

NOMINALISM, NATURALISM, EPISTEMIC RELATIVISM

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1. Two Questions

The problem of nominalism—Do abstract objects exist?—is a problem in metaphysics. But no one knows how to approach this problem directly. Rather in this case as in so many cases in contemporary philosophy, we approach the metaphysical question via a correlative question in epistemology. Instead of asking whether abstract entities in fact exist, we ask whether we are justified in believing that they do.

My aim in what follows is to clarify this epistemological question and its relation to the metaphysical debate. The most important thing to note is that the epistemological question is ambiguous in a sense in which the metaphysical question is not. Some of the ambiguities are quite subtle; indeed we lack a suitably nuanced vocabulary for sorting them out. But let's begin with what ought to be an elementary distinction.

When we ask whether we are justified in believing that abstract objects exist, we might be asking whether we are rationally entitled to believe—whether a commitment to abstract things is rationally permissible for us. But we might also be asking whether we are rationally *obliged* to believe: whether it would be positively unreasonable to reject abstract objects or to suspend judgment on their existence.

These are clearly different questions: as different as the difference between 'must' and 'may': and in my opinion, they have different answers. In what follows I shall try to make it plausible that while a commitment to abstract objects is rationally permissible for us, no such commitment is obligatory. It is rationally permissible, in other words, both to believe that abstract entities exist, and to suspend judgment on their existence and perhaps even to reject them altogether. (*Nota bene*: If these were the answers to the only relevant epistemological questions concerning nominalism, then an epistemological inquiry would leave the original metaphysical question unresolved. You can learn that it's all

right to believe and that it's all right not to believe without learning whether abstract objects exist.)

2. The Permissibility of Platonism

There are several ways to argue for the permissibility of platonism, but the case that interests me rests on three main assumptions. (The assumptions are familiar and I shall not defend them here. If the reader doubts them, he should regard the argument of the paper as conditional.)

(1) *The worldview we take for granted entails the existence of abstract entities.* When we say that there are twenty-six letters in the alphabet, or that Shakespeare wrote the Sonnets, or that the laws of motion are Lorentz invariant, what we say entails the existence of objects over and above the ink marks on paper that a nominalist might admit. Letters, languages, poems, laws, the numbers that measure quantities and the quantities themselves, not to mention the sets and functions of higher mathematics: whatever these things may be, they are not concrete objects. So if our considered worldview is roughly accurate, abstract entities exist.

(2) *Not only do we accept a worldview that entails the existence of abstract entities. By ordinary standards as we ordinarily apply them, we are fully justified in doing so.* Consider a striking observation from ordinary botany: the number of seeds in a sunflower is usually a Fibonacci number. By ordinary standards the empirical case for this claim is overwhelming. Sunflowers from all over the world have been examined, and in nearly every case a careful count of the seeds has yielded a term in the famous series. When the result was first announced at the Society for Numerical Botany, the obvious questions were pressed: Was the sample large enough? Were the seed counters reliable? But the authors of the original study were able to answer these questions. And by the standards that normally govern this sort of research, that was good enough. Of course no one asked them how they knew that there were numbers to begin with. (If someone had asked they would presumably have been at something of a loss.) But this just goes to show that by ordinary standards, one may be justified in believing a claim that implies the existence of numbers without being in a position to prove their existence by separate argument. To put the same point another way, this just goes to show that in a normal investigation, the possibility that a mathematical claim might be false because numbers do not exist is not among the possibilities one is obliged to exclude. The standards that govern normal inquiry are simply not that stringent.

This is not just a point about everyday botany. It applies equally to high-stakes research in which the most exacting standards are brought to bear. A novel claim about the rate of global warming may be challenged in many ways. But within geophysics it will never be challenged on the ground that *rates* after all are *numbers*, and numbers might not exist. You might as well object to eyewitness testimony in a criminal trial on ground that the witness cannot prove

she's not a brain in a vat. The skeptical possibility may be a genuine possibility. But even if it is, one is normally under no obligation to exclude it—not even in the most demanding precincts of science.

Now so far this is just a point about what is normally allowed to pass, and as such it shows nothing about what we genuinely entitled to believe. But it does show, in my view—and this is the crucial point—that any case for compulsory nominalism must be a skeptical case: a case for revising a pervasive (and by ordinary standards, unproblematic) commitment of common sense and established science. An argument for such revision may take one of two forms. It may exploit epistemic norms internal to the sciences (broadly construed), or it may appeal to some allegedly higher philosophical standard. In the first case what must be shown is that even though abstract objects are freely admitted in every field, they are nonetheless inadmissible *from the standpoint of science itself*. In the second case what must be shown is that whatever the standards of normal science may have to say, claims about the abstract are ipso facto unwarranted *given the real and authoritative superscientific norms governing reasonable belief*.

The case for the permissibility of antinomialism rests on the claim that no compelling skeptical argument of either form can be given. There have been many attempts to undermine our pre-philosophical commitment to abstract entities. But in each case the argument may be shown to rest on one or another dubious claim in epistemology—typically, some version of the causal theory of knowledge.¹ I am not going to argue for this sweeping thesis here, so let this rather stand as my third dogmatic assumption: (3) *There is no compelling case against a commitment to abstract objects as such*. We may legitimately wonder about particular cases: supercompact cardinals, *the* text of *Ulysses*. But there is no compelling case against numbers and the rest simply from the fact that these things would be abstract if they existed.

3. Reasonable Disagreement

If my three assumptions are correct, antinomialism is an option. But is it the only option? Is it also rationally permissible for us to doubt the existence of abstract objects—to suspend judgment on the truth of classical mathematics, for example, simply on the ground that it posits abstract things? Or is the case for antinomialism so profoundly compelling that doubts about the abstract must be reckoned unreasonable?

It should be obvious that reasonable people can disagree, even when confronted with a single body of evidence. When a jury or a court is divided in a difficult case, the mere fact of disagreement does not mean that someone is being unreasonable. Paleontologists disagree about what killed the dinosaurs. And while it is possible that most of the parties to this dispute are irrational, this need not be the case. To the contrary, it would appear to be a fact of epi-

stemic life that a careful review of the evidence does not guarantee consensus, even among thoughtful and otherwise rational investigators.

Our question then comes down to this: Is the debate over nominalism a case in point? William James held that metaphysics is always a matter of temperament, from which he inferred insofar as Reason mandates no temperament in particular, it cannot be expected to resolve debates in metaphysics.² A puerile generalization as it stands, no doubt; but there is this much to it: We have no reason whatsoever to assume a priori that metaphysical disagreement can always be resolved by appeal to neutral reasons. We should therefore be open to the possibility that just as reasonable people may disagree about the fate of the dinosaurs, reasonable people may disagree about the existence of abstract objects.

Now when the point is framed in this way, it may seem numbingly obvious. After all, if rational disagreement is to be expected anywhere it's to be expected where the evidence is thinnest and the distance between theory and data most immense. Speculative ontology is sometimes seen as the limiting case of this predicament, and so it might be said: "If reasonable people can disagree about what killed the dinosaurs, then *of course* they can disagree about whether abstract entities exist. Speculative ontology is paleontology without the fossils. As constraining evidence goes to zero, scope for disagreement goes to infinity. And that is precisely what we find in this case."

But this is confused. In the first place, it does not follow from the fact that the evidence is thin on some question that reasonable people may disagree about the answer. Sometimes the only reasonable attitude is suspense of judgment. (Is the number of stars odd or even?) More importantly, as Quine pointed out, it is a mistake to view 'ontology' as a limiting case of speculation. Recall our first dogmatic assumption, viz. that the worldview we take for granted is up to its ears in abstract things. To doubt the existence of abstract objects is not just to doubt some bloodless thesis in metaphysics. It is doubt basic arithmetic, settled physics, the solid claims of linguistics and music theory and the rest. The question is not simply whether one may doubt *that abstract objects exist*. It is whether one may reasonably doubt *that Mozart wrote sonatas, that Portuguese is a romance language, that some equations have solutions*. And whatever the ultimate disposition of the issue, it is hardly *obvious* that reasonable people may disagree about such matters given everything else we know about what the world is like.

4. Science and the Limits of Permissible Doubt

We have no settled framework for discussing the scope of reasonable doubt. But we do have intuitions about where doubt is legitimate and where it is perverse, and we may as well begin with them. The most important such intuition concerns the status of science—by which I mean not just the paradigmatic natural sciences, but solid critical thought on any topic: history, music, literature,

and so on. If my first assumption is correct, accepted science is entangled with the abstract at every turn. To doubt the abstract is thus to doubt settled science. Moreover this doubt would extend not just to claims that explicitly refer to abstract objects—'The atomic number of helium is 2'—but to claims about the concrete whose only scientific justification proceeds by way of platonistic theory. That the continents are in motion is not a claim about abstract objects. But the case for believing it takes mathematics for granted. Someone with doubts about mathematics should thus have doubts about continental drift (unless he is in a position to supply non-mathematical support for the hypothesis).

The relevant intuition about the scope of reasonable doubt is then as follows: It would be patently unreasonable for an informed citizen of the modern world simply to reject modern science—to suspend judgment on the claims of physics and geology and literary history—simply because it assumes the existence of abstract objects. It would be one thing if there were some positive ground for such doubt: some cogent case against the antinomialist background for science. But we have already stipulated that such a case cannot be made. What we are imagining is someone who dismisses modern science root and branch, simply because its assumptions about abstract objects *might be mistaken*. I submit that in the absence of positive ground for doubt, such an attitude should strike us as pathological. It recalls the skeptical doubt which traditional discussions of induction purport to address, viz., the doubt of the agent who declines to believe that the sun will rise tomorrow *simply because he cannot prove that the future will resemble the past*. This timid Humean freak is a paradigm of unreason, not because he contradicts himself, but rather because his standards for good reasoning are absurdly high. The nominalistically-minded skeptic about science is likewise unreasonable. It may well be that our basic assumptions about abstract objects do not admit of independent justification 'from below'. Still, to take this as grounds for opting out of modern science altogether would be an egregious overreaction—a paradigm case of unreasonable epistemic caution.

This means that any case for the permissibility of suspense of judgment about the abstract must show how nominalism of this sort is compatible with taking science seriously as a source of information about concrete nature. This is of course the point of the familiar 'nominalization' programs.³ When these programs are not pitched as dubious hermeneutic proposals,⁴ they are best understood as attempts to reconcile doubts about the literal truth of extant science with a policy of *accepting* platonistic theories as instruments for description and explanation. I shall not discuss these programs in detail here. Instead I shall describe what I regard as a simple trick for nominalizing at a stroke any theory whatsoever. Given any theory T formulated in the usual mathematical terms, the trick returns a theory that does without abstract objects, but which is nonetheless in a certain sense equivalent to the original. Before I describe the trick, I should emphasize that I do not endorse the novel theories it delivers. The nominalistic version of (say) quantum electrodynamics is in some sense a dif-

ferent theory from standard QED. But it is not a better, more acceptable theory. The nominalistic version is of interest, not as an account of what science actually says, and certain not as an account of what it ought to be saying, but rather as an account of what science might have said, and might have been justified in saying had cultural history gone somewhat differently. (Why it should matter what science might have said will emerge in the sequel.)

5. Bedrock

The dogmatic assumptions with which I began were claims about us as we are. Suppose they are correct: Not only do we indulge in platonistic discourse: we often believe what we say; we harbor no secret reservations; and all of this is rationally permissible by our lights. Indeed for good measure let us make the further assumption that so far as we can see, the cumulative scientific case for certain abstract entities is so utterly compelling that it would be unreasonably cautious to demur. Let us assume, in other words, that so far as we can see, platonism is not just permissible; it is mandatory.

That's how we are, but in Bedrock things are different. They speak English in Bedrock and for the most part they say what we say: "Some poems don't rhyme", "Some numbers are irrational". Bedrock science and mathematics are indiscernible from ours. Their textbooks, their advanced teaching, the transcripts of their laboratory conversation, and the rest are all thoroughly platonistic, in the sense that the sentences they contain imply the existence of abstract objects.

The difference is that in Bedrock they have reservations about this aspect of what they say—carefully considered and fully articulate reservations. Bedrockers are encouraged from early childhood to suspect that only concrete things exist, and that discourse about the abstract is thus at best a useful fiction. If you ask them how they square this with what they say when they're doing science, they smile as if they've heard the question a thousand times and deliver themselves of a speech along the following lines.

We admit that our theories imply the existence of abstract objects, and that when we put them forward in the 'assertoric mode', there is a sense in which what we say is at odds with our nominalism. But there is no real conflict. We don't believe what we say. It's not that we're dishonest or hypocritical. It's rather that our practice of 'assertion' differs from yours.

Consider, for example, the following pair of statements:

- (1) The number of Martian moons = 2
- (2) There are exactly two Martian moons.⁵

These claims are equally 'assertible' in any normal context. But they are distinct claims nonetheless, with distinct truth conditions. Any world in which the first is true must contain at least four items: Mars, its two moons, and their number, the number 2. Worlds in which the second claim is true

include all of these worlds, but also certain worlds in which this fourth thing is missing. But this is just to say that (2) is strictly weaker than (1), and in particular that (2) does not entail the existence of numbers.⁶

The claims are nonetheless clearly very close in content. Intuitively, while they differ in what they say simpliciter, they agree in what they say about the concrete world considered in itself. Let's say the **concrete core** of a world *W* is the largest wholly concrete part of *W*: the aggregate of all of the concrete objects that exist in *W*. What (1) and (2) have in common is simply this: The concrete core of every world at which (1) is true is an exact intrinsic duplicate of the core of some world at which (2) is true, and vice versa. Claims that meet this condition are said to be **nominalistically equivalent**.

Now suppose that ours is a numberless world, and that (1) is therefore false. If we were concerned to speak the truth, we would never countenance its assertion. But the fact is, we are rarely concerned to speak the truth. Our unhedged assertoric utterances normally aspire to a weaker condition we call **nominalistic adequacy**. *S* is nominalistically adequate iff the concrete core of the actual world is an exact intrinsic duplicate of the concrete core of some world at which *S* is true—that is, just in case things are in all concrete respects *as if S* were true.⁷

Our beliefs, like yours, are governed by a non-negotiable norm of truth. But for the most part our assertoric utterances do not even purport to be true. We are quite up front about this, and no one is misled. Our children are first introduced to the abstract apparatus by immersion, just as yours are. But in their early required courses in ontological hygiene, they are told explicitly that what they say about the abstract is not to be taken seriously. To drive the point home they are encouraged to prefix their utterances with fictionalizing operators, “According to the best, nominalistically adequate account...” or perhaps, “If there were abstract objects and the concrete world were intrinsically just as it is, then...” But this gets tedious rather quickly, and the prefix soon falls silent. Still, it is always there, tacitly, if you like, and we can always make it explicit when some tourist gets confused.

We should stress that you are familiar with habitual indirection of this sort. When you talk about the movie you saw last night, you may begin very carefully, saying “In the movie, this” and “In the movie, that” But sooner or later you will drop the prefix and begin to regulate your assertions, not by literal truth, but by truth-in-the-story.

This is only the clearest case of what is in fact a widespread phenomenon. Whenever you speak hyperbolically or metaphorically—in short, whenever, you speak figuratively—you ‘assert’ a sentence without committing yourself its truth. It would not surprise us if non-literal assertion in this sense were the norm, even in a literally-minded culture like yours. But it's certainly the norm with us. You may be cultural platonists. But we're

cultural fictionalists. We immerse ourselves in the pretense that the concrete world is embedded in much larger world of abstract objects and then speak from within this pretense as a matter of course. But we have no tendency to believe in the abstract objects that would exist if our claims were true. From our point of view, that is all make-believe.⁸

This indirection would be pointless if every case were like our toy example. In asserting (1) we commit ourselves to the view that (1) is nominalistically adequate. But this is equivalent to the claim that (2) is simply true. So in this case, if we wanted to speak our minds directly, we could just assert (2), bypassing pretense altogether. In other cases, however, this will not be so easy. This is where our fictionalism comes into its own.

Consider the debate over the authorship of Shakespeare's plays. Traditionalists assign the plays to the glover's son from Stratford. Looney and his followers assign them to Edward Devere, the seventh Earl of Oxford.⁹ We regard this as an issue of some importance. But of course we don't really believe in *plays* and the like. So when one of our scholars asserts, for example, that Oxford wrote *The Tempest*, he does not commit himself to the opinion that an abstract entity stands in a certain literary relation to the Earl. The question that interests him is a question about how the concrete world is configured. But he has no way to formulate that question or his preferred answer to it without invoking the fiction of abstract entities. No non-parasitic sentence in our language stands to "Oxford wrote the *Tempest*" as "Mars has two moons" stands to "The number of Martian moons = 2". So the best we can do—and this is quite good enough—is to acquiesce in the pretense that abstract entities exist and conduct our investigation within the scope of that pretense.¹⁰ The real question is not whether Oxford wrote the play. It is whether it is nominalistically adequate that he did.

This phenomenon of the expressive indispensability of the abstract is most pervasive in the natural sciences, where the descriptive apparatus is irredeemably mathematical. We take science very seriously. We teach it; we rely on it. And we do so because we regard it as the only decent way to find out what nature is like. But we do not regard science as a source of information about the abstract. For us the aim of science is (roughly speaking) to produce an account of things that is useful and informative and nominalistically adequate: a strong and explanatory representation that is true insofar as what it says about concrete nature is concerned, but which may be false (for all we care) in what it says about the abstract.

Our practice of theory choice is outwardly just like yours. The considerations that bear upon the assessment of scientific claims—empirical adequacy, simplicity, explanatoriness, and the rest—go over without modification from your culture to ours. This outward similarity conceals a difference, however. For you the resolution to accept a scientific theory is the resolution to believe it (at least tentatively) and in particular, to believe in

the real existence of its objects. For us, the resolution to accept a theory is the resolution to use it in certain ways and to believe (at most) that it is nominalistically adequate.¹¹ What you regard as a reason to believe that T is true, we regard as a reason to believe that T is nominalistically adequate. We stress that this weaker belief can have all the ‘empirical content’ you like. If you believe that there will be an eclipse tomorrow night because you believe a mathematically formulated theory from which this prediction may be derived, we will form precisely the same expectation. After all, if T is credible by your lights, it is nominalistically adequate by ours. And where P is a claim about the concrete world considered in itself, if T entails P, then so does the weaker claim that T is nominalistically adequate. To the extent that practically relevant conclusions are all claims about the concrete array, it follows that there is no practical difference between believing a theory to be true and believing it to be nominalistically adequate.¹²

Of course there is much more to science than accepting theories on the basis of evidence and deriving predictions from accepted theory. It would be an enormous project to show that every legitimate feature of science in your culture has a defensible analog in ours. To show this would be to establish that nothing essential to scientific practice and application depends for its rationality on believing in abstract entities. We believe this can be done, but it will take some time.¹³ Shall we begin?

6. Are the Bedrockers Unreasonable?

Let’s not. The point of the story is to make it plausible that there might be a community that rejects our complacent realism about the abstract despite familiarity with all of the evidence and argument we can muster—a community that ‘naturally’ (as it were) makes the sort of invidious distinction that philosophical nominalists have long urged us to make. It seems to me indisputable that there could be a group of people who respond in the manner indicated to our queries about what they are up to. And given that this is so, we have two questions to ask: Are the Bedrockers rationally entitled to persist in their fictionalism? And is it a rational option for us? In either case a positive answer entails that reasonable people can disagree about the real existence of abstract objects. But a ‘yes’ to the second question yields a particularly striking result, namely, that despite the pervasive antinominalism of our science and despite the absence of any positive ground for doubt about the abstract, it is not unreasonable for us to maintain a selective skepticism about accepted science by bracketing certain aspects of what our best theories have to say.

Let’s begin with the first question. Are the Bedrockers unreasonable? If they are then it should be possible to locate their mistake: to describe a compelling dialectical route from their complacent agnosticism to some form of realism, or at the very least to identify some principle or rule of inference which

they reject, the rejection of which strikes us—when we hold it up to the light—as somehow crazy or silly or perverse or unintelligible.

It might be objected, for example, that fictionalism is self-contradictory or self-refuting. Thus Crispin Wright has maintained that certain claims about the concrete—“There are just as many pigs as chickens”—analytically imply claims about abstract objects—“The number of pigs = the number of chickens”.¹⁴ And if this is right, agnosticism is not an option. Alternatively, it might be urged that whenever a Bedrocker accepts a claim as nominalistically adequate, he forms a belief that can only be true if abstract objects exist. The belief that T is nominalistically adequate seems to presuppose the existence of the theory T, and it is natural to suppose that theories must be abstract.¹⁵ Less obviously, the belief that T is nominalistically adequate, as I have explained it, is a belief about relations among possible worlds. And one might legitimately wonder whether a commitment to possible worlds (some of which must contain abstracta) is consistent with genuine agnosticism about the abstract.

These are serious objections. I believe they can be answered, but I shall not pursue the matter here. After all, even if the bare coherence of the stance can be secured, this would not be enough to settle the epistemological question. The flat earth hypothesis is not self-contradictory. The evidence does not strictly speaking entail its falsity. And yet knowing what we know, you would have to be crazy to believe it. And so it might be said, “Bedrock-style fictionalism is not self-refuting, nor can it refuted decisively by appeal to evidence. And yet it is unreasonable to suspend judgment about the abstract. We (and they) possess *compelling non-demonstrative grounds* for believing the settled claims of physics and music theory and the rest. The Bedrockers may be able to doubt these claims without contradiction. But they might as well be flat-earthers: consistent but unreasonable.”

Of course it’s no good just to say this. The Bedrockers I have described are the very picture of lucidity. If their fictionalism is ruled out by some compelling epistemological principle, we should be able to isolate it and so to show them where exactly they go wrong. (Whether they will listen is another matter. There is such a thing as being too far-gone.) When I claim that Bedrock-style fictionalism is not unreasonable, what I mean is that this challenge cannot be met.

7. Epistemic Naturalism: Some Varieties

To get a sense of what is wanted, consider the following from Putnam.

The fictionalist concedes that predictive power and ‘simplicity’...are hallmarks of a good theory, and that they make it rational to accept a theory, at least “for scientific purposes”. But then[...]what *further* reasons could one want before one regarded it as rational to *believe* a theory? If the very things that make the fictionalist regard [abstract] objects, etc. as ‘useful fictions’ do not make it rational to believe the

[abstract] object ‘conceptual system’, what could make it rational to believe anything?¹⁶

Putnam’s claim is that fictionalist agnosticism about the deliverances established science is unreasonable. The fictionalist distinguishes between credibility and acceptability for scientific purposes. And that is his mistake. *Reasons to accept a theory for scientific purposes just are reasons to believe that it is true.* The fictionalist is unreasonable because he flouts this basic maxim.

Before we can assess the idea, it will help to fix terms. (What follows is partly stipulative, but I believe it is in the spirit of Putnam’s view.) To accept a theory in the relevant sense is use it in certain ways: in giving explanations, deriving predictions, designing experiments, and so on. Acceptance so conceived is a phenomenon of scientific practice. A suitably placed anthropologist can determine which theories a scientist accepts by observing what he does, and in particular, what he says. It is also a fantastically various phenomenon. It comes in degrees as well as kinds, the botanizing of which remains an open problem in the sociology of science. For present purposes we focus on the most serious sorts of acceptance—acceptance without significant scientific reservations. A present-day physicist may rely on Newtonian assumptions in certain contexts. But he knows that the theory is accurate only within certain limits, and when pressed to give his most considered account or to justify his predictions when maximal precision is required, he will typically invoke one or another post-Newtonian theory. This is the theory he *seriously* accepts: the one he appeals to when the chips are down and he is pressed to give his best scientific account of what’s what.

Serious acceptance so described is distinct from belief. When the Bedrockers write their textbooks and design their space telescopes, they use the platonistic theories that our scientists use. But of course they do not believe them.

What does it mean to say that T is ‘acceptable for scientific purposes’? Here’s one way to think of it. The intellectual disciplines are social practices for theory acceptance. As such they embody a batter of norms for theory choice (i.e., acceptance). These norms are rarely made explicit. Rather, to be trained in the practice is to require a practical mastery of what counts as a reason to accept a novel claim. Putnam makes two substantive assumptions about these practice-immanent norms for acceptance. The first is that they are genuine norms: To be justified in accepting a theory by the standards of (say) biochemistry is to be justified in fact in accepting that theory. This is not a tautology. The True Believers embrace an elaborate set of rules for extracting predictions about the End Times from Wittgenstein’s laundry lists. But it’s one thing to say that S is acceptable *by the standards of crackpot eschatology*, quite another to say that S is genuinely acceptable. As Putnam frames the issue and as I have framed it here, the fictionalist and the realist agree that when it comes to the established, mature sciences, there is no gap between *acceptability by internal standards* and *genuine acceptability*.

This is not to say that scientists cannot make a mistake about acceptance. It is to say that if they do make a mistake, they will have contravened the principles implicit in their own practice. One way to formulate Putnam's first assumption is thus to say that in the established sciences—more on what that might mean in a moment—the only genuine reasons for acceptance are the reasons that function as such within the practice itself.

If we reserve the word **methodology** for the study of acceptance, this is a thesis in normative methodology. It might be called **methodological naturalism** since its motivating thought is that the methodologist must operate as a naturalized citizen of the scientific community, offering only such advice and criticism as may be warranted by the norms somehow implicit in science itself.

Putnam's second assumption, by contrast, is a thesis in normative epistemology, viz., that these internal reasons for serious acceptance are ipso facto reasons for belief. I'll call this **epistemological naturalism**, and of course, the idea is a familiar one. Having shed the bad old foundationalist ambition to justify our practices from without, the naturalist maintains that to regulate one's opinions by the norms implicit in our best cognitive practices is somehow constitutive of full rationality. The skeptic about induction or inference to the best explanation or any of the more specific principles that might be cited to justify an inferential transition within science may not be making a formal mistake. But she is making a normative mistake nonetheless. What she fails to appreciate is simply that when it comes to scientific questions, the only genuine reasons for adopting one opinion rather than another are the reasons that function within science as compelling grounds for acceptance.

Crucially for our purposes, this naturalistic conceit may be read in two ways. There is **permissive** version of the stance, according to which one is always *entitled* to believe what is fully acceptable by scientific standards. This modest view does most of the urgent anti-skeptical work for which naturalism was designed.¹⁷ But it is no threat to fictionalism of the sort I have described. The Bedrockers do not deny, after all, that we are within our rights in believing what science has to say about abstract entities. Their distinctive claim is that they are within their rights in opting out, and permissive epistemological naturalism is consistent with that position.

The view we need to discuss is therefore **restrictive epistemological naturalism**—the thesis that it is unreasonable not to believe what science recommends for serious acceptance. If this is right then fictionalism is clearly untenable. But is there anything to be said for the idea?

8. Against Restrictive Naturalism

The first thing to say is that the Bedrockers don't believe it, and yet they appear to speak the language well enough. This is enough to scotch the neo-Strawsonian thought that to believe what is acceptable is part of what it *means* to be reasonable. Restrictive naturalism may be true, but it is hardly analytic.

But it's really much worse than that. One way to bring this out is to press an issue I have so far ignored. Let's say that an intellectual practice is **authoritative** just in case its internal norms for serious acceptance constitute rationally coercive norms for belief. Where P is an authoritative practice in this sense, it is unreasonable to doubt or deny what a fully acceptable P-theory has to say. Restrictive naturalism is then the view that certain practices—the 'established mature sciences'—are to be reckoned authoritative. But what exactly is an established mature science, and why exactly do they merit authoritative status?

No one believes that every practice is authoritative. It's one thing to say that when it comes to claims about the mass density of the universe, the only relevant standards are those of modern astrophysics. It is something else to insist that when it comes to the interpretation of dreams, the only relevant standards are those of Jungian psychoanalysis. Naturalism in epistemology is a counsel of philosophical deference. But deference has its limits and naturalism owes us an account of them.

It is striking that naturalists have had so little to say on this point. Different naturalists draw the line in different ways. Some take it for granted that the 'hard' natural sciences are the sole authoritative practices, and hence that the credibility of mathematics ultimately depends upon its role in the natural sciences.¹⁸ Others regard pure mathematics as an authoritative practice in its own right.¹⁹ This disagreement can be quite pointed. Do we have reason to believe those axioms of set theory which find no application in the natural sciences? The first sort of naturalist may say 'no'; the second may say 'yes'. Of course it is no objection to a view that its proponents disagree. The objection is rather that we are given no guidance whatsoever as to how the dispute could possibly be resolved. How can we know—or better, what would make it the case—that pure mathematics is an authoritative practice in the relevant sense?

I am inclined to say that in the absence of an answer to this crucial question, epistemological naturalism is not really a theory at all, but rather an incomplete and somewhat unpromising idea for a theory. It's not that I have a better account of where the epistemic norms 'come from'. But the idea that we can proceed in normative epistemology by first locating a set of authoritative practices and then identifying the norms for belief with their internally sanctioned norms for acceptance—that approach strikes me as fundamentally misguided.

Let me try to reinforce this pessimistic verdict by returning to the case in hand. Epistemological naturalism singles out certain practices as authoritative. But we may distinguish two kinds of intellectual practice. Let us say that a practice is **cognitive** with respect to a class of claims if practitioners themselves regard a cogent internal argument for accepting a claim in that class as rationally compelling grounds for believing that it is true. A practice is **instrumental** with respect to a class of claims, on the other hand, if it is rationally permissible to doubt what the practice deems acceptable *from the standpoint of the practice itself*.

Epistemological naturalism as I have formulated does not rule it out that an instrumental practice might be authoritative. It might conceivably be maintained, for example, that even though physicists treat the virtual particles of quantum field theory as mere heuristic fictions, we (and they) are nonetheless obliged to believe in virtual photons precisely because the theory is fully acceptable by their lights. But of course this would be to charge the scientists with a fundamental mistake about what to believe, and this is at odds with the deferential spirit of naturalism. If the experts themselves consistently adopt a fictionalist stance towards certain claims, who are we (we philosophers) to call them unreasonable?

We may therefore assume that the cognitive practices are the only serious candidates for authority, or perhaps better, that a practice is a candidate for authority only to the extent that it is cognitive.

But this raises the Authority Problem in a particularly pointed form. In light of Bedrock the sociological facts are as follows. We have two scientific communities, ours and theirs. By stipulation, our scientists maintain that when it comes to abstract entities, we have rationally compelling grounds for believing whatever we have scientific reason to accept, and hence that anyone who doubts the abstract objects posited in accepted science is impermissibly cautious and thus unreasonable. *Their* scientists, on the other hand, take the ecumenical view that one is required to believe only what science says about the concrete, and that whether you go further is entirely up to you. Our science, in other words is a cognitive practice across the board, whereas theirs is instrumental with respect to claims about abstracta.

How does the naturalist propose to extract the genuine epistemic norms from this clash of opinion? Cultural relativism is an option, but not an attractive one. In some areas—e.g., spelling—it is plausible that one is bound by the norms of one's own group. In this case the relativist's thought would be whereas *we* are obliged to believe in abstract objects, *they* are entitled to suspend judgment on such matters. But this is hard to believe. Once we have been careful to distinguish *blameless* belief from genuinely justified belief, the idea that the epistemic norms extend only to the boundaries of one's community loses whatever plausibility it may once have had.²⁰ So it will not do to say that the norms embraced by our scientists are binding on us *because they're ours, after all*. The norms may be local for some other reason, but it's hard to see what it could be.

Cultural relativism aside, there are only two possibilities. Either our epistemic practices are authoritative or theirs are. When we consider the claim that the number of Martian moons = 2—a claim that is fully acceptable by everyone's lights—then either we are all rationally obliged to believe it or we are all entitled to doubt it. Naturalism, to my knowledge, provides no guidance whatsoever as to how this conflict should be resolved. It's not that answer is hard to find. It's rather that the theory tells us nothing about what could make it the case that one of these practices is authoritative to the exclusion of the other. So much the worse, in my view, for epistemological naturalism so conceived.

9. For the Permissibility of Fictionalism

Our experts say that certain opinions are required; theirs maintain that these opinions are strictly optional. Forget about naturalism. How shall we decide which side is right?

What we have is a fundamental normative clash, akin in certain respects to basic moral disagreement. Now in the moral case some of us have come to live with view that while the contested moral question must have a single answer, reasonable people may disagree about what that answer is. But it is hard to believe that our epistemological dispute has this character. Rational permission differs from moral permission in the following respect. There is no presumption that when an act is morally impermissible, we should be able to lead any clear-headed, open-minded, intelligent agent to see that it is. That's why rationally irresolvable moral disagreement is a possibility. In the epistemic case, on the other hand, a claim to the effect that one is obliged to follow a certain rule is undermined if we can describe a reasonable-seeming, fully reflective, and fully livable human practice that eschews it. If the foregoing is sound, then a fictionalist stance towards abstract objects is consistent with a serious and reflectively stable engagement both with science and with life. And given this, it strikes me as frankly implausible to insist that this fictionalist stance is nonetheless somehow unreasonable. The Bedrockers are willing to listen and they are not stupid; and they get along as well as we do in every relevant respect. You can charge them with irrationality, and they will listen to the indictment. But what will you say to back it up? When they ask you, "What's wrong with our way of proceeding?", what will you say? If you have nothing to say, then the charge will not stick. Not only will they (quite reasonably) fail to heed you. If you have nothing to say, then in my view the charge is mistaken.

Now even if this is right it does not quite settle the question with which we began. From the fact that it is rationally permissible for *them* to persist in their fictionalism, it does not follow automatically that fictionalism is an option for *us*. By hypothesis, we begin as complacent platonists with no compelling internal reason to change our minds. The question is whether we are rationally entitled to do so anyway—to bracket what we have previously taken for granted about the abstract, and to do so on the basis of no new information.

It is a peculiar question. On the one hand, if you really believe that P, then to abandon that belief for no particular reason is to discard what one presently regards as reliable information, and odd circumstances aside, it is hard to see how that could be rational. On the other hand, anyone who has seriously asked himself whether abstract objects exist has already backed off from his natural complacency about such matters. And for someone in this position, fictionalism may well constitute a genuine rational option. When the complacent theist first asks himself whether or not there is a God, and then notices that there is nothing intrinsically unreasonable in agnosticism, it would be bizarre to insist that he is nonetheless obliged to remain a theist simply because that is where

he started out, and he has been given no ‘positive grounds’ for thinking that he is mistaken. In a case of this sort, retrenchment is obviously an option. The case of nominalism is no different in principle in my opinion.

10. Should We Retreat to Fictionalism?

Bedrock is not real, but it might easily have been. If intellectual history had gone somewhat differently, we might now be fictionalists of just this sort. (Indeed, the overwhelming indifference to questions of abstract ontology among scientists and mathematicians might be taken to show that our natural attitude towards the abstract has a fictionalist element. The best version of this hypothesis, on my view, is that our natural attitude is indeterminate between a simple commitment to the literal truth of standard mathematics and a commitment to something like the nominalistic adequacy of accepted science.) To recognize this modal fact is to acknowledge that our complacent antinomialism is a strongly contingent feature of our worldview. It is not forced upon us: not by the facts; not by a commitment to science; and not by objective principles of rationality.

Should this recognition lead us to reconsider our antinomialism? We’ve already seen that it may, but *should* it? It can be disconcerting to realize that one’s views are strongly contingent in this way. When it first dawns upon the complacent theist that his belief in God is not forced upon him by compelling reasons, but is rather a matter of what he has been raised to take for granted, one response is to say, “There but for the grace of God go I. It’s a matter of luck that I wound up believing. But thank goodness for it. If I had been raised differently, I would have been mistaken.” But another possible response is to wonder, “With what right do I suppose that I am one of the lucky ones?”

The structure of this familiar predicament is as follows. You have always believed that P for no reason in particular. P is part of the worldview you take for granted: neither inculcated by argument nor supported by argument after the fact. You then encounter someone else who finds it natural to doubt it. Neither of you can offer arguments to sway the other. Nor is it plausible to suppose that you have special access to the truth in the relevant domain (e.g., a special sense for detecting the truths in question). In such circumstances the only thing to think is that the differences between you and them are due to historical contingencies which in themselves favor neither option. Our question about nominalism is then an instance of the question, How should one respond to this sort of predicament?

Al-Ghazali calls this sort of belief *taqlid*—“derivative” or “second-hand” belief. In *The Deliverance from Error* he maintains that *taqlid* is possible only for someone who does not fully realize that he is in it.²¹ Once one becomes fully aware that one takes (say) Islam for granted only because one has been raised to take it for granted, and that if one had been raised a Christian, one would have taken it for granted, then, Ghazali says, “the glass of *taqlid* is

broken".²² Ghazali intends this both as a psychological claim and as a normative one: Not only is it impossible to sustain a commitment in full recognition of its status as *taqlid*; according to Ghazali it would clearly be wrong to do so.

In my view, Ghazali is wrong on both counts: Not only is it psychologically possible for us to maintain a belief in full awareness of its strong contingency. In some cases there is absolutely nothing wrong with doing so. It seems to me, rather, that the most appropriate response to the problem of *taqlid* will vary from case to case and from person to person.

If I had been raised by Ghengis Khan, I would have been much more tolerant of deliberate cruelty than I am, and for all I know, this stance would have been stable upon reflection. But this does not shake my confidence that deliberate cruelty is contemptible, and I don't think it should. If I had been raised by a certain sort of empiricist, I would have been unmoved by the case for atoms. The fact that atomic theory provides the only moderately compelling explanation of the data would have struck me as no reason whatsoever for believing that it is true. And yet the recognition that I might have been unmoved by the explanatory power of the atomic hypothesis does not alter the fact that I find it utterly compelling on the strength of the standard arguments. And again, I do not regard this as a defect in rationality. In this sort of case I can acknowledge the fact that my commitments are contingent without finding myself with anything like a compelling ground for retreating from them.

On the other hand, it seems to me that the complacent theist who is raised to take the existence of an invisible God altogether for granted probably should reconsider when he realizes that this commitment is an accident of history. I should stress that I am imagining a distinctive sort of theist: one who takes himself upon reflection to have no positive grounds for his belief: no arguments, no compelling authority, and most importantly, nothing that he would regard as direct experience of the divine: a theist who believes simply because he has been immersed in a culture in which God's existence is taken for granted. I am prepared to grant that this sort of theist is within his rights in continuing to believe, even when he is made vividly aware of the contingency of his view and the availability of defensible alternatives. He may persist on grounds of doxastic conservatism. (The existence of defensible alternatives does not constitute a "positive ground for doubting the existence of God", as one says.) He may persist simply as an act of faith. But even if such persistence is rationally permissible, it seems to me that there is something admirable in the choice to reconsider. Reconsideration manifests a virtue for which we have no standard name: non-complacency, a concern to be responsive to reasons. Even if it is not strictly required, there is much to be said for it.

Now it seems to me that complacent antinominalism of the sort I have described is more like complacent theism than it is like complacent liberal moralism or scientific realism. To speak only for myself for now: When I reflect on the fact that I might have found it natural to suspend judgment on the existence of mathematical objects and that I have nothing to say to someone who does

find this natural, I find my complacency somewhat shaken, and rightly so, in my opinion. I grant that I am entitled to persist on grounds of conservatism, or on the ground that it takes effort and ingenuity to sustain the fictionalist *epoché*. But belief on such a basis strikes me as hollow: as a lamentable concession to necessity or to laziness. It may be permissible, but it is hard to see the virtue in it.

I shall return in a moment to the classification of complacent platonism. The important point for now is that there would seem to be cases in which the recognition that one's commitments are strongly contingent both does and should lead one to reconsider, and cases in which this recognition legitimately leaves one cold. The main challenge in this area is to articulate the norms governing such reconsideration. What (if anything) is the epistemologically relevant difference between (say) complacent liberal moralism and complacent scientific realism on the one hand, and complacent theism (and perhaps complacent anti-nominalism) on the other?

I cannot say with confidence, but here is one relevant difference. The recognition that my moral view is an historical artifact does not destroy the palpable obviousness that attaches to certain claims about right and wrong. I can dwell indefinitely on how I would have felt if I had been raised by Ghengis Khan. I can acknowledge that I would have reveled in deliberate cruelty, and that this stance would be stable upon reflection. And yet this exercise does not lead me to find deliberate cruelty any the less repellent. Similarly in the scientific case, I can recognize that if I had been configured differently by the vicissitudes of culture, I would have been unmoved by the explanatory power of the atomic hypothesis, while continuing to find the abductive case for atoms utterly compelling. By contrast, when I imagine myself in the position of the complacent theist, I imagine myself waking up to find that God's existence no longer strikes me as evident (if it ever did). In this case, the phenomenological impact of the realization of contingency is very different.

"But this is just psychology. In some cases the encounter with the Other dispels the obviousness of the contested commitments (or perhaps reveals that they were never obvious to begin with.) In others it does not. And when the obviousness is gone we are (perhaps) more inclined to retreat from the contested view. But so what? The question was not, 'What are we inclined to do?' It was, 'What should we do?' 'What does it make most sense for us to do?' How do these psychological facts bear on this question?"

My response is a conjecture. It is a familiar thought that perceptual knowledge rests on a principle to the effect that certain non-doxastic 'perceptual seemings' constitute grounds for belief.²³ If it seems to me that there is a cat on the mat, then I have reason to believe that there is a cat on the mat. Its seeming to me that P is not a matter of my believing anything. It is a *sui generis* propositional attitude that does not stand in need of justification but which is capable of supporting a perceptual judgment that P. The justificatory connection between seeming and believing is immediate. It does not depend on the reliability

of the transition. In an evil demon world the dupe is justified believing that the external world is thus and so when it seems to him that things are thus and so. Nor does it depend on the subject's believing that perceptual seemings are reliable. This thought is too sophisticated to enter in to the most basic strata of epistemic justification. To the contrary, insofar as we are justified in believing that perceptual seemings are generally veridical, it is because we are independently justified in accepting a detailed account of the perceptual mechanisms which can only be grounded in particular instances of the transition from 'seems' to 'is'.

This structure is plausibly present in a range of cases not involving sense perception. Mark Johnston has argued that a certain sort of desire is best understood as a matter of being "struck by the appeal of things".²⁴ This "being struck by the appeal" is a quasi-perceptual matter—it is phenomenologically vivid, for example; but since it is typically directed at hypothetical states of affairs, it is not literally a matter of perception. Like perceptual seeming, evaluative seeming is not doxastic. It is a matter of an object's seeming to one to possess one or another highly determinate evaluative property. There may be other routes to evaluative knowledge. But it is plausible that insofar as perceptual judgment is canonically grounded in perceptual appearances, evaluative judgment is canonically grounded in evaluative appearances. That one finds a certain contemplated course of action appalling is a reason for taking it to be appalling. And once again, it is plausible that this is a basic epistemic norm, ungrounded in further facts (or thoughts) about the reliability of evaluative seeming.

To cite just one more example, Steve Yablo has argued that judgments of metaphysical possibility are typically grounded in intuitions of conceivability.²⁵ On Yablo's view, to conceive that P in the relevant sense is a compound act: One first imagines a P-world, and that world then *strikes one* as possible. The model is as above. The non-doxastic modal seeming provides a sufficient though defeasible ground for the modal judgment. And in this case in particular there is no thought that the seeming need be a matter of sensitivity to the facts in question.

These cases suggest a pattern. It may be that as a general matter, one's finding it obvious upon reflection that P is the case—its striking one that P; it seeming clearly to be the case that P—amounts to a ground for believing that P. When the encounter with an alien sensibility destroys this felt obviousness—or when it makes it plain that it was never there to begin with—it knocks the ground out from under what one has previously taken for granted. If one has no other ground for believing that God exists, then while one may be entitled to persist in believing on grounds of epistemic conservatism, it will be natural and perhaps laudable for one to think: "Here is something I have taken for granted. And yet upon reflection I find myself with no good reason to believe it." And in this case, there would seem to be some virtue in backing off.

Again, one may not be obliged to do so. The retreat to agnosticism has its costs. One is not obliged to spend a great deal of time policing one's views,

shoring up those bits of doctrine whose support has for one reason or another gone by the board. So when the encounter with the Other brings one face to face with the groundlessness of one's commitment one may say, "Fascinating. I'll have to think about that when I don't have more pressing things to worry about." But if one does have the time, and one can see one's way through to a more coherent overall view, then, as I say, there would seem to be virtue in rethinking.

On the other hand, if the obviousness of the contested claim survives the encounter with the Other, then one still has some reason to hold it: the reason provided by the seeming. If, after reflecting on the rational tenability of an ethos that prizes cruelty, cruelty continues to strike me as self-evidently reprehensible, then my conviction that it is reprehensible has a powerful and cogent ground, despite my recognition that others who lack this ground may be fully justified in thinking otherwise.

Now as I say, I am inclined to classify antinomialism with complacent theism in this taxonomy. My reasons are perhaps inevitably idiosyncratic. I believe in one Zero. I believe in the existence of a set with infinitely many members. But when I consider the Bedrockers and what they would say about these commitments, I must say that these claims no longer strike me as obvious. My attachment to them is hollow. It has the feeling of a regrettable concession to necessity. Given my own habits of mind and the intrinsic difficulty of the project, it would take a considerable effort to sustain the fictionalism the Bedrockers find so natural. And there is always the lurking danger that unless one is very careful, one will wind up with commitments to the 'fictional truth' of certain claims about abstracta, which, when unpacked, are incompatible with one's professed agnosticism. Fictionalism is difficult; an ecumenical antinomialism is easy. But even if this constitutes a legitimate defense of a sort of antinomialism, it is hard not to feel that in persisting on these grounds, one is falling short of an ideal worth pursuing.

But as I say, this may be idiosyncratic. If you can think about the Bedrockers and still find it evident upon reflection that the existential claims of (say) number theory are literally true, then for all I have said, you have no compelling basis for retrenchment.

The upshot is a form of relativism. If the question of nominalism is 'What should I believe about abstract objects? What does it make most sense for me to believe?' then the emerging answer is in part: 'It depends on how things strike you'. The position raises a number of questions, the most urgent of which concern the evidential force of non-doxastic seemings. In each of the cases we have considered, we are presented with what is in effect an array of sensibilities: an array of dispositions that deliver, in response to various sorts of input, a seeming: a non-doxastic appearing-true. In some cases it is possible to imagine wide variation in these sensibilities. We can imagine a community of clear-headed altogether rational-seeming human beings who differ from us in what they find evident in ethics, in mathematics, and perhaps in other areas. I have

taken it for granted that other things being equal, one is fully entitled to rely on one's own sensibilities even when one is vividly aware of the alternatives. Not only is it not irrational to do so: in doing so one may constitute a model of epistemic virtue. But it may be wondered whether this is a stable position. After all, there is a sense in which when there are several available sensibilities, it should strike us as *improbable* that the sensibility history happens to have afforded us is just the right sensibility for getting on to the facts. It is manifestly irrational to rely on a method belief fixation while acknowledging that it is probably unreliable. When we rely on how things strike us in full awareness of the fact of contingency, we cannot occupy this detached point of view. We must credit ourselves with a bit of epistemic luck. And while it is possible to say that one is always entitled to take this stance towards one's own sensibilities, it is hard to resist the sense that this is a counsel of desperation—a recoil at the looming threat of skepticism. In any case, if it is an unacceptable counsel of desperation—if we have nothing to fall back on in the encounter with the Bedrockers, not even our healthy sense of what is obviously correct—then the case for agnosticism is all the more compelling. One may still be entitled to persist in one's platonism for reasons of conservatism and the like. But one will be no better off, epistemically speaking, if the existence of abstracta strikes one as evident than if it doesn't—which is to say that one's commitment is bound to have the sort of hollowness described above. And this is clearly an epistemic defect, even if it does not amount to irrationality.

Notes

1. For discussion, see J. Burgess and G. Rosen, *A Subject with no Object*, Oxford, 1997, ch.1.B.
2. "The Sentiment of Rationality", in *The Will to Believe and Other Essays*, Dover, 1956.
3. Locus classicus: Hartry Field, *Science without Numbers*, Princeton, 1980.
4. That is, as accounts of what scientists have meant all along by their words. For discussion, see Burgess and Rosen, op. cit., III.C.2.
5. English for: $\exists x \exists y (Mx \ \& \ My \ \& \ x \neq y \ \& \ \forall z (Mz \rightarrow (z = x \vee z = y)))$.
6. "What do you mean, (2) does not entail (1)? They are necessarily equivalent, so each entails the other?" There are two responses. The first is to say that "entail" does not mean "strictly entail", but rather something more like "analytically entail". The other is to do deny the claim of necessary equivalence, which is tantamount to denying the necessary existence of the numbers. For some discussion of the latter option, see my "A Study in Modal Deviance", in T. Gendler and J. Hawthorne, eds. *Imagination, Conceivability and Possibility*, Oxford University Press, forthcoming.
7. Mark Balaguer employs a similar notion. In his formulation, when the nominalist accepts a platonistic sentence S as adequate, what he believes is that "the concrete world holds up its end of the S-bargain". Balaguer's discussion involves no explanation of this metaphor. See his *Platonism and Anti-Platonism in Mathematics*, Oxford, 1998.

8. I have heard the objection that there could not be an entire linguistic practice in which non-serious, indirect assertion was the norm. The thought is that we must normally or typically mean exactly what we say, and that indirect assertion is therefore necessarily exceptional. But I have never seen a compelling philosophical argument for this principle. And in any case it would seem to prejudice on a priori grounds what ought to be an empirical issue. Do we really know how much ordinary assertion in modern English is intended literally? Can philosophy rule out the possibility that more than half of what we say is meant as some sort of joke?
9. J. Thomas Looney, *Shakespeare Identified*, Kennikat Press, 1975 (reprint).
10. Compare Fuller: "Everyone who has dealt with legal problems must, at one time or another, have had the experience of feeling that a certain doctrine of law was expressed in terms of fiction, and yet have found himself, to his dismay, unable to restate the doctrine without recourse to fiction." *Legal Fictions*, Stanford, 1967, p.10.
11. This difference may be framed as a difference in the fundamental rule of belief revision. We (the Realists in the story) are supposed to accept a version of the Quinean principle of Inference to the Truth of the Best Overall Theory, whereas the Bedrockers accept a weaker rule of Inference to the Nominalistic Adequacy of the Best Theory. The thought is that no matter how one refines the Quinean principle to take into account the real complexities of scientific practice, it will always be possible to describe a weaker principle consistent with agnosticism about the abstract.
12. "But surely it might be important for practical purposes to know (say) the speed of sound in air in units of (say) centimeters per second, and answers to this question are not entirely 'about the concrete'." The response is that in any context in which the question seems urgent, the real question might just as well be whether it is nominalistically adequate that the speed of sound in cm/s = x .
13. The task is analogous to the challenge that confronts van Fraassen's constructive empiricism. Van Fraassen's main claim is that agnosticism about unobservables is consistent with immersed participation in science. The claim in the present section is a weaker claim to the same effect, viz. that immersed participation in science is compatible with agnosticism about the abstract. For discussion, see my "What is Constructive Empiricism?", *Philosophical Studies* 74 (1994) and van Fraassen's reply in the same volume.
14. C. Wright, *Frege's Conception of Numbers as Objects*, Aberdeen, 1983. For an altogether different argument for the a priori incoherence of nominalism, see George Bealer, "Universals." *Journal of Philosophy* (January 1993), 90(1): 5–32.
15. For an analogous objection to van Fraassen's fictionalism, see "What is Constructive Empiricism?", *op. cit.*
16. From "Philosophy of Logic," in H. Putnam, *Mathematics, Matter and Method*, Cambridge, 1975, p. 354. The passage from Putnam is an attack on fictionalism about *material* objects. But it is clear from the context that Putnam regards fictionalism about the abstract as untenable for precisely the same reasons.
17. It is possible that in the passage cited earlier, Putnam means only to defend the permissive version of the view against the claim of Vaihinger and others that fictionalism about the posits of accepted science is somehow mandatory.
18. This is the view of the main contestants in the classical debate over nominalism: Quine, Putnam, Field.
19. See Lewis, *Parts of Classes*, Basil Blackwell, 1991, §1.6, and for a related view, Maddy, *Naturalism in Mathematics*, Oxford, 1998. It is unclear to me whether Maddy

is an epistemological naturalist in my sense. For discussion of this issue and the issues raised in this section, see my review in *The British Journal for the Philosophy of Science* 50 (1999).

20. A lousy thinker in a land of lousy thinkers is still thinking badly—his opinions are not warranted—even if he is blameless for his mistakes on the ground that one cannot normally be expected to transcend the universally accepted norms of one's community.
21. In W. Montgomery Watt, ed., *The Faith and Practice of Al-Ghazali* George Allen and Unwin, 1953. I am grateful to Stephen Menn for calling this remarkable text to my attention. For discussion, see Menn's "The *Discourse on Method* and the Tradition of Intellectual Autobiography" (unpublished ms.)
22. *Ibid.* p.27.
23. For an extensive discussion of this tradition, see James Pryor, "The Skeptic and the Dogmatist", *Nous* 34:4 (2000), §3.
24. "The Authority of Affect", to appear in *Phil. and Phenom. Res.*, 2001.
25. "Is Conceivability a Guide to Possibility?", *Phil. and Phenom. Res.*, 1993.