

EVOLUTION OF QUINE'S THINKING ON THE THESIS OF UNDERDETERMINATION AND SCOTT SOAMES'S ACCUSATION OF PARADOXICALITY

M. Ashraf Adeel

Scott Soames argues that interpreted in the light of Quine's holistic verificationism, Quine's thesis of underdetermination leads to a contradiction. It is contended here that if we pay proper attention to the evolution of Quine's thinking on the subject, particularly his criterion of theory individuation, Quine's thesis of underdetermination escapes Soames's charge of paradoxicality.

1. Introduction

Quine's thesis of underdetermination plays a central role in his philosophy of language and philosophy of science. As such it has generated a lot of philosophical debate and come to exert far-reaching influence on contemporary philosophical attitudes toward language and science directly or indirectly. This essay traces the evolution of Quine's thinking on the thesis of underdetermination over a period of about 2 decades, in order to undermine Scott Soames's scathing attack that Quine's thesis of underdetermination leads to a contradiction when viewed through and within Quinian holistic verificationism. In what follows I will first briefly state Soames's criticism of the underdetermination thesis and then detail the evolution of Quine's thinking on the subject. I distinguish underdetermination as a general theoretical claim from underdetermination as a claim about our practical limitations as scientists and point out that it is the latter view that is Quine's later position, although his own rejection of the thesis as a general theoretical claim is based on a misinterpretation

Contact M. Ashraf Adeel at Kutztown University, Kutztown, PA 19530 (adeel@kutztown.edu).
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of Craig's theorem. I also point out that in order to avoid epistemological relativism that follows from the thesis of underdetermination, Quine in his later writings introduces a device, the so-called trivial expedient, that amounts to a withdrawal of the thesis of underdetermination altogether. This, however, is a rather temporary phase in Quine's writings, and he seems to withdraw this withdrawal in a still later essay. Once the details of Quine's position have been worked out, I sketch an argument to show that Soames's criticisms of Quine's thesis stem from a failure to pay proper attention to Quine's criterion of theory individuation.

2. Soames's Accusation of Paradoxicality

Scott Soames has strongly criticized Quine's thesis of underdetermination. His argument is of great interest and deserves careful analysis. Here is how he understands the thesis:

For any consistent theory T_1 , and the class of possible observations O that fit it, there is a theory T_2 , logically incompatible with T_1 , which also fits O . (Soames 2003, 289)

This thesis is claimed by Soames to generate a paradox when read in conjunction with a and b below:

- a. The meaning of a theory = the class of possible observations it fits.
- b. Two theories have the same meaning iff they fit the same class of possible observations. (289)

His idea here is that if two consistent theories have the same meaning, they cannot be logically incompatible or inconsistent with each other. So if the thesis of underdetermination claims that two consistent theories can be empirically equivalent and yet inconsistent with each other, then the thesis is making a contradictory claim. Soames elaborates this idea further by claiming that "we can derive a contradiction" from the above statement of underdetermination and principles a and b by adding "apparently trivial supplementary premises" (289). His supplementary premises are as follows:

- SP1. If two theories mean the same thing, then they make the same claim about the world, in which case they cannot differ in truth value. Hence one is true if and only if the other is true; similarly one is false iff the other is false.

SP2. If two theories are logically incompatible, then they cannot both be true. (289)

This leads Soames to the alternative that “ T_1 and T_2 are both false.” But he finds such a situation strange, given the fact that “there are some true theories of something” (289). Therefore, he adds a third supplementary premise here:

SP3. Some theories of some subject matters are true (289).

From these supplementary premises and the thesis of underdetermination coupled with *a* and *b* above, Soames derives the contradiction that *both T_1 and T_2 are true since they are empirically equivalent, and only one of them is true because they are inconsistent with each other*. Soames then concludes that obviously something is wrong somewhere in the premises that lead to this contradiction.

He suggests a resolution of this paradox by turning essentially to Quine's naturalism about truth and applying the same idea to meanings as well, although he seems to attribute it to Gilbert Harman (Soames 2003, 391). The idea is to relativize meaning and truth to a language or a theory and get what Soames calls a weak version of Quine's holistic verificationism and underdetermination thesis. Soames now works with the following version of underdetermination thesis:

For any consistent theory T_1 , in the language L_1 , of someone who accepts it, and for any class of possible observations O that fit it, there is a theory T_2 , also in L_1 , logically incompatible with T_1 , which fits O as well. (395)

The *a* and *b* above are now changed to:

- a'. The meaning of a theory in the language of someone who accepts it = the class of possible observations that it fits (given by the class of observational conditionals entailed by the theory).
- b'. The meaning of a theory T_1 in the language of someone who accepts T_1 = the meaning of a theory T_2 in the language of someone who accepts T_2 iff T_1 and T_2 fit the same class of possible observations (i.e., iff they entail the same class of observational conditionals). (395)

This revised version of the thesis of underdetermination and holistic verificationism blocks the contradiction noted above by making the meanings of T_1 and T_2 relative to two different languages. In Soames's own words: “What

does T_2 mean in L_1 ? The weakened version of holistic verificationism does not say. But whatever it means, it is not what T_1 means in L_1 ” (395–96). Hence, despite their empirical equivalence, speakers of both T_1 and T_2 do not know what the other’s theory means.¹ There is no way to derive a contradiction in such a situation. Soames points out that this position is “both coherent and Quinean. It also receives some support from the electron/molecule example” (396).

In order to fully appreciate why Soames’s line of thinking has gone drastically wrong about underdetermination, one needs to detail the evolution of Quine’s thinking on the subject and also clarify some of his basic ideas and terminology. This is what we do in the next section.

3. Evolution of Quine’s Thinking on Underdetermination

The evolution in Quine’s thinking on underdetermination has taken place primarily in two areas. First, Quine has changed his mind regarding the relationship between theory and observation. Originally Quine thought that physical theories imply what he calls *observation conditionals*, and it is these conditionals that are borne out by empirical evidence. This is the position that he takes, for example, in his “On Empirically Equivalent Systems of the World” (Quine 1975). However, in *Theories and Things* he replaces the observation conditionals with what he calls *observation categoricals*. But before I elaborate on what this change means for Quine, let me point out the second, and clearly more important, area in which Quine’s thinking has undergone change. Before “On Empirically Equivalent Systems of the World” Quine believed that all possible observations, past, present, and future, cannot determine a unique physical theory for us. In “On Empirically Equivalent Systems of the World”

1. This position has obvious similarities to the incommensurability thesis as advocated by Kuhn and Feyerabend. In Kuhn’s terminology this thesis is the claim that scientists working in different paradigms or global theories of the world fail to understand each other because the concepts/terms used in their respective theories make sense only in the context of home theories holistically. Taken out of the context of their holistic relations with each other, concepts/terms of a given theory of the world cannot mean what they mean. Hence, scientists working in a different theory of the world cannot understand these concepts/terms (Kuhn 1970; Feyerabend 1975). Attributing such a position to Quine means attributing the incommensurability thesis to him. As Donald Davidson has argued in his “On the Very Idea of a Conceptual Scheme,” the incommensurability thesis is best understood as a claim about failure of translation between languages of theories (reprinted in Davidson 1984). Attributing such a thesis to Quine, then, effectively attributes the thesis of failure of translation between languages of different theories to him. However, we know Quine only believes in indeterminacy of translation for theoretical terms of a language and not failure of translation between languages (Quine 1960). Hence, this is an additional reason, beyond my argument given below, for rejecting Soames’s interpretation of Quine’s underdetermination thesis.

Quine declares such a version of underdetermination as “surely untenable.” In this paper Quine claims that underdetermination is a thesis about our practical limitations as scientists. Let us refer to the earlier general version of the thesis as the theoretical underdetermination (TU), and the later version as the practical underdetermination (PU). TU and PU can be stated in the following manner:

TU: Given all possible evidence, past, present, and future, we can build empirically equivalent but logically nonequivalent systems of the world such that no reconstrual of predicates can reconcile them with each other (see Quine 1970, 178–79).

PU: Given all the observations, past, present, and future, we can build empirically equivalent but logically incompatible systems of the world, such that, because of our practical limitations as scientists, we may never be able to discover a reconstrual of predicates that would reconcile the alternative systems. (Reconstrual of predicates for Quine means any mapping of our n -place predicates onto n -variable open sentences; see Quine 1975, 320, 327.)

Replacement of the observation conditionals by observation categoricals and TU by PU are the two changes, then, in Quine's thinking on underdetermination. Before elaborating on these changes briefly, I want to add a few terminological remarks on regarding TU and PU.

Kitcher (2001) and others (see, e.g., Stanford 2001; Biddle 2013) have employed the terms “permanent underdetermination,” “transient underdetermination,” and “global underdetermination” to characterize various forms of underdetermination of theory by evidence. Kitcher defines the transient underdetermination thesis as underdetermination of some theories by logic and currently available evidence. The permanent underdetermination thesis is the claim that some theories are underdetermined by all possible evidence accessible to scientists. Global underdetermination, however, makes the claim that all theories are permanently underdetermined by all possible evidence (Kitcher 2001, 30–31). These characterizations are helpful but slightly different from TU and PU above, which are based on Quine's own text. In Quine's own characterization, PU, the thesis about our practical limitations as scientists, applies to all systems of the world (total theories of the world) and not just some of them. Quine, as per the above characterization of PU, does not believe that only some total theories are underdetermined by currently available evidence. Similarly Quine does not take his general version of the thesis, TU, to be about some total theories or systems of the world. He took TU to be ap-

plicable to all systems of the world. In this regard, TU is similar to Kitcher's global underdetermination, provided we take care to characterize the latter thesis in terms of total theories or systems of the world.

In "On Empirically Equivalent Systems of the World" Quine distinguishes *theory formulations* from a theory itself. A theory is an infinite set of sentences implied by a theory formulation, that is, "a conjunctive sentence comprising the so-called axioms of the theory" (Quine 1975, 318). More than one logically equivalent formulation of a single theory, in this sense, is obviously possible. These theory formulations, Quine informs us, imply *observation conditionals*. The notion of an observation conditional is clarified in terms of the notion of a *pegged observation sentence*. A pegged observation sentence is just an observation sentence with specifications of place-time. Now a theory formulation does not imply each of these pegged observation sentences individually. What happens is that it implies observation conditionals whose antecedent, in each case, is a conjunction of some pegged observation sentences and whose consequent is a pegged observation sentence. The antecedent underscores the boundary conditions (already verified pegged observation sentences), which along with the axioms of the theory would yield the consequent. This, says Quine, is "a just view of the relation of scientific theory to observations that support or refute it," because observational consequences are yielded by scientific theories only under certain boundary conditions (317).

Such then is the relation of theory to observation for Quine at this stage: a theory formulation implies observation conditionals. However, Quine does not want to identify a theory with the logical consequences of its formulation in a straightforward way. He says:

Take some theory formulation and select two of its terms, say "electron" and "molecule." I am supposing that these do not figure essentially in any observation sentences; they are purely theoretical. Now let us transform our theory formulation merely by switching these two terms throughout. The new theory formulation will be logically incompatible with the old: it will affirm things about so-called electrons that the other denies. Yet their only difference, the man in the street would say, is terminological; the one theory formulation uses the technical terms "molecule" and "electron" to name what the other formulation calls "electron" and "molecule." The two formulations express, he would say, the same theory. Someone else might urge, however perversely, that they express very different theories: both of them treat of molecules in the same sense but disagree sharply regarding the behavior of molecules, and correspondingly for electrons. (1975, 319)

Such theory formulations are, for Quine, empirically equivalent in the sense that they imply the same observation conditionals. However Quine sides with the layman in regarding the two as formulations of the same theory notwithstanding their “overt logical incompatibility.” If we were to identify a theory with its logical consequences, we would have to sacrifice the layman’s intuition in the case at hand, for our two formulations are logically nonequivalent while empirically indistinguishable. Hence, Quine remarks: “What is required of two formulations of a theory must be, in short, some relation stronger than empirical equivalence and weaker than logical equivalence” (319).

We can, however, render the two formulations, in the above example, logically compatible simply by switching the predicates “molecule” and “electron” throughout one formulation. The intuitive idea here is what Quine calls a *reconstruction of predicates*. This means “any mapping of our lexicon of predicates onto our open sentences (n-place predicates to n-variable sentences). Thus the predicate ‘heavier than’ might be mapped to the open sentence ‘x is heavier than y,’ an identity mapping changing nothing, while the predicates ‘molecule’ and ‘electron’ might be mapped to the respective open sentences ‘x is an electron’ and ‘x is a molecule’” (Quine 1975, 320).

Quine uses this possibility to formulate his criterion for theory individuation: “Two formulations express the same theory if they are empirically equivalent and there is a reconstruction of predicates that transforms the one theory into a logical equivalent of the other” (1975, 320). It is this Quinian criterion of theory individuation that is completely missed by Scott Soames. As noted above, he subjects Quine’s thesis of underdetermination to a scathing criticism and takes Quine’s underdetermination thesis to be talking about two theories, having the same meaning because of their empirical equivalence and being only verbally distinct from each other (Soames 2003, 389–90). In fact Quine’s criterion of theory individuation clearly shows that empirically equivalent but only verbally distinct theories are not taken by him as two theories at all. But we will talk more about it in the last section. For now, let us continue with Quine’s evolving ideas.

As noted above, TU is the claim that we can come up with formulations (of global physical theory) that imply exactly the same observation conditionals but cannot be rendered logically compatible by any reconstruction of predicates. However, understood in this way Quine considers the thesis to be “surely untenable.” The reason is that if the implied observation conditionals are finite in number we can simply identify our theory formulation with the conjunction of these conditionals. In that case every other empirically equivalent theory would not only imply our formulation but also remain consistent with it. But even if the implied conditionals are infinite in number, Quine believed the

situation remains unaltered basically. For in that case we can, in Quine's expression, *encompass* all the conditionals in a finite number of universally quantified conditionals, perhaps even in a single one. And again no empirically equivalent theory can ever conflict with it. Why Quine believed (wrongly as we know now) in this possibility will be made clear in a moment.

Quine continues, however, to endorse underdetermination as an "attitude toward science," as a practical thesis. The idea behind the practical version of underdetermination, PU, is that our efforts to capture an infinite assortment of observation conditionals in a tight formulation may not succeed. They may not succeed because any finite formulation that we come up with cannot be equivalent to the conjunction of the infinite assortment of the desired conditionals. "Any finite formulation that will imply them is going to have to imply some trumped-up matter, or stuffing, whose only service is to round out the formulation. There is some freedom of choice of stuffing, and such is the underdetermination" (Quine 1975, 324).

The point can be made in another way: Quine draws a distinction here between tight-fit and loose-fit theories. The tight-fits are the ones whose formulations imply exactly the desired observation conditionals and nothing else. The loose-fit formulations, however, imply the desired conditionals along with some trumped-up matter without which the formulations could not be rounded out. Underdeterminism is untenable in case of the tight-fits. But in cases of the loose-fits we can in principle get alternative formulations that are empirically equivalent but logically incompatible because of the difference in the "stuffing"—the extraneous matter that helps round out such formulations. Whether such alternatives could be reconciled by a reconstrual of predicates is, for Quine, an open question. There could always "be a reconciling reconstrual of predicates, subtle and complex and forever undiscovered" (Quine 1975, 327). Hence, we may never be able to decide whether the alternative formulations are genuine alternatives. Obviously this is a claim about our practical limitations.

Let me add some clarifications about loose-fits in order to get a possible sense of Quine's notion of stuffing. If a theory formulation is a loose-fit, it implies the desired observational conditionals about the world plus some other things ("stuffing") that are not known, at this stage of the current research, to be correct or incorrect. Given our choice of the axioms, we cannot avoid these extra implications. That is the case with loose-fits by definition. When we are not able to come up with a tight-fit theory formulation, we work with a loose-fit for the sake of explaining our currently available data about the world. The same data, however, can be explained through a different loose-fit formulation, which implies everything we desire, plus a different "stuffing" or "extraneous

matter”—again not known to be correct at this stage of our research. These two loose-fit theory formulations are empirically equivalent, but, since their extra implications (“stuffing”) are different, they cannot be shown to be logically compatible with each other at the current stage of our research. We do not know at this stage of our research as to what predicates, in the other-than-desired implications of the two theory formulations, can be reconciled with each other. Hence, we cannot tell of the two empirically equivalent theory formulations whether they are genuine alternatives or they will be reconciled ultimately through a reconstrual of predicates. This practical limitation on our part is what PU seems to underline.

In other words, theory formulation TF1 can imply all the known empirical data D plus a set of theoretical ideas, I, not fully understood by us yet. The other theory formulation, TF2, also implies D plus a set of theoretical ideas I*. At this stage of our research we do not fully understand either I or I*. They just come out as implications of the best loose-fit theory formulations that we can come up with in order to explain our empirical data D. Now TF1 and TF2 are clearly empirical equivalents. But we cannot decide whether they are logically reconcilable through reconstrual of predicates found in I and I*. This is our practical limitation as working scientists, and this is what PU is meant to underscore.

Now let us try to answer the question as to why Quine thought that for tight-fit theory formulations, TU is “surely untenable.” Actually, Craig’s theorem showed that for axiomatized systems, there is a way to replace their auxiliary expressions or predicates (Craig 1953, 1956). The rough idea is that given the class of consequences (sentences) of an axiomatized system, we can specify another class of sentences whose members replace the auxiliary expressions of the given class, are decidable, and are logical equivalents of the sentences of the given class. Quine interpreted this (in “On Empirically Equivalent Systems of the World”) to mean that we can specify a replacement class for any desired class of consequences. As Christian List (1999) showed recently, this interpretation of Craig’s result was too strong and actually leads to a contradiction. List notes that Quine thought wrongly that “for *any* desired class of consequences” of a theory formulation, we can specify a second class of sentences that is decidable and whose elements are logically equivalent to the elements of the given class” (5). Actually, such a result is possible only for recursively enumerable set of consequences and not for any desired set of consequences.

The relevance of this point to the issue at hand is that Quine wrongly concluded from his own strong interpretation of Craig’s result that tight-fit theory formulations can be shown to be logically equivalent when they are

equivalent empirically, that is, even when the number of their implied observation conditionals is infinite. But actually such a possibility exists only for those tight-fit theory formulations whose implied observational conditionals are recursively enumerable or decidable in the sense that either each conditional or its negation can be proven in the axiomatized system. That is not possible in the case of theory formulations that imply a whole infinity of observational conditionals. The consequence class in such cases need not be recursively enumerable.

But if that is the case, then we cannot claim that two theory formulations that are empirically equivalent cannot conflict with each other logically. Indeed they will, as Quine's own artificial example of molecule/electron versus electron/molecule above shows. That means that we can have tight-fit theory formulations that meet Quine's criterion of individuation of theories; that is, no reconstrual of predicates makes them logically equivalent. It appears therefore that Quine's retraction of TU in "On Empirically Equivalent Systems of the World" is based on a misinterpreted result, and TU stands unscathed.

In *Theories and Things* Quine replaces his "observation conditionals" with what he calls "observation categoricals." Conditionals, as we might recall, were constituted out of pegged observation sentences, that is, observation sentences with place-time specifications. This makes the conditionals problematic for two reasons: place-time specifications are hard to come by and, more importantly, such specifications in the antecedent of an observation conditional will be obviously at some remove from the place-time where the observation predicted in the consequent is due. Quine asks: "How does the experimenter know that the supposed initial conditions were fulfilled a while back and some way off?" Any appeal to memory or testimony of others would make the initial conditions a matter of inference rather than observation. And such "inference is already a part of scientific theory, however tacit and unconscious" (Quine 1981, 27).

Quine is led, in order to adhere to strict observation in experimentation, to observation categoricals that transcend place-time specifications by virtue of their generality. These categoricals are sentences like "Where there is smoke there is fire" or "When it rains it pours" or "When night falls the lamps are lit." Quine remarks: "these enjoy generality over places and times, but they do not need to be read as assuming a prior ontology of places and times or any implicit universal quantification over them. The construction can be seen rather as a simple one, learned early. The child may learn the component observation sentences 'Here is smoke' and 'Here is fire' by ostension, and then the compound is an eternal sentence that expresses his having become conditioned to associate the one with the other" (1981, 27).

So now for Quine, it is observation categoricals that a theory formulation implies and not observation conditionals. This brings Quine very close to a Popperian view of science. As Quine remarks, observation categoricals can be falsified by observation, but, because of their generality, observation can never establish their truth conclusively.

Obviously the theory formulations that imply the same categoricals would be empirically equivalent. But for Quine, at least in case of loose-fit theory formulations, empirically equivalent theories may come out to be logically incompatible. According to the practical version of underdetermination (in Quine 1975) we may never be able to discover a reconstrual of predicates through which such formulations could be rendered logically compatible. But we have noted above that the same should go for tight-fit theory formulations despite some misgivings of Quine.

In *Theories and Things*, however, Quine makes another move that seems to undercut both PU and TU. Before I describe this Quinian move, let me point out the reason Quine makes it. His thesis of underdetermination asserts that there are theory formulations that are empirically equivalent and logically incompatible. The problem for Quine as an empiricist is how to decide which one of the two such theories is true. Since each one is equally supported by empirical evidence, an empiricist will have to grant that each of the two theories is true. This worries Quine because it “raises the spectre of relativism: each is evidently true only from its own point of view” (Quine 1981, 29). In order to avoid relativism, Quine is forced to make a move that he calls the *trivial expedient*. He says:

Being incompatible, the two theory formulations that we are imagining must evaluate some sentence oppositely. Since they are nevertheless empirically equivalent, that sentence must contain terms that are short on observational criteria. But then we can just as well pick out one of those terms and treat it as if it were two independent words, one in the one theory formulation and another in the other. We can mark this by changing the spelling of the word in one of the theory formulations. Pressing this trivial expedient, we can resolve all conflict between the two theory formulations. Both can be admitted henceforward as true descriptions of one and the same world in different terms. (29–30)

It seems clear that this trivial expedient turns the two theory formulations logically compatible with each other and, hence, virtually destroys the thesis of underdetermination. The reason obviously is that the thesis of underdetermination asserts that there are empirically equivalent and logically incompatible

theories that cannot be reconciled by any reconstrual of predicates (TU), or we may never be able to find a reconstrual of predicates that will reconcile two such theories (PU). This means that Quine's trivial expedient takes away with one hand what his thesis of underdetermination gives with the other. Luckily, however, Quine's later remarks (Quine 1986) on the subject suggest that he does not entertain the trivial expedient anymore and, instead, considers only one of the two rival theories to be true.

4. The Trouble with Soames's Argument

The basic trouble with Soames's line of argument, noted in section 1, is that it fails to take notice of Quine's criterion of theory individuation. We noticed that in "On Empirically Equivalent Systems of the World," Quine formulates the following identity conditions for theories: "Two formulations express the same theory if they are empirically equivalent and there is a reconstrual of predicates that transforms the one theory into a logical equivalent of the other" (Quine 1975, 320). As is clear from the previous section, Quine's point is that when it comes to theory formulations that express empirically equivalent theories that are logically compatible (equivalent) with each other, or can be made so through reconstrual of predicates, they express the same theory and not two different ones. In order for any two theory formulations to express two different empirically equivalent theories, such theories have to remain logically incompatible (nonequivalent) for want of a possible reconstrual of predicates that can turn them compatible. For Quine it is necessary for two empirically equivalent theories to be logically irreconcilable through any reconstrual of predicates, if they are two different theories. If this necessary condition is not met by two theory formulations, they are formulations of one and the same theory and not two different theories. From this it seems to follow:

- A: The irreconcilable logical difference between two theories, despite their empirical equivalence, implies some fundamental difference between the ways two theories conceptualize the world.

This just means that the two theories are working with two different ontologies or set of facts. There is no doubt that being empirically equivalent makes the two theories candidates for sameness of meaning, but, within Quinian doctrines, there is such a thing as ontological relativity. The world can be sliced by empirically equivalent theories in different ways. "Rabbit," "rabbithood instantiated," and "rabbit-slices" all could be empirically equivalent objects in different holistic ontologies. Some of the empirically equivalent theories might

be reconciled in their ontologies through a reconstrual of predicates, and they will no longer remain different theories. For them Soames's *b* above would hold; that is, "two theories have the same meaning iff they fit the same class of possible observations." Such reconciled theories would turn out to mean the same thing. The trouble, however, is that they will no longer be two theories but one under Quine's criterion of theory individuation. There might be some other theories, however, which are empirically equivalent but whose ontologies cannot be reconciled through any reconstrual of predicates. The holistic verificationism that Soames talks about does not imply that empirically equivalent theories will all have the same ontology or their ontologies will always be reconcilable. Despite fitting the same observations, two theories might be working with objects or facts that imply irreconcilable logical differences. This can happen because the totality of observations might be made to fit logically incompatible objects or facts by two different theories. One might claim, for example, that light is continuous, the other that it is discrete. Not that one theory would be calling the same thing "continuous" while the other will use the word "discrete" for it. No. Both theories use the two terms exactly in the same sense. Still, they distribute all observations of the world in such an overall way, that light (or some other entity or event) turns out to be continuous in one theory and discrete in the other. This is an artificial example and should not be taken as a piece of science. It is meant to make the point that two global theories can slice the world differently, even when they fit the same overall observations. A radical difference of ontology between such global theories is not ruled out as long as we fail to discover a reconstrual of their predicates that reconciles them. Once we discover such a reconstrual, Quine is willing to grant that then these theories would become the same theory. If we presume beforehand that such a reconstrual is possible between two theories, we are simply talking about one theory and not two under Quine's criterion of theory individuation.

Now if we grant *a* above, it quickly follows that two empirically equivalent but logically irreconcilable theories of the world need not mean the same thing, or have the same meaning, because they conceptualize some aspects of the world differently. As long as there is no reconstrual of predicates available to reconcile them, we cannot declare that they mean the same thing under Quine's holistic verificationism. As a result, Soames cannot derive his contradiction that *both theories are true, and only one is true*. He cannot do so because we have yet to establish that the two theories, Soames's T_1 and T_2 , mean the same thing in all respects. They are not identical rivals like the ones in Quine's molecule/electron example after they have been reconciled (cf. Magnus 2003). They are rivals as long as we have not discovered a reconstrual of predicates to reconcile them. That is all Quine needs. Soames declares the two theories to

be identical rivals through his *a* and *b* above and then derives a contradiction from this declaration plus the thesis of underdetermination. This, he considers to be a fatal blow to the thesis. However, his interpretation of the thesis, which is formulated in terms of two rival theories, does violence to the thesis by first turning it into a thesis about identical rivals and then deriving a contradiction from it. An interesting thing is that for deriving his contradiction Soames needs to make the thesis into a thesis about identical rivals and, at the same time, state it in its original form as a thesis about rival theories (with irreconcilable differences). He cannot have it both ways, and, therefore, the thesis of underdetermination remains unscathed by his criticisms.

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