
SEMANTIC INDETERMINACY AND SCIENTIFIC UNDERDETERMINATION

BY

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Introduction

QUINE'S well-known thesis of the indeterminacy of translation—a permanent fixture in his writings since *Word & Object (W&O)*¹—says that incompatible translation manuals for any language may be set up among which there can be no objectively correct choice. Quine's thesis of the underdetermination of theory by evidence says that there can be scientific theories of the world that are incompatible yet empirically equivalent—no observational evidence could adjudicate among them. Quine thinks the possibility of conflicting theories specifying the meaning of theoretical sentences renders the content of such sentences indeterminate, and threatens the objectivity of meaning. Yet he does *not* believe the possibility of conflicting theories of the world renders truth non-objective.

Now Quine's belief that scientific method "affords even in principle no unique definition of truth"² seems at odds with his belief in science as 'the last arbiter of truth'. If scientific method is apt to produce empirically indistinguishable but incompatible theories of the world, all equally eligible to deliver the truth, how could we choose non-arbitrarily 'the last arbiter of truth' from among these? And if we cannot, how could we expect scientists to be the narrators of the final true story about the world?

Underdetermination poses a problem for anyone who wants to maintain a fully realist attitude toward science. Intuitively, a *full solution* to the problem would either assure us that there are always grounds for a rational choice between empirically equivalent theories (so we could declare one

of them true), or else allow us to deny that there is any theoretical choice to be made (i.e., to deny that we can be faced with significant alternatives). The latter represents the chief strategy deployed by Quine in the various resolutions he has attempted over the years. The aim of this paper is to show, first, that Quine's particular strategy depends on a certain view of theoretical content which is, in effect, encapsulated by his Indeterminacy thesis; and, second, that this view is ultimately at odds with the fully realist attitude toward science Quine wants to defend.

In its simplest form, the tension I have in mind is between the thesis that nothing objective fixes the meaning of theoretical sentences and the notion that we can look to science to tell us the whole true story about the world. The former implies that most sentences in the scientific story, being theoretical, would lack objective content. But this means that, in the scientific Book of Nature, most chapters would be no more than 'make-believe'. A full appreciation of the tension in question, however, requires a close examination of the intricate interrelations between Quinean semantic indeterminacy and scientific underdetermination.

To fix ideas, let us isolate the chief ingredients in Quine's views that will play a role in our discussion. We have

- (1) *The Realist View of Science*; the idea that scientific theory can give us the whole *objectively true* story about the world;
- (2) *The Underdetermination thesis*, which says that any scientific system of the world is not without empirically equivalent but incompatible alternatives; and
- (3) *The Indeterminacy thesis*, which says that
 - a. the theoretical sentences of any language could be translated in mutually incompatible ways, each compatible with all objective evidence; and *hence* that
 - b. theoretical sentences lack objective content.

We have already noted the tension between (1) and (2). Quine's strategy is to try to alleviate that tension, by convincing us that the possibility of conflicting theories of the world (propounded in (2)) does *not* render *truth* indeterminate, or non-objective. At the same time, Quine has insisted that the possibility of conflicting theories specifying the meaning of theoretical sentences (see (3)a.) does render *meaning* indeterminate, or non-objective ((3)b.).³

In Section I, I show how Quine tries to rescue the objectivity of truth by sacrificing the objectivity of meaning. For Quine's recent resolutions to the underdetermination problem rely on a view of theoretical content that is contained in the Indeterminacy thesis (see (3)b.). In Section II, I argue that there are difficulties in squaring Quinean semantic indeterminacy ((3) a. & b.) with scientific underdetermination (2). In Section III, I offer a construal of Quine's reasoning which aims at overcoming these tensions. But this construal leaves intact a crucial tension in Quine's views: true semantic

indeterminacy is *itself* deeply at odds with the 'robust realism' about science that Quine preaches. This I argue in the final section.

I. Underdetermination, Truth and Meaning

Quine regards the doctrine of underdetermination as a result of recognizing, with Duhem,⁴ that scientific theories are linked to observation holistically, not sentence by sentence. We can think of science, Quine suggested,⁵ as a 'field of force', whose periphery comprises sentences reporting observations, later called 'observation sentences'. Observation sentences are presumably connected with experience directly; they wear their empirical content on their sleeves, as it were. Most sentences, though, approach the 'interior', in varying degrees: they are connected with experience only indirectly. As Quine saw it, once we acknowledge the 'tenuousness of the connection between observation sentences and theoretical ones', we would recognize 'the vast freedom that the form of the theory must enjoy, relative even to all possible observations'.⁶ We would see the possibility of there being two (equally simple, elegant, etc.) theories of the world which agree on all their observation sentences (and hence provide equally good predictions), but which are nonetheless *logically incompatible*. This is what Quine originally took the Underdetermination thesis to say.⁷

Now, consider the following *meaning-verificationist* argument:

(MV) If we had two theories which, by hypothesis, have the same observational output, then the difference between them would be purely verbal. This is because there is no meaning but empirical meaning; and theories with the same meaning must be seen as translations one of the other.⁸

Quine himself espouses holistic meaning-verificationism, which he expresses by the following combined Duhem/Peirce doctrine:

(DP) "[T]heoretical sentences have their evidence not as single sentences but only as larger blocks of theory" (Duhem's thesis), and "the meaning of a sentence turns purely on what would count as evidence for its truth" (Peirce's thesis).⁹

Thus, one might have expected him to *endorse* the argument (MV). Yet he seems to find it uncongenial: "This argument rules out, by definition, the doctrine that physical theory is underdetermined by all possible observation."¹⁰ The argument in question, with its blatant reliance on meaning-verificationism, pretends to solve the underdetermination problem by dissolving it. Whereas Quine believes that a true understanding of 'how scientists work'¹¹ (in part captured by his holism) would inevitably lead us to accept at least some version of the Underdetermination thesis. Thus, Quine initially tried to avoid a dogmatic appeal to a verificationist move.

In *W&O*, Quine presented the worry to which the Underdetermination thesis gives rise in the form of a skeptical ('relativist') challenge to his own view of science as the 'last arbiter of truth'. His response to the challenge there involved insisting that "we continue to take seriously our own particular aggregate science . . . Within our own total evolving doctrine, we can judge truth as earnestly and absolutely as can be; . . ." (pp. 24f.).¹² Quine was propounding what he calls '*the sectarian line*',¹³ which says: "If ours were one of those two rival best theories . . . , it would be our place to insist on the truth of our laws and the falsity of the other theory where it conflicts" ("EES", p. 327).

However, Quine himself saw that this line cannot provide a full solution to the underdetermination problem. For it seems to involve us in 'an irreducible existentialist act of irrational commitment' (see "EES", p. 328): How can we rationally commit ourselves to a theory while knowing that an equally adequate one would deny some of the statements that the theory we have espoused would have us affirm? Thus, someone who, like Quine, professes to be a 'robust realist', might still find the possibility of logically incompatible rivals to our theory of the world worrisome. This is why Quine was motivated to undermine the intelligibility and theoretical significance of the Underdetermination thesis as it was expressed in *W&O*.

Quine takes the holistic doctrine we have dubbed "(DP)" to imply that it makes no sense to speak of *the* meaning of each theoretical sentence in isolation. If he is to drive a wedge between (DP) and the 'dissolving' argument (MV), he must give clear sense to the idea that two theories of the world which have the same net empirical output should be thought of as *two* theories, saying different things about the world, rather than one theory couched in alternative terms. Quine tried to salvage an objective element in this idea: We can talk of significant differences between empirically indistinguishable theories 'where we no longer see how to state rules of translation that would bring them together'.¹⁴ In considering logically incompatible theories, we can isolate an objective obstacle in our way of 'bringing A and B together'. Take a theoretical sentence S which is evaluated as true in A but false in B. Even if (as (DP) implies) there is ultimately no sense in asking what *content* we associate with S, A and B would still have to be regarded as saying conflicting things (assuming S to be non-ambiguous).¹⁵

Now, if the possibility of logically conflicting (empirically equivalent) theories of the world can be given objective sense, Quine's realist notion of truth would seem threatened. Thus, he was motivated to find a way of denying the significance of that possibility. This he attempted in a series of steps. In "On Empirically Equivalent Systems of the World" ("EES"),¹⁶ the Underdetermination thesis is presented, first, as a thesis about the relation between a 'theory formulation' (a single sentence in our language, typically a conjunction of the so-called axioms of the theory) and its implied

observation categoricals (testable sentences such as 'Where there is smoke there is fire').¹⁷ On Quine's view, the empirical content of a theory is exhausted by the observation categoricals its formulation implies.¹⁸ Thus, two formulations of a single theory will always be empirically equivalent; they will imply the same observation categoricals. However, we can imagine a theory formulation containing, say, the theoretical terms 'electron' and 'molecule', which was transformed into a new formulation by simply switching these two terms throughout. Despite the apparent logical incompatibility which would ensue,¹⁹ Quine says, we should count the two formulations as expressing the same theory, in conformity with pretheoretical intuitions. Quine proposes to individuate theories accordingly, so that two formulations would express the same theory if, in addition to being empirically equivalent, there is a mapping of predicates into predicates or open sentences which transforms the one into a logical equivalent of the other (as in the 'electron'/'molecule' case).²⁰

Quine then claims that if the set of observation categoricals implied by theory beliefs were finite, we could simply take the conjunction of the implied observation categoricals to be the theory formulation. Such a '*tight fit*' formulation could have no incompatible formulations which were empirically equivalent to it, since any material which could yield incompatibility would have to be superfluous, and hence, not part of the theory. This means that "the thesis of underdetermination must fail where only finitely many observation [categoricals] are implied". Thus, we must consider the possibility of "two irreconcilable formulations each of which implies exactly the desired set of observation [categoricals] plus extraneous theoretical matter, and where no formulation affords a tighter fit" ("EES", p. 324).

This last characterization²¹ represents a major step in Quine's attempt to demote the Underdetermination thesis into one which can retain only *practical* feasibility. The thesis, he thinks, becomes ultimately a thesis about what 'we, humanly, are capable of' regarding theory construction. In the end, what Quine endorses is a 'last-ditch, vague and modest version' of the thesis: "our system of the world is bound to have empirically equivalent alternatives which, if we were to discover them, *we would see no way of reconciling* by reconstrual of predicates" ("EES", p. 327, my emphasis).

We must notice here that in reaching the last formulation of the Underdetermination thesis Quine has made use of a controversial view of scientific theories, which seems informed by a certain *instrumentalist* element.²² Quite clearly, only someone who was prepared to regard the part of the theory which is additional to the implied observation categoricals (i.e., to the 'predictive' portion) as 'extraneous' (albeit much-needed) theoretical matter, would accept the identification of a theory formulation with the conjunction of observational categoricals. There are those who would insist that a crucial function of scientific theories, on a par with their role in predicting future phenomena, is to *explain* phenomena we are already

familiar with (as well as to 'substantiate' such phenomena, and 'posit' phenomena that must have occurred in the past).²³ And as long as scientific theories are thought of as ways of making sense of how the world is, rather than as mere instruments for predicting how the world will be, we could not rest content with theories exhausted by a set of observation categoricals, finite or not.

The instrumentalist attitude pointed out above is precisely the attitude that would be prescribed by a view which locates all of a theory's empirical content in its observational portion, as does Quine's.²⁴ In bringing the instrumentalist element into play in the characterization of underdetermination, Quine seems well on the way back to endorsing the verificationist argument (MV) (see previous section), which earlier on he found ungenial. And as we shall see below, he seems to go even further in that direction, when he proposes his solution to the problem at hand.

"EES" concludes with the suggestion that we adopt what Quine calls an *ecumenical line*,²⁵ instead of the sectarian line of *W&O*. Faced with the (merely practical) problem of alternative theories which we could not see how to reconcile, we would do better to 'settle for a frank dualism': "Where there is forever no basis for choosing, then, we may simply rest with both systems and discourse freely in both, using distinctive signs to indicate which game we are playing" ("EES", p. 328). But this we cannot rationally do, unless we find a way to resolve the logical conflict between A and B. The required resolution is offered in *Theories and Things (T&T)*:

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. . . .

Pressing this trivial expedient, we can resolve all conflict between the two theory formulations. Both can be admitted thenceforward as true descriptions of one and the same world in different terms. The threat of relativism of truth is averted (p. 30).

The suggestion here is to regard all logical conflict which resists resolution by 'reconstrual of predicates' as a merely 'surface' conflict, to be treated by purely verbal means.²⁶ The *T&T* device has the effect of rendering the problematic term as ambiguous between the two competing theories. Given that this can always be done, Quine concludes, the possibility of competing theories of the world not only lacks serious theoretical significance, but also need have no unsettling effect on us, should it present itself in practice. For, once the proposed device is thoroughly activated, we can accept *both* (now reconciled) theories as simultaneously true—we can adopt the two jointly as a 'single tandem theory'.

Note that Quine takes it for granted that for two theory formulations to be in conflict, they must 'evaluate some sentence oppositely'. The only

conflict that concerns him (and which the *T&T* trick is designed to remove) is thus *logical* conflict. But we must notice that the expedient, though capable of erasing logical conflict, is unable to render the formulations less rival in other respects. The more terms we take to be ambiguous, as between the two formulations, the less vocabulary they share, and, consequently, the likelier it is that the theories they express will become 'ontologically' rival (posit competing ontologies), or else will be rendered 'incommensurable'.²⁷ And, for the champion of explanation, two theories that explained the data equally well yet differently would just provide a further instance of underdetermination. As soon as we accepted one of them we would have no rational reason for accepting the other; so we couldn't really accept both, contra Quine's suggestion.²⁸ Thus, for the anti-instrumentalist, the ecumenical line may offer only cold comfort.

Recently, Quine himself rejected this ecumenical line. He believes that adding the rival theory to our repertoire and acquiescing in a 'single tandem theory' would involve "an abandonment of the scientists' quest for economy and of the empiricists' standard of meaningfulness" ("E", p. 14). This is because, after the expedient is employed, we have, in the rival theory, sentences 'treating, ostensibly, of irreducibly new matters', which 'constitute a gratuitous annex to the original theory'.²⁹ So Quine thinks we should revert to the sectarian position, though in a modified version. Faced with two theories as above we should use the *T&T* device again:

... to reconcile the theories but not, this time, to combine them in tandem. The device simply renders the rival theory untranslatable into our language and hence not subject to our predicates of truth and falsity.

We could still learn to think in the rival theory and even oscillate between it and ours, for the sake of an enriched perspective on nature. But whichever theory we are working in is the one for us to count as true, there being no wider frame of reference ("E", pp. 14f.).

On the new sectarian line, we are to treat alternative systems of the world as though they were different languages, among which no theoretically significant choice can be made (since no observations can decide among them). This line, with its rather Carnapian flavor,³⁰ would, I believe, fare no better in the eyes of the anti-instrumentalist. From that perspective, believing the theory 'we are working in' and opposing the other, while understanding it, and knowing it to be equally justified, would still seem like engaging in 'an irreducible existentialist act of irrational commitment'. This, as we saw, is what led Quine, at the end of "EES", to abandon the old sectarian view and adopt the ecumenical view.

Note that the dispute between Quine and the anti-instrumentalist now concerns the theoretical status and significance of the presumed differences which remain (or emerge) between the theories after the *T&T* 'trivial expedient' has been applied. The expedient, in effect, dismisses our initial inclination to take two empirically equivalent theories to be logically incor-

patible.³¹ But we have seen that it would not render the two formulations into formulations of the same theory.³² Quine's new sectarian line just affirms this observation: the expedient would render the formulations incommensurable. Now, the anti-instrumentalist takes the residual differences to be significant *content* differences, and is hence reluctant to regard Quine's ecumenical *or* new sectarian line as providing a full solution to the underdetermination problem. If Quine intends his resolution to yield a full solution to the problem, he would have to deny that the remaining differences are significant differences in what the two theories 'say about the world'.

Quine would have to support his denial by claiming that no serious content differences can arise between the theoretical sentences of theories which agreed in their empirical content (how else could it be supported?). But appeal to this view would take Quine back full circle to a position which is at bottom the one expressed in the verificationist argument (MV), and which he originally sought to avoid.

II. Semantic Indeterminacy and Scientific Underdetermination

So far we have seen how Quine's more recent characterizations and solutions to the problem of underdetermination are ultimately informed by his view of theoretical content. On the view in question, to recapitulate, theoretical sentences cannot be assigned content individually. This is the thesis Quine sees as supported by the Duhem/Peirce (DP) doctrine. But this thesis, as Quine points out,³³ is *none other than the Indeterminacy thesis*, applied to our own language. On the face of it, then, it would seem that the Indeterminacy thesis (in its home version) would militate against the Underdetermination thesis; for, accepting the former means accepting that our theoretical sentences lack fixed, objective content. And this would seem to 'rule out, by definition, the doctrine of underdetermination'.³⁴

The task of this section is to sharpen and clarify the difficulties in squaring Quinean semantic indeterminacy with scientific underdetermination. I shall first recall the straightforward argument *from* underdetermination to indeterminacy offered by Quine in "On the Reasons for Indeterminacy" ("RIT"). I will then show how it is undermined by Quine's presumed solution to the underdetermination problem. I conclude the section by expounding the tension I see between the Underdetermination and the Indeterminacy theses, taken as *independent* theses.

Quine dubs the argument he presents in "RIT" 'the argument from above' and describes it as the 'real ground' for indeterminacy. The argument is as follows. Suppose as translators we have successfully matched all of the native's observation sentences with ours.³⁵ Given underdetermination, we know that fixing the truth values of all possible observation sentences in our own language in no way allows us to choose between two competing

theories of the world, A and B. But, now, the native's observation sentences no more pick out for him one of the alternatives than our observation sentences pick out one for us. So *a fortiori*, our translation of his observation sentences cannot help us fix the translation of his physical theory (decide whether his theoretical sentences should be translated in accordance with A or B). Thus, even if we have chosen A, we 'remain free to translate the native as believing either'. Given the compatibility of both A and B with all observation, doing so would be consistent with regarding him as perfectly rational.³⁶ But, since A and B are, by hypothesis, logically incompatible, we cannot reasonably attribute to the native both at the same time. Quine concludes that the question whether 'the foreigner *really* believes A or believes rather B, is a question whose very significance should be put in doubt'.³⁷ This is the upshot of the indeterminacy of translation, which, Quine insists, is not 'just an instance of the empirically underdetermined character of physics', but is 'additional'.

Consider now the radical translator who is initially unable to choose for herself between the conflicting theories A and B. On Quine's current position, she is to regard the conflict-causing term (occurring in the sentence which A and B evaluate oppositely) as an ambiguous term. Now, after applying the Quinean trick, *accepting that it affords a full solution* to the underdetermination problem, the translator can actually appreciate for herself that A and B are not genuinely conflicting alternatives after all. This is despite the fact that she had initially taken them to be conflicting, and (as a result of the trick) has to see A and B as not intertranslatable. But if this is so, how can the translator reach the Quinean conclusion that there is no objective fact about the translation of theories? The "RIT" argument predicated the lack of objectivity of the translation of theoretical sentences on the possibility of attributing either of two (logically) *conflicting* theories to the native. However, if the translator accepts Quine's solution as a full solution, then once all logical conflict is dissolved, she cannot see A and B as (ultimately) significantly different alternatives from which to choose. But then the attribution to the native of one theory rather than the other does not constitute a real choice on her part either!

To appreciate my point, recall Quine's claim that no indeterminacy arises in the translation of observational sentences. Quine supports this claim by saying that there can be no objective conflict between alternative translations of such sentences. Any adequate translation of an observation sentence would have to share with it its stimulus-meaning; i.e., the set of stimulations that would prompt its utterers to assent to and dissent from it, which serves to link it objectively to non-linguistic reality. Given that, no two translations of the same observation sentence can be said objectively to conflict.³⁸ Now, I am suggesting that if we (and the translator) no longer see an objective conflict between (the theoretical portions of) A and B, there should be no more threat of indeterminacy for the translation of the

native's theory than Quine sees for the translation of observation sentences. Where no conflict can be found between proposed alternative translations, no real indeterminacy can arise.

To recapitulate, after accepting the Quinean solution to the underdetermination problem, we would still be presumably left with two non-intertranslatable theory formulations, A and B (which we cannot take to express the same theory). Being Quinean, however, we are not to take the differences between A and B to reflect significant differences in theoretical content; after all, they are empirically equivalent, and they no longer conflict logically. Yet the spirit of the "RIT" argument requires that our inability as *translators* to decide whether to attribute A or B to the native should prove threatening to the notion that there is a fact of the matter as to which the native 'really' holds. This requires that we take A and B to be significantly different. Thus, the difficulty for Quine is to characterize the differences between A and B in such a way as to make it benign enough for us to accept his solution to the underdetermination problem, yet serious enough for us to be concerned about our inability to decide whether the native believes one rather than the other.

Quine might try to invoke obstacles to our 'bringing A and B together' which do *not* presuppose content differences. Perhaps A and B are not isomorphic, and structural differences between them make it so we do not see how to state the rules for intermapping them. The purpose of invoking such formal obstacles would be to give objective and non-objectionable 'Quinean' sense to our *taking* A and B to be very different theories, even though objectively speaking they are not significantly different. However, to be convinced of the dubiousness of the question of which theory the native believes, we must at least think of these differences as reflecting *significant* differences, ones we care about. We cannot regard them as merely 'surface' differences, which do not conceal differences in what the theories say.

It seems that once the underdetermination problem is taken to be fully solved, underdetermination cannot be appealed to in a straightforward argument for indeterminacy. But Quine might argue that this just shows that the argument from above has to be given up.^{39,40} He might suggest that the case for indeterminacy should rest on other considerations he developed in *W&O* regarding the non-uniqueness of any system of analytical hypotheses,⁴¹ rather than on the Underdetermination thesis. So, before turning to an alternative construal of Quine's reasoning, which may help rescue the argument from above, I wish to consider briefly a certain tension which seems to remain between the theses, even when they are taken to be *independent*.

The Indeterminacy thesis advises us of the existence of too many (incompatible) translations of alien theoretical sentences into our own, consistent with all the evidence. Applied to our language, the thesis says that our own

theoretical sentences could be translated in very different ways into the language of someone else. Indeed, talk of translation is only meant to help establish the following point: The set of sentences of any given speaker's language can be mapped onto itself (consistently with all possible evidence) in such a way that "the mapping is no mere correlation of sentences with *equivalent* sentences, in any plausible sense of equivalence however loose" (W&O, p. 27).

Now take the sentences comprising the theory formulation A. Indeterminacy tells us that no objective evidence fixes the content of the individual (theoretical) sentences of A: they can be mapped onto a different set of sentences of our language which we would not judge to be individually equivalent to the original ones. Quine's present formulation of underdetermination, on the other hand, requires us to think that the theoretical sentences of A and B cannot be intermapped; "the device renders the rival theory untranslatable into our language". Thus stated, the two Quinean theses are *prima facie* compatible. Underdetermination requires that for any theory there should be an *untranslatable* empirically equivalent rival, whereas indeterminacy essentially requires that for any theory there should be a *translatable* such rival.⁴² But there is some tension here.

While the Indeterminacy thesis may not *guarantee* that we could always find an acceptable mapping between, say, the theoretical sentences of A and B, it makes it very difficult to see what one might claim objectively to stand in the way of such a mapping. Consider any mapping of A into B, consistent with a fixed mapping of the observation categoricals and of the logical vocabulary. The mapping may not be to our taste: it may be extremely messy and complicated, so that we could not see any 'point' to it. Still, the availability of the T&T trick guarantees that we can always map sentences held true by the one theory into sentences held true by the other. And, given indeterminacy, we could not appeal to mismatches in the *contents* of those truths. So what is to prevent us from accepting it?

Once again, Quine might bring up structural mismatches. After all, the T&T trick is needed for those cases in which we cannot render A and B logically equivalent by some 'reconstruction of predicates'. While the trick is presumably responsible for making A and B non-intertranslatable, it does not introduce any structural changes into the formulations; it merely guarantees that conflict-causing terms be treated as different words. So Quine might argue that the 'pre-trick' obstacles might still be there to account for our ('post-trick') inability to intertranslate A and B. However, given the Indeterminacy thesis, these obstacles cannot be accorded any significant *semantic* status; they cannot be taken to reflect objective differences between what A and B say about the world. But this means that, if we accept the Indeterminacy thesis, we cannot make objective sense of the Underdetermination thesis. A proponent of indeterminacy can at most give objective sense to the possibility of two theories which exhibit *syntactic* differences.

(It is only in this nonthreatening, and rather uninteresting sense that we could describe them as 'non-intertranslatable'.)

It seems that the attitude expressed by the idea that theoretical terms do not possess determinate meanings—the *very attitude that legitimizes the 'ambiguating' trick of T&T in the first place*—should allow us to accept *some* mapping between A and B. Thus, I believe that (even independent) acceptance of the Indeterminacy thesis would make it very difficult to accept any serious version of the underdetermination problem.

III. A Possible Reconciliation?

The upshot of the previous section was that, whether or not Quine wishes to *support* the Indeterminacy thesis by the Underdetermination thesis, there is a palpable difficulty in reconciling the two theses. In this section, I wish to propose an alternative construal of Quine's reasoning, which could be used to overcome the difficulty. The interest of this construal goes beyond its power to do so. I believe that this *form* of reasoning can help one understand Quine's resolution of the underdetermination problem, and is necessary for a full understanding of *any* Quinean argument for the Indeterminacy thesis. (Although, as I will claim in the last section, this construal does *not* help relieve the tension between the Indeterminacy thesis and Quine's professed realist attitude toward science.)

Quine's holistic meaning-verificationism (as well as a full Quinean solution to the underdetermination problem) requires that the two rival theories should not be taken, *as wholes*, to disagree in their content. The spirit of the argument from above, on the other hand, requires looking at the theories sentence-by-sentence, and seeing them as saying—'locally', as it were—different things. Quine could point out that the temptation to see disagreement between A and B (manifested behaviorally by our 'inability to bring them together by translation') is a result of the expectation that theoretical content can be assigned sentence-by-sentence. The whole point of the argument from above would be to convince us that this expectation is misguided, by showing it to be empty in the case of the native's theory.

The idea, then, would be to base the argument on *apparent* (or 'non-objective') conflict between A and B, rather than on logical incompatibility (which Quine can no longer appeal to) or on 'real' content differences (which Quine cannot allow). The argument would proceed from content differences the translator would perceive *intuitively* (and uncritically) even after all logical conflict between the two theories has been erased. Once the translator recognizes that no evidence can decide which of two theories that she *takes* to be very different the native holds, she would be led to conclude that the question of which one the native *really* holds is of dubious significance. Then, applying the lesson to her own case, she could appreciate that someone trying to translate *her* theoretical sentences would con-

clude that the question of which theory she holds lacks significance. For, the disagreement between A and B would not be reflected in her own dispositions to verbal behavior. And she would be led to acknowledge that, objectively speaking, A and B could only be said to appear different to her when she 'acquiesces' in her own language, 'takes its terms at face value',⁴³ and expects that theoretical sentences can be assigned determinate meanings one by one. Once she recognizes that the differences she perceives between A and B have no objective status, she would conclude that underdetermination presents only an apparent problem.

In order to argue in the above way, Quine would have to appeal to some contrast between what can be said from the translator's point of view, when she *uses* her language and takes it as 'held fixed', and what can be said from an objective point of view, when *theorizing* about both the foreigner's language and the translator's. Such appeal may be required for any Quinean argument for the Indeterminacy thesis, given its statement in terms of the possibility of conflicting alternative translations. The alleged alternatives are bound to be theoretical sentences. Thus, if the thesis is true, they do not possess determinate meanings; so the conflict between them cannot be seen, objectively, as a conflict in what they say. But for the thesis to have the significance it purports to have, some perspective has to be acknowledged from which the alternative translations are seen as seriously conflicting. This is, I suggest, the perspective of the translator as a *user* of her language, setting out to map into it theoretical sentences one by one, in the spirit of 'uncritical semantics', Quine's chief target of attack.

IV. Indeterminacy, Underdetermination and Our 'Picture of the World'

Our attempt to overcome difficulties in reconciling Quine's positions on indeterminacy and underdetermination led to a certain construal of Quine's reasoning. That construal relied on an appeal to a general contrast between what can be said from an intuitive point of view (the 'user's perspective') and what ought to be said from an objective point of view (the 'theoretical perspective'). Can Quine draw the requisite contrast, and provide a thorough account of it, without violating central tenets of his own views, such as the idea that there is only one kind of knowledge and only one kind of truth (to be arrived at through scientific method), the rejection of Carnap's 'external'/'internal' distinction, the notion that science, and philosophy, are fully continuous with common sense? I believe he cannot; and, in any event, he has not. I would like to conclude by mentioning two main problems I see in this connection.⁴⁴

There is a serious question about the status Quine would ascribe to the perspective of the language-user. Quine's monolithic view of knowledge and truth ('one kind of knowledge, one kind of truth') would hardly allow

him to regard pronouncements made about distinctions of meaning from that perspective as expressing beliefs of a different *kind*. Furthermore, in order for our alternative construal to work, whatever practical problem arises in connection with underdetermination from the 'user's perspective', it must disappear when we look at matters from the 'objective perspective'. To overcome the difficulties the 'two-perspective' construal is supposed to overcome, the 'theorist's perspective' must be taken to provide us with the only truths which matter, objectively speaking. As theorists about language, we are to appreciate (once we recognize indeterminacy) that our theoretical sentences do not have determinate meanings. Consequently, as theorists about language, we are to regard empirically equivalent theories as semantically indistinguishable. This, despite the fact that, due to their divergent vocabularies, practicing scientists might *take* such theories to be saying very different things about the world.

Reconciliation of underdetermination and indeterminacy *via* the 'two-perspective' construal, then, would have to be bought at a certain price. Such a reconciliation would require us to look at practicing scientists from some point of view which is *outside* their practices, and to see the theories they work up, and work with, as (ultimately) 'make-believe', or 'a put-up job'. This, however, would suggest a fully instrumentalist view of scientific theories, according to which we cannot regard all items in the complete scientific story as conveying true information about the world. And it would seem deeply at odds with Quine's naturalistic insistence that we must *not* 'look down' on (or 'patronize') science, that "[w]hat reality is like is the business of scientists, . . . ; and what there is, what is real, is part of that question".⁴⁵

The second main problem raised by the 'two-perspective' construal concerns Quine's belief that, in telling the complete and final story about the world, scientists would have no use for intentional vocabulary. Quine supports his belief that intentional vocabulary is scientifically suspect—and therefore has no room in a respectable scientific picture of things—by citing the possibility of constructing incompatible translation-manuals for any language, each compatible with all possible evidence (non-intentionally described). This is the first part of his Indeterminacy thesis. But our discussion raises a problem of burden of proof.

An opponent of indeterminacy might wonder why the intuitive ('user's') constraints that would have to be invoked in describing two empirically equivalent theories as non-intertranslatable could not be used to guide a radical translator in constructing a translation-manual for another language. After all, the apparent differences the translator would be said to draw on in arguing for indeterminacy seem to be the same differences which would get in our way of intertranslating the two theories. Indeed, such intuitive judgments about differences of meaning, which translators would make as

users of their own language, are arguably what would guide them in ruling out bizarre alternative translations of the kind Quine envisages. And the 'noncapricious' use of 'implicit supplementary canons' is what, by Quine's own admission, enables actual translators to achieve at least in-practice determinacy.⁴⁶

Can Quine give independent, non-question-begging considerations to convince us that the constraints which undeniably play a role in our *actual* translation practices, as well as in our practices of attributing content to theoretical sentences, are objectively suspect? For, if he cannot, then the possibility remains open for theorizing about translation, and language, using the perspective of language-users as a source of such constraints. To the extent that this is possible, one can still hope to recover for the ordinary 'vernacular of semantics and intention' a respectable place in our complete picture of the world.

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NOTES

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¹Cambridge, Massachusetts: The MIT Press, 1960.

²*W&O*, p. 23.

³Critics have often noted the difficulty for Quine in defending this apparently dogmatic contrast he draws between the status of meaning and the status of truth. That is, they have typically wondered why the transition Quine makes from (3)a. to (3)b. has no parallel in the case of underdetermination. And it has been implicitly assumed that, if Quine could defend the contrast, by providing a full solution to the problem of underdetermination which had no parallel in the case of indeterminacy, then he could retain (1).

⁴It was pointed out to me by the referee that nothing in Duhem seems to entail the Underdetermination thesis, and that Duhem himself seems to have believed in the falsifiability of individual theoretical sentences, though not by single 'crucial experiments'. I am following Quine's own attributions to Duhem in my discussion.

⁵Cf., the last section of "Two Dogmas of Empiricism", in *From a Logical Point of View*, pp. 20–46. (New York: Harper Torchbooks, The Science Library, Harper & Row, Publishers, 1961.)

⁶See "The Nature of Natural Knowledge" ("NoNK" henceforth), in S. Guttenplan, ed., *Mind and Language*, p. 79, (Oxford: Clarendon Press, 1975).

⁷See "On the Reasons for Indeterminacy", *Journal of Philosophy*, 1970, p. 179, for a full statement.

⁸See "NoNK", p. 80, and compare *W&O*, p. 78, where Quine considers this argument.

⁹See "Epistemology Naturalized" (henceforth "EN"), in *Ontological Relativity and Other Essays (OR)*, pp. 80–1, (New York: Columbia University Press, 1969).

¹⁰See "NoNK", p. 80.

¹¹Scientists 'do not rest with mere inductive generalizations' but 'invent hypotheses that talk of things beyond the reach of observation and are related to observation only by a kind of one-way implication'. Cf., the opening passage of "On Empirically Equivalent Systems of the World" (henceforth "EES") *Erkenntnis*, 1975.

¹²The challenge can begin with Quine's own naturalistic view of truth itself, which says that 'there is no extratheoretic truth', since "whatever we affirm, after all, we affirm as a statement within our aggregate theory as we now see it; and to call a statement true is just to reaffirm it." The Underdetermination thesis says that no evidence could adjudicate between, say, theory A, in which a sentence S is said to be true, and theory B, in which S is said to be false. Wouldn't that mean, asks the skeptic, that there is no fact about S's truth?

In "EES", Quine's response is developed into an argument that the relativistic doctrine of truth is paradoxical. To state the thesis that truth is relative, the relativist needs a truth-predicate applicable to both A and B, so as to be able to state that S is true in the one theory but false in the other. But, given that truth is always affirmed *within* a theory, there is no platform for the relativist to stand on and declare S as true in A but false in B. The paradox arises when we suppose, *per impossible*, that the relativist can 'rise above' A and B, so as to relativize truth to each. For, Quine argues, the relativist's doctrine must itself be affirmed extratheoretically, as *absolutely* true. So the relativist 'cannot proclaim relativism without rising above it', and 'cannot rise above it without giving it up' (see "EES", pp. 327f.).

¹³The label comes from a recent lecture given by Quine, "Sensory Support of Science", 1986, p. 13. Quine was kind enough to send me an excerpt from this lecture, which will be referred to as "E".

¹⁴See "NoNK", pp. 80f.

¹⁵The fact that we would *take* A and B to be logically incompatible is an objective fact about us, which could even be made sense of in behavioral terms: we would invariably dissent from the sentence "S iff not-S".

¹⁶And see a brief recapitulation in "Empirical Content", *Theories and Things* (henceforth T & T), pp. 24–30. (Cambridge, Massachusetts, and London, England: Belknap Press of Harvard University Press, 1981.)

¹⁷I omit many of the details, for reasons of space. In "EES" Quine replaces observation sentences by observation *conditionals*—material conditionals whose antecedents represent the 'boundary conditions' and whose consequents are checkable sentences. (A primitive example would be 'If there is smoke at place *p* at time *t*, and atmospheric conditions at that same place-time *pt* are C, then there is fire at *pt*'.) This he does because observation sentences are occasion sentences ('commanding assent on some *occasions* but not others') whereas the sentences of a scientific theory are all standing sentences. The notion of observation categoricals, which we will employ throughout our discussion, comes to replace the problematic notion of observation conditionals (see *T&T*, p. 27).

¹⁸See "EES", p. 324.

¹⁹One formulation 'will affirm things about so-called electrons that the other denies'.

²⁰A further refinement, intended to block another type of trivial example of underdetermination, is discussed on p. 323 (of "EES"). (It needn't concern us here.)

²¹See "EES", p. 324: "There is some infinite lot of observation categoricals that we want to capture in a finite formulation. Because of the complexity of the assortment, . . . [a]ny finite formulation that will imply them is going to have to imply also some trumped-up matter, or stuffing, whose only service is to round up the formulation. There is some freedom of choice of stuffing, and such is the underdetermination."

²²For instrumentalist pronouncements in Quine, see "Two Dogmas", where Quine says he regards science 'as a tool, ultimately, for predicting future experience in the light of past experience'. Years later, in *T&T* he still describes science as 'a conceptual bridge of our own making, linking sensory stimulation to sensory stimulation' (p. 2), insisting that "our overall scientific theory demands of the world only that it be so structured as to assure the sequences of stimulation that our theory gives us to expect" (*ibid.*, p. 22). This view is meant to be

combined with 'robust realism' (connected with Quine's naturalism): the view that, since we must always reason from within *some* theory of the world, we are not justified in patronizing our current scientific posits. But see discussion below.

²³For the relevant distinctions, as well as for considerations in support of the claim that prediction may not deserve the status of exclusive primacy in scientific inquiry, see Israel Scheffler, *The Anatomy of Inquiry*, Part I, esp. pp. 43–57, (Indianapolis and New York: The Bobbs-Merrill Company, Inc., 1981).

²⁴Cf., "EES" p. 322 and compare *T&T*: "The observation categoricals implied by a theory formulation *constitute*, we may say, its empirical content; . . ." (p. 28, my emph.). This represents a move toward a stronger verificationism about theoretical content than the verificationism of "Two Dogmas", which only prescribed the denial of empirical content to theoretical sentences taken *one by one*. Whereas the full equation of empirical content with the observation categoricals involves denying *all* empirical content to the nonobservational portion.

²⁵See "E", p. 13.

²⁶Incidentally, the trivial expedient is clearly alluded to already in *W&O*, p. 78.

²⁷Ontologically rival theories may share their vocabulary, yet simply disagree on what things exist. Incommensurable theories, on the other hand, do *not* share enough vocabulary to allow us to compare what they assert. They are not intertranslatable.

²⁸This point was suggested to me by David Christensen.

²⁹"It is as if some scientifically undigested terms of metaphysics or religion, say 'essence' or 'grace' or 'nirvana', were admitted into science along with all their pertinent doctrine and tolerated on the ground merely that they contravened no observations" ("E", pp. 13f).

³⁰Cf., R. Carnap, "Empiricism, Semantics and Ontology", Supplement A of his *Meaning and Necessity*, Second Edition, esp. pp. 206ff. (Chicago and London: The University of Chicago Press, 1958), where Carnap presents his notion of 'linguistic frameworks'. Carnap's idea that the choice of which linguistic framework to adopt is a *practical* one (an idea which early in his career Quine *criticized*) is already echoed in Quine's presentation of his ecumenical line, at the end of "EES" (quoted above), where he suggests that 'we rest with both systems and discourse freely in both, using distinctive signs to indicate *which game we are playing*'. We will come back to this issue in the last section.

³¹This, *despite* the fact that this inclination could be cashed out in behavioral terms. See footnote 15.

³²By the "EES" criterion (p. 322), the two formulations would express the same theory only if the one could be transformed into a logical equivalent of the other. But the expedient, though capable (by design) of erasing all logical conflict, cannot get us logical equivalence.

³³See, e.g., *OR*, pp. 28f.

³⁴See above, p. 247.

³⁵In *W&O*, Quine described the enterprise of radical translation as beginning with the holophrastic translation of observation sentences.

³⁶So apparently we are not constrained to choose for him the theory we choose for ourselves. But see footnote 40.

³⁷We may note, in passing, that an analogous argument would show that Quine's claim that the translation of observation sentences is determinate is, at best, misleading. As Quine himself points out (cf., "EES", p. 314), observation sentences, as used by ordinary speakers, 'do not stand free of theory'. The Inscrutability thesis tells us that theory intervenes to help us decide 'what aspects of the stimulatory situations to single out as objects'. And the 'argument from above' tells us that wherever theory intervenes to give a sentence its content, the translation of the sentence cannot be decided determinately. It follows that indeterminacy must infect the enterprise of the *actual* translation of observation sentences.

³⁸Observation sentences can be seen as determinately translatable only when taken as *one-word sentences*. See previous footnote.

³⁹In "More On Quine's Reasons for Indeterminacy of Translation" (*Analysis* 37 (No. 3), 1976, pp. 136–141). Robert Kirk levels an objection which Quine reportedly takes to have

'demolished' the argument from above (see Kirk's footnote 1, p. 141). Kirk wants to argue that the truth of the claim that we are free to translate the foreigner's sentences in accordance with either A or B (part of the conclusion of the "RIT" argument) is *inconsistent* with a construal of the underdetermination premise in terms of our 'inability to bring A and B into agreement by translation'. His reason, as I understand it, is simply this: If we cannot see how to intertranslate A and B, then we could not see how to translate a third theory (the native's; call it T) indifferently into either. Conversely, if we could see how to map the foreigner's theory into both A and B, then *ipso facto* we would have a way of mapping A and B into one another: we could do it indirectly, *via* the native's theory (exploiting the transitivity of mapping).

Note that Kirk's objection was raised *before* Quine proposed the T&T device for erasing all logical conflict between A and B. Where Quine talked in "NoNK" about our 'inability to bring the theories into agreement', he had in mind *logical* agreement. He was considering theories which stood in logical conflict and which we couldn't reconcile by any mapping of predicates. Prior to using the device, the fact that our A and B evaluate some one sentence oppositely would stand in the way of bringing them together into *agreement* (in the relevant sense) by *any* mapping. In particular, this is true of the indirect mapping afforded by the translations (into A and into B) of the native's T, since it will match a certain sentence of A with its negation in B. Given that, it would still be the case that, if we endorse A, we must reject B; we cannot agree with both at the same time (even after using the indirect mapping). However, we can take *someone else* to believe B, even if we ourselves believe A. While we are *not* free to adopt B for ourselves, once we have adopted A (due to the logical conflict), we *are* free to attribute B to the *native*, without violation of any evidence. (This is because there is no constraint on us (barring an implausible use of Charity, see next footnote) to agree with the *native* on the choice of theory.) And this is precisely Quine's point in the argument from above. Thus, Kirk's objection, as applied to the *pre-T&T* view, seems mistaken (Quine's endorsement notwithstanding).

The situation seems to change once we consider Quine's more recent resolutions, which do away with all logical conflict. For, the indirect mapping of A into B (*via* T) *would* tell us which truths of A to map into which truths of B. And the trivial expedient (which 'ambiguates' all conflict-causing terms) will have guaranteed that no truth of A would be matched with its negation in B. Thus, while we may still find the resultant intermapping of A and B just as 'messy', unilluminating, etc. as any of the mappings we tried *before* giving up and reverting to the Quinean device, *we would have no objective reason to reject it (unlike before)*. This would mean that Kirk's objection (based on transitivity of mapping), just like the objection we have raised in this paper, can be effectively used against the argument from above only given Quine's use of the T&T expedient.

⁴⁰Quine now *also* thinks that the Principle of Charity *should* 'incline us to construing the native as espousing our theory' (correspondence, 6/4/86); and that this independently undermines the argument from above. But this seems implausible. For, suppose we, on Monday, hold theory A, but on Wednesday we switch to B (as Quine thinks we can happily do, "for the sake of an enriched perspective on nature"). Charity would dictate translating the very same theoretical sentences which the native accepts in accordance with A on Monday and in accordance with B on Wednesday. So now we would have the content the native associates with the same sentences vacillate with *our* theoretical swings, which doesn't seem very charitable (in the ordinary sense). Quine might reject this, by arguing that the fact that we accept the *sentences* of B on Wednesday (and reject the sentences of A) does not establish that we have changed our theory. To think it does is to assume that the sentences of A and B have fixed meanings, which they do not. But to argue in this way is already to *presuppose* the intended conclusion of the argument from above, according to which the assignment of content to theoretical sentences (the native's *as well as* ours) is an arbitrary, nonobjective matter.

⁴¹See esp. Chapter 2, where the method of analytical hypotheses and the 'gavagai' example are discussed. This is what Quine suggested in correspondence. However, once the two theses

in question are taken to be independent, Quine would have to face anew the challenge mentioned in our introduction to this paper: He would have to defend the contrast he draws between the status of meaning and the status of truth, given the non-uniqueness of the relevant systems of hypotheses.

⁴²I wish to thank the referee for stressing this point to me.

⁴³I am using here Quine's expressions from a closely related discussion in "Ontological Relativity", in *OR*, esp. p. 49.

⁴⁴The first problem was alluded to earlier, p. 250.

⁴⁵*W&O*, p. 22.

⁴⁶See, e.g., *W&O*, pp. 74f.