REALISM WITHOUT PAROCHIALISM

Phillip Bricker

University of Massachusetts Amherst

I am a realist of a metaphysical stripe. I believe in an immense realm of "modal" and "abstract" entities, of entities that are neither part of, nor stand in any causal relation to, the actual, concrete world. For starters: I believe in possible worlds and individuals; in propositions, properties, and relations (both abundantly and sparsely conceived); in mathematical objects and structures; and in sets (or classes) of whatever I believe in. Call these sorts of entity, and the reality they comprise, *metaphysical*. In contrast, call the actual, concrete entities, and the reality they comprise, *physical*. Physical and metaphysical reality together comprise all that there is. In this paper, it is not my aim to defend realism about any particular metaphysical sort of entity. Rather, I ask quite generally whether and how any brand of realism about metaphysical sorts of entity could be justified?[1]

Belief in metaphysical sorts of entity does not rest upon acquaintance, or anything analogous to perception; by definition, we bear no causal relations to them. If we have beliefs about such entities at all, it is by way of description, through theories that postulate their existence. Thus, the question of belief in metaphysical sorts of entity may be shifted to the question of belief in metaphysical theories. I believe in metaphysical sorts of entity because I believe theories postulating their existence to be true, to provide an accurate description of what there is.[2]

What criteria do I use in deciding which metaphysical theories to believe? Of course, if a theory is internally incoherent, it can be rejected out of hand. One way for a theory to be internally incoherent is for it to be logically inconsistent, but I suppose there are other ways. Moreover, if a theory is unfaithful to the notions it aims to elucidate, be they notions of ordinary or of scientific thought, that too is a form of incoherence; it too can be rejected out of hand. Unfortunately, however, criteria of coherence appear to leave the choice of metaphysical theories vastly underdetermined. What to do? Enter here the broadly pragmatic criteria. According to conventional wisdom, we should believe theories that, on balance, are more fruitful, simple, elegant, unified, or economical than their rivals. We should believe pragmatically virtuous theories. It won't matter, for this paper, what a complete list of the pragmatic virtues would look like, or how the virtues are to be weighed one against another. The problem I want to discuss would remain even if only one pragmatic virtue played a role in deciding which metaphysical theories to believe.

The problem is this. It is one thing for a theory to be pragmatically virtuous, to meet certain of our needs and desires; it seems quite another thing for the theory to be true. On what grounds are the pragmatic virtues taken to be a mark of the true? It is easy to see why we would desire our theories to be

[1] I mean nothing fancy by 'realism': to be a realist about some sort of entity is just to believe that entities of that sort exist.

[2] I use 'metaphysical theory' broadly to include any non-contingent theory that postulates metaphysical sorts of entity; it may be a mathematical or a semantical theory.

pragmatically virtuous: the virtues make for theories that are useful, productive, easy to comprehend and apply. But why think that metaphysical reality conforms to *our* desire for simplicity, unity, and the other pragmatic virtues? Moreover, standards for simplicity, unity, and the like have been notoriously difficult to pin down objectively; it seems such standards may differ from culture to culture, era to era, galaxy to galaxy. Why think that metaphysical reality, even if simple and unified by some standards, conforms to *our* standards for simplicity and unity? Believing a metaphysical theory true because it is pragmatically virtuous leads to parochialism, and seems scarcely more justified then, say, believing Ptolemaic astronomy true because it conforms to our desire to be located at the center of the universe.

Here I take my stand as a realist. I deny categorically that the pragmatic virtues of metaphysical theories are a mark of the true. Do I then abjure the use of pragmatic criteria in metaphysics? Not at all. The pragmatic virtues, I maintain, serve as criteria of acceptance, without serving as criteria of truth, or of reasonable belief. What I mean by 'acceptance' is this. Suppose I want to write the book on metaphysics, to develop a grand unified theory of what there is. Of course, I want the book to be *true*. I also want the book to be *systematic* and *comprehensive*. It should include precise explications of all the fundamental concepts of our ordinary and scientific thought; it should be a complete articulation of our conceptual scheme. But I also want the book to be *succinct*. Metaphysics, after all, is a human endeavor. There is no expectation that all true metaphysical theories will earn a place therein. In particular, when different theories cover more or less the same ground, all but one may be omitted without sacrificing comprehensiveness. The metaphysical theories I accept are just those I would include in the book, in a grand unified theory of metaphysics.

I thus distinguish between acceptance and belief. I accept a metaphysical theory in part because I believe it true and in part because I would include it in the best comprehensive, succinct systematization of our fundamental ordinary and scientific beliefs. Pragmatic criteria of theory choice are relevant only to the goal of systematization, not to the goal of truth. I recognize no presumption that the more fruitful, simple, elegant, unified, or economical theory is more likely to be true; no presumption that reality is made in our image.

Call the view that I endorse *absolute realism*, or *absolutism*. It holds, first, that the notions of truth and reality are absolute: the metaphysical theories that are true for us are true for the Alpha Centaurians, true for all actual and possible thinkers. And it holds, second, that the notion of reasonable or rational belief is absolute: the epistemic principles that are correct for us, are correct for the Alpha Centaurians, correct for all actual and possible thinkers; and the correct application of these correct principles would lead all thinkers to belief in the same metaphysical theories (or to none at all).[3] Call any realist view that opposes either or both of these claims *parochial realism*, or *parochialism*.

One of the opponents I have in mind is David Lewis. Lewis squarely rests his defense of realism about possible worlds on pragmatic grounds. At the beginning of *On the Plurality of Worlds*, he writes:

---

[3]Of course, I do not assume that all thinkers are capable of discovering the correct principles, or of correctly applying them, even if discovered.

"Why believe in a plurality of worlds? – Because the hypothesis is serviceable, and that is a reason to think that it is true."[4] According to Lewis – and I concur – possible worlds and individuals have proven enormously fruitful in diverse areas of philosophy. They provide "the wherewithal to reduce the diversity of notions we must accept as primitive, and thereby to improve the unity and economy of ... total theory...." (P. 4). And, for Lewis, such theoretical benefits provide good (though not conclusive) reason for believing that possible worlds and individuals exist. Lewis has not, so far as I know, acknowledged that the use of pragmatic criteria leads to parochialism (in my sense); but I do not see how it could plausibly be denied.[5]

In this paper, I examine the prospects for absolute realism, for realism without parochialism. My aims are extremely modest. I do not expect to sway a content parochialist, much less an ardent renouncer of metaphysical sorts of entities. There is no thought of *proving* my basic conviction, that a parochial foundation for belief is no foundation at all. Nor will I attempt to provide an alternative foundation. My chief concern will be to show how absolutism can be reconciled with the free and inevitable use of pragmatic criteria of theory choice. In particular, I ask: what must one presuppose about metaphysical reality to ensure that the use of pragmatic criteria will not lead one to accept false theories. I argue that an absolutist must posit a vastly greater metaphysical reality then the parochialist ever would or could accept. Pragmatic criteria must be seen as selecting from, rather than determining, what is metaphysically real. I conclude the paper by discussing briefly the views that I oppose.

The problem of pragmatic criteria in theory choice has been more often discussed in relation to scientific theories, than in relation to metaphysical theories.[6] I shall have little to say here about scientific realism. In my view, the cases are substantially different. The choice of scientific theories is based in large part upon inductive and causal-explanatory criteria that play no role in the metaphysical case.[7] These criteria are not, in my view, essentially pragmatic; that is to say, although theories that satisfy these criteria tend to be pragmatically more virtuous than those that do not, the epistemic ground of these criteria is independent of their pragmatic consequences. Thus, pragmatic virtues are selected, not for their own sake, but because they ride piggyback on inductive and causal-explanatory virtues. Those pragmatic virtues that are systematically selected in this way may indeed be a mark of the true. But they are no more a ground of truth, I would argue, in science than in metaphysics.

---

[4]*On the Plurality of Worlds* (Oxford: Basil Blackwell, 1986), p. 3.

[5]Other opponents – for example, Putnam and Quine – openly embrace parochialism. Quine has recently written: "The very notion of object, or of one and many, is indeed as parochially human as the parts of speech; to ask what reality is really like, however, apart from human categories, is self-stultifying. ... Positivists were right in branding such metaphysics as meaningless." "Structure and Nature," The Journal of Philosophy 89, January, 1992, pp. 5-9.

[6]See, for example, Bas C. van Fraassen, *The Scientific Image* (Oxford: Clarendon Press, 1980), pp. 87-96; Richard Boyd, "Observations, Explanatory Power, and Simplicity: Toward a Non-Humean Account," in *Observation, Experiment, and Hypothesis in Modern Physical Science*, P. Achinstein and O. Hannaway, eds. (Cambridge, Mass.: MIT Press, 1985), pp. 42-94.

[7]We do say that metaphysical, as well as scientific, theories have "explanatory power." In the case of metaphysical theories, I take it this is an amalgamation of pragmatic features involving fruitfulness, unification, and perhaps others. By causal-explanatory criteria, I have in mind principles that support inference to the existence of unobserved, and even unobservable, causes.

* * *

I reject the use of pragmatic criteria as grounds for truth or reasonable belief, not as grounds for acceptance. When the parochialist makes use of pragmatic criteria in a decision to accept some metaphysical theory, I want to be able to do so as well. The dispute between absolutism and parochialism, as I see it, need have little effect upon metaphysical practice; it is a dispute over the best interpretation of that practice.[8]

Suppose then that a parochialist uses pragmatic criteria to choose one among a class of competing theories. An absolutist who wants to match that choice has two basic strategies at his disposal. He can find epistemically correct, non-parochial criteria that dictate the same choice, thus showing that the pragmatic virtues of the chosen theory ride piggyback on non-pragmatic virtues. Unfortunately, this strategy has limited use when dealing with metaphysical theories. Or, as a second strategy, the absolutist can argue that the theories in question should *all* be believed true – or, at least, believed true to the same high degree – in which case the pragmatic criteria serve only as grounds for acceptance, not as grounds for belief. That is the strategy I want to pursue in what follows. First, I will consider mathematical theories in some detail, where the strategy is familiar and more widely accepted; then I will briefly consider other metaphysical theories, and propose a parallel treatment.

There is no doubt that pragmatic criteria play a dominant role with respect to theory choice in mathematics. Theories that are fruitful and elegant earn a place within the body of mathematics; theories that are sterile or clumsy may earn a Ph.D., but are quickly forgotten. The use of pragmatic criteria in mathematics, however, is no threat to absolutism. The discarded theories, if consistent, are thought no less true for being sterile or clumsy. Pragmatic criteria determine which theories are worth pursuing and worth preserving for posterity, not which theories are true, or reasonably believed to be true.[9]

What if the choice is between logically incompatible theories, as frequently appears to be the case? The strategy has the onus of providing a plausible interpretation of the theories under which the *prima facie* incompatibility disappears. Otherwise, joint belief in all the theories would lead to belief in a logical contradiction. Consider the strategy's most famous application: the case of non-Euclidean geometry. On the face of it, Euclidean and the non-Euclidean geometries (say, of three dimensions) are logically incompatible theories: where Euclidean geometry asserts that through a point not on a line there is exactly one parallel to the given line, non-Euclidean geometries assert that there is no parallel, or more than one. If the geometrical terms, such as 'point', 'line', and 'intersect', have the same meanings throughout the different theories, then logic dictates that at most one of the theories be true. But modern mathematics treats all of these theories on a par: all are true, if any are. The solution, of course, assuming a realist interpretation, is

[8]Reconciliation has its limits. The dispute over the interpretation of metaphysical theories, we shall see, carries with it a dispute over the extent of metaphysical reality; and that dispute is genuine, not verbal.
[9]This is controversial with respect to set theory. Gödel, for one, held that the pragmatic consequences of accepting, say, the Continuum Hypothesis, were relevant to its truth or falsity. See "What is Cantor's Continuum Hypothesis", reprinted in Benacerraf and Putnam.

to hold that some or all of the terms are equivocal between the different theories. Once the equivocation is set right, the theories are seen not to be logically incompatible, and there is no logical obstacle to believing all of them true.[10]

The equivocation will be differently diagnosed on different methods of interpreting geometrical theories. It will be worth our while to consider the interpretation of geometrical, and, more generally, mathematical theories in some detail as preparation for the discussion of other metaphysical theories. Let us say, as usual, that an interpretation of a theory consists of a domain of entities, and an extension over the domain (of appropriate type) for each primitive, non-logical term of the theory.[11] The simplest diagnosis of the equivocation would be this: the Euclidean theory and the non-Euclidean theories are each *fully interpreted* theories, that is, each has a unique "intended" interpretation; but the "intended" domains of the theories are mutually disjoint. Thus, the Euclidean theory makes assertions about Euclidean points and lines, the various non-Euclidean theories about various non-Euclidean points and lines, and no logical incompatibility can arise.

But just what is a Euclidean or non-Euclidean point or line? The theories themselves do not tell us; nor do the geometers who present the theories. The view that geometrical theories are fully interpreted, each with a unique intended interpretation, does not accord with modern mathematical practice. On the modern approach, a geometrical theory serves to characterize a geometrical structure (or, in more abstract branches of geometry, a class of geometrical structures), but without singling out a domain of entities instantiating that structure. There are many equally intended interpretations; the terms of the theory are thus *partially*, not fully, interpreted.[12] Which interpretations count as intended? The theory itself tells us something about the relations among points and lines; only interpretations that satisfy the theory count as intended. (An interpretation *satisfies* a theory iff all assertions of the theory are true in the interpretation, using the standard model-theoretic account of truth.) What about denumerable, "Skolemized" interpretations that satisfy first-order formulations of the theory? Such interpretations are clearly unintended. I suppose that the geometrical theories are not formulated in a first-order way, so that the "Skolemized" interpretations do not satisfy the theories. That allows geometrical theories to be categorical, to determine their interpretation "up to isomorphism". Moreover, geometers sometimes – though not

---

[10] I pursue only realist interpretations of theories in this paper. Another familiar reaction to non-Euclidean geometry, endorsed by formalists and logical empiricists, treats geometrical theories – if mathematical, rather than physical – as wholly uninterpreted, and thus as lacking in truth value or ontological commitment. See, for example, Hempel, "Geometry and Empirical Science."

[11] If our metalinguistic framework includes set theory, then domains and extensions of predicates can be identified with sets (or classes) in the usual way. But when the interpretation of set theory is itself at issue, talk of interpretations must be reconstrued within a framework admitting plural quantification and quantification over relations. (Relations need not be taken *sui generis* if the framework includes mereology. See David Lewis, *Parts of Classes*, especially the appendix by Burgess, Hazen, and Lewis).

[12] I do not mean to suggest that there is not some perfectly good sense of 'meaning' according to which the meanings of the geometrical terms are fully determined, say, by their theoretical or conceptual role; but on my use, full meaning or interpretation requires determinate reference.

always – tell us more than the theory itself:  points are simple and have no proper parts; lines are composite and have points as their simple parts; points are intrinsic duplicates of one another; and, perhaps, points and lines are "mathematical", not "physical", entities.  I suppose that the intended interpretations satisfy these extra-theoretical constraints.  But nothing we are told, explicitly or implicitly, is intended to fully interpret the terms of a geometrical theory.

Ordinary geometrical assertions about points and lines are now seen to be doubly equivocal.  One equivocation is set right by relativizing to theory, for example, by replacing 'point', and 'line' by 'Euclidean point' and 'Euclidean line'.  The other equivocation we let stand, but without thereby forfeiting talk of truth.  A geometrical assertion about Euclidean points and lines, though equivocal, is true if true in all intended interpretations of Euclidean theory, and if there are some.[13]  The Euclidean theory itself is then true just in case some intended interpretation exists.  And, similarly, for the other geometrical theories.  (Of course, for axiomatized theories, one can speak more simply of intended interpretations of the axioms.)  Again, there is no logical obstacle to believing both Euclidean and non-Euclidean theories true.  Geometers rarely explicitly affirm belief in the truth of their theories; but such belief, I take it, is presupposed by the acceptance of the theory into the body of mathematics.[14]

I have said that a theory is true if true in some intended interpretation.  In other words, the theory is true if the theory and intentions together are true in some interpretation; that is, if the theory and intentions together are *consistent*.  Is consistency, then, the way to truth?  No, even supposing there is no problem about formulating the intentions, consistency is no easier (or harder) to find than truth itself, for two well-known Gödelian reasons.  First, given that mathematical theories are not first-order, there is no proof procedure in terms of which consistency can syntactically or formally be defined; consistency is thus itself a semantic notion, and cannot provide a non-semantic criterion of truth.  Second, even if we were (mistakenly) to interpret theories as first-order, and define consistency as formal consistency, we would have no general method for establishing the consistency of a theory without simply assuming the consistency of some stronger theory.[15]  Tying truth to consistency may serve to suggest the scope of truth; but it does nothing to provide a foundation.

I said there is no *logical* obstacle to believing all the geometrical theories true?  What about *ontological* obstacles?  Does believing all geometrical theories true step up demands on ontology?  Not on

---

[13]Here I suppose it natural to adapt the method of supervaluations:  an assertion is false if false in all intended interpretations, or if there are none; neither true nor false if true in some intended interpretations and false in others.

[14]One might prefer to view geometrical theories, not as partially interpreted, but as "Ramsified":  what appear to be predicates are instead second-order variables bound to existential quantifiers prefixed to the theory as a whole (or, better, the conjunction of its axioms).  Logically speaking, the differences are small: an equivocal predicate behaves logically just like a second-order variable (with appropriate range); and the presupposition of existence commits one to belief no less than its explicit assertion.  But to the extent that the differences are genuine, they favor the partial interpretation view as being closer to actual practice.  For a discussion of Ramsification as applied to set theory, see David Lewis, *Parts of Classes*, pp. 45-54, 139-144.

[15]We have no formal method, according to Gödel's second Incompleteness Theorem; and I know no reason to think there is some non-formal, accessible method.

the above characterization of intended interpretation. If each of the theories has some intended interpretation, then each has an intended interpretation over one and the same domain. That is because, on the usual model-theoretic account, nothing about the domain other than its size contributes to the satisfaction of the theory. And the extra-theoretical assertions, being the same for all of the theories, can all be satisfied by a single domain. Indeed, if we do not require that the domain consist of "mathematical" entities, then actual physical points (assuming there are continuum many), and fusions of physical points, will serve as an intended domain for both Euclidean and non-Euclidean theories. Of course, at most one such theory will have 'point' and 'line' interpreted, respectively, as the class of *physical* points and *physical* lines; but the other theories come out true under some non-physical interpretation. If, on the other hand, we require that the domain consist of "mathematical" entities, then a moderate belief in "pure" sets will meet the ontological demands of any ordinary geometry positing continuum many points; and to meet the demands of one is to meet the demands of all.[16]

As theories have thus far been construed, one can multiply belief without ontological cost because the intended interpretations are ontologically indiscriminate. That is a false victory for ontological parsimony. The present model-theoretic construal of truth for partially interpreted theories, though standard, does not seem to me plausible. Geometrical theories, I have said, posit a structure, and make assertions about whatever entities instantiate that structure. (I assume for simplicity we are considering only categorical geometrical theories.) Surely, whether or not some entities instantiate a posited structure is not solely a matter of their number; if it were, then geometrical theories would tell us *nothing* about which entities are points and lines. That is too much inscrutability. I think geometrical theories tell us that the points and lines, whatever they may be, instantiate the posited structure in virtue of their genuine, or *natural*, properties and relations. Call this genuine, or *natural*, instantiation: a domain of entities *naturally* instantiates the structure posited by a theory iff the theory comes out true under some *natural* interpretation over the domain, that is, some interpretation that assigns only natural properties and relations over the domain to the primitive, non-logical terms of the theory. I hold that, for any domain, irrespective of the nature of the entities, it makes sense to ask what natural properties and relations the entities stand in, and thus what structures the entities naturally instantiate. In general, only an infinitesimal minority of the classes of entities, and of the classes of n-tuples of entities, will be (or correspond to) natural properties and relations. The distinction between natural and unnatural properties and relations is indispensable to the task of describing what there is, be it physical or metaphysical reality. It belongs to the universal framework of all theories, and as such is no less a part of logic than the existential quantifier or identity.[17]

---

[16]The extra-theoretical mereological demands may be satisfied too, if we accept the thesis, defended by David Lewis in *Parts of Classes*, that the parts of a (non-empty) set are its (non-empty) subsets. Points will then be singletons; lines will be unions (fusions), rather than sets, of points.

[17]On the need for a sparse conception of properties and relations that distinguishes between the natural and the unnatural, see David Lewis, *On the Plurality of Worlds*, pp. 59-69. Lewis's discussion focuses, however, on natural physical properties and relations. Some of what he says does not apply, I think, to natural mathematical properties and relations. Thus, I do not hold that all natural properties are intrinsic, or that all natural relations are external. I do not hold that all natural properties and relations are qualitative:

The truth of geometrical theories, then, requires natural instantiation. Natural instantiation should be compared with *model-theoretic* instantiation, according to which, for any two domains of the same size, either both or neither instantiate the structure posited by a theory, and with *elementary* instantiation, according to which, for any two infinite domains, of whatever size, either both or neither instantiate the structure posited by a theory. Equating truth of a geometrical theory with there being some model-theoretic instantiation of the posited structure seems to me hardly more plausible than equating truth with there being some elementary instantiation. Neither, I think, captures the intentions of geometers. Let us say, then, that an interpretation of a geometrical theory counts as intended only if its domain naturally instantiates (henceforth, just instantiates) the structure posited by the theory; that is, only if the interpretation both satisfies the theory and is natural.[18]

Is the strategy of believing all geometrical theories true now ontologically demanding? That depends. In the case where we drop the requirement that geometrical entities be "mathematical", we can no longer expect the points of physical space to provide an intended domain for more than one geometrical theory, since the physical points presumably do not instantiate more than one geometrical structure in virtue of their natural metrical relations. A moderate belief in a plenitude of possible worlds, however, would provide all the theories with intended domains, assuming the structure of space is contingent. In the case where we keep the requirement that geometrical entities must be "mathematical", the mere existence of "pure" sets no longer suffices for truth. But the "pure" sets are rich in structure; they stand in myriad natural relations definable in terms of the membership relation. Familiar ways of interpreting Euclidean and non-Euclidean geometry within set theory – for example, by identifying points with tuples of real numbers, and real numbers with ... – show how natural set-theoretical properties and relations may be assigned to primitive geometrical terms in such a way that the theory comes out true.[19] Thus "pure" sets,

---

mathematical entities and domains have no qualitative character; their nature is determined by structure alone. I do not hold that "there are only just enough [natural properties and relations] to characterise things completely and without redundancy" (p.60). (In another place, Lewis suggests it would be "overbold" to think there are natural mathematical properties and relations other than, perhaps, a single primitive of set theory (for Lewis, the singleton relation). See, *Parts of Classes*, p. 51.)

[18]It might appear that in more abstract areas of mathematics – abstract algebra and algebraic approaches to geometry – the model-theoretic approach to interpretation has taken over: the "points" of an abstract "space", it is explicitly asserted, may be any set, relations between "points" may be any set of ordered pairs of "points", and so on. I dispute this. The arbitrary, non-natural interpretations are themselves objects posited by the theory; they are not used to interpret the theory. The theories of abstract mathematics, nowadays, are couched entirely in set-theoretic terms, and the question how to interpret them is just the question how to interpret set theory. And for set theory, I suppose, only natural interpretations are intended.

[19]I cannot discuss here three important questions: (1) Which set-theoretical properties and relations are natural? First-order definability in terms of the membership relation (and identity) is both too broad and too narrow: too broad, because even single disjunctions of natural properties need not themselves be natural; too narrow, because, for example, the ancestral of a natural relation is itself natural. In any case, I suppose that the set-theoretical properties and relations that come into the standard reduction of mathematics to set theory are all natural. (Note that a definition can be arbitrary, in the sense that there are others that are just as adequate, without the defined property or relation being unnatural.) (2) Is naturalness all or nothing, or a matter of degree? If naturalness is a matter of degree, does instantiation of structures

assuming *they* exist, provide intended domains for any ordinary geometry; and the strategy of multiplying belief need not yet result in multiplying entities.

Are all mathematical theories partially interpreted? The chief evidence for partial interpretation is this. Mathematicians are generally aware of the reducibility of mathematics to set theory, but they don't much care whether the basic entities of which they speak are taken *sui generis*, or are identified with pure sets. Either option is considered perfectly satisfactory.[20] When pressed about the existence of the entities, some turn formalist or structuralist; put them to one side.[21] Others maintain realism about the entities, and are aware that the two options are incompatible; but they nonetheless refrain from choosing between them. The choice is not considered to be a mathematical choice because it would make no difference to the truth of any mathematical theorem. Leaving the choice unmade is tantamount to leaving their theories partially interpreted.

This evidence obviously does not apply to set theory itself. But there are reasons for taking set theory as well to be partially interpreted. For one thing, there seems to be no end to the discovery of new, undecidable "axioms"; neither the axioms of Zermelo-Frankel set theory nor the iterative conception that underlies it seem able to determine the interpretation of the membership relation "up to isomorphism." Thus, many structures seem to be compatible with both the theory and the iterative conception. If only one such structure were instantiated, I suppose we could single out the membership relation as the relation of this instantiated structure. But what reason could there be for thinking that just one such structure is instantiated? Perhaps pragmatic reasons of ontological parsimony would support unique instantiation; thus a parochialist need not deny that set theory is fully interpreted on account of the undecidable "axioms". But an absolutist cannot support full interpretation in this way. Second, even if somehow our conception of set did manage to single out a unique relation between entities and the sets formed from those entities, the universe of "pure" sets would not yet be determined. For that depends upon singling out some entity to be the null set, and nothing set theorists say seems to come close to accomplishing that. Set theory tells us that the null set is the only set that has no members; and set theorists may add that it is a "mathematical" entity,

---

depend only upon the *perfectly* natural properties and relations, or is it itself a matter of degree? If instantiation is a matter of degree, is the truth of partially interpreted theories a matter of degree as well? Probably all are a matter of degree; but I will continue to speak as if they are all or nothing. (3) Is the distinction between natural and unnatural relations compatible with the joint identification of relations with sets of ordered pairs, and of ordered pairs with sets, given that there are many natural ways of identifying ordered pairs with sets? If not, either relations or ordered pairs will have to be taken as primitive entities, *sui generis*. For discussion, see Ted Sider, "Against Primitive Class Naturalism."

[20]For example – and examples could be multiplied – Herbert Enderton begins his chapter on the natural numbers: "There are, in general, two ways of introducing new objects for mathematical study: the axiomatic approach and the constructive approach." Either approach, he says, may be used to introduce the natural numbers. *Elements of Set Theory*, p. 66.

[21]We can bring them back as a last resort, but only if more straightforward interpretations of mathematical theories are known to fail. By "structuralism", I mean the view that mathematical theories are committed to the existence of structures only, not objects that instantiate the structures. See, for example, Michael Resnik, "Mathematics as a Science of Patterns." Another use of 'structuralism' is almost the opposite: one keeps the objects, but denies that they naturally instantiate structures, thus forcing a model-theoretic construal of theories. See David Lewis, *Parts of Classes*, pp. 45-53.

not an ordinary individual.  But since set theorists, as just noted, typically allow other "mathematical" entities that are memberless (but are members of sets), such as *sui generis* numbers or geometrical points, it follows that they do not intend to uniquely specify the domain of pure sets.  I conclude, then, that mathematicians leave all their theories only partially interpreted.[22] The task of fully interpreting them, of fixing references for mathematical terms, if it can be done at all, is left to the philosophers.

Can it be done at all?  There are two problems that need to be separated:  uniqueness and existence.  Consider first uniqueness.  Start with a categorical theory, such as (second-order) Peano arithmetic.  If I am right that this theory is partially interpreted by number theorists, then, relative to a context in which number theory is being done, there is no fact as to whether natural numbers are *sui generis* entities, or are von Neumann "numbers", or Zermelo "numbers".  One may stipulate, say, that 'natural number' means Zermelo "number"; that is, that 'zero' denotes the null set, that 'successor' denotes the singleton function, and that 'number' denotes the intersection of all classes containing the null set and closed under taking singletons.  One thereby creates a context in which the ordinary meanings of the arithmetic terms have been changed by narrowing the range of "intended" interpretations.  Relative to a context in which the stipulation is made, the following sentences are true:  'natural numbers are sets', 'two is the singleton of the singleton of the null set', and 'two is a member of three'.  If instead one stipulates that 'natural number' means von Neumann "number", one creates a context in which the first and third sentences above are true, but the second sentence is false.  The von Neumann stipulation has now become standard, and so stands as an established technical meaning for 'number' alongside its more ordinary meaning; thus today, in contexts where set theory is being done, the stipulation is presupposed unless explicitly denied.  Still, relative to any ordinary context, the three sentences above are neither true nor false.[23] Does the von Neumann or Zermelo stipulation fully interpret the arithmetic terms?  That depends, of course, upon whether the set-theoretic terms are themselves fully interpreted.

One may also stipulate that natural numbers are *sui generis*, or basic.  What does that mean?  I take it that *sui generis* natural numbers – if any there be – have no superfluous structure among themselves, no structure that they are not required to have by the Peano axioms (or the extra-theoretical axioms, if any).  I will say that a domain of entities *matches* a structure if it instantiates that structure, and no more inclusive structure.  I also suppose that the *sui generis* natural numbers stand in arithmetic relations only to one another.  I will say that a structure *isolates* a domain that instantiates it if the instantiating natural relations never hold between entities inside and outside the domain.  We have, then, the following:  a domain of

---

[22]Mathematicians do speak of *the* null set, *the* number three, *the* Euclidean plane.  But this, of course, is compatible with partial interpretation; such talk requires unique reference within each intended domain, not across intended domains.  Similarly, our use of 'the cloud' in ordinary English does not give evidence that we believe in a single object with an indeterminate border, a so-called "vague object".  See the following note.

[23]I treat ontological indeterminacy as analogous to vagueness.  Compare vague words of ordinary language (such as 'adult') which similarly may have one or more precise (or more precise) established meanings that are selected in certain contexts; and may for the nonce be given a precise (or more precise) meaning to serve some purpose at hand.

entities is *sui generis* relative to a mathematical theory iff the domain matches, and is isolated by, some structure posited by the theory.[24]

For any mathematical theory, one may stipulate that the entities posited by the theory are sui generis (still waiving the problem of existence). Does the stipulation fully interpret the theory, and thus uniquely fix the reference of its terms? Not if the theory fails to be categorical; at best it would narrow the range of intended interpretations to one for each structure compatible with the theory. Thus, I doubt the stipulation that sets are *sui generis* uniquely fixes the reference of 'set'. What about categorical theories, such as Peano arithmetic? Does the stipulation that natural numbers are *sui generis* uniquely fix the reference of 'natural number'? That would require a non-trivial version of the identity of indiscernibles. Consider: domains that match and are isolated by the same structure are identical. No; that is too strong. I am a realist about possible worlds, and I suppose that domains of worlds may match and be isolated by the same structure without the domains being identical; they may differ in their purely qualitative features. That suggests we restrict our attention to "mathematical" domains. Intuitively, what characterizes a domain as "mathematical" is that its entities, as well as all fusions of its entities, lack any intrinsic qualitative character. (I say an entity lacks intrinsic qualitative character if its intrinsic nature is entirely determined by the number of its parts, and the *pattern* of instantiation of natural properties and relations among its parts.) Would the stipulation that the domain is both *sui generis* and mathematical fully interpret a mathematical theory? One still needs an indiscernibility principle: mathematical domains that match and are isolated by the same structure are identical. I know of no reason to disbelieve the principle; but no reason to believe it either.[25]

It may be, then, that uniqueness of reference is impossible to achieve when dealing with metaphysical sorts of entity. But uniqueness is a side issue. On the partial interpretation approach, uniqueness is not required for truth. Existence is another matter. *I hold that every coherent mathematical theory is true, with or without the stipulation that the posited entities are sui generis.* That is ontologically quite demanding. It multiplies the number of basic kinds of entity well beyond what is needed for the truth of mathematics. It is time I said something to defend it. And what I say had better be compatible with absolutism: I do not want to replace a parochial desire for ontological uniformity with a no less parochial desire for ontological variety.

I ask first: why believe that every coherent mathematical theory is true? As noted above, a belief in pure sets would suffice, assuming the reducibility of mathematics to set theory; but my belief does not rest upon a belief in sets. For one thing, there is nothing special about my belief in sets; the reasons I have for

---

[24]I do not think isolation is part of the meaning of *'sui generis'*, as that phrase is commonly understood. Requiring *sui generis* domains to be isolated does not allow, for example, the *sui generis* natural numbers to be included among the *sui generis* integers; or the *sui generis* points of two-dimensional Euclidean geometry to be included among the *sui generis* points of three-dimensional Euclidean geometry. If isolation is left out, however, unique reference demonstrably fails. Infinitely many subdomains of Euclidean 3-space match the structure of the Euclidean plane.

[25]It wouldn't help to *stipulate* that a domain is mathematical only if it satisfies the principle; that would merely shift the problem from uniqueness to existence.

belief in sets apply, *mutatis mutandis*, to my belief, say, in natural numbers or in geometrical objects. For another thing, if I somehow discovered that set theory was incoherent and I had to retract my belief in sets, I would not also retract my belief in natural numbers or geometrical objects. My belief in sets, then, cannot be the sole support for those other beliefs.

How, then, do I support my belief in the truth of mathematical theories? Here is the barest sketch of an argument. I do not present it to convince: its premises are no less controversial then its conclusion. Consider the case of natural numbers. I understand Peano arithmetic. Moreover, I understand it as it is written, with existential quantifiers over entities called numbers, not in some devious way. (Partial interpretation, I insist, is not devious; if it were, then the standard understanding of vague language, and so of most of ordinary language, would be devious as well.) Understanding is a relation between a thinker and what is thought about, in this case, between me and domains that instantiate the Peano structure. If no such domains existed, I could not stand in this or any relation to them; relations hold only between what exists and what exists (in the broadest sense of 'exists'). Therefore, my understanding of Peano arithmetic entails the existence of domains that instantiate the Peano structure, that is, the truth of Peano arithmetic.

Of course, there are mathematical theories that I will never understand; and mathematical theories no human being will ever understand. But if the theory is capable of being understood by some actual or possible thinker, if it is in the broadest sense intelligible or coherent, then the above argument will apply. Or so says the absolutist: epistemic arguments must be the same for all actual and possible thinkers, and lead to belief in the same mathematical theories. I conclude that the coherence of a mathematical theory is sufficient grounds for its truth.

What about the added stipulation that the entities posited by the theory are *sui generis*? The same argument applies. The theory plus the stipulation, if coherent, is true. For example, I understand Peano arithmetic with the stipulation that the numbers are *sui generis*. Or at least I think I do. And if I do, then, by the above argument, *sui generis* numbers exist.

Of course, my claim to understand a theory is fallible, to varying degrees. For one thing, understanding requires logical consistency, and even the best of us can be wrong about that (as witness Frege and naive set theory). Moreover, the framework I have used for interpreting theories may itself be incoherent, with its mathematical domains, and its natural mathematical properties and relations. In that case, the whole notion of *sui generis* mathematical entities may be incoherent as well. But the rejection of such entities on grounds of incoherence is compatible with the view that coherence suffices for truth and existence. And it is compatible with absolutism: such entities would not be rejected on grounds of ontological superfluity, or pragmatic undesirability.

But I do not believe my framework is incoherent. Thus, I believe in a vast universe of *sui generis* mathematical entities: for any structure, a mathematical domain that matches and is isolated by that structure. There are *sui generis* natural numbers, rational numbers, real numbers; *sui generis* Euclidean and non-Euclidean points and lines; and for each structure compatible with set theory, there are *sui generis* sets that instantiate the structure, as well as *sui generis* ordered pairs, sequences, ordinal and cardinal numbers. And on and on and on.[26]

Some would say my beliefs are extravagant. They would say: "since mathematics is reducible to set theory, all of these basic kinds but one are theoretically dispensable in science, mathematics, and (at least most of) philosophy; they are indefensible on pragmatic grounds." That moves me not. They may also say: "the vastness of your ontology flies in the face of common opinion." That would have some force if it were true: it would cause me to question my own beliefs. But I doubt that common opinion has much definite to say about the nature or extent of metaphysical reality. There is an offhand reluctance to admit the existence of any metaphysical sort of entity. When that is overcome, there remains a reluctance to identify kinds of entity that have been introduced into language or thought as distinct: the identification of, say, numbers with sets receives no support from the man on the street. As to the vastness of metaphysical reality: common opinion makes no distinction between orders of infinity; belief in the iterative hierarchy of sets has already left common opinion far behind.

My liberality does not extend to physical reality, to the actual, concrete world. With respect to an arbitrary physical theory positing some physical kind of entity, there is, if anything, a presumption against existence. To defeat that presumption, to justify belief in that physical kind, one needs evidence of causal interaction, direct or indirect, with entities of that kind. The more physical kinds one believes in, the more justification one needs. In general, with physical reality, believing in more is harder to justify than believing in less.

Just the opposite is true, on my account, with respect to metaphysical reality. Our apparent understanding of a metaphysical theory carries with it a presumption in favor of existence. We need a reason to defeat that presumption, a reason for thinking our understanding is not genuine. Believing in less than all we think we understand is what requires justification. In general, with metaphysical reality, believing in less is harder to justify than believing in more.

Let us return, at long last, to the debate between absolutism and parochialism, and the absolutist strategy of reconciliation. Suppose the absolutist takes my broad-minded approach to metaphysical reality. Then he can freely make use of pragmatic criteria in deciding which theories to accept, even when ontological reduction is at issue. Suppose we are deciding whether to accept a metaphysical theory that identifies all mathematical entities with pure sets on grounds of ontological parsimony and theoretical unification. For the parochialist, this is a decision as to what to believe about the extent of metaphysical reality: to accept the theory is to decide that sets exist, and that mathematical entities other than sets do not. For the absolutist, this is a decision whether to narrow, by linguistic stipulation, the class of intended

---

[26]I do not say that distinct mathematical theories always have distinct *sui generis* domains. Distinct theories may posit the same structure, and thus be associated with one and the same basic kind. Identifications of this sort are discovered, not stipulated. But such identifications do little to limit the abundance of basic kinds. (A standard example: Boolean structures characterized in terms of the operations of "meet" and "join" are identical with corresponding Boolean structures characterized in terms of the "less than" relation.)

interpretations of mathematical theories to interpretations whose domains consist entirely of sets.[27] It is a decision what to talk about. And the sui generis numbers, and other non-sets, are thought no less real for the decision not to talk about them. Now, there is no reason why an absolutist cannot allow the decision what to talk about to be based upon its pragmatic consequences. All sides agree that doing mathematics entirely within set theory has pragmatic advantages: it unifies and simplifies the vast array of mathematical notions; it facilitates the cross-fertilization of mathematical theories; and so on. Thus, an absolutist, no less than a parochialist, can accept on pragmatic grounds the metaphysical theory that identifies all mathematical entities with pure sets. For the absolutist, however, the pragmatic criteria serve to select some portion of metaphysical reality to be the universe of discourse for our mathematical theories; they do not determine what is metaphysically real. Moreover, an absolutist, no less than a parochialist, can reject on pragmatic grounds any metaphysical theory that posits *sui generis* mathematical entities other than sets. For the absolutist, however, theories rejected on pragmatic grounds are not thereby false. They are merely useless because essentially redundant; we can say all that we care to say without referring to the reality of which they speak.

Conversely, an absolutist who does not take my broad-minded approach to metaphysical reality cannot freely make use of pragmatic criteria in deciding which metaphysical theories to accept. For suppose the absolutist is considering a class of competing metaphysical theories, all of which are thought coherent, and thought equally likely to be true. And suppose he narrow-mindedly takes the theories to be genuine alternatives: one of them at most is true. Finally, suppose he nonetheless accepts one of the theories on pragmatic grounds. Then he accepts a theory he does not believe to be true, since, as an absolutist, the pragmatic grounds do nothing to boost his degree of belief. Perhaps that is not so bad. Perhaps the goal of metaphysical theorizing, rightly understood, has only to do with systematization, and nothing to do with truth. Perhaps, the way to uphold an absolutist epistemology and a realist interpretation of metaphysical theories is to be wholly agnostic about the truth of metaphysical theories. But to embrace agnosticism is to abandon absolutism as herein characterized; it is to abandon absolute *realism*. Agnosticism is an alternative to realism, not a species thereof.

* * *

I turn now, all too briefly, to the consideration of non-mathematical metaphysical theories, such as theories of possible worlds, or propositions, or impure classes. You will not be surprised to find that I hold: *every coherent metaphysical theory is true*. If that is to be at all plausible, coherence must go well beyond logical consistency, as ordinarily conceived. In particular, any theory that conflicts with principles of the

---

[27] Of course, the parochialist can (and should) allow that the choice of any particular identification between, say, numbers and sets is a matter of linguistic stipulation; but the general assertion that numbers are sets expresses a discovery about what there is.

framework by which I interpret and understand metaphysical theories will be rejected as incoherent. That will include numerous traditional theories of truth and existence, including parochialism itself.

If all coherent metaphysical theories are true, then much of what was said about the interpretation of mathematical theories will apply, *mutatis mutandis*, to other metaphysical theories; and again the absolutist can freely make use of pragmatic criteria in choosing among coherent theories. Consider, for example, theories of propositions. On their face, they are often incompatible: some take propositions to be "structured", some "unstructured"; some take propositions to be "intensional", some "hyperintensional". When properly interpreted, however, the incompatibilities disappear. Each theory serves to explicate a different conception of proposition; and the different conceptions are in peaceful coexistence. I do not say that every conception of propositions is coherent; some, for example, founder on the Liar paradox, and its kin. But if a conception of propositions is coherent, then the theory articulating that conception is true, and the entities posited by the theory exist. An absolutist who accepts only the most fruitful of coherent conceptions need have no fear of accepting false theories.

My approach to ontological reduction, too, is the same for metaphysical theories generally, as for mathematical theories. For many philosophical purposes, the propositional theories are left partially interpreted; no attempt is made to provide each theory with a unique domain. For purposes of "ontology", however, the theorist must decide whether the entities posited by a propositional theory are to be taken as basic, and if not, how they may be identified with the entities posited by some other theory. On my view, these "ontological" decisions are not, in general, matters for discovery;[28] they are matters for linguistic stipulation. Perhaps there are coherent metaphysical theories whose posited entities may not coherently be taken as basic; I address this question below. But when different "ontological" decisions are equally coherent, metaphysical reality accommodates them one and all; and again the absolutist can choose between them on pragmatic grounds.

Although I have used mathematical theories to motivate my approach to metaphysical theories in general, I do not claim that the case of mathematics is in all respects representative. There are ways that metaphysical theories may be incoherent that have little or no application in the mathematical case. For one thing, non-mathematical metaphysical theories typically serve to explicate notions of ordinary language and thought; if such a theory veers too far from ordinary usage, it is incoherent because analytically false. Mathematical theories, in contrast, have broken away from their ordinary origins, and cannot be charged with incoherence on these grounds. Mathematical "rings" cannot be faulted for not being round.

There is another, related way that mathematical theories may be protected from charges of incoherence. The mathematical entities of which they speak are isolated from the physical entities, not just causally, but with respect to all natural relations; and the mathematical and physical entities have nothing but purely structural natural properties in common. Being thus isolated and dissimilar from the physical realm, the mathematical realm runs little risk of conflicting with fundamental principles of ordinary

[28]There are exceptions. As in the mathematical case, I allow for non-trivial discoveries that theories are analytically equivalent, and thus posit the same entities. For example, I suspect (with many others) that on some conceptions of properties, and some conceptions of classes, properties and classes coincide.

thought; for ordinary thought is directed first and foremost towards the physical. Non-mathematical metaphysical theories posit entities more closely tied to the physical realm; that makes judgments as to their coherence inevitably less secure.

Let me illustrate. Begin with the mathematical theory of Newtonian spacetime. Add that the spacetime points are isolated by the Newtonian structure. Now consider two purely qualitative natural properties that hold of point-sized objects (assuming there are such); call them 'red' and 'blue'. Add to the theory that everything is "blue" up to and including some time, and then "red" thereafter. Add that nothing has any other qualitative property. I think I understand the resulting theory, *modulo* an understanding of 'red' and 'blue'. I therefore think the theory is coherent (if qualitative natural properties of point-sized objects are), and that there exists a domain of entities of which the theory is true. I call (the fusion of) any such domain, naturally enough, a possible world.

(Of course, the example generalizes. Start with any spatiotemporal structure, with any class of purely qualitative natural properties and relations, and with any distribution of just those properties and relations over the domain of the structure; one thereby describes a possible world.[29] The details needn't concern us here. What I have to say about coherence applies whether one posits one world or many.)

Are the worlds that I believe in the worlds of David Lewis? No, it is a principle of my framework that the distinction between physical and metaphysical reality – between the actual, concrete world and everything else – is a fundamental ontological distinction; whatever is of the same ontological kind as a part of physical reality is itself a part of physical reality. Since Lewis's worlds are of a kind with physical reality without themselves being physical, I judge them incoherent relative to my framework.

And Lewis, I suspect, would return the favor. What I call worlds Lewis would call pictorial ersatz worlds.[30] On my account, parts of possible worlds and parts of physical reality can share qualitative character – indeed, can be qualitative duplicates – even though they are of fundamentally different ontological kinds. Is that coherent? I think it is, but I won't try to defend that here. My point has been made. Metaphysical theories positing entities that share qualitative character with physical entities face challenges to their coherence that do not arise in the mathematical case.

Mathematical domains and unactualized possible worlds have this in common: they are all isolated from the physical realm. Other metaphysical sorts of entity are less aloof. Consider again some theory of propositions. Of the propositions that purport to describe physical reality, some succeed and some do not; the successful ones we call true. Any adequate theory of propositions, I suppose, will be in part a theory of this relation between the true propositions and the physical reality they purport to describe. The theory thus

---

[29]What if one starts with an arbitrary mathematical structure, say, a four-element group? The resulting theory is no less coherent, and the domains that satisfy the theory are no less real; but they would not, in general, properly be called possible worlds.

[30]Except that I include the actual, concrete world among the possible worlds, and deny that there must be some "ersatz" world that represents the actual, concrete world. See *On the Plurality of Worlds*, pp. 165-174, for Lewis's discussion and dismissal of Pictorial Ersatzism.

posits a structure with a "mixed" domain: part physical, part metaphysical. And the two parts are interrelated, I suppose, by some natural external relation.

Now, within the physical realm, an object's intrinsic qualitative character does not determine the natural physical relations that it bears to other objects: this pen is touching a piece of paper, but nothing about the pen's intrinsic qualitative character necessitates that that be so. Within the mathematical realm, the same principle vacuously applies: since a mathematical entity has no intrinsic qualitative character, nothing is necessitated by its intrinsic qualitative character. What about a mixed realm, containing physical and metaphysical entities standing in natural external relations to one another? The principle is violated. Somehow, the intrinsic qualitative character of this pen makes it absolutely necessary that the pen stand in the truth-making relation to some propositions, but not others (and, for good measure, in the instantiation relation to some properties, but not others, and in the membership relation to some classes, but not others). A fundamental modal principle that holds for all natural physical relations fails to hold for all natural relations. Is that coherent?[31]

I think it is. I do not see why the modal principle in question must apply generally to all of reality. One must beware of false projection. But I won't try here to defend theories of propositions (or properties, or impure classes). My point is this: theories positing metaphysical entities that stand in external relations to the physical realm face serious challenges that do not arise in the mathematical case.

The working mathematician’s attitude towards the objects of which he speaks, as summarized by David Lewis, is this: "No worries, it's all abstract!" I have more or less supported that attitude towards mathematical entities, naive though it be. Worry seems out of place in mathematics, formalists and intuitionists aside. Lewis considers metaphysicians who defend controversial ontology by mimicking the mathematician's response: "No worries, it's all abstract!" And when asked what that means, they say: "You know, abstract the way mathematical entities are abstract."[32] I have tried to distance myself a little ways from that response.

First, I have refrained from calling all the parts of metaphysical reality abstract. What makes the mathematical entities abstract, on my view, is their purely structural character. "Modal" entities, such as possible worlds, are not abstract in that way, because they have qualitative character. "Intensional" entities, such as propositions, are not abstract in that way, because their character depends in part upon relations to the physical. Labeling all these kinds of entity 'abstract' would serve only to cover up their fundamentally different natures.

Second, worry does not seem out of place when considering "modal" or "intensional" entities. The carefree existence of mathematical entities need not transfer to other metaphysical kinds. I worry that my belief in, say, possible worlds or propositions, may be wrong. But worry alone cannot defeat the

---

[31]The above is adapted from Lewis's argument against magical ersatz worlds in *On the Plurality of Worlds*, pp. 176-191. Lewis would not quite say that the propositions, or properties, or classes, are incoherent; only that if we do somehow understand them, we know not how we do it.

[32]*On the Plurality of Worlds*, p. 137. Lewis is addressing the various ersatz modal realists.

presumption of existence. Until an argument convinces me that I could not understand what I think I understand, I will continue to believe.

* * *

The approach that I take to truth and existence is often associated with David Hilbert and the formalist philosophy of mathematics. Hilbert wrote, in a well-known letter to Gottlob Frege:

> "If the arbitrarily posited axioms together with all their consequences do not contradict one another, then they are true and the things defined by the axioms exist. For me, this is the criterion of truth and existence."[33]

Frege responded with two objections. The first was epistemological. Since one can only know that a theory is consistent if one knows that there exist objects of which the theory is true, consistency cannot provide a foundation for truth and existence. Frege's objection pushed Hilbert down the path of formalism. I do not follow Hilbert down that path. For one thing, it leads to Gödel's cul-de-sac: not even formal consistency is epistemologically secure. But more important, to even begin down that path is to forfeit any claim to be giving a criterion for truth and existence. On a formalist interpretation, mathematical theories are not true, and have no existential import. Formalism does not provide an account of truth and existence in mathematics, but a discounting of these notions altogether. How, then, can a realist respond to Frege's objection? Concede the point: the criterion does not provide a foundation.

Frege's second objection to Hilbert's criterion was posed as a question:

> "Let us suppose that we know that the propositions:
>
> 1. A is an intelligent being.
> 2. A is omnipresent.
> 3. A is omnipotent.
>
> together with all their consequences did not contradict one another. Could we infer from this that there exists an omnipotent, omnipresent, intelligent being?"[34]

It appears that Hilbert's criterion applies, and that the answer to Frege's question is "yes". But that, I take it Frege would say, is objectionable. It shouldn't be that easy to prove the existence of a deity.

Hilbert promised Frege a letter in response; to Frege's chagrin, it never came. But I don't much care what Hilbert's formalist response might have been. I offer a realist response in its place. First, Frege's question needs disambiguating. There are two distinct realms of existence: the physical and the

---

[33]Reprinted in Gottlob Frege, *On the Foundations of Geometry and Formal Theories of Arithmetic*, p. 12.
[34]Frege, *op. cit.*, p. 20.

metaphysical. Typically, when we use 'exist' and its cognates, we speak only of some or all of physical reality. Is Frege asking whether the criterion leads to the existence of a being that is, among other things, physically located and physically active? If that is his question, then the answer is "no" – at least as I construe the criterion. The criterion has no implications for the existence of physical beings. The criterion leads only to a priori knowledge. All knowledge of physical reality is a posteriori.

On the other hand, Frege may be asking whether the criterion leads to the existence of an intelligent, omnipresent, omnipotent being in the widest sense of 'exist', as a part of either physical or metaphysical reality. Indeed, I think it does, assuming Frege's mini-theory is coherent. But the existence of such a being as a part of metaphysical reality, presumably off in some possible world, does not seem to me objectionable. Such a being is causally isolated from the physical realm. An easy proof of its existence provides small comfort for the deist.

* * *

I conclude the paper by discussing briefly the views that I oppose: first the parochialist, then the skeptic. Suppose we have before us a metaphysical theory that is universally agreed to be fruitful and elegant. I ask: why is fruitfulness or elegance a reason to believe the theory true? I hold that fruitfulness and elegance are good reasons to develop and use a theory believed true on other grounds; the parochialist holds that fruitfulness and elegance are good reasons (though, I suppose, not sufficient reasons) to believe the theory true.

I distinguish two such parochialists, depending upon whether they deny the absoluteness of truth, or of epistemic rationality. The first parochialist is a traditional pragmatist, and endorses a pragmatic theory of truth: having appropriate pragmatic features is part of what constitutes a theory's being true, part of the meaning of the word 'true'. This seems both wrong and unhelpful: wrong as a claim about ordinary language; unhelpful, because it evades rather than answers the question I intended to ask. Suppose I give the pragmatist the word 'true'. I can rephrase my question thus: why believe that the theory in question agrees with reality, or describes what there is? Well, you know how the dialectic goes. The pragmatist won't be content with the word 'true'; he'll claim that pragmatic criteria in part determine the meaning of 'reality', 'existence', our whole vocabulary for talking about what there is (including 'is'). But this is still unhelpful. Suppose I give the pragmatist this whole vocabulary. The question I intended to ask still remains, inexpressible though it be in the appropriated language. Pragmatic reinterpretation does not make it go away.

The other parochialist holds to a realist conception of truth, and a realist interpretation of theories. He holds that the pragmatic criteria of theory choice are constitutive, not of truth, but of reasonable belief. Perhaps he argues thus. The standards by which our community in fact designates beliefs as reasonable, he claims, determine the very meaning of 'reasonable', and these standards are pragmatic through and through.

I deny both conjuncts. Moreover, even if I granted that pragmatic criteria were part of what we mean by 'reasonable belief', it would do nothing towards answering the question I intended to ask.

First off, I doubt that the standards by which we in fact adjudge beliefs reasonable are pragmatic through and through. Often, we deem it reasonable to believe the simpler or more fruitful hypothesis, not on pragmatic grounds, but because of the nature of the subject matter; for example, reasonable hypotheses about human behavior tend to be simple and fruitful because human beings are simple creatures, who typically do things for a reason. The subject matter of all of physical science cannot be supposed simple in this way; but here, I think, the use of pragmatic criteria has been much overestimated. Scientist's affirmations of belief are normally comparative judgments among alternative theories; and scientists rarely, if ever, consider alternatives differing only on pragmatic features. Thus, the case for pragmatic criteria as grounds for belief in science is virtually impossible to make.[35] In any case, our concern here is with metaphysical, not scientific, theories; and our standards of reasonableness in the two cases need not coincide. In mathematics, I have said, theories that are unfruitful or inelegant are not thereby deemed false. In philosophy, the use of pragmatic criteria as grounds for belief has waxed and waned over the years. I doubt that philosophical practice, historically viewed, manifests any consensus on standards of reasonable belief in metaphysics.

Even supposing that our standards of reasonable belief are pragmatic, I deny that such standards constitute the meaning of 'reasonable belief', any more than, say, our standards for measuring distance constitute the meaning of 'distance'; neither term is "operationally" defined. Our standards for measuring distance may be wrong, whether or not we could ever discover that they were wrong; and similarly for our standards of reasonable belief. What is constitutive of reasonable belief is that it be formed according to standards that are reliable, though perhaps fallible, guides to the truth. If I somehow discovered that one of the standards we use was not reliable in this way, I would retract the designation 'reasonable' from beliefs formed in accordance with that standard without the meaning of 'reasonable' having thereby changed.

Finally, even were I to grant that pragmatic criteria are constitutive of reasonable belief, that would not help answer the question I intended to ask. I could rephrase it thus: Why have reasonable beliefs? Why think this will further our pursuit of the truth? For the realist, at least, our practice of forming beliefs has a goal external to itself – the goal of truth – and so the question inevitably arises, whether the practice is justified in the sense of being suited to attain that goal. It is no justification to simply point out that it is our practice, or that, upon reflection, we are satisfied with it, or that we know of no better. Nor, for that matter, is it justification to point out (wrongly, I think) that, perhaps for evolutionary reasons, we are (biologically) incapable of conforming to any other.[36] At most, that would justify – that is, make blameless – our use of the practice; it would not justify the practice in the relevant sense of showing that it leads reliably to the truth.

---

[35]Recall what was said above: inductive and causal-explanatory criteria of theory choice are not, on my view, pragmatic.

[36]William Lycan, for example, pursues an evolutionary response in *Judgment and Justification* (Cambridge: Cambridge University Press, 1988). I am the "snooty epistemologist" of his scenario.

Please don't misunderstand. I am not demanding that the parochialist justify his use of pragmatic criteria; I point out that he has not done so only in order to make room for my own view. The demand for a justification of all epistemic principles is surely illegitimate. Indeed, I myself have no intention of foregoing the use of inductive criteria pending a solution to the problem of induction. Nonetheless, the cases of inductive and pragmatic criteria are not, for me, alike. The very conceivability of justification for pragmatic criteria is ruled out by their parochial nature; no criteria directly tied to specifically human needs, interests, or desires could conceivably be linked to truth and reality, absolutely understood. Although it has been argued that inductive criteria, too, are parochial, it can plausibly be denied; and I deny it.

I turn now briefly to my opponent on the other side: the skeptic about metaphysical sorts of entity. The skeptic and I agree in rejecting pragmatic criteria as grounds for belief. But the skeptic is not much impressed by my argument that coherence suffices for truth. The skeptic allows that one may reasonably choose to contemplate a metaphysical theory, or to develop it, or to examine its consequences; but one may not reasonably believe the theory true. The only reasonable position, says the skeptic, is to withhold belief in metaphysical sorts of entity.

Here the realist may protest: metaphysical theories have their "data", no less than scientific theories; there are fundamental mathematical and modal intuitions that any account of reasonable belief must respect. The skeptic has a familiar argument in response. Metaphysical sorts of entity, by their nature, do not causally affect us in any way. Thus, all of our intuitions, our beliefs, indeed, all of our psychological states would be the same whether such entities existed or not.[37] It follows that our intuitions, beliefs, and states cannot provide evidence that these entities exist. So argues the skeptic.

But the argument has no force against the realist. How are we to understand this subjunctive conditional: if metaphysical sorts of entity did not exist, our psychological states would be just as they are? As such conditionals are standardly understood, it is the barest triviality. If the antecedent is true, the conditional is true merely in virtue of the truth of its consequent. If the antecedent is false, it is impossible, and anything follows from an impossible supposition: our psychological states would be just as they are, they would be different, they would be whatever you please. To the extent that the conditional seems non-trivial, it only reiterates the assumption that the metaphysical entities are causally independent of our states; and to suppose causal dependence is a prerequisite of knowledge, or reasonable belief, is to suppose just what the realist is at pains to deny.

The skeptic's argument cannot compel the realist. Nor, I think, can the realist's appeal to fundamental intuitions as incontrovertible "data" compel the skeptic. For what are fundamental intuitions if not fundamental beliefs, and such beliefs cannot serve as grounds for themselves. Nor will the skeptic be moved by Cartesian appeals to the clarity and distinctness of our fundamental intuitions or beliefs: illusions need not lack for clarity and distinctness. No, the realist should not expect to counter the skeptical challenge by argument; the only counter to a coherent skepticism is belief itself.

---

[37]This assumes a "narrow" individuation of psychological states; but I have no problem granting that assumption.

Thus, I reject the skeptic's demand that I give good reasons for my belief in metaphysical sorts of entity. I have my reasons, to be sure, but they are not reasons the skeptic will accept; and if asked to give reasons for these reasons, my reason giving soon comes to an end. I am not against believing without good reasons; for that is just to allow that some beliefs are basic, and cannot be supported by reasons at all. What I am against is believing for bad reasons. Better, I say, to reject the skeptic's demand for reasons altogether, then to put forth parochial reasons as grounds for belief.