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Realism:
Metaphysical, Scientific, and Semantic

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1 INTRODUCTION

Today realism comes in many philosophical guises. In this essay, I shall review and compare three somewhat different, influential forms of realism. My own sympathies in all three cases lie on the realist side. However, I do not intend to defend realism conclusively and in detail here; that would surely be too large a task for one essay. Here I briefly characterize what sorts of arguments can be given in their support. My main aim is to clarify these positions and their mutual relations; later chapters examine these and related forms of realism in detail.

2 METAPHYSICAL REALISM

2.1 Putnam's Metaphysical Realism

Let us begin with what I call metaphysical realism. A potential source of confusion needs to be sorted out first. In contemporary philosophical literature, 'metaphysical realism' often refers to the specific view that the later Putnam took as his target while defending his own 'internal realism'. The view that Putnam calls *metaphysical realism* is a complex view. According to Putnam, it is committed to the following three doctrines:

> 1) There is exactly one true and complete description of the way the world is.
> 2) It requires 'a ready-made world'; the world itself must have a built-in structure.
> 3) Truth involves some sort of correspondence relation between words or thought-signs and external things and sets of things. (Putnam 1981, 49–50)

The last doctrine is really a semantic thesis and not metaphysical at all (see below). The first two are expressions of an extreme conceptual absolutism, and of an extreme reductionist variant of scientific realism, which is what I think Putnam primarily had in mind. This is a view very few contemporary scientific realists advocate.

2.2 Realism, Idealism, and Phenomenalism

Be that as it may, this is emphatically not what I mean by 'metaphysical realism' here. Rather, I simply want to focus on realism construed as a

metaphysical doctrine. The question of the nature and plausibility of realism, in this sense, arises with respect to a large number of subject matters: common-sense physical objects, universals, non-existing possible objects, numbers and other mathematical objects, concepts, meanings, moral values, etc.It is obviously possible to be selectively realist or non-realist about various topics: For example, one could be a realist about the everyday world of macroscopic objects and their properties, but a non-realist about, say, mathematical objects or moral values.

What I wish to focus on here is the most general and uncontroversial issue: common-sense realism, or realism about the external world, that is, realism about the middle-sized commonsense macroscopic physical objects. 'External' here means external with respect to the knowing mind. This is the view that trees and stones, tables and chairs, dogs and cats, exist—even when we, knowing subjects, do not think about or perceive them. That is, they exist independently of the mental.

There are two important qualifications: First, realism obviously does not deny the possibility of error and even hallucination; the thesis is not that all middle-sized physical objects which are believed to exist must exist, but only that in order to exist, an object need not necessarily be (actually or potentially) thought or perceived. Second, realism does not deny the obvious fact that there are all sorts of mundane causal interactions between mental and physical reality; and clearly artifacts such as tables and chairs even owe their existence to the creativity of the human mind. The thesis is simply that the existence of an object at any time does not conceptually depend on being (actually or potentially) thought about or perceived. Realism, in this sense, is typically contrasted to idealism and phenomenalism.

By 'idealism' I mean the view that asserts only the existence of that which is actually thought about or perceived. One must be careful here, though: the idealist does not usually deny that stones, tables and other such things exist. She merely adds that they are all constituted of ideas, thoughts, sensations, or sense data, or more generally, that their existence is not independent of mental states. Historically, at least, the key motivation for turning towards idealism has been the desire to avoid radical skepticism, by closing the gap between reality and the knowing mind. Whether it really helps is quite another issue, as will become evident below.

Such idealism faces a serious problem: According to this view, a new object comes into existence whenever a subject perceives it, and ceases to exist when it is no longer perceived. However, when the subject perceives the object again, it makes no sense to ask whether it is the same object as before. Idealism also leads to the counterintuitive conclusion that a rock in the forest, or a beer can in the refrigerator with the door closed, does not exist. However, a certain kind of continuity and temporal identity is fundamental for our very concept of an object. In other words, adopting this kind of idealism would render all our deeply rooted beliefs about objects mistaken, and almost everything we think we know about the world would be in error. That is, radical skepticism would follow.

For such reasons, many philosophers wishing to remain skeptical about realism have preferred phenomenalism instead. According to this view, something really exists if and only if it *could be* perceived. According to phenomenalism, the rock in the forest, or the beer in the fridge, exists even if nobody actually sees it, as long as it would be at least possible to see it. Already Berkeley (1710, §3; 1713, 251) briefly reflected on phenomenalism, although more often he stuck to idealism. Nonetheless, he did rely on all ordinary objects being actually thought about by God, in order to guarantee their continued existence. John Stuart Mill (1867) first clearly formulated and

defended phenomenalism. Phenomenalism became very popular in the first half of the 20th Century, partly with the rise of Logical Positivism. The influential proponents of phenomenalism have included A. J. Ayer (1940) and C. I. Lewis (1946)

2.3 Problems of Idealism and Phenomenalism

Phenomenalism accords with the common-sense belief about the persistence of physical objects better than pure idealism. Still, according to both idealism and phenomenalism, there could be no existence without minds; the existence of matter depends upon the existence of perceivers. We can then ask, following Armstrong (1961), what would happen if there were no conscious minds in the world. This scenario is not contradictory and is not known to be false purely *a priori*, but only empirically; it is only a contingent fact that this is not the case. Certainly the universe could have developed in a way that no creatures of a 'higher consciousness' would have emerged. It follows from idealism that in this case neither trilobites nor stars would have existed. Also, in the actual world, stars and trilobites did not then exist until there was a conscious mind that perceived or at least could have perceived them. And yet, we know perfectly well that stars and trilobites existed long before us, and also that stars and trilobites would have existed even if humankind or something similar had never evolved. Both idealism and phenomenalism thus entail that we have been wrong about all these issues, and radical skepticism threatens again.

Or imagine, following Stout (1938–39), someone in a room which is supported by foundations which no one perceives. What the person perceives — i.e.the room — is actual, but the foundations either do not exist (idealism), or are at best mere unfulfilled possibilities (phenomenalism). But how could something actual be supported by unfilled possibilities (or even something non-existent)? It seems that this would lead us to reject many of our ordinary causal and other explanations.

Idealism and phenomenalism may also be accused of being circular. They submit that a given material object "consists of" certain (actual or potential) thoughts or sensations. But which sensations (or thoughts)? Peter Strawson (1959) and Roderick Chisholm (1976, 138–44) note that providing an answer seems impossible without referring to that very material object (e.g., "the sense experience of *this* tomato"); the idealistic account of material objects, therefore, moves in a circle. The problem is that objects and things are typically identified by reference to their location in time and space, which in turn is determined by referring to other external material entities. They cannot, however, be identified simply by sensory experiences alone, because a person might have qualitatively identical sensations of two distinct objects in two completely different places.

Further, it may be asked what then is the foundation of the existence of the mind itself on which the existence of physical objects is supposed to depend? For idealism claims that all existence is based upon being thought about or perceived by some conscious mind. The existence of the mind itself must therefore be based either on that mind itself, or on the fact that some other mind is aware of it. But the idea that the existence of an object is based upon the object itself seems odd. If, on the other hand, the existence of the mind is based upon the existence of another mind, on what is the existence of the latter based? This idea leads to an infinite regression, and the existence of minds would be left without any support—except, perhaps, Berkeley's or Malbranche's all-perceiving God.

An argument that is widely taken as decisive against phenomenalism is the

argument from perceptual relativity, due to Chisholm (1948). The gist of the argument is to point out how perceptual experiences of unchanging physical objects vary with changes in the conditions and perceivers: "Whether a material thing will ever present, say, a red appearance or sense-datum depends partly upon the thing and partly upon the conditions under which it is observed." The lighting may be abnormal, the observer may be colorblind, and so on. Therefore, a statement concerning a physical object, e.g., "This table is red" is *not* as such equivalent with any definitive statement about sensations, or sense-data, but at best a statement about sensations or sense-data is equivalent with the statement together with a statement about observation-conditions. Consequently, both observation-conditions and things-perceived should be definable in terms of what might appear. Due to the relativity of perception, however, the task of the phenomenalist seems to be "similar to that of an economist who hoped to define both supply and demand in terms of possible prices."

These and other problems which have accumulated have made idealism and phenomenalism increasingly unpopular among philosophers. At the same time, though, it is unlikely that realism can ever be absolutely proved correct by deductive logical reasoning. D.C. Williams (1966) has argued, however, that an inductive argument can be presented on the behalf of the "probability" of realism. Hilary Putnam (1975b) has developed this argument further. They do not, though, mean the familiar textbook cases of simple inductive reasoning, such as, "All ravens observed so far are black; therefore (probably) all ravens observed in the future will be black." Rather, what Williams and Putnam have in mind is the so-called inference to the best explanation, or, in Peirce's terminology, "abduction": the theory which explains and systematizes the phenomena we observe much better than any of the alternatives, is the theory according to which there are permanent material objects, existing independently of any mental states. Williams notes that this theory is confirmed by our daily observations in innumerable ways.

Putnam adds that the situation is exceptional in that no exactly formulated alternative theory that could be taken seriously has ever been devised; this same point has also been made by Popper. Putnam further notes that the situation is all the more peculiar in that our language already assumes realism, and all the attempted alternative theories must be formulated in a language (e.g., a "language of appearing") which already presupposed the "thing language" (e.g.,"looks like a stone," which already presupposes the concept of 'stone'), a point made already by Sellars (1956).

This is closely connected to Wittgenstein's critique of "private language" and Sellars' refutation of the myth of the "Given." Both argue that forming a language that would be essentially private, and would *only* make reference to one's own sensations, would be impossible. This is because language is essentially social and public; and all talk about sensations and thoughts depends both conceptually and epistemologically on the "thing language" in which reference is made to physical objects. Thus, idealism would make all meaningful language impossible.

Philosophy is unlikely to ever achieve absolutely conclusive conclusions. The above analysis, however, gives good reasons to conclude that idealism faces a number of difficult problems. And because nothing actually speaks against it at all, there is excellent reason to believe that ordinary physical objects are real and that they exist independently of the mental.

3 SCIENTIFIC REALISM

3.1 Objects of Scientific Enquiry

Natural science is replete with expressions that appear to talk about all sorts of exotic entities unobservable by human senses, such as electrons, neutrinos, and genes. According to scientific realism, scientific theories, with all their talk about the unobservable, are meaningful and serious attempts to describe and explain mind-independent reality. It could perhaps be claimed that scientific realism, not radical empiricism, is the natural attitude of scientists themselves. Einstein and Planck, for example, endorsed realism even in the heyday of Positivism. And indeed, one can see the classical debate between Galileo Galilei and the Catholic Church as an instance of the disagreement between realism and instrumentalism. The Church was well prepared to admit that the heliocentric theory was better in practice, in simplifying calculations and predicting observations; the heresy lay in any claim for its truth. Mere calculative simplicity was not enough for Galilei.

He insisted that the world actually is as the heliocentric theory says. In other words, Galilei did not defend just the theory, but also its realistic interpretation (cf. Popper 1963, Kitcher 2001). In contemporary philosophy of science, realism was first defended against Logical Positivism, or Logical Empiricism, starting in 1950s, by Smart (1956, 1963), Popper (1956, 1963), Sellars (1961), and Maxwell (1962). Later, realism has competed mainly with relativism and constructivism.

In all its forms, Logical Empiricism gave a privileged status to empirical language or observational concepts. Early Logical Positivism even hoped to show that all scientific concepts could be explicitly defined in observational terms: it was committed to ‘descriptivism’ or ‘reductive empiricism’. This task was soon realized to be impossible, as Carnap (1936–37), a leading theorist of positivism, admitted already in 1936. This led Logical Empiricists to accept a more sophisticated version of empiricism, which had been advocated earlier, specifically, called ‘instrumentalism’. According to this view, it is not possible to eliminate theoretical concepts from science, or define them in terms of observational concepts, but these theoretical concepts do not refer to anything real; they are only practically useful fictions which enable one to systematize observations and predict new observations on the basis of old ones. Contemporary scientific realism emerged largely in opposition to this view.

Beginning in the 1960s, certain radical views about science have also enjoyed popularity. Kuhn (1962) and Feyerabend (1962, 1963, 1965) argued that an old theory and the new one which replaces it, are “incommensurable”; they concluded it makes no sense to say that science can progress and that the new theory is closer to the truth than its predecessor. Some remarks by Kuhn about “different worlds” have also inspired a constructivist view, according to which each comprehensive scientific theory creates its own reality. Such views have been popular especially in science studies. Latour and Woolgar (1979), in their famous book, *Laboratory Life: The Social Construction of Scientific Facts,* for example, argued that not only scientific facts, but also the theoretical entities postulated in science, are social constructions. In general, radical constructivism either denies that there is any reality which is independent of language, theories, or conceptual schemes (pure idealism), or states that the independent reality is beyond the reach of our knowledge (as in Kantian transcendental idealism). In either case, whatever reality is knowable is created through the imposition of concepts. After the collapse of Logical Empiricism, such views have been the main opponents of scientific realism.

3.2 Varieties of Scientific Realism

It is possible and indeed useful to distinguish a weaker and stronger version of scientific realism.

1. *Minimal Scientific Realism* is the modest claim that, *pace* instrumentalism, scientific theories and their existence postulates should be taken at face value, that is, all talk about non-observable entities in science should be interpreted literally and realistically, and is not to be given some anti-realistic reinterpretation. Here are a couple of representative expressions of such a minimal view:

> The theoretical claims of scientific theories are to be read literally, and so read are definitely true or false. (Leplin 1984b, 2)

> Theoretical terms of scientific theories (i.e. nonobservational terms) should be thought of as putatively referring expression; that is, scientific theories should be interpreted 'realistically'. (Boyd 1983, 45)

Unfortunately, these formulations involve the concepts of 'reference' and 'truth', which seems to make them in part semantic theses. However, upon closer scrutiny, only the trivial 'disquotational' properties of truth and reference are needed, and merely deflationary notions may be invoked; that is, these formulations do not, after all, commit scientific realism to any particular substantial view of truth and reference. (This same observation applies also to the stronger formulations below.) Here is a more kosher formulation, also by Leplin:

> Scientific theories make genuine existential claims. (Leplin 1984b, 2)

Note that this formulation is silent about the success of scientific postulation; it is perfectly compatible with a thoroughgoing skepticism, i.e., the view that science generally fails here and that the postulated entities do not typically exist. Most realists certainly want to endorse more, but this formulation is enough to contradict instrumentalism, for example, and it is useful to distinguish it from the other, stronger theses.

2. *Standard Scientific Realism* claims, very roughly, the following:

> One ought to believe in the existence of the unobservable entities posited by our most successful scientific theories.

However, the lessons of the actual history of science already make it necessary to revise this formulation: namely, it has turned out that at least some theoretical existence-postulates of science fail. For example, in chemistry, it was once assumed that there is a special burning substance, 'phlogiston', which leaves the burning material during combustion, but it is now agreed that nothing of that sort exists. Or, in astronomy, it was once postulated that there is another planet—it was christened 'Vulcan'—between Mercury and the Sun causing the observed deviations in Mercury's orbit; but it turned out that no such thing exists. And there are further cases. Therefore, if we want a thesis which is not clearly false, it is better to weaken it somewhat:

> Most unobservable entities posited by our scientific theories exist independently of the mental.

Here is a representative statement from Devitt:

> The central idea of scientific realism is that science really is committed and is, for the most part, right in its commitments. (Devitt 2004, 767)

A couple further qualifications are needed. First, in their early stages, sciences typically make stabs in the dark, and often get things badly wrong, and their postulated theoretical entities may well fail to exist. Therefore, it is better to restrict the realist thesis to mature sciences. Second, at the frontiers of scientific research, scientists often tentatively put forward speculative hypotheses with their postulates, but do not even themselves firmly believe in them; the realist does not obviously need to commit herself to anything more. The realist thesis is not plausible if it is not restricted to well-established theories. As our refined formulation, let us take the following:

> Most unobservable entities posited by the well-established theories of mature sciences exist independently of the mental.

Standard scientific realism is thus a form of metaphysical realism, applied to the non-observable entities postulated in science. It does not involve any semantic theses, such as the correspondence theory of truth.

3. *Strong Scientific Realism*, or *Convergent Realism*, is a stronger view often espoused by scientific realists, in terms such as these:

> The best current scientific theories are at least approximately true. (Leplin 1984b, 1)

Naturally, the same qualifications as above are in order: the thesis is plausible only with respect to the well-established theories of mature sciences. The difference between this stronger view and standard scientific realism is close to the distinction between *entity realism* and *theory realism*, put forward by Cartwright (1983) and Hacking (1983).

3.3 Arguments for Scientific Realism

What kind of arguments can be presented to support scientific realism? To begin with, it was vital for Logical Empiricism in all its forms to have a clear-cut and absolute distinction between the observable and the theoretical. But this dichotomy turned out to be quite unclear and problematic.

It is reasonable to doubt the claim that all that exists is restricted to what is observable by human senses. This claim has no particularly convincing arguments in its favor, and it is problematically species-chauvinistic and arbitrary: dogs, for example, can smell and hear things that are not observable to humans, not to mention what is observable to bats with their echolocation. It would be odd to insist that what dogs or bats can observe does not exist. The borders of the observable begin to look hopelessly blurry.

Hanson (1958) captured the criticism of the empiricist idea of pure observation with the now popular slogan that “observation is theory-laden.” According to him, it is not the case that first there is some pure observation, which is then interpreted, but rather that observations are always immediately interpreted. Observation always involves a conceptual structuring. That is, in a sense, nothing is observable. Soon also Thomas Kuhn and Paul Feyerabend began to emphasize the theory-ladenness of observation as part of their critique of Logical Empiricism (Kuhn 1962; Feyerabend 1962, 1963, 1965). Hilary Putnam (1962) and Peter Achinstein (1965) argued convincingly that the whole distinction between the observable and the theoretical was confused and untenable.

We have seen above that there are very good reasons to accept metaphysical realism about mundane observable objects—such as rocks, flowers, and cats; its denial is extremely implausible. Then, because of the relativity and blurriness of the boundary between the observable and the theoretical, there is no principled reason to limit the reality to the former. This gives some reason to believe at least in a minimal version of scientific realism.

However, the most popular argument in favor of scientific realism is the so-called *miracle argument* or the success argument; different versions of this argument have been put forward, e.g., by Grover Maxwell (1962), J.J.C. Smart (1963), Hilary Putnam (1975a, 1978), and in particular, Richard Boyd (1981, 1983); also see Carrier (1991, 1993), Psillos (1999).

The point of departure of the argument is the apparent empirical and practical success of science. It is assumed that all parties of the debate agree on this point. Mature science is informed at all levels by theoretical presuppositions about "the deep structure of reality." The methods of science regularly result in correct predictions, and a wide range of working practical applications (such as satellite channels, DVD players, or the GPS navigation system). This dramatic success of science, at a purely instrumental level, would be inexplicable, 'a miracle', unless these presuppositions were, in fact, at least approximately true of an independently existing reality, and the theoretical objects postulated by them really existed. It's the best explanation for all the pragmatic success of science. This is a very convincing argument on behalf of a moderate realism. It is an instance of the so-called inference to the best explanation, and thus an abductive argument. Consequently, realism in this sense is an empirical hypothesis, even if a very general one.

This argument has, I think, considerable force. On the other hand, however, it operates on a rather general and abstract level, and may have a somewhat sublime flavor for some. Therefore, I often illustrate the issue with the following story:

Consider radiation and radioactivity. It is something one cannot see, taste or smell; that is, it is not observable. Nevertheless, both scientists and laymen nowadays strongly believe that there is such a thing. The investigation of radiation was prepared by Röntgen's pioneering work with x-rays. This inspired Henri Bequerel to conduct experiments with uranium compounds; in 1896 he observed a phenomenon that led to the discovery of radiation. In the following year, Marie and Pierre Curie discovered two new radioactive elements, polonium and radium. At the time there was hardly any idea of the health effects of radiation, and the researchers did not realize that they should have protected themselves properly against them. Consequently, many pioneers of radiation research, including Röntgen, Bequerel, and Marie and Pierre Curie, had to experience the health effects of radiation personally—they suffered suppurant burns. In 1904 the first person known to have been killed by x-ray exposure, a research assistant of Edison, died. Marie Curie died in 1934, overtaken by pernicious anemia clearly caused by years of radiation exposure.

Now it is extremely difficult to make any sense of these historical events if one does not accept some form of scientific realism. Were these deaths and other health effects caused by "mere fictions"? Did these pioneer scientists "socially construct" something that caused them burns or even killed some of them? Certainly such effects were not part of the ideas they formed circa 1896.

Actually, the first radiation accidents took place even before radiation was discovered. Already in 1895 Emil Grubbe studied cathode rays. He injured

his hands with wounds which resembled serious burns but which his doctors could not explain. Moreover, already centuries earlier, in Central Europe, a mysterious, lethal 'mine disease', now identified with lung cancer, was strikingly frequent among miners, whereas otherwise it was quite rare. This was apparently caused by radiation from radon in mines.

So it seems that contemporary science provides us with a detailed notion of radioactivity—a notion well-supported with observational evidence. It can also explain the mechanism through which radiation causes its health effects, e.g.burns or cancer. But the view that scientists' talk of radiation does not refer to anything real—that the concept of radiation is just a practically useful fiction which enables one to systematize observations; or that radiation was only socially constructed by the researcher that discovered it—in addition to being quite implausible, also implies that useful fictions can have causal effects, or that social constructions may have causal effects, even before they began to exist (i.e., prior to their formulation)! That is, a social construction may work causally backwards in time! In sum, views which deny the mind-independent reality of the theoretical entities of science lead to totally absurd accounts of such rather familiar stories, and to a totally preposterous conception of causes and effects. Cases like this should, at least, give pause to anyone attracted to non-realist views in this context.

3.4 Objections to Scientific Realism

Let us next briefly review the most popular objections to scientific realism.

1. The Argument from Underdetermination. One common objection to scientific realism is based on the alleged radical underdetermination of theory by observation: the thesis that for any theory, it is possible to find an indefinite number of empirically equivalent theories, that is, theories which are compatible with all the observations. The standard response is to grant that *deductive* underdetermination (i.e.that the theory cannot be logically derived from the evidence; or, that two incompatible theories may have exactly the same deductive observational consequences) is unavoidable, but to insist that we also must take into account the *inductive* relationships between observations and theory—and that this allows one to discard any radical underdetermination (see, e.g., Laudan 1990, 1998; Ladyman 2002; Psillos 2005).[1]

2. Pessimistic Meta-Induction. The inductive argument against scientific realism based on the history of science, the so-called pessimistic meta-induction, proceeds, roughly, as follows: "Many past theories in science have turned out to be to a large extent false, and their theoretical terms non-referring. Therefore, it is not justified to expect that the theoretical entities postulated by present theories exist either, or that present theories are (approximately) true" (see, e.g., Laudan 1981). However, the conclusion of this argument can be resisted. Is it not at least equally plausible to assume that our methods and theories have improved through trial and error, and that as science proceeds, the erroneous existence assumptions have become, in the long term, less frequent? (see, e.g., Devitt 1991).

3. The Circularity Accusation. It has also been claimed (Laudan 1981; Fine 1986) that "the miracle argument" of realists is circular because it uses inference to the best explanation. Arguably this criticism, however, misses its target, because the dispute is about realism and not the reliability of this type of reasoning. Further, inference to the best explanation is applied regularly in science also to observable phenomena. The critics of scientific realism do not usually contest the reliability of this type of inference in that area. The problem cannot concern the type of reasoning. There is no reason to limit

radical skepticism to science only, but from the skeptical perspective, observable everyday reality is equally at risk. The conclusion would be that there could be no justified knowledge about anything besides the current states of one's own consciousness. Such an extreme position is difficult to prove false, but there is also no good reason to believe it. Not even the opponents of scientific realism usually want to go that far. Their skepticism is thus arbitrarily selective.

In sum, the standard arguments against scientific realism are not a seriousthreat, and scientific realism is on firm footing. There is some room for controversy about the best and the most defensible formulation of scientific realism. But in some form or other, it is a very plausible view.

4 SEMANTIC REALISM

4.1 Dummett's Recasting of the Contrast between Realism and Anti-realism

The way that philosophers have understood realism underwent considerable changes during the 1970s, largely due to Michael Dummett. He was also influential in Putnam's conversion to what he called "internal realism" in contrast to "metaphysical realism" (as he defined it; above §2.1). Dummett (1978) argued that at least in some cases, it is not fruitful to focus on the existence of entities of a certain type: First, he pointed out that phenomenalism (or even idealism), as we have seen, need not say that macroscopic physical objects, such as rocks and trees, cats and dogs, tables and chairs, do not exist. Rather, the claim typically is that such objects are reducible to (or are constructions out of) sense data, or other such entities.[2] Second, he noted that in some cases, such as with realism about the past (or about the future), the question is not at all about the referential character of terms. Moreover, in the case of realism in mathematics, focusing on the reference of terms would be, according to Dummett, at least highly misleading, because the fundamental issue there is the objectivity of mathematical statements, as also with statements about the past.

For such reasons, Dummett prefers to characterize the dispute between realism and anti-realism in a way that concerns, not a class of entities, nor a class of terms and their reference, but rather some class of statements. These may be statements about the physical world, about mental events, mathematical statements, the theoretical statements of science, statements in the past tense, etc. —"the disputed class," as Dummett calls it.

'Realism'—in the Dummettian sense—is the belief that statements of the disputed class possess an objective truth value, independently of our means of knowing it. Realism so understood thus considers truth as at least potentially verification-transcendent, as some kind of correspondence to reality. Dummett and his followers often prefer a slightly different characterization and say that realism is committed to the Principle of Bivalence, that is, to the view that every meaningful statement is determinately either true or false, regardless of whether we are in a position to verify or falsify it. Anti-realism, in contrast, submits that the meanings of these statements are tied directly to what we count as evidence for them, so that a statement, if true at all, can be true only in virtue of something which we could know—and similarly for falsity. As a consequence, the Principle of Bivalence may well fail. Famously, Dummett defends such anti-realism with respect to, e.g., mathematical statements and statements about the past.

The realism dispute in this context thus concerns the notion of truth

appropriate for statements of the disputed class; it is also a dispute concerning the kind of meaning which these statements have. Consequently, it is sometimes appropriately called *semantic realism*, in order to distinguish it from some other philosophical views regarding realism. According to semantic realism, the meaning (or a central component of the meaning) of a (declarative, indexical-free) sentence can be taken to be the conditions in which the sentence is true, where truth is, as before, understood to be at least potentially verification-transcendent. Actually, in his earlier papers, Dummett suggested that truth, taken as something verification-transcendent, cannot serve as the central notion of the theory of meaning and must be replaced by verifiability. Later, however, he suggested that truth itself must be equated with verifiability. Either way, the question is whether a sentence can have verification-transcendent truth-conditions.

What, exactly, is the relation of the Dummettian semantic realism to the metaphysical construal of realism? The question is elusive. To begin with, Dummett often seems to suggest that the metaphysical views of realism and idealism are merely two unclear metaphors (e.g. Dummett 1978, xxv) which cannot be rationally argued for or against, but must be replaced with this semantic setting (cf. Devitt 1983, Miller 2006):

> How [are] we to decide this dispute over the ontological status of mathematical objects[?] As I have remarked, we have here two metaphors: the platonist compares the mathematician with the astronomer, the geographer or the explorer, the intuitionist compares him with the sculptor or the imaginative writer; and neither comparison seems very apt. The disagreement evidently relates to the amount of freedom that the mathematician has. Put this way, however, both seem partly right and partly wrong: the mathematician has great freedom in devising the concepts he introduces and in delineating the structure he chooses to study, but he cannot prove just whatever he decides it would be attractive to prove. How are we to make the disagreement into a definite one, and how can we then resolve it?. (Dummett 1978, xxv)

This interpretation of Dummett—ascribing such a "metaphor thesis" to him—is the prevailing one (e.g., both Devitt and Miller endorse it), and there certainly is textual evidence for it. Nevertheless, there is some room, it seems to me, for a different reading. Namely, Dummett typically applies the metaphor thesis more specifically to *mathematical* objects, and this leaves open the possibility that the metaphysical question might be perfectly meaningful in the case of, for example, ordinary middle-sized physical objects. And on still other occasions, Dummett rather seems to admit that (even in the case of mathematical objects) the metaphysical realism question and the semantic realism question are simply two independent and equally meaningful questions:

> To characterize a type of realism as a thesis about (putative) objects of some kind focused attention, I thought, on the wrong issue. For example, a neo-Fregean platonist about mathematical objects, such as Wright or Hale, could still deny that they have any properties other than those we are capable of recognizing, whereas, conversely, a Dedekindian who maintained that mathematical objects are free creations of the human mind might nevertheless insist that, once created, they have properties independently of our capacity to recognize them. It appeared to me evident, and still appears to me evident, that, interesting as the questions about the nature of mathematical objects, and the ground for their existence, may be, the significant difference lies between those who consider all mathematical statements whose meaning is determinate to possess a definite truth-value independently

> of our capacity to discover it, and those who think that their truth or falsity consists in our ability to recognize it. Hence, from my standpoint, the Dedekindian would be a species of realist, and the neo-Fregean a species of constructivist. Put more generally, what reality consists in is not determined just by what objects there are, but by what propositions hold for good: the world is the totality of facts, not of things. This was the reason for the concentration on acceptance or rejection of the principle of bivalence. (Dummett 1993, 465)

Now is Dummett's semantic approach a good substitute for the more traditional, metaphysical issue of realism? For example, is the commitment to the correspondence theory of truth a good indicator for someone's being a realist? The answer is arguably negative: On the one hand, some influential scientific realists such as Peirce, Sellars, and Bhaskar have favored an epistemic view of truth, and viewed truth as some kind of idealized verifiability, perhaps the later Putnam could be included here as well. Some philosophers, such as Field and Horwich, in turn combine scientific realism with the deflationist theory of truth rather than with the correspondence theory.

On the other hand, it is possible to advocate the correspondence theory of truth, but hold that the relevant correspondence is, for example, to sense data rather than to any objective mind-independent entities, as the spirit of realism would require. For example Schlick (1932, 1934, 1935), the leader of the Vienna Circle, held such a view, and combined the correspondence theory of truth with a kind of phenomenalism; he explicitly stated that realism is just as meaningless a metaphysical doctrine as idealism. Consequently, the correspondence theory of truth is neither a necessary component nor a sufficient criterion of (metaphysical) realism.

Neither is the commitment to the Principle of Bivalence a good criterion of realism. We might be forced to give it up, for example, because of complications in quantum physics—a possibility suggested by Quine and Putnam—and still remain scientific realists. Also, some considerations in the philosophy of logic—the need to avoid the paradoxes of truth, for example—might similarly lead one to abandon the Principle of Bivalence, though without altering one's realistic commitments in metaphysics. Hartry
Field (2008) might again provide a good example. And again, someone like Schlick can combine the Principle of Bivalence with a non-realist view, e.g. phenomenalism.

Therefore, although the questions of the theory of truth and the theory of meaning are certainly philosophically very interesting, they cannot replace the more traditional metaphysical question of realism.

4.2 Dummett's Argument for Anti-realism

Let us briefly review Dummett's master argument for anti-realism, the so-called "manifestation argument" (cf.Shieh 1998, Miller 2003): We understand the sentences of the disputed class. Assume then that the meaning (or a central component of the meaning) of such a sentence were its recognition-transcendent truth-conditions. Then, so the argument goes, we would know the truth-conditions of the sentence.

To suppose, in general, that knowledge of meaning consisted of verbalizable knowledge would involve an infinite regress: it would be impossible for anyone to learn a language if they were not already equipped with a fairly extensive language. Hence, Dummett concludes, the knowledge which

constitutes the understanding of language must be, in the end, implicit knowledge.

Implicit knowledge cannot, Dummett continues, meaningfully be ascribed to someone unless it is possible to specify what counts as the manifestation of that knowledge: there must be an observable difference between the behavior or the capacities of someone who is said to have that knowledge and someone who is said to lack it; hence it follows that grasping the meaning of a statement must, in general, consist of a capacity to use that statement in a certain way.

Consequently, our knowledge of the verification-transcendent truth-conditions of the relevant sentences should be manifested in our use of those sentences, i.e., in our exercise of the practical abilities which constitute our understanding them. Dummett, however, submits that such knowledge is never manifested in the exercise of the practical abilities. Consequently, we do not possess knowledge of verification-transcendent truth-conditions.

Therefore, the assumption must be discharged, and the sentences of the disputed class do not have verification-transcendent truth-conditions, hence semantic realism about the subject matter of disputed class must be rejected.

4.3 Some Problems for Anti-realism

Essential to Dummett's argument for anti-realism is the idea that understanding amounts to the knowledge of meaning, in a very literal sense. Namely, Dummett takes it for granted that if the meaning (or a central component of the meaning) of a declarative sentence is the conditions in which the sentence is true, then understanding the sentence is a matter of knowing its truth-conditions. Miller (2006, 994) aptly calls this key premise in Dummett's argument "the epistemic conception of understanding." Although Dummett and many others take it more or less as a tautology—Wright (1993, 18) states that it is "the immediate consequence of a series of platitudes"—it is far from uncontroversial.

No theory of meaning is constitutive of scientific realism. However, as soon as one accepts even modest scientific realism, the door is opened for semantic externalism, the view of meanings made famous by Putnam (1975c) with his slogan, "Meanings just ain't in the head!" If radical empiricism is given up, and if it is granted that there can be differences between two substances without there being some observable difference—that not everything that looks like the same substance really must be the same substance—then it also seems possible that there be a case in which everything appears the same but nevertheless two speakers speak about different things. And this is all that semantic externalism needs. Externalism, however, entails that there is a definite sense in which we do *not* actually know the meanings of many of our words. Semantic externalism therefore conflicts with the key premise of Dummett's argument.[3] Consequently, inasmuch as the arguments for semantic externalism have force, Dummett's master argument against semantic realism is undermined.

Dummett submits that we should accept an epistemically constrained notion of truth, and identify truth with verifiability. Is this notion really as clear and plausible as Dummett and others assume? I have argued elsewhere in detail (Raatikainen 2005) that the kind of notion of truth Dummett asks for has never been adequately explained even in the most well-defined case, the case of mathematical statements, where verifiability amounts to provability. All attempts to explicate this idea arguably turn out to be either clearly implausible, or circular.

The verificationist notion of truth is even less plausible if we turn our attention to physical reality and empirical knowledge of it. Different epistemic utilities, e.g.,simplicity, explanatory power, or support from observations, are effective in the acceptance of scientific theories and hypotheses (cf. Levi 1967, Kuhn 1977, McMullin 1983, Laudan 1984). Different dimensions of the goodness of an explanation include nonsensitivity, cognitive salience, precision, factual accuracy, and degree of integration (Ylikoski and Kuorikoski 2010). These various utilities and explanatory virtues, however, often pull in opposite directions, and the choice of which one to maximize may be pragmatic if not arbitrary. Therefore, it is doubtful that 'ideally justified' converges toward a determinate, unique theory. There may well exist indefinitely many mutually incompatible theories which deserve equally to be called 'ideally justified'. But that cannot be identified with truth, for whatever truth is, it is not contradictory.[4]

It is important to note the difference between the traditional verificationism and Dummett's approach: Dummett does not declare a statement meaningless if it is not verifiable. However, his view is that a competent speaker must know its verification-conditions, that is, she must know what would count as a verification of the statement. Dummett's whole approach requires that the theory of meaning must necessarily be strictly atomistic, or molecular. It must be possible to ascribe determinate and unique verification-conditions to each and every meaningful statement. Therefore, it is striking how little attention Dummett and his followers pay to the widely accepted idea of confirmation holism, or the Duhem-Quine thesis.[5] Namely, it is arguably a sound observation in the philosophy of science that isolated sentences of the more theoretical sort often have no connection to observations in themselves, but only when taken together in relatively large bundles, as a theory; and even then often only with some further auxiliary assumptions; moreover, different choices of auxiliary hypotheses lead to different inferential connections with observations. This suffices to show that not all apparently meaningful scientific statements have verification-conditions of their own (cf. Devitt 1983). Dummett grants that a statement can often be verified in a number of different ways. However, he adds that we must distinguish between direct (or 'canonical') and indirect means of verification, and that the former plays an essential role in the knowledge of meaning. In the light of confirmation holism, however, it seems very difficult to make any clear sense of the talk about some specific direct means of verifying a theoretical statement. Consequently, the whole Dummettian positive picture of the meaning of a sentence as its conditions of verification becomes deeply problematic.

5. CONCLUSION

We have discussed various 'realisms' in philosophy. They are conceptually independent, although one view can provide some degree of support for another. The best arguments in their favor are very different. It is quite implausible to deny general metaphysical realism, according to which there is a mind-independent reality—that ordinary material objects exist whether or not we cognize them. Furthermore, it is very natural and arguably justifiable to extend this idea to the unobservable entities postulated by science, and thus accept some form of scientific realism. Whether semantic realism á la Dummett is tenable is an entirely separate issue, and cannot replace the more traditional metaphysical question. Dummett's argument against semantic realism can be resisted, and the semantic anti-realism advocated by Dummett and his followers can be effectively criticized.

NOTES

1. The response is popular, and plausible, but there does not seem to have been an exact demonstration. However, in (Raatikainen 2012) I present a concrete and exact example, a pair of theories which are deductively underdetermine but once inductive relations are taken into account, observations clearly support one and not the other.

2. Dummett seems to miss the relevance of the *independence* dimension in the characterizations of metaphysical realism; mere existence is not sufficient. Consequently, this is not a genuine problem for metaphysical realism. Both idealism and phenomenalism deny the *mind-independent* existence of physical objects, and that is sufficient to distinguish them from realism.

3. I discuss this conflict in some detail in (Raatikainen 2010). I am, of course, not at all the first one to suggest this kind of objection. Perhaps the first to use explicitly externalist views against the Dummettian arguments was Millar (1977); see also Currie & Eggenberger (1983), Devitt (1983), Miller (2006).

4. For a useful review of several problems for epistemic theories of truth, see David (2004).

5. I don't intend to suggest that Dummett was not aware of the Duhem-Quine thesis; he certainly was. Dummett's discussions of this theme simply are not very helpful. On the one hand, he comments on some of Quine's observations more or less approvingly; on the other hand, he does not tire of emphasizing how disastrous a holistic view of meaning would be. Yet he says very little that would help to show how his view would avoid the problems mentioned here.

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