

## *The NOAer's Dilemma: Constructive Empiricism and the Natural Ontological Attitude*

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Faced with interminable combat over some piece of philosophical terrain, someone will inevitably suggest that the contested ground is nothing more than a philosophically manufactured mirage that is therefore not worth fighting for. Arthur Fine has long advocated such a response — the 'Natural Ontological Attitude,' or NOA — to the realism debate in the philosophy of science. Notwithstanding the *prima facie* incompatibility between the realist's and anti-realist's positions, Fine suggests that there is in fact enough common ground for NOA to stand on its own as a minimal alternative, one that enjoys the advantage of being free of the philosophical burdens of its overweight contenders.

Notwithstanding Fine's claim to have identified a position that is neither realist nor anti-realist, critics charge that NOA, as Fine describes it, is a realist position.<sup>1</sup> I endorse this criticism below, with attention to the relation between NOA and Bas van Fraassen's Constructive Empiricism (CE).<sup>2</sup> I show that Fine's repudiation of the globalism he identifies in realism (and in anti-realism) does not insulate him from that charge.

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1 For example, see A. Musgrave, 'NOA's Ark — Fine for Realism,' *The Philosophical Quarterly* 39 (1989) 382-98.

2 See B. van Fraassen, *The Scientific Image* (Oxford: Oxford University Press 1980).

He has, however, voiced themes in his various representations of NOA that, if taken seriously, determine a position that cannot be construed as realist. When NOA is interpreted along these lines, Fine is then not subject to the criticism that he is a reluctant realist. Further reflection on the implications of that interpretation, however, reveals that the resulting position is, in its doxastic recommendations, indistinguishable from CE itself. This alternative interpretation of NOA thus escapes the realist's arms only by running into those of the constructive empiricist instead.

There is yet another theme in Fine's presentation of NOA that at least gestures in the direction of a significant alternative to CE and its realist antagonist. The theme is, however, too underdeveloped in Fine's work to take him as having uncovered genuine middle ground. I explore this alternative in the last four sections.

## I NOA

Fine tells us that both the realist and anti-realist toe a certain 'homely line': they must accept the certified results of science as on a par with those affirmed in the course of our everyday lives.<sup>3</sup> This is not to say that they cannot distinguish degrees of confirmation either in everyday life or in science, or worry over some mode of inference — such as inference to best explanation (IBE) — at home and away. 'It is just,' he says, 'that one must maintain parity. Let us say, then, that both realist and antirealist accept the results of scientific investigations as "true," on a par with more homely truths' (ibid.). To do this is to affirm what Fine calls the 'core position.'

Fine qualifies the word 'true' here by placing it within quotation marks because, as he recognizes, 'some antirealists would prefer to use a different word' (ibid.). Van Fraassen, for example, would prefer 'empirically adequate' to 'true' (ibid., n.19). But that this is van Fraassen's preference is, Fine claims, 'no matter' (ibid.).

What distinguishes the realist and antirealist, then, is not that they toe Fine's homely line. Rather, it is what they add onto the core position. The anti-realist adds a pragmatist, instrumentalist or conventionalist account of truth, or an idealist, constructivist or phenomenalist analysis of concepts, or anti-realist construals of particular inferences, or explanations or laws (ibid., 129).

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3 A. Fine, 'The Natural Ontological Attitude,' in A. Fine, *The Shaky Game: Einstein, Realism, and the Quantum Theory* (Chicago: University of Chicago Press 1986), 128

'What the realist adds on,' Fine tells us, 'is a desk-thumping, foot-stamping shout of "Really!"' (ibid., 129) In quieter moments the realist adds a theory of truth — the correspondence theory — to the core position. Fine thinks that this is, however, really just more noise. 'Like the extra "really,"' he says, the correspondence account is 'an arresting foot thump and, logically speaking, of no more force' (ibid., 129).

When we recognize that realism and antirealism constitute additions to the core position, another, minimal, alternative emerges: that we endorse the core position all by itself (ibid., 129). Endorsing it, and nothing more, is NOA.

## II CE and NOA

Van Fraassen does suggest that we treat the everyday and scientific contexts alike. Consider his response, for example, to the realist's claim that only she respects this constraint. We do, he says, infer from scratching in the wall, the patter of little feet, and the disappearance of cheese that a mouse has come to live with us, that being the best explanation for these phenomena. The realist points out that the same inferential pattern — inference to the truth of the best explanation — is ubiquitous in science, and frequently leads to the postulation of unobservable entities. If we treat this pattern consistently, the realist concludes, we will affirm the existence of those entities as well.

Van Fraassen (*The Scientific Image*, 20) counters that in 'ordinary' cases the conclusion concerns observable entities. He then offers the rival hypothesis that we always infer to the empirical adequacy, rather than the truth, of the best explanation. To infer to empirical adequacy when the conclusion concerns such observables as the mouse is to infer to the truth. This is not due to a difference in our treatment of IBE, however, but to the fact that empirical adequacy and truth coincide when the conclusion concerns observables (ibid., 21). Van Fraassen thus agrees with the realist that we treat everyday and scientific cases alike; but he rejects the realist's claim that doing so requires that we treat them both as inference to truth rather than to empirical adequacy.<sup>4</sup>

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4 Strictly speaking, van Fraassen does not present this alternative interpretation of IBE because he *endorses* this mode of inference; in fact, he does not. He presents the alternative only in order to argue that even *if* we accept IBE as a legitimate mode of inference, doing so does not force realism upon us. But this complication does not matter here. See M. Alspector-Kelly, 'Should the Empiricist be a Constructive Empiricist?' *Philosophy of Science* 68 (2001) 413-31.

Van Fraassen would, I suspect, take issue with Fine's suggestion that his preference for 'empirically adequate' over 'true' is 'no matter.' Van Fraassen is at pains to emphasize his repudiation of the positivists' reductive non-literal construals — which conflate empirical adequacy and truth — and advocacy of agnosticism with respect to unobservables instead.

But suppose we put that criticism aside and read 'accept' for Fine's use of 'believe true.' Then van Fraassen does accept the results of science in the same way that he accepts the evidence of his senses in everyday life. And he adds to this core position by substituting 'believe empirically adequate' for the placeholder word 'accept,' which distinguishes his position from that of his realist opponent who will substitute 'believe true' instead. Unfortunately, however, the somewhat convoluted apologetics that this reading of NOA requires cannot be squared with what Fine has to say about truth.

### III Truth

NOA does, Fine tells us, 'go for the idea' that science involves belief in the truth.<sup>5</sup> But he rejects the robust theories of truth that philosophers of both realist and anti-realist persuasion have offered,<sup>6</sup> robust in that they are not exhausted by Alfred Tarski's account ('The Natural Ontological Attitude,' 133). Alan Musgrave suggests that all Fine has done is emphasize the fact that realism is better off without a robust correspondence account. But NOA nonetheless is, Musgrave contends, a realist position; on NOA's ark, the realist can 'sail happily above the floods of criticism' ('NOA's Ark,' 383).

In fairness to Fine, the thought that realism essentially involves a robust correspondence account of truth is not idiosyncratic. But van Fraassen, at least, does not burden his realist opponent with such an account. A view — such as Musgrave's — that utilizes only the minimal conception of truth manifested in Fine's description of NOA is realism enough to constitute the position against which CE is aligned. The core position is therefore unacceptable to the constructive empiricist, Fine's claims to the contrary notwithstanding.

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5 'Unnatural Attitudes: Realist and Instrumentalist Attachments to Science,' *Mind* 95 (1986) 149-79, at 149

6 'And Not Antirealism Either,' in *The Shakey Game*, 149

This is evident in the following passage from 'The Natural Ontological Attitude':

When NOA counsels us to accept the results of science as true, I take it that we are to treat truth in the usual referential way.... Thus, NOA ... commits us, via truth, to the existence of the individuals, properties, relations, processes, and so forth referred to by the scientific statements we accept as true. (130)

Musgrave ('NOA's Ark,' 385) doubts that this can reasonably be called, as Fine calls it, a 'no-theory' theory of truth ('Unnatural Attitudes,' 177). But, however it is characterized, van Fraassen certainly could not follow NOA's counsel. It is precisely because acceptance of the results of science as true commits us to the existence of unobservable entities — and because van Fraassen denies that we should be so committed — that he insists that acceptance of a scientific theory is acceptance as empirically adequate rather than as true. If the NOAer (Fine's preferred designation for the advocate of NOA) is so committed, then NOA just is the realist position to which CE is presented as an alternative.

#### IV Globalism

Sometimes Fine stresses his opposition, not so much to robust theories of truth, as to the global characterizations of the scientific endeavor proffered by both the realist and the anti-realist. He advocates instead a local, nuanced, and contextual approach ('And Not Antirealism Either,' 147-50). There are two aspects of the globalist tendency to which he objects. First, realism and anti-realism both maintain a monolithic epistemological attitude toward scientific doctrine as a whole. Fine prefers a nuanced, case-by-case approach. Second, they both suggest that science has a single overriding constitutive aim that it is the business of the philosopher to identify. While Fine agrees that scientists have particular aims and goals — to conduct a better experiment, to solve an outstanding problem, to build a better instrument, etc. — he points out that it is a fallacy to infer from 'They all have aims' to 'There is an aim they all have' ('Unnatural Attitudes,' 173).

Neither the realist nor the antirealist is, however, committed to a monolithic epistemological stance. The realist is not committed to assigning the same probability to every scientific proposition, whatever the evidence or opinion of the scientific community may be. Indeed, her attitude is likely to be precisely that of the NOAer: scientists are the ones to determine what claims are to be considered well-established, which are still under investigation, which are implausible but worth exploring, and so on. Her realism consists in accepting those claims that are well-

established and understanding that acceptance to consist in the assignment of a sufficiently high degree of belief as to involve existential commitment, just as the NOAer suggests.

The constructive empiricist may well endorse the various degrees of acceptance assigned to particular scientific claims by the realist. But she will then go on to characterize acceptance as a claim of empirical adequacy rather than truth. Van Fraassen is careful to recognize the possibility that acceptance, for both realist and constructive empiricist, may come in degrees (van Fraassen, 1980, 9). And the constructive empiricist has every right (as does the realist) to assign different degrees of acceptance to particular scientific theories. She will differ from the realist in understanding those degrees of acceptance to concern her confidence in the theories' empirical adequacy rather than her belief in their truth. It is the character of acceptance, not a monolithic vs. subtle epistemology, that distinguishes CE and realism. So the nuanced epistemology of the NOAer does not disqualify NOA as a realist standpoint.

But can we not distinguish NOA from both views in light of its steadfast refusal to postulate any such grand vision of science as having an overriding, constitutive aim?

Fine has, he says, enough confidence in the 'system of "check, double-check, triple-check" of scientific investigation' that if scientists tell him that there really are 'molecules, and atoms ... and who knows, maybe even quarks,' then he 'must accept that there really are such things with their attendant properties and relations' ('The Natural Ontological Attitude,' 126-7). To accept these 'results of science' (ibid., 130) is, Fine insists, to accept them as true.

But what is it to accept the *results* of science as true without recognizing the systematic activity Fine praises as *directed* toward achieving those results? If participants in an activity have a variety of disparate aims but there is no aim that they all have, then there can only be the scattered results of the various pursuits of individual participants, and so no overall results to speak of. But when Fine refers to the results of science, he does not mean the better experiment conducted here, the better instrument there, and so on. If a particular scientist is, after all, only concerned to build a better instrument, why would the NOAer believe her when she affirms the existence of quarks?

The results of science that the NOAer endorses are its well-established theoretical claims. These the NOAer believes to be true. So the scientific endeavor is a systematic process that effectively uncovers truths. And yet we are not to recognize the production of those truths as an intended consequence of that systematic endeavor, or, presumably, of the individual participating scientist *qua* scientist, because that would then constitute the postulation of an overall aim of the scientific endeavor. This is, I submit, incoherent unless the production of truths in which the NOAer

places such trust is an utterly unintended, coincidental by-product of the disparate and unrelated pursuits of a group of people loosely identified as scientists — which is, surely, not Fine's view.

The NOAer has rightly cautioned us to recognize that science may have more than one systematic aim. Perhaps science is directed at *both* truth *and* empirical success *and* technological innovation *and*.... Fine is correct to point out that 'They all have aims' does not imply 'There is an aim they all have.' But neither does 'They have no one sole aim' imply 'They have no common aim.' That science does pursue the truth, and does so effectively enough for us to believe the existential claims of its most established theories, is quite enough for realism, whatever else science might achieve.

To see science as aimed at the truth does not require that we endorse some more robust account of truth than the minimal sense Fine accepts. To attempt to determine whether quarks exist is, in that sense, to attempt to determine whether 'Quarks exist' is true. The NOAer does not require some additional more abstract aim — that our theories' sentences stand in a mysterious correspondence relation to the world — which is indirectly and obscurely related to scientists' investigation into the existence of quarks. But he *does* need to recognize the pursuit of truth — in the minimal sense — as an aspect of the scientific endeavor. And that is all van Fraassen's realist opponent needs as well.

## V Retreating to 'Accept'

Perhaps Fine could retreat to using the term 'accept' in a sense that really is neutral between CE and its realist opponent. This seems at times to be just what he is proposing. He claims that both the constructive empiricist and the realist 'accept' scientific theory, that the 'techniques and rules of evidence' employed in science 'seem to reach only to the fact of acceptance, and not to its character,' and that NOA is determined not to push 'the issue of the specific character of scientific acceptance farther than the reach of ordinary scientific procedures and common reflective thought allow.'<sup>7</sup>

'Accept' must then constitute neither 'believe true' nor 'believe empirically adequate,' where the word 'true' is understood in the minimal sense that Fine endorses. For otherwise, the 'fact of acceptance' *would* decisively settle the dispute between CE and realism in favor of the realist.

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7 A. Fine, 'Piecemeal Realism,' *Philosophical Studies* 61 (1991) 79-96, at 94

If the facts about science reach only as far as acceptance so understood and the NOAer refuses to go further for fear of engaging in 'hermeneuticism run amok' (Fine, 'Unnatural Attitudes,' 174), then, contrary to what Fine repeatedly says, to endorse the core position is to *refuse* to believe in the existence of, for example, quarks. It is also, of course, to refuse to deny their existence. If the facts of acceptance do not resolve the dispute between CE and realism and NOA limits us to what those facts alone determine, then we are in a position to neither affirm nor deny the existence of the unobservables that are the point of contention between those views.

But then the NOAer offers the same doxastic advice as does the constructive empiricist. CE and realism agree that we should endorse the existence of observables, disputing only the legitimacy of belief in unobservables. So if NOA endorses neither view, then it holds that the facts of acceptance do not allow us to settle the question whether we should either believe in unobservables or neither believe nor disbelieve in unobservables. But to refuse to settle that issue just *is* to refuse to settle the question whether to believe in unobservables. And that is the recommendation of CE; for it is CE, and not realism, that is agnostic with respect to unobservable entities.<sup>8</sup>

The NOAer (so understood) and van Fraassen endorse this position for different reasons. The NOAer does so because the facts of acceptance do not settle the question whether scientists believe their theories or only believe them to be empirically adequate. Van Fraassen's reasons are more complex.<sup>9</sup> Sometimes he suggests<sup>10</sup> that CE makes *better* sense of

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8 An analogy: your mentor offers you a theological tome and directs you to believe all and only its teachings. But its language is obscure. You are certain it repudiates atheism. But you cannot tell whether it affirms theism or agnosticism. So you should not be a theist, since you are not convinced that the tome affirms God's existence, and you are determined to believe only its pronouncements. But to reserve judgment this way just *is*, you realize, agnosticism. And so you become an agnostic; not because that is the tome's teachings, but because you despair of determining what its teachings are, and this is the only way to obey your mentor that is open to you.

9 This difference between the constructive empiricist and the NOAer (under this interpretation) might be put this way: the constructive empiricist is agnostic concerning our knowledge of unobservables, whereas the NOAer is agnostic concerning whether science is agnostic about unobservables. I owe recognition that the difference can be expressed along these lines to an anonymous referee. The similarity that I identify between the NOAer and the constructive empiricist is in doxastic consequence, not in philosophical motive.

10 *The Scientific Image*, esp. ch. 5 and 6; and *Laws and Symmetry* (Oxford: Oxford University Press 1989)

science than does realism, that it wins on the hermeneutic issue. But van Fraassen often seems prepared to grant — for the sake of argument, perhaps — that realism makes as much sense of science as does CE. He then argues that CE is nonetheless the position to affirm because it commits us to less than does realism, and in so doing makes sense of science 'without inflationary metaphysics' (*The Scientific Image*, 68-9).

Realists have challenged the implicit appeal to ontological restraint that van Fraassen's latter argument involves. They question whether the reduction in ontological commitment is worth the cost of drawing an artificial distinction between observable and unobservable entities.<sup>11</sup> Instead of remaining neutral, NOA seems to offer van Fraassen a response to this challenge: even if appeal to ontological restraint is unwarranted so that van Fraassen cannot claim support from either that principle or the facts of acceptance, then CE still wins, because its doxastic recommendations are *equivalent* to those that result from favoring neither position on the hermeneutic issue. CE is then in a very strong position indeed: the facts of acceptance may settle the issue in its favor; if not, ontological restraint may settle the issue in its favor; if not, the NOAer's refusal to settle the interpretive issue settles the issue in its favor.

Fine could, I suppose, endorse an even more extreme agnosticism than that of the constructive empiricist and disavow belief in unobservables *and* observables. This would amount to claiming that we are never in a position to know whether we are affirming the existence of anything whatsoever. I take that result to constitute a *reductio ad absurdum* on such an excessively timid hermeneutic stance and will discuss it no further.

Fine does not really intend any of this. The NOAer *does* believe-true — in the minimal sense pertinent to the debate — assertions concerning unobservables, and therefore believes that the facts of acceptance in science *do* settle the interpretive issue against CE. If that is hermeneuticism run amok, then NOA is as interpretively unrestrained as are both CE and realism, and it runs with the realist.

To summarize: there are two ways to read the 'core position.' On the first reading, 'accept' means 'believe true,' even when applied to unobservables. The upshot is that NOA just is the realist standpoint against which CE is positioned. On the second reading, 'accept' is neutral between 'believe empirically adequate' and 'believe true.' The upshot in that case is that NOA's doxastic recommendations are indistinguishable

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11 See, for example, A. Musgrave, 'Realism versus Constructive Empiricism,' in P. Churchland and C. Hooker, eds., *Images of Science: Essays on Realism and Empiricism* (Chicago: University of Chicago Press 1985), 199.

from those of the constructive empiricist. Therefore, in no case does NOA represent a neutral, minimal, 'core' position that can be adopted as a third alternative.

## VI Contexts

There is, however, another theme in Fine's characterizations of NOA that might be worth considering. Some of Fine's comments suggest that he repudiates, not what the realist affirms *per se*, but the standpoint that the realist assumes vis-à-vis science. The realist, Fine says, 'tries to stand outside the arena watching the ongoing game and then tries to judge (from the external point of view) what the point is. It is ... [according to the realist] *about* some area external to the game' ('The Natural Ontological Attitude,' 131).

But the realist is, Fine insists, 'fooling himself. For he cannot (really!) stand outside the arena, nor can he survey some area off the playing field and mark it out as what the game is about' (*ibid.*). 'We cannot actually do more with regard to existence claims,' Fine says, 'than follow scientific practice' (*ibid.*, 132). But since ordinary scientific inferences to existence will not 'satisfy the [realist's] demand for showing that the existent is really "out there"' (*ibid.*), the realist hankers for more than he can legitimately have; he is 'chasing a phantom' (*ibid.*).

One might be tempted to counter that the subject-matter of much science — the rate of decay of a sample of radium that might be the concern of a particular physicist, for example — is not itself part of the game of science: radium atoms are not themselves scientists or their theories, and they are 'out there' if anything is. So science *is* about an area external to the 'game' in at least this obvious sense.

There is, however, a different — and more interesting — sense in which the debate between van Fraassen and the realist is 'external' to the scientific endeavor. While Fine is primarily concerned to bring the charge of externality against the realist, I will consider it first in relation to CE.

Van Fraassen recognizes (*The Scientific Image*, 71-2) that scientists deliver explanations for observable phenomena that appeal to unobservable entities, and that explanatory success is a criterion of theory choice. He denies that that success is a reason to believe that the unobservable posits exist. But he nonetheless endorses that criterion because the search for explanation is, he says, 'ipso facto a search for empirically adequate, empirically strong theories' (*ibid.*, 157). So the positing of unobservables that empirical success involves is integral to the scientific endeavor, even as CE understands that endeavor's aim.

In order to both recognize and endorse the positing of unobservables in science while nonetheless disowning belief in them, van Fraassen distinguishes the engaged context of the practicing scientist in which they are posited from the detached context of the philosophical epistemologist in which such positing is bracketed. 'To someone immersed in the scientific world-picture,' he says,

the distinction between *electron* and *flying horse* is as clear as between *racehorse* and *flying horse*; the first corresponds to something in the actual world and the other does not. While immersed in the theory, and addressing oneself solely to the problems in the domain of the theory, this objectivity of *electron* is not and cannot be qualified. *But this is so whether or not one is committed to the truth of the theory ... it is possible even after total immersion in the world of science, to distinguish possible epistemic attitudes to science, and to state them, and to limit one's epistemic commitment while remaining a functioning member of the scientific community — one who is reflective, and philosophically autonomous as well.* (ibid., 82)

This distinction between what we should affirm *qua* immersed scientists and what we should believe *qua* autonomous philosophers is at least reminiscent of the distinction between the 'game of science' and the 'area external to the game' that Fine repudiates. And van Fraassen needs this distinction if the fact that scientific methodology inevitably involves the postulation of unobservables is not going to give the game away to the realist.

The question before us, however, is not whether CE assumes an external standpoint, but whether van Fraassen's realist opponent does. Fine obviously thinks so; his repudiation of that standpoint is, after all, directed against the realist rather than the constructive empiricist. But is the realist really committed to that assumption? I don't see why she must be. But, as we'll see, it is reasonable to think that some realists nonetheless are.

## VII Upstairs and Downstairs Realism

Realists might object to CE in two very different ways. First, they might allow van Fraassen his distinction between the immersed scientific and autonomous philosophical contexts, agree that reference to unobservables in the former context does not determine our ontological commitments, and understand their engagement with van Fraassen to be located within the latter context. The issue is then whether we should ratify those apparent commitments as the realist advocates or whether we should limit our endorsement to only observables as urged by the constructive empiricist. The existential claims in science constitute input to this investigation, claims which are to be treated seriously but not as

delivering the last word with respect to what we should believe there is. Call this 'upstairs realism,' since the philosophical dispute in which this realist is engaged is conducted, as it were, in the offices above the factory floor of scientific practice, wherein which offices the final decisions are made concerning the fate of the theoretical products generated below.

Alternatively, the realist might simply repudiate the distinction between the immersed and autonomous contexts. She might claim that the scientific endeavor is the paradigm of rational inquiry, standing in no need of subsequent correction by the philosopher, empiricist or not. To suggest otherwise, she might point out, is to take the ontology of our best science as nothing more than the topic of a higher-order epistemological inquiry. And that hierarchical conception of the relationship between philosophy and science, she might argue, ought not to be tolerated in this naturalistic age.

This realist would not so much suggest that CE is wrong as incoherent, presupposing as it does a distinction between the engaged scientific and autonomous philosophical contexts for its very characterization, which distinction she repudiates. Call this 'downstairs' realism since, to continue the metaphor, it amounts to solidarity with the commitments of the scientists at work below.

This latter standpoint is recognizable in the way some other ontological disputes are conducted. Participants in the debate concerning abstract entities in the philosophy of mathematics, for example, frequently assume that if such entities as numbers turn out to be indispensable to science — that is, if there is no way to represent scientific doctrine and practice without availing ourselves of reference to such things — then the realist wins.<sup>12</sup>

That's why Harry Field has tried to show that scientific doctrine can be represented without reference to abstract entities.<sup>13</sup> Field's hope is that our ultimate account of what the world is really like will not include reference to such things (*ibid.*, 1). But since he is committed to scientific doctrine as telling us what the world really *is* like, and since the latter

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12 Notice the assumption in Hilary Putnam's classic statement of the indispensability argument: 'So far I have been developing an argument for realism along roughly the following lines: quantification over mathematical entities is indispensable for science, both formal and physical; therefore we should accept such quantification; but this commits us to accepting the existence of the mathematical entities in question' (H. Putnam, 'Philosophy of Logic,' in *Mathematics, Matter and Method: Philosophical Papers, Volume I* [Cambridge: Cambridge University Press 1975], 347).

13 H. Field, *Science Without Numbers: A Defense of Nominalism* (Princeton: Princeton University Press 1980)

doctrine, as it stands, includes abstract existentials, Field needs to show that scientific doctrine can be rewritten without them. Otherwise, Field says, one is 'merely taking back in one's philosophical moments what one asserts in doing science, without proposing an alternative formulation of science that accords with one's philosophy.' Doing that, he suggests, amounts to 'intellectual doublethink' (ibid., 2).

As we saw, van Fraassen concedes that the positing of unobservables in science is inevitable. But, unlike Field, van Fraassen does not think that what one asserts in doing science prevents taking it back in one's philosophical moments. Van Fraassen exposes himself to the charge of doublethink as a result only if his distinction between the immersed and autonomous contexts is illegitimate.

Realists in the philosophy of science do not typically distinguish between the upstairs and downstairs standpoints. But they should be distinguished, because they are incompatible. The downstairs realist *presupposes* that there is no such autonomous context as van Fraassen takes to be available. If there were, then the mere fact that positing unobservables is unavoidable in the scientific pursuit would not, *pace* Field, require that we concede their existence. But the upstairs realist intends to engage with van Fraassen precisely within the autonomous context, thereby granting what the downstairs realist denies.

### VIII No Miracles

Many realists do, I think, present arguments that reflect the upstairs realist standpoint.<sup>14</sup> Their typical argumentative strategy, and line of attack against CE, is the 'no-miracles' argument: only the assumption that scientific theories are true (or approximately true) can account for the obvious predictive success and technological feats that science delivers. CE is therefore without the resources to account for that success as anything less than miraculous.

The no-miracles argument can only be sensibly offered by someone who thinks that the facts about science — including the fact that scientists

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14 An exception is Paul Churchland's response to CE, which seems to represent a downstairs realist standpoint: 'Our best and most penetrating grasp of the real is still held to reside in the representations provided by our best theories. Global excellence of theory remains the fundamental measure of rational ontology. And that has always been the central claim of scientific realism.' (P. Churchland, 'The Ontological Status of Observables: In Praise of the Superempirical Virtues,' in Churchland and Hooker, 47).

refer to unobservables and would find it impossible to avoid doing so — do not settle the realism issue. For if they did, then the issue that the argument is intended to resolve needs no resolution, having been already settled in favor of realism. To think that it is not so resolved is to grant van Fraassen his distinction between the immersed and autonomous contexts. And only the upstairs realist does that.

Realists who do mount the no-miracles argument against CE — Richard Boyd is the perspicuous example — typically view their argument as an expression of philosophical naturalism. They use an argument pattern — IBE — that is ubiquitous in science, and so their realism constitutes a scientific theory of the success of science.<sup>15</sup>

But the downstairs realist is also a philosophical naturalist. And indeed her naturalism appears to be the more thoroughgoing. Not only does she defer to science in way of argumentative methodology, she also defers to it in ontology, which the upstairs realist does not do. However much the upstairs realist borrows his argument pattern from scientific practice, his concession that the argument is *needed* is not a natural assumption for the naturalist to make.

We are a long way from Fine's presentation of NOA. But we have arrived at a position — downstairs realism — that shares many of NOA's characteristics. Corresponding to the core position is the immersed context of the practicing scientist. Remember that even van Fraassen concedes that it is appropriate in that context to affirm sentences that appear to commit us to the existence of unobservable entities. The constructive empiricist loads onto this core position the distinction between the immersed scientific and autonomous philosophical contexts, and the claim that we should, in the philosophical context, disown commitment to unobservables. The upstairs realist who counters van Fraassen with the no-miracles argument also loads the core position with the distinction between contexts. She just argues that we should ratify rather than renounce commitment to unobservables within the philosophical context. And corresponding to NOA is the standpoint of the downstairs realist, who claims that immersion in science is the only legitimate epistemic standpoint, and so that the ontology delivered by our best science is the sole determinant of our ontological commitments.

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15 See R. Boyd, 'Scientific Realism and Naturalistic Epistemology,' in P. Asquith, P. Giere, and R. Giere, eds., *Philosophy of Science Association Proceedings 1980* (East Lansing, MI: Philosophy of Science Association 1981); 'The Current Status of Scientific Realism,' in J. Leplin, ed., *Scientific Realism* (Berkeley: University of California Press 1984), and '*Lex Orandi est Lex Credendi*,' in Churchland and Hooker, *Images of Science*.

## IX Why Downstairs Realism?

To describe such a position is not, of course, to argue for it. Fine does not present such an argument, which is no surprise since he does not represent NOA in these terms at all beyond the vague externality metaphors of the sort cited above.<sup>16</sup> Evaluating downstairs realism requires evaluating its underlying naturalism, in both its epistemological and ontological aspects, a task far beyond the scope of this paper. I will instead pursue the less ambitious course of arguing that a realist's endorsement of epistemological naturalism but not ontological naturalism — as represented by Boyd for example — constitutes an unstable position, and so that downstairs realism is the only legitimate naturalist response to the realism debate. The argument is a variation of one of Fine's own arguments against realism *per se* ('The Natural Ontological Attitude,' 114-16). I put it to use here instead as an argument against only naturalistic upstairs realism.

The upstairs realist offers the no-miracles argument against the constructive empiricist. Van Fraassen counters that IBE may well be an inference only to the empirical adequacy of the best explanation, or even that IBE is not a legitimate inferential rule at all. And so the debate proceeds.

But van Fraassen might offer a different response. The naturalistic upstairs realist's employment of IBE is legitimized — in her eyes — by the ubiquity of that inferential tool in scientific methodology; that is her epistemological naturalism at work. But the very fact of IBE's ubiquitous employment in science guarantees that this particular application of it is both pointless and question-begging.

The epistemic naturalist's position is 1) that science is the methodological gold-standard; 2) that it is clear that IBE is a prominent feature of scientific methodology; and 3) that IBE as employed by the practicing scientist is clearly inference to the truth rather than to the empirical adequacy of the best explanation (for otherwise her appeal to it is hostage to upstairs wrangling concerning the 'interpretation' of scientific methodology). But IBE's employment within science *already* delivers unobservables: this cloud-chamber streak is explained as the condensation-path of a passing particle, that red shift is explained as the

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16 Fine does present some arguments against realism's supposed externality. Musgrave derides Fine's arguments as far too idealistic to represent the *natural* ontological attitude. I agree. See Fine's discussion of the 'problems' of 'reciprocity' and 'contamination' in 'Unnatural Attitudes,' 150-2, and Musgrave's response in 'NOA's Ark,' 391-6.

change in frequency of the electromagnetic radiation as the star recedes from us, and so on. So if these claims *are* correct, then the inferences scientists routinely make to unobservables themselves settle the issue in favor of realism, no matter what the fortunes of IBE's employment in the no-miracles argument might be.

Nothing in this argument hinges on the fact that the inferential rule in question is IBE. Whatever tool it is that the epistemic naturalist borrows from scientific practice, if that tool is used in science to infer to unobservables, then its employment upstairs is superfluous; but it is only legitimate for the epistemic naturalist to use it upstairs *because* it is used downstairs (from whence it was borrowed). Conversely, if van Fraassen's skepticism really does require a response — as the upstairs realist concedes — that response cannot legitimately employ an inferential tool borrowed from scientific practice which, within that practice, is used to infer to unobservables without begging the question.

The upshot is that if science is the epistemic gold-standard then it is also the ontological gold-standard; one cannot engage with van Fraassen on the ontological front without engaging with him on the epistemological front as well. Van Fraassen might take some comfort from that result. But it only clarifies the structure of the debate; it does nothing to resolve it in his favor. If the realist engages with van Fraassen at all, then her method of engagement cannot have naturalistic underpinnings. But the naturalist still has the option of repudiating the coherence of the entire upstairs debate, by appeal to the wholesale naturalism of the downstairs realist. Again, this is no argument for that more thoroughgoing naturalist standpoint, and therefore no argument for downstairs realism. But it at least clarifies the role that a naturalistic philosophical outlook can legitimately play in the realism debate.

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