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THE CONTROVERSY OVER *RES* IN PHILOSOPHY OF SCIENCE AND THE MYSTERIES OF ONTOLOGICAL NEUTRALITY

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Clarification of the terms 'realism' and 'antirealism' has always been a challenging task for philosophers of science, epistemologists, and metaphysicians. The first part of my paper offers a certain classification and critical exposition of realisms in philosophy of science. Next, I take up the issue of finding a middle or natural ground between realism and antirealism. Arthur Fine's Natural Ontological Attitude is generally considered as a highly interesting and promising attempt at combining the strengths of the two sides of the debate in philosophy of science while avoiding their excessive "philosophical" claims. I argue that while reconciliatory approaches are definitely welcome in this matter, Fine's project fails because of its inability to properly handle and carry certain significant and perhaps even indispensable features of realism and antirealism into the new position. Another indication of NOA's failure is Fine's notable misrepresentation of the main theses of the two camps that he strives to bring together. The resultant picture of NOA leaves a great deal to be desired because of Fine's Procrustean treatment and the inadequate ontological account emerging out of it.

Keywords: Antirealism – NOA – Ontology – Realism – Truth – Unobservables

1. Introduction. It is not only striking but also slightly embarrassing to observe that after decades of lively discussion and earnest attempts at analytic clarity and precision, the terms 'realism' and 'antirealism' continue to baffle contemporary philosophers, especially in areas like theory of knowledge, metaphysics, and philosophy of science. Etymologically speaking, '*re*-alism' is a hardly enlightening term for it does nothing more than making an obvious reference to the concepts of *object* and *reality* whereas problems of realism are often regarded as involving not solely matters of objective existence but epistemic and alethic issues as well. In this paper, I first offer a broad classification of scientific realisms found in the current literature and then critically evaluate a position – more correctly, an attitude – which claims to overcome the problems of realism and antirealism by adopting a neutral stance.

2. Realisms in Philosophy of Science. Although the current literature abounds in kinds of realism, one can talk about the existence of three main lines of thought that un-

derlie most of the pertinent debates. One sort of realism is obviously concerned with *entities* or *objects* of the Cosmos. While the general question of such realism is "What kind of entities do exist?", philosophers of science are interested, from a narrower point of view, in the question "Do the *unobservable* entities that are postulated by our best theories really exist?" This metaphysical or ontological question is typically answered in the affirmative by realists. I will use 'realism^{E}' for this particular brand of realism. Another sort of realism is broadly related to *truth* of sentences or propositions; and the scientific realist version of this claim is about the truth of our *scientific theories*. Philosophers of science may, for instance, engage in theoretical investigations such as critically evaluating the legitimacy or usefulness of discourse on truth, explicating the nature of truth in association with scientific theories, and so on. In that context, realism amounts to the claim that scientific theories are capable of being true or false due to their denoting or (more cautiously) being about some objective features of reality. Let me employ 'realism^{T}' to refer to this kind of realism. Finally, one can also be a realist with regard to our *epistemic* or *doxastic* states. Such a realist argument can be cast in various forms. It might, for instance, be required that in order for a theoretical proposition to be *known* it must be true (in the sense of realism^{T}). In other words, realistically construed truth is required to be a necessary condition of scientific knowledge as in the case of the traditional tripartite definition of sentential knowledge. Alternatively, a realist might maintain that "*acceptance of a scientific theory involves the belief that it is true*" (van Fraassen 1980, p.8). I will use 'realism^{K}' to refer to this sort of realism.

This tripartite categorization can be applied to contemporary perspectives on scientific realism and scientific antirealism.[1] To mention just a few, H. Putnam (1984) and M. Devitt (1991) use the term '(scientific) realism' mainly to refer to realism^{E}; many realists who confront instrumentalist theses are seen to be realists^{T}; B. van Fraassen combines realism^{T} and realism^{K} when he offers a characterization of 'realism' (1980, p.8); and, lastly, according to I. Hacking (1986; 1996) scientific realism involves realism^{E} and realism^{T}. Moreover, as Devitt (1991, pp.39-59, pp.108-121) correctly notes, the metaphysical thesis and the semantic claim are independent claims. One can be a realist^{E} without being a realist^{T} and *vice versa*. So it is possible to defend realism^{E} while remaining skeptical about the nature of truth; or, conversely, one may believe that truth consists in some sort of non-arbitrary or structured relations without invoking the idea of objects being out there. One can also reasonably assert that the above definitions do not dictate, as they stand, any particular interpretation of truth. For instance, truth as correspondence is just one common form of realism^{T} where theories are alleged to correspond to mindinde-

[1] In this paper, I will not touch upon the broader onto-semantic issues concerning realisms and antirealisms but only try to focus on some significant realism-related controversies in philosophy of science. For the former matter, see, for instance, Goldman (1986; 1999), Devitt (1991), Rorty (1991), Putnam (1994), Allen (1995), Searle (1995), Alston (1996), and Baç (2006). Michael Lynch's two recent books (2004; 2009) are especially illuminating vis-à-vis the issues of propositional truth, realism and ontological pluralism. I will say more about "ontological pluralism" in Section 5.

pendent parts/aspects of external reality. I am inclined to think that these three sorts of realism can be viewed as largely independent of one another. Regardless of the validity of the thesis of "conceptual separation," however, various aspects of the matter get actually connected in the literature on realism and antirealism – as in the case of philosophers' subscribing to realism^{T} and realism^{E} simultaneously.

3. Scientific Realism About Unobservable Entities: Realism^{E}. The claim that unobservable entities employed in theories really exist is one crucial tenet of scientific realism. Devitt (1991, p.109), for example, identifies "scientific realism" with realism^{E}, contending that it has nothing to do with the matters about truth or knowledge. Now, one smart strategy for the realist^{E} is to draw some support from common sense realism (viz., the claim that medium sized dry goods exist), a thesis with which the antirealists^{E} do not have any quarrels. The main point of common sense realism is often made in a quasi-Kantian fashion: it is perfectly rational to make an inference from what we observe, or what is within our experience, to the *real existence* of an entity.[2] For example, I hear somebody knocking on my door and shouting "Anybody home?" Nothing is more natural in such a case than inferring that there *is* somebody at my door. Actually, we always make such inferences in various contexts from what we observe to what we do not (and sometimes what we cannot). Astronomy, to give an obvious example, is full of such instances. But if this point is admitted, it becomes very difficult to see why we should not make a similar inference for the existence of electrons, photons, etc., which are postulated by our most successful scientific theories. To pose the question a bit differently, "[w]hat possible ground could there be for someone who accepted such inferences to unobserved observables to reject inferences to unobserved unobservables?" (*ibid.*, p.110). There is also a critical issue about drawing a dividing line between what we can observe and what we cannot. Do we "see" through a microscope or a telescope? A positive answer is surely to strengthen the hand of the realist^{E}: we can imagine engineers of the future building extremely powerful and precise instruments like super-microscopes and super-telescopes and, consequently, rendering the division between the observable and unobservable entities more or less arbitrary. The clear upshot of this line of reasoning is that the alleged distinction can be dispensed with.

The issue here may actually go deeper than it seems to the realist^{E}. According to van Fraassen (1980, pp.13-19), the mere fact that the division between observable and unobservable realms is a vague one does not show that the division serves no actual *telos*. Take our conception of heavy and light objects. If someone claims that the Eiffel Tower is not a heavy object since it is always possible for a gigantic creature to lift it easily, our natural reaction would be to say that this is simply an abuse of language. Although that sort of a scenario is a conceivable one, we should refuse to entertain it seriously as a counter-

[2] Kant famously declares in his *Critique of Pure Reason* that it would be absurd to state that "there can be appearance without anything that appears" (1965, Bxxvii).

argument against attempts to draw a dividing line between opposites like heavy-light or observable-unobservable. When people talk about observability, they are normally not much interested in what might transpire in the realm of empirical possibility. Hence, there *is* a point in retaining the distinction between the "observable" and "unobservable." Consider also Devitt's analogy between "inferences to unobserved *observables*" and "inferences to unobserved *unobservables*." Is this a tenable parallel? Is there not a fundamental distinction between what we can observe in principle given our current physiological and cognitive capacities and technological instruments and what we can not (even in principle) observe in the presence of such current conditions? We can observe the moons of Jupiter using a telescope, *and* it is within the limits of our current scientific abilities to go there and check them physically. On the other hand, in a cloud chamber experiment all we can observe is certain traces formed by the ionization of the vapor, not an electron. As a result, the realist^{E} thesis that unobservable entities exist *as postulated* by our theories cannot be defended successfully.

In a nutshell, the realist^{E} must argue for a continuum instead of a division on this matter. For an antirealist^{E}, however, the division serves a strategic purpose because if there is a way to treat the two realms separately, he can avoid being labeled an antirealist about medium sized objects and assure us that his antirealism^{E} will not have disastrous consequences concerning the common objects of our world. It goes without saying that most of the crucial arguments in this debate between realism^{E} and antirealism^{E} revolve around the question of "aided observation," and it is not accidental that both parties of the controversy employ numerous examples involving such devices as telescopes and microscopes. Interestingly enough, very few philosophers have seriously and analytically approached the question "Do we see through a microscope?". The tacit understanding is apparently that microscope is a device which magnifies small objects, rendering them visible for normal human observers in a manner not much different than what ordinary eye-glasses do. Hacking (1985) convincingly argued that the facts about microscopes were more complicated and less obvious than what was generally assumed by philosophers. First of all, contrary to what some realists^{E} wish to believe, there *is* a distinction between low-power and high-power microscopes. With most sophisticated microscopes of the latter sort, the visible image is not necessarily a faithful replica of the object. A light microscope "is essentially a Fourier synthesizer of first or even second order diffractions" (*ibid.*, p.142). Consequently, Hacking argues, we need to correct a common misconception about this device: we do not see through a microscope; we see *with* it. Now, although the antirealist^{E} will certainly be happy to hear this contention, there is a consolation for the realist^{E}. Scientists who use a microscope also use a metal grid when they are viewing the microscopic objects. The grid is originally drawn in ink and then reduced by photographic techniques. When we examine a specimen in a microscope we also see the squares of the grid each carrying a label that was drawn *by us* before the grid has been shrunk to that size. Therefore, when we see "with" the microscope, we can be confident, leaving aside the possibility of a Cartesian demon, that what we see is real because the grid – which is part of the image perceived – is our production. However, as Hacking is

careful to point out, the microscopic illumination techniques used in obtaining the image prevent us from proclaiming that the object under consideration is real. Still, given the fact that scientists have so far been able to develop a number of techniques to eliminate noise and get more veridical images of microscopic objects, there are good reasons for being hopeful on that matter. And this is because now "we can interfere with [the micro structures] in quite physical ways, say by microinjecting" (*ibid.*, p.152).

Another notable argument favoring realism$^{\mathbf{E}}$ is the claim that the existence of unobservables is the best explanation for numerous phenomena we observe in the universe. And a significant response to this line of reasoning is van Fraassen's (1980, p.15) distinction between *observing* and *observing that*.[3] Admitting that something in the cloud chamber causes the ionization of the vapor is not equivalent to admitting the existence of electrons. There may be radically different sorts of entities or occurrences in reality that remain beyond our cognitive reach. So, the realist$^{\mathbf{E}}$ needs to make a leap of faith from *observing* to *observing that*. One must be reminded at this point that there is a remarkable difference between observables and unobservables in the present context: when I observe a tree or a planet, I am aware of the fact that I observe *that* very object independently of the existing scientific theories describing it (putting aside the "myth of frame" for a moment). By contrast, as our theories change and evolve in time, we may end up having very different conceptions of an electron. Consequently, we are not in a comfortable position to argue that an unobservable entity postulated at an earlier stage of the atomic theory is the same entity described and referred to by a modified form of that theory. This interesting asymmetry further supports the thesis that a hypothesized entity like electron cannot be a legitimate object of "observing that."

Hacking maintains that one criterion for the reality of unobservables is our ability to intervene and manipulate those entities. The argument can be formulated more precisely as follows – as spelled out by Devitt (1991, p.113):

Suppose *U* exists. Then, if we do *A*, that should make *U* do something leading to *P*. When we then go ahead, do *A*, and produce *P*, we have powerful evidence of the existence of *U*. Those not afraid of abductive talk would put it this way: the best explanation of *P* is that we have indeed manipulated *U*, and so *U* really does exist.

The problem here is one and the same: our manipulation and producing a certain effect does *not* show that *those* particular unobservables (as opposed to something else) actually exist out there. Fine (1986, p.164) expresses this idea as follows:

> I think [the criterion of intervening] misses the point ... There is no special reality-making power involved ... in [the] act of intervening the nature. Nor does the ease of discourse about these acts, or others, have the power to make these objects of discourse real.

[3] This distinction can be explained by noting that two people observing the same "object" can produce very different reports (of the form "I observe that p") depending on their respective epistemic backgrounds and linguistic resources.

The [scientific] behaviour and discourse simply show what is already taken for granted. The realist question here is whether the entities exist.

If this point is conceded, then the realist^{E} is deprived of a powerful argumentative tool against antirealism^{E}.

4. Realism About Truth of Scientific Theories and the Problem of Access: Realism^{T} and Realism^{K}. While philosophers like Putnam and Devitt treat realism^{E} and realism^{T} as distinct theses in that the success or failure of one is fairly independent of that of the other, many others claim that realism^{T} is related to (or, cannot be dissociated from) realism^{E}. According to R. Bertolet (1988), the success of realism^{E} is definitely dependent upon the correctness of our theories. Realism amounts to the claim that the terms like 'electron' do actually refer to such entities *and* that our scientific statements talking about them are at least approximately true (see van Fraassen 1980, p.9; Putnam 1984, p.142). Devitt, on the other hand, contends that it is not much difficult to show the plausibility of realism^{T} with the aid of realism^{E}: given first that we are comfortable with the thesis that our ordinary empirical statements are true or false because of referring to observables, and secondly that realism^{E} is right, it seems just natural to take one step further and assert that our scientific statements which contain theoretical terms referring to hypothetical entities have truth values just like ordinary statements. In a nutshell, certain realist^{E} arguments can reasonably be used *mutatis mutandis* to support realism^{T}. For instance, a realist^{T} can use an abductive argument and maintain that our scientific success is a strong reason to accept realism^{T}. Accordingly, unless we adopt the realist^{T} perspective, the apparent success of scientific enterprise is totally miraculous – just as it is in the case of realism^{E}. This argument, however, can be challenged on various grounds. Fine (1986; 1996) offered a series of counter-arguments to show that this realist^{T} strategy will not work. He distinguishes, in the first place, the success that is related to (or brought about by) the *methods* of science from the "ground level" success (e.g., a novel prediction), and maintains that the latter can hardly be used to support realism^{T}. The real challenge, we are told, is to account for the fact that methods of science in general lead to success. In his treatment, Fine (1996, p.23) emphasizes that there is a constraint on any meta-level argument such as the realist^{T} argument from the methodological success:

> the metatheoretic arguments must satisfy more stringent requirements than those placed on the arguments used by the theory in question, for otherwise the significance of reasoning about the theory is simply moot. I think this maxim applies with particular force to the discussion of realism.

Consider then the statement "the methodological success of science is best *explained* by realism^{T}, viz., the thesis that our accepted scientific statements are (at least approximately) *true*." But suppose for a moment that the instrumentalists are right in claiming that "the usual explanation-inferring devices in scientific practice do not lead to principles that are reliably true (or nearly so) ..." (*ibid.*, p.23). If there really is such a deficiency,

then of course realism^{T} cannot be said to "explain" anything because an inference to realism^{T} as the best explanation would be like trying to prove a proposition by employing the methods of an *inconsistent* system. Thus, given Fine's condition about metatheoretic arguments, we cannot use the simple abductive technique (which might yield good, or even the best, scientific explanations) in order to arrive at realism^{T}. In a nutshell, the realist^{T} has to beg the question: if realism^{T} is to explain the methodological success of science, our theories must indeed be (approximately) true – which is what needs to be established.

Fine (1986, pp.150-151) rightly diagnoses the problem as one of truth, or, more specifically, a problem of access. The realist^{T} advocates the view that our scientific statements are made true by virtue of "corresponding" to some external reality that exists independently of our theories and doxastic states. But when it comes to having an access to such truth (that is, when the realist^{K} idea that we should accept or aim at nothing less than true theories is also embraced by realism^{T}), the entire realist^{T} project gets threatened by a serious *epistemic* gap. How can the realist^{T} convince us that we do have an access to such a reality? How can such an epistemic gap be closed? We apparently need a sort of "intermediary" to move from the explanatory success to the claim that our theories are correspondence-true. And this intermediary must, it seems, be something like the pragmatist's reliability. Unfortunately, however, this notion (or similar pragmatic ones) is the utmost distance we can go epistemically: "there is no evidence for realism beyond what there is for instrumental reliability" (*ibid.*, p.166).

This antirealist^{K} idea briefly discussed above is basic in rejecting realism^{T}. Let us take a brief look at another realist^{T} argument and see how it is replied to along similar lines. One can justifiably claim that our best scientific theories are at least approximately true. If a later theory is known to imply most of the observable consequences of an earlier one and do even better instrumentally, and if it also has certain other theoretical virtues, then it seems just natural to assume that later theories are better approximations to truth and that their theoretical terms refer to unobservable entities progressively better (see *ibid.*, p.26; Devitt 1991, p.125). But, once again, this kind of move is vulnerable to the sort of objection presented above. The crucial question here is "What can the realist^{T} offer us that the instrumentalist cannot?" If it is about the instrumental success, she is no better off than her opponent. If it is about truth, then the realist^{T} is just begging the question and giving us something with no "cash value."

In fairness to realisms, it must be conceded that each of the three sorts I have displayed and discussed so far has its intuitive appeal. Nonetheless, it must also be admitted that they all encounter serious challenges. The problem (perhaps, the enigma) of realism often gets aggravated because different aspects or sorts of realism are found to be entwined or intermingled. Curiously, the enigma frequently forces philosophers to concoct their own (sometimes fairly complicated) versions of realism. I have given some examples early in this paper. One of the most interesting combinations, I believe, is that of van Fraassen: in my terminology, he is a realist^{T} (admitting that theories have literal truth values independent of our epistemic states), an antirealist^{K} (believing that our acceptance

of a theory involves something less than our being doxastically connected to its truth), and an antirealist or agnostic *vis-à-vis* realism^{E} (denying possibility of knowledge of unobservable entities).[4]

5. Can We Be Natural? Some philosophers have understandably felt that the debate concerning realism is beginning to stagnate and that much of what is discussed on this matter has little significance from a practical (one might say, the scientist's) point of view. Arthur Fine thinks that we can go beyond this inconclusive debate and find a common ground that would appeal to both the realist and antirealist. The essential part of Fine's objection against realism^{T} has already been mentioned: the realist^{T}'s argument from success will not do because "he must not offer as grounds for belief in realism its role in successful explanatory stories, on the pain of begging the question" (Fine 1986, p.161). Realism^{T} invokes an idea of correspondence-truth which is impossible to test other than with instrumentalist means. So what about the instrumentalist camp? Fine considers van Fraassen's constructive empiricism (where empirical adequacy, rather than truth, is set forth as the goal of scientific theories) as one of the chief representations of the instrumentalist ideal in contemporary literature. Constructive empiricism is notoriously deflationist in its attitude towards realism^{E}. However, Fine thinks, van Fraassen's deflationism is not all-encompassing for he fails to be parsimonious about our doxastic practices (*ibid.*, p.168). The problem here is about van Fraassen's well-known distinction between *belief* and *acceptance*: acceptance of a theory involves not only belief but also commitment to a research program. Explanatory success of a scientific theory is a strong reason to accept it; but we are not thereby allowed to believe that the theory is a true one. According to Fine this distinction is otiose. He thinks that van Fraassen ceases to be a deflationist when he multiplies the practices beyond necessity.

Having shown the weaknesses of realism and antirealism, Fine (1986; 1996) proceeds to offer a new perspective aimed at capturing the intuitions shared by both of these camps. He calls it NOA (Natural Ontological Attitude). According to this view, first of all, we can all agree that science is *immensely successful* regardless of the controversy about which philosophical theory could explain its success better. Fine contends that we must trust scientists and embrace the findings of science just like we naturally embrace empirical truths about our mezzo universe. So, his own view on the debate between realists and antirealists involves a commonsensical and minimalist first step which can be accepted by theoreticians of very different philosophical convictions. NOA is minimalist in that once this "core position" or "common ground" is adopted, the realist and antirealist can add to this, say, common core in accordance with their particular preferences. In this respect, NOA refrains from ontological partisanship. Furthermore, it regards the quest for

[4] I suppose Fine (1986, p. 157) is right in thinking that van Fraassen can be correctly described as an agnostic, rather than an antirealist, in this sense of realism. We must also note that van Fraassen often comes close to the realist (correspondence) view of truth.

a general aim of Science as futile as that for the Meaning of Life. It is distinguished from traditional sorts of realism in renouncing the idea that scientific progress will gradually bring us closer to Truth, that is, a complete and accurate description of the mind-independent reality. But one should not infer from these statements that what Fine has in mind is a kind of skepticism concerning theoretical entities or reality itself. Natural Ontological Attitude does not avoid ontological commitments. It simply refrains from unnecessary attachments to science: it has no additives.

The critical claim of Fine seems to be that both realists and antirealists can comfortably adopt the natural or neutral ontological attitude. Fine believes that both the realist and antirealist perspectives feed NOA in different ways and that each view actually emphasizes different aspects of our onto-epistemic reality. But NOA decidedly avoids excessive philosophical claims of customary positions. Realists are notorious for their metaphysical (to wit, noumenal) worries and obsessions. Antirealists often get stuck at some empirical or behavioral level of inquiry and have theoretical difficulties in explaining the stable features of knowledge and mind-independent reality. NOA admittedly provides hope for all who are fed up with the traditional extravagancies of philosophers.

One main problem about this view is, obviously, about the exact identity of the presumed "meeting ground" of the two views. For instance, it is highly unlikely that an antirealist could accept most elements of the natural attitude or core position. In particular, she cannot embrace Tarski's referential semantics (Musgrave 1996, pp.47-52). Consequently, some people have felt that while Fine's position may look attractive or acceptable, it can be accepted as a *realist* position not a neutral one. Perhaps it is fair to say that while Fine seems liberal enough to allow the realist to *add* her correspondence-truth or external objects to the core position, he fails to notice that the antirealist would most likely demand to "take away" from it. At this point one may begin to have doubts about NOA's success in arriving at a common ground.

According to Fine, NOA is fed by the positive features of both realism and antirealism. While realism is sensitive to non-mental, stable, objective aspects of the world surrounding cognizers, antirealism draws our attention to "human" or "man-made" aspects of scientific enterprise. Such an approach, which claims to capture the rationality of science "in the small," has the potential to serve our theoretical needs better for it can in principle provide a more balanced perspective over certain substantial ontological questions that bother philosophers of science. But it can also fall prey to philosophical superficiality. We need to question at this point whether NOA constitutes a full-fledged account that can deal with, say, various ontological, semantic and epistemological issues we find philosophically important and interesting. J. R. Brown states in his "Realism, Antirealism, and NOA" that Natural Attitude is akin to taking the Bible at face value (1999, p.342). To a certain extent, people of different creeds and convictions may take the Bible at face value, but only until the discussion involves certain biological and geological facts contradicting Genesis. In a similar vein, NOA can be taken as an initial position in science (or theology) but, Brown contends, it is incapable of being a final view. This issue also relates to

Fine's assertion that NOA is uncontaminated by salient philosophical commitments. But, contrary to what Fine seems to endorse, it is a moot point that a somewhat unphilosophical attitude is really what scientists need – let alone philosophers. As Fine (1996) himself mentions, scientists often do have strong philosophical commitments and this typically influences their work to a large extent (pp.30-34). They apparently do not need the protection of NOA from philosophical interferences. Regarding NOA's position on the realism-antirealism debate, P. Kitcher makes a remarkable point about the elusive nature of the Natural Attitude by saying that "in his attack on realism, Fine seems to become an anti-realist, and in rejection of antirealism, he appears to become a realist" (1993, p.134). This eloquent statement reflects a central problem of NOA: in pretending to be a "neutral" or "pure" attitude which strives to please all parties of the dispute, it arguably becomes a philosophical neverland.

Another important issue is about Fine's reaction to realism and antirealism. Fine seems to think that *realism* presupposes a Kantian sort of correspondence-truth with noumenal implications and that *antirealism* comes basically as some kind of behaviorism. R. Klee (1996) rightly protests that this is a highly misleading portrayal of the antirealist position (p.237). One indeed gets the impression that Fine's perspective suffers from certain important misconceptions about the main theses of the realist as well as antirealist camps. First of all, it would be a serious mistake to suppose that most philosophers who consider themselves realists about the realm of existence retain an absolutely noumenal conception of what stands at the object-end of correspondence relations. This is obviously a vast issue I cannot adequately treat in this paper. Let me just indicate that philosophers such as Alvin Goldman (1986; 1999), William Alston (1996), John Searle (1995), and Donald Davidson (1990) have all defended *mildly* or *reasonably realist* onto-alethic views without any scary noumenal baggage. The main idea here is that truth can be taken as a robust (i.e., nonepistemic) property without being a fully externalized relation. According to most contemporary thinkers producing work in this area, propositional truth cannot be properly explicated without, for instance, making a reference to certain semantic constructs such as conceptual schemes on the basis of which correspondence relations can be envisaged. In short, the concept of nonepistemic truth can definitely be made sense of within the boundaries of a non-noumenal realism.[5]

The other side of Fine's account also presents an issue. In the current literature, antirealism is generally conceived of in Kantian (more specifically, phenomena-related) terms, not by reference to some kind of behaviorism. The best example of this is the post-Putnamian literature on conceptual schemes and how they play a constitutive role in the

[5] By the phrase 'non-noumenal realism', I refer to the sort of realism which takes truthmakers (i.e., actual facts) and truth values of propositions to be independent of the transitory mental states of individual subjects and also of any sort of communal consensus or public interest, but nonetheless denies that the constitution or formation of our worldly states of affairs can be explicated in a manner totally independent of the discursive limits and cognitive resources of finite subjects. See also footnote 1 above.

"formation" of mundane objects. Fine seems to miss this point as he fails to discern the real historical roots of antirealist philosophy. One crucial "root" is obviously found in Kant's transcendental idealism which basically claims that conditions of the possibility of empirical objects (and of human knowledge) can only be provided by the *forms* of cognition or understanding. This kind of antirealism, however, is strictly different from "subjectivism" – in the pejorative sense of the term – which characterizes physical objects as mental creations.[6] The neo-Kantian, post-Wittgensteinean approach to the notions of objecthood and truth, championed by Putnam (1986; 1994) in the 80's and 90's, delivered a significant blow to metaphysical realism, but it did not aim to obliterate objectivity completely. Just as Fine misleadingly associates realism with the idea of Kantian (noumenal) correspondence relations, he also misses the role that neo-Kantian themes play in contemporary antirealist literature on ontology and truth. As I have intimated above, the actual historical stories are quite different, and sometimes subtler, than Fine's depiction.

The problem of misrepresentation is a significant issue which seems to mar Fine's middle-of-the-road project. The *ontological* aspect of Fine's Natural Attitude is an uncomfortable one because metaphysical realism and metaphysical antirealism are typically set apart not by virtue of minor terminological disagreements or technical details but because of having two rather different philosophical pictures about the generation and individuation of objects in the first place. One source of the ontological rift between realism and antirealism can be found in the role attributed to *mental or theoretical constitution* in the "being" of objects/reality: antirealists praise it while realists disdain it. Therefore, it will definitely not do to pretend to have found the common point between the rival traditions in a "core position" like NOA or at the level of plain truths (or common findings of science).

I must perhaps add that those who view the debate from the standpoint of "common findings of science" often feel the strong appeal of realism for they normally find it rather incredible that certain impressive scientific achievements ever cohere with the general spirit of antirealism. Consider one such historical example. On July 4, 1997 the American spacecraft Pathfinder touched down on Mars. While the spacecraft entered the atmosphere, it managed to maintain an angle of 14.2^{o} which was a critical value for preventing problems like overheating. Pathfinder landed on a specific region of the planet that had been carefully chosen by the scientists. Its landing on the surface came about with such a precision and success that scientists did not need to make any "last minute" software adjustments in the route of the spacecraft. After the landing, Sojourner (Pathfinder's landrover) roamed about the surface and sent thousands of pictures of the red planet with

[6] It must be borne in mind that Kant, just like John Locke, thought that human mind cannot be the creator of whatever is presented in sensation. The former philosopher, it must be remembered, was not only a transcendental idealist but also an empirical realist.

unprecedented clarity and high resolution, thus enabling scientists to retrodict that there had been some enormous flooding on Mars long time ago. This scientific and technological feat has been made possible with the aid of numerous physical theories which employ many unobservable entities. Just to mention one, none of these achievements would have been possible had our current scientific repertoire not contained the electromagnetic theory of signal transmission.

Do electromagnetic waves or electrons "exist"? Is the electromagnetic theory "true"? Pondering over the examples as the one given above, one is tempted to answer these questions affirmatively without hesitation. It is of course true that we are unable to observe entities like electrons directly. But shouldn't we protest against antirealism$^{\mathbf{E}}$ when we hear a scientist saying *not only* that "something" in the cloud chamber ionizes the vapor, but *also* that "it" has a charge of 1.60219×10^{-19} C, rest mass of 9.1095×10^{-31} kg., etc.? Despite the strength of this point, there are serious problems about scientific realism. The distinction between "observing" and "observing that" appears to diminish the credibility of realism$^{\mathbf{E}}$. As for realism$^{\mathbf{T}}$, I am sympathetic not only to the idea that theories make truth claims, but also to that our successful theories are good approximations to truth. Yet, I cannot see how this idea can be connected to "getting ever closer to (the) Truth" as theories get replaced one after another. In this sense, Kuhnian arguments still seem strong enough to resist the realist$^{\mathbf{T}}$ who wishes to hold on to the convergence thesis. Lastly, there are important difficulties with realism$^{\mathbf{K}}$, viz., the position that science is (or should be) interested only in *really true* theories. The underdetermination thesis, to mention one, largely undermines any claim to "knowledge of truth *sub specie aeternitatis*."

Looking at the superscripted terms employed above, one may lament the multifarious nature of the current controversy on scientific realism as it prevents us from presenting the issue in a less confusing and more gratifying fashion. But the subject matter is indeed multi-faceted, and any comprehensive account on the matter cannot but reflect such diversity. Some sort of unitary vision encompassing the main theses of realism and antirealism is arguably an attractive theoretical goal although it is hard to tell how such unification would actually look like. In this sense, Fine's NOA must be regarded as an honest attempt at theoretical truce. Still, attempts at unitary perspectives must avoid *inter alia* two major philosophical sins, namely, representing views of the debate as less subtle or intricate than they really are, and truncating the more exciting theoretical aspects of available accounts in a Procrustean fashion for the sake of producing reconciliatory views.

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