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CONTENTS

ON MICHAEL DUMMETT'S NOTION OF DECIDABILITY[1]

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Realism is the doctorine that universals have real and objective existence regardless of man's ability to come to know the truths concerning them. In truth-conditional semantics, this means that the truth or falsity of a sentence is an epistemically unconstrained property that holds between the world and the linguistic expression. In this sense, realism holds that the truth or falsity of a sentence is recognition-transcendent. Michael Dummett claims to have a comprehensive argument against the realist's thesis and contends that there is an intrinsic difficulty in determining in a truth-theoretic manner the relation between language and the world. Donald Davidson, representing the realist's point of view in this regard, proposes that the meaning of a sentence be equated with its truth conditions. He further argues that to know what it is for a sentence to be true is to understand the semantic concept of the truth of the language (Davidson 1967:456). If Dummett is right and it is also shown that the world and language are not so uniformly related, then we are compelled to vitiate Davidson's position and repudiate realism altogether. My paper concerns whether Dummett's putatively sound argument is indeed sound, as he claims. I will first illustrate his line of argument as I understand it, and offer my critical evaluation of Dummett's position against realism.

The point of departure in the analysis of a theory of meaning in both Dummett's and Davidson's proposals rests on the notion that a theory of meaning must be closely related to a theory of understanding. In this regard, Dummett states:

> ...it is the job of a theory of meaning for a language to give an account of how that language works, that is, of how its speakers communicate by means of it ... a theory of meaning is a theory of understanding ... (1975:99)

Elsewhere he also writes:

> ... philosophical questions about meaning are best interpreted as questions about understanding: a dictum about what the meaning of an expression consists in must be construed as a thesis about what it is to know its meaning. (1976:69)

Davidson has written about the same subject as follows.

> To know a semantic concept of truth for a language is to know what it is for a sentence ... to be true, and this amounts, ..., to understanding of the language. (1967:456)

In this way, both Dummett and Davidson crucially link a theory of meaning with a theory of understanding. Then, Dummett contends that to ask what it is to be able to understand is to ask what it is to be able to communicate. A communicative skill is a skill extracted from and refined by the finite corpus of linguistic data and, if language is to fulfill this communicative function, meaning must be manifested in and recoverable from the linguistic use and empirical facts. An adequate theory of meaning, Dummett advances, must therefore appeal only to the speaker's semantic knowledge within the limits of his epistemic capability, and such knowledge should be directly relatable to the linguistic use and empirical facts. Otherwise, a theory of meaning is inadequate. It follows, then, that a theory of meaning that relates meaning to something that lies beyond the speaker's recognitional capabilities cannot be an adequate representation of his semantic knowledge.

Dummett further argues against Davidson that the link between this semantic knowledge and the linguistic use must be manifested not only in being able to state the conditions under which the sentence is true, but also in the capacity to recognize, or come to know, the truth value of the sentence. Dummett goes on to say, however, that there are many instances in which the truth values of certain sentences cannot, in principle, be determined. Any competent speaker of English 'understands' the sentence 'A city will never be built here' as a somehow 'meaningful' sentence, but this cannot really be held to be true, for he has no effective means of recognizing the conditions under which the truth of the sentence obtains. The trouble in this sentence resides in the fact that the expression 'never' quantifies over an infinite domain. Dummett further argues that truth, if defined in terms of possible worlds, as in the cases of counterfactuals, alethic modals, and sentences of propositional attitudes, no longer serves as the needed link between the speaker's capacity to recognize the truth conditions as obtaining and the linguistic use and empirical data. In Dummett's argument, we might recall that stating and recognizing the truth conditions are two essential components of the semantic concepts. In essense, there is no account of how knowledge of this kind can be manifested. Dummett concludes that the theory of meaning which lacks this mechanism is necessarily false. Since the theory of understanding is equated with the theory of meaning, the realist's theory cannot represent, even in principle, the conditions which might obtain beyond the speaker's epistemic domain. As I understand it, the foregoing is the summary of Dummett's fundamental position.

The crux of Dummett's objection to the realist's view of semantics is the allegedly missing link between the use of the language and the real world knowledge and the speaker's capacity to recognize the truth conditions as obtaining for certain problematic sentences. He elucidates this point as follows:

> ...[semantic] knowledge will consist in [the speaker's] capacity, perhaps in response to suitable prompting, to evince recognition of the truth of the sentence when and only when the relevant condition is fulfilled. (Dummett 1976:80-81)

He further states that:

> The difficulty arises because natural language is full of sentences which are not effectively decidable, ones for which there exists no effective procedure for determining whether or not their truth conditions are fulfilled. (Dummett 1976:81)

Here I am compelled to offer an alternative view of the matter. It has been recognized by many philosophers and linguists that natural language is full of ambiguities that defy a straightforward analysis. For example, some philosophers have proposed the notion of fuzzy sets whereby certain semantically fuzzy predicates, 'tall,' 'big,' to name a few, are said to denote sets of entities to which the predicates apply, but in which the set membership is defined to be of scalar type. This approach, although it has its share of problems, is possibly more appealing since it attempts to take into account some inherent ambiguities in natural language, which a formal language does not have. Therefore, the proposition expressed by 'John is tall' where John in fact measures 5'8" may not yield T in certain semantic models, while it is equally conceivable that the same proposition is false in some other interpretation. It has often been said that the logical implication '->' can be translated into English 'if ... then ...', but we are perfectly aware of the fact that '->' is quite different from 'if ... then ...' There is some evidence to suggest that 'if ... then ...' is not truth-conditional. For instance, consider 'If you write the philosophy paper for Brownstein for me, I promise to give you fifty dollars.' If the logical implicaton is to hold in English, the speaker is obliged to surrender the sum of fifty dollars even if the hearer refuses to write the paper for him. The important point these two simple examples illustrate is that there is no 1-1 structure and meaning preserving function from natural langauge to logical language if the logical language is not sophisticated enough.

To take Dummett's original example 'A city will never be built here,' it has been argued that one of the difficulties in giving a truth value to this sentence from a realistic standpoint is that it is impossible for anyone to recognize the truth of the sentence as obtaining. One unjustified assumption on Dummett's part comes from the interpretation of 'never,' quantifying over the time period between the time of utterence to infinity (or to the end of time, if any), in which it is presumed, without due justification, that the sentence is logically equivalent to 'there is no such time t in the future at which a city is built here.' In fact, the English language allows us to use all sorts of polarity adjectives, adverbs, predicates, reference to kinds (the cat, for example, denoting the set of all cats), etc. We often hear 'John is always eating. That's why he is so fat,' but we do not wish to translate the first to 'There is no such time t in the past, present, or future, at which John is not eating.' To do so leads us into a blind alley and imposes upon us an unnecessary restriction on the use of the English language. The preferred approach is to take a formal system of logic, with due modifications to accommodate natural language's inherent (seeming) ambiguity, and then apply it to the analysis of natural language. One cannot, as Dummett does, take a grossly inadequate metalanguage and expect to come up with a plausible analysis of natural

language. Certainly, we expect problems dealing with polarity items, among other things, even in a very elaborate formal system. But the shortcomings are solvable if we devise a formal system that is sufficiently rich for disambiguating semantically relevant ambiguities. Although Dummett never makes a specific reference to the richness of metalanguage (and he does not think that the translation manual is useful), he nevertheless confuses the meaning (or the intended meaning) of 'never' as uttered by someone in a context like 'A city will ...' and the putatively logical interpretation of 'never' in his metatheoretical argument.

We shall ignore this flaw in Dummett's argument and return to the sentence 'A city will never be built here.' Dummett maintains that this sentence is undecidable since there is no effective procedure, in a finite number of steps, for anyone to come to recognize the truth of the statement as obtaining. Suppose we have a sentence 'A city will never be built here in two years,' which we wish to verify. If Dummett is an adherent of a strong verificationism, he would have to say that this is undecidable due to the infinitude of the domain. This must be so since no one can establish a finite procedure which checks every densely ordered time moments contained in these two years. But we know that we can in principle verify or falsify the statement in two year's time. Certainly, Dummett is not a strong verificationist, and it seems that the argument based solely on the infinitude of domain does not get Dummett anywhere. Perhaps the cause of the difficulty is not only the size of the domain, but also, and perhaps more importantly, the unforeseeable end of the spatio-temporal continuum. More specifically, Dummett may conceivably argue that regardless of whether time continues to exist or ends at a certain future point in time (say 200 years from now), no human being living now would be in the position to verify the outcome of that sentence value. If we assume that time ends in 200 years, it seems that the fact no human can live that long is a mere medical impossibility, not a necessity required by some a priori principle. I agree with Russell on this point. However, it seems to follow that even if a man is blessed with immortality, thus living with time in a parallel fashion into infinity, he will not be able to recognize the truth conditions of the sentence as obtaining.

Dummett's argument against realism is far from conclusive so far. From my line of argument, I grant that, as much I would hate to do, it is undecidable at the moment, if time is infinite in duration (and it exhibits all the symptoms of being so). To repudiate realism here, Dummett must show that the undecidable sentences are conclusively so, for, otherwise, he would not be able to say definitively that the law of excluded middle does not hold. To look at the crucial point more carefully, we shall see what is really meant by decidability. Dummett says:

> ...we may say that the speaker's knowledge of the condition for it to be true consists in his mastery of procedure for deciding it, that is, his ability, under suitable prompting, to carry out the procedure and display, at the end of it, his recognition that the condition does, or does not, obtain. (Dummett 1976:81)

What exactly does it mean for someone to have this ability to carry out the procedure and display the results? He lays down three conditions under which this may be carried out:

> First, the making of the observation-report must not rest upon any extraneous inference ... Secondly, in every case the sentence is true, it must be in principle possible that it should be observed to be true. And, thirdly, the possibility of observing it to be true cannot involve any operation whicn affects transformation of a constitution of any object referred to in the sentence. (Dummett 1976:95-96)

We encounter a serious problem here. First is the reliaoility of the human sensori-motor ability that is supposed to lead us to verification or falsification. It might be said that our ability of sensory descrimination is directly limited by the sensory organs themselves. For instance, the paint containing equal amounts of blue and yellow (say one gailon of each) will render the mixture green. An addition of one drop of blue paint will make this new mixture different from the original one in color. It is very unlikely that any human perceptual sense is sharp enough to tell the difference in color. If this is carried too far, this approach to decidability comes dangerously close to solipsism and individualized semantics. Suppose that this is not a view of verification that is advocated by Dummett and suppose that the difference in color is indeed verifiable, for there is, in principle, a method by which one can tell that these two mixtures have different colors. We say that it is conceivable to construct an instrument by which even a milligram of additional paint can be detected. So far so good.

The kind of verification Dummett proposes is what might be called weak verificationalism in which not all facts (verified things) are necessarily the results of empirical observation. Verificationism, whether strong or weak, assumes that the human perceptual senses and data therefrom are consistent among experiencers. Although certain common experiences do, I believe, exist, it is an error in his argument to say that they are always consistent. We shall be lienient here and grant Dummett that experiences are public commodity and consistent.

The burden placed on Dummett is this. He must show that, in this idealized situation, all undecidable sentences are ultimately undecidable. For the purpose of discussing his claim to this effect, we shall examine a hypothetical situation. Suppose that a group of cave dwellers, called the people C, inhabited the place which is today known as Mt. Oread. These people C lived in 50,000 B.C. in this area, and let us further suppose that they spoke a language called English*, a language that is exactly like English as we know it today. The people C had no method ot testing the acidity of a solution. Take a sentence uttered of a bottle of a solution by one of the medicinemen of C: 'The solution is acidic.' In Dummett's terminology this sentence in English* would be (or would not be?) undecidable given their state of technological development. This may be so, since there is no available technology to verify the truth or the falsity of the sentence. Now, imagine a similar situation taking place at the University of Kansas at present. An archaeologist discovered a bottle of solution which containea the very

same solution of which the medicineman was speaking in the year 50,000 B.C. A research chemist utters the same sentence 'The solution is acidic.' The chemist now has an observable method of verification, like the litmus test. Thus for the chemist, the sentence is effectively decidable. He can actually perform the act of dipping a litmus paper in the solution, and verify it with his own eyes.

I think what is crucial in deciding whether the sentence is undecidable in the first instance is the precise interpretation of Dummett's phrasing 'in principle' in his second rule. For the people C to decide the truth or falsity of the sentence, it must be the case that they possess some means of testing the acidity of the solution. Analogously, to say that that the sentence is undecidable is to say there is no method in principle for carrying out the varification procedure. The question is whether or not the people of C had (or did not have) in principle the effective procedure for determining the truth value of the sentence. In retrospect, it seems natural to say that there is an effective procedure, namely the litmus test. If we opt for the idea that the sentence in English* is in principle decidable, we are in a sense saying that there existed an effective means for making that decision in the year 50,000 B.C., and, at the same time, requiring the people C to have, by hypothesis, a capability that is well beyond the epistemic domain of the people C. How can we require them to have this knowledge? How can a member of this community C say, in principle, that the sentence was decidable (or not decidable)? Suppose we take the other route and say that the sentence in English* was in principle undecidable. But this must be false since there exists an effective procedure for testing the acidity of the solution, the litmus test. This is obviously a contradiction.

Here we arrive at the conclusion, by inference, that the sentence in English* must be in principle decidable. It follows that even in those days there existed an effective method of verification not known to the people of C. But this is to require, as I have stated before, something that did not yet exist in their epistemic domain. It should be carefully noted that the existence of an effective method need not be known to someone at some time. There may exist effective methods that no one may ever discover in the entire history of the human civilization. We have come to realize at this point that Dummett's phrasing of 'in principle' is really devoid of any applicable significance, because the stipulation of it in the verification procedure requires the speaker to know, beyond his epistemic ability, whether a sentence is ultimately decidable. This is therefore an appeal on the part of Dummett to something that is not immediate to our realm of understanding, a position that he fervently attacks.

To recapitulate, the previous illustration shows that his procedure of determining the truth value of a sentence does not have a generalized applicable significance to his own theory and it is self-defeating. Note especially that his very method of the verification procedure is knowledge transcendent. The associated problem is that, according to the views held by Dummett, a statement may once have been undecidable for whatever reason, but it is still capable of becoming decidable. To elaborate this point, consider the following example.

Before Cantor offerred a proof that a real set is larger than the integer set, the statement S 'The real set is larger than the integer set' was either decidable or undecidable. If we take the first option and say that S was in principle undecidable, it is a contradiction since there is a proof for it, namely Cantor's diagonal proof. If, on the other hand, we say that S was in principle decidable, this must amount to the following. From a verificationist's point of view, this is equivalent to saying that, for a statement S to be decidable, S must be shown to be derivable from a finite consistent set of basic observation statements and other verified statements O_1, O_2, ... , O_n, such that S is entailed by the conjunction of O_1, ... , O_n. There are several problems here. For one thing, universal statements, including S, cannot be represented by a finite conjunction of basic statements, since we are dealing with infinite sets. Secondly, a statement O_i can in principle be the basis of an unlimited number of statements, thus it is not conclusively verifiable. This shows that it cannot be generally said that S was in principle decidable. Suppose we weaken the requirement for Dummett by removing the phrase 'in principle,' since, after all, it is knowledge transcendent, and say simply that S was decidable. But this compels us to return to the earlier point I made in the paper that this requires mathematicians of pre-Cantor days to have been blessed with the knowledge they did not have. This constitutes a contradiction.

The only escape route Dummett can find is to say that S was undecidable in pre-Cantor days, and became decidable (in fact verified) after his proof was completed. This points to an observation in favor of realism, for it shows that not all undecidable sentences are ultimately undecidable, even though they may seem to be undecidable. Dummett has no compelling reason to dismiss the possibility of one day having all (or only some) previously undecidable sentences become decidable, and this might include the sentence 'A city will never be built here.'

It is clear now that Dummett's theory of verification says that a statement is true iff verified, false iff falsified, otherwise undecidable. Only in this way can Dummett's theory of verification maintain its internal consistency, and also, save for the undecidable sentences, they are not in opposition to the realist's view. Now, clearly the set of verified sentences is a (proper) subset of ultimately true sentences. Likewise, the set of falsified sentences is a (proper) subset of ultimately false sentences. The gap is accounted for if the undecidable ones are decided. So, it may be safely said that not all undecidable sentences are ultimately undecidable. Dummett's problematic sentences merely show that certain sentences are not yet verified (or decided upon), they do not show, however, that they are ultimately undecidable. In other words, verification is simply a characterization of empirical sentences.

One of the most puzzling aspects of Dummett's proposal is whether decidability is a criterion of meaning or meaningfulness. He repeatedly speaks of a semantic theory whose foundation is verifiability (assertability). Suppose that 'A city will never be built here' is undecidable. Then, it should not have any truth conditions. If we are to say that meaning is the truth conditions under which the statement obtains, then it should be devoid of meaning. If this approach is

plausible, we cannot explain what is being communicated by uttering that sentence. Then if it is not the meaning that is being communicated, it begs the question of what is really being communicated. Schlick proposed that it is the procedure of verification but the statement like 'The solution is acidic' would then have several different meanings.[2]

'A city will never be built here' is certainly communicative, informative, and meaningful. A theory of meaning based on verifiability however must render this sentence meaningless for the lack of verification procedure. The notion of decidability as a central concept for a theory of meaning fails on these very important counts. It is impossible to establish, in any meaningful manner, the alleged link between verifiability and meaning.

I would like to emphasize the far reaching effect of Dummett's theory of meaning, if he is shown to be correct. His theory forces us to abandon the entire notion of truth and its place it occupied in logical semantics. Even if the theory is not reduced to solipsism, it leaves us with a very imprecise account of verifiability and falsifiability, the in-principle notion, and most importantly, how verifiabilty relates to meaning.

NOTES

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2 This is obviously an oversimplification and I don't know how it can work.

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