatever properties are they are attributes of objects that explain the way those objects behave under various conditions. Lewis takes properties to be sets of individuals. But, no collection of spatio-temporally isolated individuals can explain the behaviour of water or the flammability of petroleum products. Even if the modal realist says something interestingly illuminating about propositions and properties by calling to our attention sets of worlds or individuals, a critic might well maintain that this illumination derives from, perhaps, modal facts about propositions and properties rather than from the fact that these intensional entities are the sorts of things the modal realist says they are.[2]

Thus, there are substantial questions that must be addressed before anything like this pragmatic argument may be taken to give us good reasons to believe in the existence of the modal realist's worlds. If, in fact, theoretically pragmatic reasons of the sort adduced by Lewis for modal realism are, indeed, epistemic reasons, then the modal realist may claim reasons to believe in genuine worlds rather than merely reasons to carry on as though there were genuine worlds.

There is a deeper and somewhat more developed argument which centres on mathematics, one in which an analogy with mathematics itself does some work. It is this analogy that will concern us for the remainder of this paper.

4. Analogy with Mathematics

As an empirical claim, we contend that most mathematicians think that the advancement of their professional subject matter involves the advancement of knowledge. Knowledge of what, exactly? The surface syntax of mathematical assertions certainly gives the impression that mathematical assertions are

---

[2] Alvin Plantinga makes a similar complaint in 'Two Concepts of Modality : Modal Realism and Modal Reductionism', *Philosophical Perspectives* 1, 1987: 189-231.

about objects—numbers, sets, functions, groups, etc. To treat the surface syntax as referential in the way we treat much of our non-mathematical discourse is to create for ourselves an obvious epistemological problem. On the one hand, if those assertions are truly about mathematical objects, then there is no obvious available explanation of how we could come to know true mathematical propositions. On the other hand, it is hard to see how, contrary to the surface syntax, those propositions can really be about things that we can know to exist—a proof, for instance. Mathematicians seem to treat the method of mathematical proof as a method of discovery rather than invention or creation. Philosophers of mathematics face a dilemma: have an adequate account of the truth conditions of mathematical statements or have an adequate account of mathematical knowledge, but not both.[3]

Lewis thinks it obvious which option to prefer.

> It's too bad for epistemologists if mathematics in its present form baffles them, but it would be hubris to take that as any reason to reform mathematics. Neither should we take that as any reason to dismiss mathematics as mere fiction; not even if we go on to praise it as very useful fiction, as in Hartry Field's instrumentalism. Our knowledge of mathematics is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on mathematics.

The analogy between mathematics and modal realism is obvious. Philosophers have no business telling mathematicians how to do their business and no business telling them that they do not really possess mathematical knowledge. After all, philosophers are not renowned for their obvious successes at pushing back the curtains of ignorance and presenting clearly workable solutions to problems. It is not clear that the world's most revered political philosophers could manage to run world affairs any better than those who currently do. If there is a genuine choice between thinking that mathematicians know their business and go about their business obtaining knowledge on the one hand and thinking that our best epistemological theories show mathematical knowledge to be problematic, then no philosophical scruple about the necessary conditions of knowledge should take precedence. So much the worse for any philosopher who thinks that causal epistemologies should cast doubt on the legitimacy of the

---

[3] Paul Benacerraf famously made this point in 'Mathematical Truth' *Journal of Philosophy*, 70 (1973): 661–79.

standard interpretations of mathematical discourse and the standard means of obtaining mathematical knowledge.

If correct, this line of reasoning may be invoked by modal realists. They, like mathematicians, try to systematise an area of discourse and knowledge by appears to be about the existence and structure of objects causally unrelated to us. If the best approach to mathematical discourse and knowledge is to accept the obvious readings and truth conditions of that discourse and admit that we have knowledge of causally unrelated objects, then there can be no principled objection to doing the same thing with respect to modal discourse and knowledge. No causal conditions on knowledge and justification can be general, so they are no threat to the modal realists' claims that there are genuine worlds.

5. Disambiguating

The central feature of this argument by analogy is the choice that is presented. Which is 'more likely' to be true—mathematics or a philosophical theory? This choice is supposed to be obvious. There are textbooks full of generally-agreed-upon information about mathematical matters. Disputes are limited to what the majority of the experts acknowledge as peripheral or to issues on which acknowledged proofs are lacking at the moment. Outside of textbooks on elementary logic, there is little that is covered in philosophy texts that enjoys such widespread agreement among professional experts.[4] The choice, however, like the argument by analogy that rests upon it, is ambiguous and it is the ambiguity that gives the analogy its plausibility. It trades between platitudinous claims about mathematics and philosophical claims about mathematics.

It is a platitude that mathematicians possess a great deal of mathematical knowledge. They know the axioms of number theory and group theory. They know how to prove theorems from those axioms. They understand the conventions for interpreting algebraic equations and can go about finding solutions to a great many of them. If we let 'mathematics' refer to the unique professional activities engaged in by professional mathematicians and the published results of those activities, then there is no question that mathematicians know what they are doing, they know a great deal more about their subject matter than

[4] And there are substantial disagreements about the relations between standard, textbook classical logic and our pre-theoretical understandings of the nature of logical consequence, good argumentation, ordinary conditionals, etc.

do non-mathematicians and no small amount of hubris *is* required for non-mathematicians to make declarations to the contrary.

If the analogy with mathematics is interpreted in a stable fashion and if it concerns only the platitudes about mathematics, then there is absolutely no question that one should prefer the thesis that mathematicians possess a great deal of mathematical knowledge over any epistemological theory which says otherwise. There can be little dispute about these platitudes because mathematical practice is neutral with respect to many different accounts of the subject matter of mathematics. Within the obvious limits required by the demands of reflective equilibrium in our systems of judgments, any philosophical account of mathematics which conflicts substantially with mathematical practice fails to be an account of mathematics. Advances in both platonistic and nominalistic theories of mathematics should be, and typically are, consistent with the vast majority of mathematical practice—the acceptance of axioms, the proving of theorems, and the solving of equations.

If the argument by analogy limits itself to platitudes about mathematics, then the linchpin of the argument, the choice between mathematical practice and philosophical theory, is surely secure. It is clear, however, that if the argument limits itself to these platitudes, then it can provide Lewis with no reason for thinking that there are other concrete worlds besides our own. The platitudes make no mention of the nature of mathematical objects, whether mathematics is about objects of any kind at all, or the nature of mathematical truth and knowledge.

When limited to platitudes, the argument by analogy becomes this:

> Our knowledge of mathematics is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on mathematics. Likewise, our knowledge of modality is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on modality.

Mathematicians know what they are doing when they do mathematics in the sense set out. In the same way, Lewis is perfectly justified, at least at the initial stages of inquiry, to make a similar claim about modalised propositions. We have modal knowledge and any epistemology that seeks to cast doubt on modality is less secure. There is an analogy here, but it is one that is unnecessary for Lewis. He, like many others, quite rightly takes as his starting point for philosophical inquiry the considered judgments we are prone to make about a wide variety of topics. Disagreement among thoughtful and intelligent people, as well as mutually inconsistent pairs of such beliefs, are grounds to begin a process of winnowing the wheat from the chaff, with a more adequate theory in mind as the end result of this process. We can begin with the belief that most of us possess some mathematical knowledge and that mathematicians typically possess a great deal of it. We may also begin with the thought that most of us possess some modal knowledge and that some philosophers possess somewhat more. These are starting points and philosophical inquiry may involve revising some of these beliefs about our knowledge. No analogy is needed to establish that a body of reasonably well-entrenched beliefs and study embodies some amount of knowledge that is not easily dislodged by philosophical argumentation.

Not only is the argument unnecessary, when limited to platitudes about mathematics, it is irrelevant to Lewis's concerns. By virtue of being platitudes, the premises about mathematical practice and knowledge are neutral with respect to controversial theories about mathematics. In particular, they make no declarations about mathematical objects. Thus, platitudinous claims about mathematical knowledge contain no commitment to mathematical objects *qua* abstract objects causally and spatio-temporally isolated from us. The analogy so interpreted, then, does nothing at all to convince us that since we are committed to a body of secure knowledge of such objects in the case of mathematics, there is nothing devastating about the claims that we also have a body of secure knowledge of similar objects in the case of modality. The premises of the argument contains no such claims about mathematical objects, so this version of the analogy fails. The key move is secure precisely because the uncontroversial claims about mathematics are analogous to uncontroversial claims about modality rather than to the controversial ones Lewis is trying to justify.

What Lewis needs in order to justify the conclusion that there is no principled objection, based on the conditions of knowledge, to his claim that there is a multiplicity of concrete worlds is an analogy with mathematics which contains uncontroversial premises about mathematics and mathematical knowledge that involves our acquiescence in the thought that mathematics is about objects from which we are spatio-temporally isolated and that mathematical knowledge involves knowledge about those objects. Then if the linchpin move is secure, Lewis can evade general epistemological objections to this metaphysical view. In other words, Lewis needs an argument that is something like this:

> Our knowledge of mathematical entities is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on the knowledge of mathematical entities. Likewise, our knowledge of concrete worlds is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on our knowledge of concrete worlds.

On this version of the analogy, the conclusion is certainly what Lewis desires, but at the cost of a premise that is not platitudinous but controversial. What we can all grant is that in some sense mathematicians know mathematics. They have mastered a professional practice. That practice is useful for doing our accounts, building bridges that don't fall down, and for predicting the time and location of solar eclipses. One of the most contested issues in the philosophy of mathematics is of what, precisely, one has knowledge when one possesses mathematical knowledge. What Lewis needs in order for the analogy to yield a result that bears on belief about concrete objects is a premise that commits him to mathematical platonism.

The linchpin of the argument is now not secure at all. What Lewis asks us to grant, on this interpretation of the argument, is a premise to the effect that mathematical platonism is true. The choice that confronts us now is between mathematical platonism and an epistemology that casts doubt on the possibility of knowledge of platonistic entities. The choice is no longer obvious. We are choosing not between platitudinous claims about mathematics, mathematicians, and mathematical knowledge on the one hand and a dubious philosophical theory on the other. We must now choose between a dubious philosophical claim about mathematics and a dubious philosophical claim about knowledge. The questions is: Which is more dubious? We should fully expect that philosophers of different stripes will have good reasons for making different assessments about the relative merits of each. Even if one holds to the absolute right of mathematicians to dictate their discipline, *qua* mathematicians, it does not follow that they are privileged in their philosophical understanding of their own discipline. There is plenty of precedent for thinking that practitioners of a field are not automatically philosophical experts about their field of expertise. Listen to or read what practicing scientists say about their own sciences. Many describe 'the scientific method' in hopelessly näive inductivist terms. It would be foolish to feel compelled by appropriate professional humility and boundaries to think that philosophers of science who are not self-consciously revisionist in their attitudes are duty-bound to be näive inductivists. So, philosophers of mathematics should not be constrained by any platonism of practicing mathematicians.

Who will grant that our knowledge of mathematical entities—platonic, abstract, acausal entities—is more secure than out knowledge of a conflicting epistemology? Committed platonists. Lewis gives platonists who are not yet genuine modal realists a reason to be modal realists that they did not have before. Platonists must already resist any general epistemological theory which builds into knowledge or epistemic justification causal or spatio-temporal connections as necessary conditions.[5] Lewis points out, rightly, that (i) platonists cannot consistently complain about problems about knowledge of possible worlds simply because those worlds are causally isolated from us and that (ii) platonists should recognise that the theoretical moves that they take to be sufficient for mathematical knowledge may be used to secure modal knowledge.

The analogy as currently understood, however, has no power to do anything similar for nominalists or those who waver between platonism and nominalism. First consider the nominalists. For one reason or another they deny that mathematical knowledge of peculiarly mathematical entities is more secure than some incompatible epistemology. Whether for epistemological reasons or not, nominalists deny that there are any mathematical entities to be known, so the premise is not acceptable to them. Since the major claim about mathematical knowledge is not acceptable to them the similarity between platonist metaphysics and epistemology and genuine modal realist metaphysics and epistemology has no power to reasonably convince nominalists that there are no insuperable epistemological difficulties for modal realism.

There are two types of waverer: epistemological and metaphysical waverers. Epistemological waverer don't know what to think about the natures of mathematical truth and knowledge precisely because they do not yet have what for them are sufficiently convincing reasons for deciding whether there is or could be an adequate epistemology for abstract entities, which entails that they have no adequate reason for thinking that platonism should be preferred over causal epistemologies. The

---

[5] So far I have taken 'platonism' to cover those who think that the best semantics for mathematical discourse is a semantics that makes clear that mathematical assertions are about the existence and structure of abstract, acausal, spatio-temporally unlocated objects, that true mathematical assertions are true by virtue of the existence and structure of abstract, acausal, spatio-temporally unlocated objects, that some people possess some mathematical knowledge. This is typical, full-blooded platonism. Minimal platonism might adopt 'platonistic' semantics for mathematical discourse only, thus being an error theory about mathematical beliefs.

argument in this form simply displays the two theories and proclaims that one is more obviously true than the other. Epistemological waverers are perfectly within their epistemic rights to be unmoved by this declaration.

Metaphysical waverers are those who are undecided about platonism not because they have doubts about an epistemology of abstracta. They might be perfectly convinced that all causal epistemologies are bankrupt, but this conviction has nothing to do with their doubts about platonism. Their cause for wavering is metaphysical, involving doubts about the coherence of the very idea of mathematical objects. For the metaphysical waverer it might be true that the platonism is more secure than causal epistemologies, but that security purchases no preferential justification for genuine modal realism. A metaphysical waverer might already reject the kind of epistemological theory the force of which Lewis is trying to undercut with the analogy with mathematics. If the metaphysical waverer has no independent reasons for thinking there are other concrete worlds, this argument provides no others. If the metaphysical waverer has such independent reasons, the argument is completely unnecessary.

Our result is that the most that the analogy with mathematics can do to serve the modal realist’s cause is to show platonists that they can have no epistemological scruple against modal realism on pain of inconsistency. Precisely because the key premise must reflect commitment on a controversial issue in the philosophy of mathematics the argument has force only for those who already accept that controversial premise.

Lewis thinks that he has an answer to the charge that the argument has limited force and then only for convinced mathematical platonists. Of course it has this limited appeal, like any argument, but one to whom it does not appeal on platonist grounds has bigger problems already.

> To serve epistemology by giving mathematics some devious semantics would be to *reform* mathematics. Even if verbal agreement with mathematics as we know it could be secured—and that is doubtful—the plan would be to understand those words in a new and different way. It’s too bad for epistemologists if mathematics in its present form baffles them, but it would be hubris to take that as any reason to reform mathematics as

> mere fiction; not even if we go on to praise it as very useful fiction, as in Hartry Field's instrumentalism.[6]

Really, we should all be platonists. The surface syntax and semantics of mathematical discourse requires it. The ambiguity we examined earlier arises here as well. A 'devious' semantics for mathematics would show that the apparent platonistic commitments of mathematical discourse are merely apparent. The strong point that Lewis tries to make at this juncture is that any such nominalistic semantics will do violence to mathematics itself. It would effectively be a *reform* of mathematics, not an account of it as it stands.

One way in which nominalism might involve a reformation of mathematics is if it declares some part of mathematics illegitimate. A reformation might declare mathematical statements to be false that had been held by mathematicians to be true. Not because any fallacies were found in the application of accepted proof procedures, but because the assertion transgresses the bounds of meaningfulness or the accepted proof procedure involves unwarranted moves. The assertion involves nonsense even if it appears to have a legitimate sense. Certainly there is precedent for this kind of revisionism and is the kind of revisionism advocated by intuitionists.

Not all nominalism involve this kind of revisionism. Modal structuralism and mathematical fictionalism, for instance do not, by virtue of being modal structuralism or mathematical fictionalism, entail that anything that mathematicians call theorems should not have that privileged status. The intuitionist rejects certain classical theorems and certain classical rules of inference, but the structuralist and fictionalist need do neither. It is the revisionism that the intuitionist advocates that Lewis at least has a hope of rejecting because of its revisionary character. Who is the intuitionist to tell the mathematician that various items are not really well-justified theorems? Which is epistemologically more secure: mathematical practice or verificationist semantics? Obviously, this question is unlikely to have any force against an intuitionist, but at least it has force beyond convinced platonists. The modal structuralist and the mathematical fictionalist can come on board and agree with Lewis that classical theorems and inference rules have better standing than verificationist semantics, precisely because what is being compared is mathematical practice with a semantic theory.

---

[6] Lewis, *On the Plurality of Worlds*, p. 109.

Neither the structuralist nor the fictionalist, however, propose any reformation of mathematics of this kind. They propose to revise any platonism that is floating around in the heads of mathematicians and philosophers. We have confronted this problem before. Even if Lewis were warranted in basing his modal epistemology on the apparent inability of nominalists to deal with Benacerraf's dilemma in 1986, structuralists and fictionalists have made significant advances in their accounts of mathematical knowledge in nominalist terms, thus actually justifying the correlative thought that the surface syntax and semantics of mathematical discourse should not be taken as revealing the logical structure of that discourse.

Characteristically, Lewis anticipates that, contrary to his imaginative expectations, such advances are possible. He says that even if the nominalist project can be advanced so as to preserve all of classical mathematics along with its surface syntax and semantics yet without the platonistic ontology, the analogy with platonistic mathematics still serves his purpose.

> Even if there does turn out to be some ontologically innocent way to understand mathematics, still we have judged—and judged rightly, say I—that we did not require any such thing before we could have mathematical knowledge; we *would* have had mathematical knowledge even if it *had* been knowledge of a causally inaccessible realm of special objects.[7]

If nominalism turns out to be true, platonism is still consistent, possible, conceivable. If nominalism had not panned out, we would have had precisely the same basis for platonism as we currently have except for the existence of an adequate nominalism. Lewis's strategy seems to be exonerated. According to the rules within which he is operating, Lewis concludes that platonism is our best theory of mathematics because it is the most economical approach for doing justice to mathematics. If nominalism turns out to be workable, then it is the best theory of mathematics for the same reasons of economy. Lewis's strategy is to justify modal realism on precisely this basis. It is the most economical way to deal with a diverse variety of philosophical problems. It gives a unified account of what would otherwise require a hodge-podge of independent theories to solve the same problems.

---

[7] Lewis, *On the Plurality of Worlds*, p. 110.

This is the final way in which the conflation of mathematical practice and philosophical mathematics afflicts Lewis's strategy. However the platonism/nominalism dispute is resolved at the end of the day we would have had mathematical knowledge in the sense of knowing mathematical practices and procedures. Of course, if nominalism turns out to be true, we still have this kind of mathematical knowledge. Save for error theories of mathematics, accounting for what it is that mathematicians know *qua* mathematicians is what the philosophy of mathematics is all about. So, yes, if there is an ontologically innocent way to understand mathematics we do now and did then rightly judge that we could have mathematical knowledge irrespective of the success of nominalism.

What precisely does not follow if nominalism is possibly true is that we do, in a nominalistic world, have knowledge of a causally inaccessible realm. Consider cognisers in three different circumstances: one in a platonistic world and the other two in nominalistic worlds. Further, those in the nominalistic worlds differ only in that in one world there are no nominalists sufficiently clever to develop a nominalism superior to platonism, while the second has better fortune on this score. All three possess the same platonistic reasons, so the cogniser in the platonist and the one in the unlucky nominalistic world should both be platonists, according to Lewis's rules of engagement, while the cogniser in the fortunate nominalist world should be nominalist. Mathematical practice itself underdetermines the proper choice between platonism and nominalism. What tips the balance in the third case is the presence of a clever nominalist.

Now we can see more clearly the difficulties in conflating pragmatic and epistemic reasons. There is certainly this similarity: the worth of pragmatic and epistemic reasons are both relative to the existence of other reasons. In the absence of better tools, I have pragmatic reasons to drive a nail with an axe head when my only choices are the axe head, a newspaper and an electric lawn mower. The axe has the best combination of physical virtues which warrants me in using it for the task at hand. The relative worth of the axe head changes as soon as someone introduces me to a proper hammer. So, with epistemic reasons, reasons that warrant belief in a theory may cease to be sufficient in the presence of adequately strong defeaters. If the defeaters have a purely negative character they may undermine the worth of the original reasons without thereby justifying belief in any alternative theory. The result of the defeat may be that no theory is sufficiently warranted to justify belief, even if some are more warranted than others; they are all too poorly justified. If the defeaters are not purely negative, but count positively in favour of some alternative theory, then the result of the defeat is that an alternative theory is warranted in place of the first.

This shows that theoretical economy is insufficient to provide adequate epistemic grounds. What we typically require of epistemic reasons is a condition of dependence. Whether a theory is true or false should make some difference to our evidential situation. The modal realist can object that while this may well be an appropriate condition on epistemic reasons regarding contingent observable matters, it is singularly inappropriate for epistemic reasons about what is necessary. A fair point, but not quite sufficient.

Lewis says that quite general and *a priori* methods are appropriate to knowledge of necessities and possibilities. Let us grant this. What is still required is some story of how *a priori* methods are reliable as methods of acquiring knowledge. No theory must make it utterly mysterious how knowledge of a postulated ontological domain may be gained. It is precisely at this point that mathematical platonism fails. It is not merely that the platonist epistemology has not been worked out fully, but that so far there is no platonist epistemology which amounts to more than ‘there is a way of gaining mathematical knowledge’. There is much about our own mechanisms for acquiring knowledge that cognitive scientists and epistemologists have failed to discover, but they are able to gesture to (more than) a research programme for solving existing problems in a given theory. It is the complete inability to even point to a research programme that plagues the platonist. The analogy with mathematics is, once again, strong, but unhelpful for the modal realist.

Not all appeals to *a priori* methods suffer on this count. One might think that we have *a priori* knowledge of a range of matters, necessary or not, because we have certain innate knowledge of those matters and because the connections between human cognisers and the reality known *via* innate beliefs is that God, who has knowledge of such states of affairs, has constructed us in the act(s) of creation so that these ideas are veridical. An innatist epistemology like this might still need to answer questions about divine epistemology, but at least it provides some connection between our *a priori* methods and the facts of which those methods are supposed to give us knowledge.

Another slightly less contentious appeal to *a priori* methods might link *a priori* knowledge with the what we can know on the basis of the mastery of concepts alone. So long as there is some story to be told about how we acquire linguistic skills and how those are linked with concepts, then the appeal to *a* *priori* methods is not vacuous. Lewis does nothing analogous for his use of conceivability and the principle of recombination.

There is one strategy that is yet open to the modal realist. Lewis's strategy in *On the Plurality of Worlds* is a kind of check-list strategy. Bluntly, theorists should list on a chalk board all the problems that we want a theory to solve. There are many. Truth-conditions for modalised statements, the nature of propositions, the nature of properties, the nature of semantic content, the semantics of counterfactual conditionals. The list can go on and on. Lewis's strategy is to put up a rather large list and note those items on which his modal realism can solve the problem. If there is a way in which competing theories also have a solution, Lewis's theory gets a positive score relative to the alternatives when modal realism solves the problem better than all competitors. He claims that once we go down the entire list of relevant considerations modal realism wins. Not only does it have answers to many problems, it does so in a unified way. Other theorists might have answers to the same questions but at the cost of, for example, multiple primitive modalities, plus abstract propositions, a separate account of semantic content and speaker's meaning, etc. Lewis assumes that explanatory economy is a virtue and his theory has it in spades.

What, precisely, is on this check list? Is the item 'Has an account of modal knowledge' on this list or not? The non-realist will insist that this certainly should be an item on the list and, for the reasons given above, that modal realist most surely does not win on this matter. Worse, it is not just that some other theories fare a bit better, it is that the others at least can gesture toward an account of modal knowledge while modal realism leaves it an utter mystery.

Lewis should insist that 'Has an account of modal knowledge' not appear on the list in the first instance. He has not forsaken an account of modal knowledge, but has endorsed a very definite account. If he wins the day on sufficiently many items, then we should draw the conclusion that there are other concrete worlds in the same way that we should conclude that there are mathematical objects because platonism wins on the check-list for theories of mathematics.

At this point we have come full circle. Winning the check-list competition shows that if there are concrete possible worlds, then they would serve our philosophical purposes better than anything else for a wide range of problems. But, this is simply conditional. The suggestion that winning the check-list competition must be supplemented by an argument for the conclusion that sufficient pragmatic justification for using a theory is *ipso facto* epistemic justification for believing the theory to be true. No such argument has been given by the modal realist. Without some such argument, the realist leaves it an utter mystery how one could be as mathematically reliable as mathematicians are. Without such an argument, the realist is completely without an accompanying epistemology and without hope of finding one. Thus, we plead with the modal realist to provide a distinctively modal realist epistemology. Were one provided it would provide at least a research programme for mathematical platonists to solve their own epistemological problems. A challenge worth taking up.

School of Philosophy
University of Leeds
Leeds, LS2 9JT
UK

phloab@leeds.ac.uk
s.shalkowski@leeds.ac.uk