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Gavagai! The Evolution of Quine's Indeterminacy Theses

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Abstract: Quine's conjecture that there are multiple correct though mutually incompatible translation manuals for alien languages (the indeterminacy of translation) and his related thesis that there is no fact of the matter as to what our terms refer to (the indeterminacy of reference) are two of the most notorious ideas in the history of analytic philosophy. Yet little is known about the genesis and development of Quine's indeterminacy theses. In this paper, I reconstruct the evolution of Quine's views on radical translation and argue that they can be traced back to two unpublished papers on logic and ontology, which he wrote but eventually abandoned in 1937 and 1949. Next, I analyze the evolution of his ideas up until the late 1980s, showing how Quine gradually changed the, in his own words, "foggy" position he introduced in *Word and Object* (1960) and "Ontological Relativity" (1968a). This reconstruction, I argue, does not only contribute to a better understanding of Quine's philosophical development. It will also help to contextualize his views and to identify and resolve some unclarities in his most-read writings on the topic.

Keywords: W. V. Quine, indeterminacy of translation, indeterminacy of reference, Rudolf Carnap, Edward Sapir

1. Introduction

Quine's conjecture that there are multiple correct though mutually incompatible translation manuals for alien languages (the indeterminacy of translation) and his related view that there is no fact of the matter as to what our terms refer to (the indeterminacy of reference) are two of the most notorious theses in the history of analytic philosophy. Hilary Putnam has said that Quine's thought experiment may well constitute "the most fascinating and the most discussed philosophical

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argument since Kant's Transcendental Deduction" (1974, 28) and Crispin Wright has written that Quine's conclusions are "among the most widely discussed and controversial theses in modern analytical philosophy" (1999, 397). While present-day historians tend to emphasize Quine's naturalism and rejection of the analytic-synthetic distinction, discussions about his philosophy had a different focus up until the 1980s. Rita Bruschi's comprehensive overview of secondary literature on Quine's philosophy, for example, reveals that the indeterminacy of translation was his most-discussed view in the decades following the publication of *Word and Object* (1986, 174).

The extraordinary size of the literature on Quine's indeterminacy theses is partly explained by the *prima facie* absurdity of his conclusions. In denying that there is a fact of the matter about whether members of an unknown tribe are talking about rabbits or about temporal segments of rabbits when they use the word 'Gavagai' (1960, ch. 2), Quine presented philosophers with a puzzle that challenged deep-rooted beliefs about reference and translation. Yet the number of responses to Quine's theses also seems to be function of the unclarity of his argument in *Word and Object* and "Ontological Relativity", two publications that sparked the debate (Quine 1960; 1968a). Quine put radical translation on the philosophical agenda in 1960 but it was only in the decades thereafter that he got clear on (1) the distinction between the indeterminacy of translation and the indeterminacy of reference, (2) the exact nature and status of his two theses, and (3) their significance to his overall philosophical project. Indeed, Quine himself admitted that his ideas about the subject were "foggy" in *Word and Object* and "still somewhat foggy" in "Ontological Relativity" and that the "proper bearing" of his views only became "clearer to [him …] long after" he first introduced them.[1]

This paper reconstructs the development of Quine's indeterminacy theses. Starting with his first discussion of radical translation scenarios in the 1930s, I trace the evolution of his views up until the 1986 Stanford conversations (this volume), which Dagfinn Føllesdal organized to discuss problems such as the "indeterminacy of translation and inscrutability of reference".[2] This reconstruction, I argue, does not only contribute to a better understanding of Quine's philosophical development. It will also help to contextualize his views and to identify and resolve some unclarities in his most-read writings on the topic.

2. Prelogical People

Radical translation scenarios have played a prominent role in Quine's writings throughout his career. The thought experiment can be traced back to at least 1937, when Quine introduced such a

[1] Quine to David Premack, 13 November, 1986, W. V. Quine Papers, Houghton Library, Harvard University (hereafter, WVQP), Box 31, Item 872. See also Quine to Koppelberg, 10 July, 1983, WVQP, Box 22, Item 601.

[2] Føllesdal to Quine, 18 February, 1986, WVQP, Box 12, Item 363. Following Føllesdal and Quine himself, I will use 'indeterminacy of reference' and 'inscrutability of reference' interchangeably.

scenario in an unpublished paper titled "Is Logic A Matter of Words?", presented at the APA Eastern Division Meeting at Princeton University.[3] In the paper, Quine raises the question of how an anthropologist should determine "whether a certain tribe of unknown tongue shares our logic". And he uses the scenario to argue that it is plausible to conclude that logic is true by convention. After introducing some of the main features of Carnap's conventionalism, in particular his thesis that the transformation rules of a language are metalogical conventions, Quine writes:

> As to the plausibility of the doctrine, some support may be gained from the abstract consideration of an *anthropological problem*: the problem of determining whether a certain tribe of unknown tongue shares our logic. Before testing whether [they] accept a given logical principle, we must translate the principle into their language; and before doing this we must construct a dictionary of translation. We can identify many words for our dictionary, words of concrete meanings, simply by direct correlation with features which were prominent in the environment when the words were uttered. But the words relevant to logical principles, such particles as 'is', 'if', 'not', 'and', 'every', cannot be translated by this direct method; we must examine rather the general manner of use within contexts other words of which we have learned by the direct method. And among such contextual criteria of translation we will surely include conformity to the basic logical principles which characterize our use of 'is', 'if', etc. *We will thus find the* [*tribe*] *conforming to our logic*; but only because of our so choosing our translations as to preserve logic.… to choose otherwise, and conclude that [they] do not share our logic, would be no less gratuitous.[4]

Quine's discussion is illuminating because it reveals that he already accepted two key components of what would later become his indeterminacy of translation thesis: (1) the idea that radical translators have some freedom in setting up a "dictionary of translation" for an alien language and (2) that they can make use of extra-empirical criteria in order to decide between competing translation manuals. Though Quine assumes that the anthropologists will produce a dictionary that conforms to our logic, he explicitly notes that they could *choose* otherwise. The anthropologists

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[3] Quine, "Is Logic a Matter of Words", Unpublished manuscript including shorthand annotations by Carnap, Rudolf Carnap Papers (hereafter RCP), Archives of Scientific Philosophy, University of Pittsburgh, 102-61-05. In a letter to David Koppelberg, Quine traces his indeterminacy thesis to 1936, identifying "Truth by Convention" as his "first step toward the thesis of indeterminacy of translation". Quine to Koppelberg, 4 September, 1981, WVQP, Box 22, Folder 601. "Truth by Convention" and "Is Logic a Matter of Words" deal with more or less the same topic. Here, I will focus on the latter because it is the only paper of the two to explicitly discuss a radical translation scenario.

[4] Quine, "Is Logic a Matter of Words", RCP, 102-61-05, original emphasis. The words in brackets replace Quine's own term to describe members of an unknown tribe, which is today sometimes considered a slur.

will most likely conclude that the tribe accepts the principle of non-contradiction but "only because of [their] so choosing [their] translations as to preserve logic".[5]

Though there are similarities between Quine's conclusions in "Is Logic a Matter of Words?" and the indeterminacy theses he defended in later work, there are also a few significant differences. For one thing, Quine accepts some form of indeterminacy for "words relevant to logical principles" but he still presupposes that radical translators have no or very little room to maneuver in translating the empirical portion of an alien language—his so-called "words of concrete meanings". Quine argues that the anthropologists *will* be able to "identify many words" for their dictionary "simply by direct correlation with features which were prominent in the environment when the words were uttered".[6] Presumably, 'gavagai' would be an example of such a word, since it involves correlating a tribe member's utterances with the presence of rabbits in the environment. A significant portion of the anthropologists' translation, in sum, *is* determinate according to Quine in his 1937 paper.

Second, even when we limit our discussion to the tribe's *logical* vocabulary, it is not clear whether Quine had already drawn the conclusion that there is no *fact of the matter* about the correctness of a particular manual of translation. Michael Friedman (1975) has distinguished between epistemological and ontological readings of Quine's indeterminacy theses; and present-day scholars unanimously agree that he defended the latter in *Word and Object* and later publications (e.g., Hylton 2007, 201–4; Kemp 2023, 56–8).[7] It is possible, however, that he still held the weaker, epistemological thesis in his 1937 paper. He concludes that we will "*find*" the tribe conforming to our logic and, a page later, that it demonstrates "the *experimental* inseparability of logic and language", which can be read as saying that we do not have sufficient evidence to determine whether the tribe *in fact* shares our logic.[8]

Finally, nothing much seems to hang on Quine's discussion of the "anthropological problem" at this stage of his career. While translation issues would come to play an important role in Quine's work in the 1960s and 1970s, it is only mentioned in passing in his 1937 paper because it offers, in his own words, "some support" for the "plausibility" of Carnap's views about the nature of logic.[9] Quine does not return to the problem in the remainder of the paper nor did he decide to publish it, presumably because he had already published "Truth by Convention" (1936), a paper that deals with the same topic but does *not* discuss the anthropological problem. Most importantly, Quine had already published his doubts about one version of the thesis that logic is true by convention in the latter paper, questioning whether "the widespread conviction" that

[5] Quine, "Is Logic a Matter of Words", RCP, 102-61-05, 5–6.

[6] Quine, "Is Logic a Matter of Words", RCP, 102-61-05, 5–6.

[7] In the epistemological reading, we do not have sufficient *evidence* to determine the correct manual of translation; the ontological reading says that there is nothing to be correct or incorrect about. See also Quine's reply to Chomsky (1968b).

[8] Quine, "Is Logic a Matter of Words", RCP, 102-61-05, 6–7.

[9] Quine, "Is Logic a Matter of Words", RCP, 102-61-05, 5.

"mathematics and logic proceed wholly from linguistic conventions … asserts anything at all" (1936, 70, 99).[10] If anything, Quine's brief discussion of radical translation seems to be nothing more than a passing remark, included to help his audience understand why one might think that logic *could* be true by convention.

3. Intellectual Context

While Quine's 1937 discussion of radical translation was still relatively non-committal, it helps us better understand the intellectual context that eventually gave rise to his indeterminacy theses. It is no coincidence, for example, that Quine first introduced the scenario as an *anthropological* problem. American ethnographers such as Franz Boas, Edward Sapir, and Benjamin Lee Whorf had been making new contributions to the study and classification of indigenous languages and U.S. philosophers were typically well acquainted with their findings. John Dewey was influenced by Boas in adopting an anthropological perspective on culture and experience (Colón and Hobbs 2015), H. G. Alexander used Sapir's work on the Navajo to explore the relation between language and metaphysics (Alexander 1936; 1937), and Susanne Langer employed a variety of anthropological literature to speculate about the origins of language (Langer 1942; Verhaegh 2022).

Quine, too, was familiar with the work of American ethnographers. Archival material from the 1940s shows that he regularly referred to it in his teaching. Quine's note cards for his 1947 philosophy of language course, for example, contain a list of readings for his students, including Clyde Kluckhohn and Dorothea Leighton's *The Navaho* (chapter "The Tongue of the People"), Bronisław Malinowski's "The Problem of Meaning in Primitive Languages", Sapir's *Language*, and three papers by Whorf.[11] A 1953 transcript of the same course reveals that he used this literature to dispel a number of myths about the nature of language. Quine discussed Malinowski's work on phatic communion to question the assumption that the exclusive function of language is to communicate ideas. He used Sapir's findings to dismiss the "naive tendency … to think of

[10] Some commentators have argued that Quine did not aim to dismiss Carnap's variant of conventionalism in his 1936 paper (e.g., Ebbs 2011; Morris 2018). "Is Logic a Matter of Words?" confirms this reading because it *does* address Carnap's variant but does not repeat the counterarguments raised in the 1936 paper. See Creath (1987, 494) for a similar conclusion. Interestingly, Carnap's notes on his copy of Quine's unpublished paper suggest that he agreed with Quine conclusions about the anthropological problem. Next to sentence "*We will thus find the* [*tribe*] *conforming to our logic*", Carnap wrote "Yes" in the margins.

[11] Quine, ca. 1947), "PHIL148, early plans". WVQP, Box 115, Item 3266, my transcription. See Verhaegh (2018, 93n34) and Sapir (1921), Kluckhohn and Leighton (1946), and Malinowski (1923). It is unclear which papers by Whorf were included in the syllabus. Most likely, Quine and Sapir were also personally acquainted as both had been members of the organizing committee of the Fifth Congress for the Unity of Science in 1939.

language generally as mirroring facts". And he discussed Whorf's studies to introduce his students to the view that the "basic ways of conceptualizing nature—for example, segregating physical objects, and separating space from time—are provisional characteristics of one or another particular language system".[12]

Even Quine's remarks about the possibility of prelogical people appear to have been inspired by the anthropological literature, albeit in a more negative way. They seem to have been a direct response to work by Lucien Lévy-Bruhl, a French philosopher-anthropologist who had suggested the existence of primitive, prelogical cultures.[13] Though Lévy-Bruhl rarely did any empirical research, he identified major differences between "civilized" and so-called primitive or "prelogical" cultures, which do "not bind [themselves] down, as our thought does, to avoiding contradictions" (1926, 78). Several of Lévy-Bruhl's books—including *Primitive Mentality* (1923) and *How Natives Think* (1926)—had been translated into English and his views were regularly discussed in Anglophone philosophy journals in the 1930s (e.g., Perry 1932; Keeling 1933; Alexander 1937), the period in which Quine first encountered Carnap's thesis that logic is true by convention (Verhaegh 2023). It is not unlikely therefore that Lévy-Bruhl's work first inspired him to reflect on the relation between conventionalism and the idea that there might be prelogical people. Indeed, Quine later linked the two in "Carnap and Logical Truth":

> plausibility accrues to the linguistic doctrine of logical truth when we reflect on the question of alternative logics. Suppose someone puts forward and uses a consistent logic the principles of which are contrary to our own. We are then clearly free to say that he is merely using the familiar particles 'and', 'all', or whatever, in other than the familiar senses, and hence that no real contrariety is present after all … Much the same point can be brought out by a caricature of a doctrine of Levy-Bruhl, according to which there are prelogical peoples who accept certain simple self-contradictions as true. … [L]et us suppose it claimed that these natives accept as true a certain sentence … of the form 'q ka bu q' the English translation of which has the form 'p and not p'. But now just how good a translation is this, and what may the lexicographer's method have been? If any evidence can count against a lexicographer's adoption of 'and' and 'not' as translations of 'ka' and 'bu', certainly the natives' acceptance of 'q ka bu q' as true counts overwhelmingly. We are left with the meaninglessness of the doctrine of there being prelogical peoples.[14] (1954, 386–87)

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[12] Quine, "Philosophy 148, Phil. of Language, Jan.–May 1953", Lectures taped and transcribed by Alice Koller with autograph corrections by Quine, WVQP, Box 107, Item 3158. This is not to say that Quine fully embraced Sapir and Whorf's linguistic relativism, as we will see in Section 4.

[13] See Laugier (2022). Sandra Laugier has frequently made the point that Quine's perspective on meaning "is an anthropological one" (2013, 16).

[14] Quine also briefly connects his reflections on alternative logics to Levy-Bruhl's thesis in his "Lectures on David Hume's Philosophy" (1947, 88).

Quine's radical translation scenario, in consequence, should not be viewed as a pure thought experiment, like Donald Davidson's swampman or Frank Jackson's color scientist (*pace* Stuart et al. 2018, 1). It would be more accurate to characterize it as a philosophical idealization of a situation linguists and anthropologists actually encounter in their work. While ethnographers are rarely confronted with truly alien languages, both their activities and their argument that some cultures conceptualize reality in radically different ways naturally stimulated philosophical reflection on the nature of language and translation.

4. Quine vs. Sapir

Thus far we have predominantly focused on Quine's use of radical translation scenarios to reflect on the nature of logic. Yet he would eventually come to employ them to make some significant points about meaning and reference. The first evidence of Quine's transition toward these latter topics can be found in "On Ontologies", an unpublished paper read at the University of Southern California in July 1949.[15] The lecture expands on his criterion of ontological commitment, which he had carefully laid out in "On What There Is" (1948) a year earlier but introduces a new element to the discussion—i.e., the question to what degree we are warranted in imputing our ontology to speakers of "radically alien" languages. In the opening pages of the lecture, Quine writes:

> imagine we are confronted with a sentence in the Carib language. Suppose the sentence as a whole amounts to the English 'There is a green lizard under your hammock'. The Carib sentence amounts to this English one in the sense that it is to be adjudged true just in the cases where there is a green lizard under your hammock; but it does not correspond to the English to the extent of consisting of exactly eight words which individually correspond in meaning to the respective eight words of the English statement. Now what, on the basis of just this sentence, are we to impute to the Carib speaker as *his* ontological commitment? One might uncritically say that this Carib sentence commits the speaker to an ontology comprising at least … three concrete objects: some green lizard, your hammock, and you. However, this answer is unwarranted, for it turns upon irrelevant verbal details of the English translation … It might be argued [for example] that … the spirit of the Carib language is better conveyed by phrasing the translation thus: 'Some shade of green lizardizes itself subhammockily to you' [such that the Carib is …] talking about just two things, a shade of green and you.[16]

[15] "On Ontologies", autograph manuscript, 1949, WVQP, Box 103, Item 2981.

[16] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 3–5. Here, too, the overall set up of Quine's scenario might be influenced by anthropological research. In his autobiography, Quine recalls meeting two former students of the anthropologist Kenenth Pike in Mexico in 1949 (1985, 214). Pike was known for his "monolingual field work method", which involves studying a

Prima facie, Quine's conclusion seems to tie him to Sapir and Whorf's linguistic relativism, which he summarizes as the view that "language is the creator, not the mirror, of things".[17] Quine, we have seen, wrote the paper in a period in which he regularly used Sapir's and Whorf's findings in his teaching (Section 3) and he opens "On Ontologies" with a discussion of the idea that "the world is unthinged save as we thing it". Indeed, "On Ontologies" is more radical than his above-discussed 1937 paper, in which he still argued that a radical translator "can identify many words for our dictionary, words of concrete meanings, simply by direct correlation with features which were prominent in the environment when the words were uttered" (see Section 2). By 1949, Quine clearly has given up on the idea that there are words of concrete meanings, as he argues that even basic objects such hammocks and lizards go "a good deal beyond raw sense data". Following Sapir and Whorf, but also his teacher C. I. Lewis, Quine now submits that "reality is organized in as many ways as there are … language families".[18]

Still, it would be a mistake to read Quine as a linguistic relativist. Though he describes Sapir as a "great linguist" with a "healthy" philosophy of language that "offsets" the myth that language mirrors the world, he also dismisses the relativist conclusion that our basic ways of "conceptualizing nature … are provisional characteristics of one or another particular language system".[19] The problem, Quine argues, is that we cannot separate the "contribution made by language" and the "contribution made by the world", thereby going beyond the Sapir-Whorf thesis that different languages *do* organize reality in different ways. The mature Quine is clear that there is no *fact of the matter* about the correct translation of a radically alien language and he already strongly hints at this conclusion in his 1949 "On Ontologies":

> The criterion of ontological commitment … can be extended directly to the Carib speaker *if* we can fix upon a dependable Carib translation of the idiom '$\exists x(\ldots x \ldots)$'. In practice such choice of translations presents no difficult for languages less remote that Carib; but in theory there is a danger, when we turn to a basically alien language, that we may force the issue … by a prejudiced choice of translation… So perhaps the whole question of

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language without an interpreter. In his 1947 book *Phonemics*, Pike notes that "in some parts of the world this is the only technique possible, since in out-of-the-way places there exist tribes in which there are no speakers of European languages or other languages likely to be known to the investigator. Under these circumstances the student is forced to utilize a technique which begins with the language material itself and analyze it in terms of linguistic contexts" (1947, 231). I thank Anne Salazar Orvig for suggesting this connection. Quine first presented "On Ontologies" a few months after his encounter with Pike's students. See also Quine (1960, 28n2).

[17] Quine, "Philosophy 148, Phil. of Language, Jan.–May 1953", WVQP, Box 107, Item 3158, I.13.

[18] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 2–3.

[19] Quine, "Philosophy 148, Phil. of Language, Jan.–May 1953", WVQP, Box 107, Item 3158, I.6, II.2.

> ontological commitment, the question of how the Carib mind 'things' reality … is strictly meaningless: it makes no sense, except from the accidental point of view or our own provincial … ontology…. The fundamental-seeming philosophical question, 'How much of our science is merely contributed by language and how much is a genuine reflection of reality?' is perhaps a spurious question which itself arises wholly from a certain particular type of language. Certainly we are in a predicament if we try to answer the question; for to answer the question we must talk about the world as well as about language, and to talk about the world we must already impose upon the world some conceptual scheme.[20]

Quine, in sum, is toying with the conclusion that "it is strictly meaningless" to ask whether the Carib sentence is best translated as 'There is a green lizard under your hammock' or as 'Some shade of green lizardizes itself subhammockily to you'. His argument is relatively straightforward: Observation *sentences*, not *terms* are the most fundamental unit of empirical meaning, such that we can only "understand the Carib's sentence as a whole" and have "no clue to the Carib's ontological organization of experience".[21] The situations in which the Carib affirms the sentence remain the same no matter whether we translate him as talking about lizards and hammocks or about subhammockily lizardizing shades of green. Even if we were to ask a Carib speaker to explain their "ontological doctrine", we would not be able to decide between the two candidate translations: "For such a statement, unlike the very empirical example about the lizard, cannot be interpreted simply by finding sense experiences which could be said to confirm it":

> We can understand the Carib's philosophical sentences only by construction from an understanding of their parts, and we can understand these parts only by a prior abstraction from other sentences which are sufficiently empirical in import to be understood first as wholes. But these abstractions and constructions, being our own work, may be trusted to have the net effect of imputing to the Carib's philosophical utterances almost any philosophical content we care to contrive.[22]

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[20] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 14–5, original emphasis. See also Quine (1958, 21): "Sapir, and latterly B. L. Whorf, have stressed that deep differences of language carry with them ultimate difference in the way one thinks or looks upon the world. I should prefer not to put the matter in such a way as to suggest that certain philosophical propositions are affirmed in the one culture and denied in the other. What is really involved is difficulty or indeterminacy of correlation. It is just that there is … less sense in saying what is good translation and what is bad—the farther we get away from sentences with visibly direct conditioning to non-verbal simuli and the farther we get off home ground".

[21] Of course, Quine would soon come to argue that the unit of empirical significance is the whole of science. We will come back to this in Section 6.

[22] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 5–6.

The difference between English and Carib, Quine argues, is that in English we have a clear criterion of ontological commitment. Anticipating his later argument that "in practice" we acquiesce "in our other tongue", "taking its words at face value", Quine notes that if a speaker of English says that 'There is a green lizard under your hammock', we are not imputing our ontology if we take them to be committed to the existence of lizards: "We are merely construing 'there is' to mean 'there is'".[23]

5. Quine vs. Carnap

Quine never published "On Ontologies". He initially wrote it for a *festschrift* for H. M. Sheffer but ultimately decided to submit another, more technical paper ("The Ordered Pair in Number Theory") to be included in the volume.[24] Still, some of the ideas of "On Ontologies" were later incorporated in "The Problem of Meaning in Linguistics", which he published in *From a Logical Point of View* (Quine 1953). This second paper focuses on meaning instead of ontological commitment but uses a similar scenario to draw a similar conclusion—viz., that it is "strictly meaningless" to ask how speakers of an alien language conceptualize reality. Quine introduces a lexicographer seeking to create an inventory of synonymous expressions in a "hitherto unstudied language" but concludes that there is "nothing for the lexicographer to be right or wrong about":

> We observe a speaker of Kalaba, say … and we look for correlations or so-called causal connections between the noises he makes and the other things that are observed to be happening … If we could assume that our Kalaba speaker and our English speaker, when observed in like external situations, differed only in how they say things and not in *what* they say, so to speak, then the methodology of synonymy determinations would be pretty smooth … But of course the trouble is that … basic differences in language are bound up, as likely as not, with differences in the way in which the speakers articulate the world itself into things and properties, time and space, elements, forces, spirits, and so on. It is not clear even in principle that it makes sense to think of words and syntax as varying from language to language while the content stays fixed; yet precisely this fiction is involved in speaking of synonymy, at least as between expressions of radically different languages. (1953, 49, 60–1, 63)

Quine, in sum, defends a similar thesis—it is meaningless to ask how speakers of an alien language carve up reality—but uses it to shed light on a different type of question. The conclusion in "On Ontologies" was phrased as an answer to the epistemological question "How much of our science

[23] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 7.

[24] Quine to Langer, 18 October, 1949. Susanne Langer Papers, Houghton Library, Harvard University, Box 3, Folder: "Sheffer, Henry M."

is merely contributed by language and how much is a genuine reflection of reality?".[25] Quine's second paper seeks to answer the question whether we can make empirical sense of intensional notions such as meaning and synonymy and concludes that lexicographers have nothing to be right or wrong about "in compiling a domestic dictionary" (1953, 56).

"The Problem of Meaning in Linguistics" is a crucial step in the development of Quine's indeterminacy theses. It is his first *published* paper discussing radical translation and it first employs the scenario to question the intelligibility of synonymy and analyticity, one of the central debates in analytic philosophy in the 1950s. It should be no surprise, therefore, that Quine's scenario quickly prompted a number of responses from people who disagreed with his conclusions. Carnap, for example, appealed to something like a radical translation scenario in one of his replies to Quine. In "Meaning and Synonymy in Natural Languages", he introduces a scenario involving two linguists who do "not know anything" about German and who "study it by observing the behavior of German-speaking people" (1955, 35). One of the linguists, Carnap writes, concludes that the German word 'pferd' means 'horse', while the other is convinced that 'pferd' means 'horse or unicorn'. Since the two translations are extensionally equivalent, Quine would have to conclude that there is no behavior that could make a difference in deciding between them. Carnap, however, submits that is very well possible to find out which of the two translation is correct. If the linguists were to point at a horse and ask the German to imagine "a thing like this but having one horn in the middle of the forehead", or if they were to point at a drawing of a unicorn asking whether they are willing to apply the word 'Pferd', they would be able to decide between the two (1955, 38).

Carnap's argument misses the mark. Quine, we have seen, presupposes a more 'radical' form of indeterminacy than Carnap seems to have had in mind. The linguist's drawings and pointings will not help her settle the issue of whether Germans carve up the world into hammocks and green lizards or into subhammockily lizardizing shades of green—an issue one needs to settle before one can answer the more fine-grained question whether 'pferd' means 'horse' or 'horse or unicorn'. Nor do follow up questions help decide between these alternative translations as the linguist will only be able to understand the German's "philosophical sentences … by construction from an understanding of their parts" which in turn are understood "only by a prior abstraction from other sentences which are sufficiently empirical".[26] If two translations are extensionally equivalent it is simply meaningless to ask which of them is correct. Carnap is not to blamed for the misunderstanding though. "The Problem of Meaning in Linguistics"—Quine's only *published* paper discussing radical translation—does not contain any concrete illustration of what he had in mind. The lizard-hammock example in "On Ontologies" does a better job but Quine, we saw, never published the paper.[27]

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[25] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 15.

[26] "On Ontologies", 1949, WVQP, Box 103, Item 2981, 5–6

[27] Quine does briefly allude to differences in how "speakers articulate the world itself into things and properties" in "The Problem of Meaning in Linguistics" (1953, 61) but this seems compatible with Carnap's 'pferd' example.

Quine, in other words, had already formulated a response to Carnap before the latter had articulated his objection. It is no coincidence, therefore, that he was quick to publish a reply. In 1958, Quine first presented his seminal Gavagai scenario—a variant on the lizard-hammock example—arguing that a linguist, in deciding between different translations ('rabbit', 'temporal rabbit stages', or 'undetached rabbit parts'), has nothing "to be right or wrong about".[28] In a passage that appears to directly address Carnap's above-discussed solution, Quine writes:

> Does it seem that the imagined indecision between rabbits, stages of rabbits, and integral parts of rabbits should be resoluble by a little supplementary pointing and questioning? Consider, then, how. Point to a rabbit and you have pointed to a stage of rabbit and to an integral part of a rabbit. Point to an integral part of a rabbit and you have pointed to a rabbit and to a stage of a rabbit … [Q]uestions of identity and diversity: 'Is this the same gavagai as that? Do we have here one gavagai or two?' … presuppos[e] that the native conceptual scheme is, like ours, one that breaks reality down somehow into a multiplicity of identifiable and discriminable physical things … The point is not that we cannot be sure [which of these is correct] but that there is not even … an objective matter to be right or wrong about. [29]

The same scenario and a slightly rewritten version of the above passage would form the basis of Quine's discussion of translation in chapter 2 of *Word and Object*, launching a decades-long debate about his indeterminacy theses.[30]

6. *Word and Object*

[28] Quine 1958 paper was originally published in French ("Le Mythe de la signification", 1958). My references are to the English version ("The Myth of Meaning", WVQP, Box 103, Item 2965).

[29] The Myth of Meaning", WVQP, Box 103, Item 2965, 10–1.

[30] Peter Hylton has argued that "there is little direct evidence" that Quine's "advocacy of indeterminacy" in *Word and Object* was a response to Carnap's attempt to argue that "synonymy is a perfectly reputable concept" (2007, 198). Note though that Quine explicitly argues that his views on empirical meaning are superior to Carnap's "remarks on empirical semantics" because they "can be explored ... at the first stages of radical translation", suggesting that at least his inclusion of a translation scenario was in part a response to Carnap's paper (1960, 35). Hylton is right to point out, however, that Quine *also* discusses radical translation in connection which his "general epistemological project" to determine "the extent of man's conceptual sovereignty" (Hylton 2007, 378n3; Quine 1960, 5). Quine, we saw, had already used radical translation scenarios to shed light on this question in "On Ontologies". In my view, both projects—the attempt to answer the epistemological question and the crusade against intensional concepts—come together in the first two chapters of *Word and Object*.

While there are similarities between Quine's lizard-hammock example and his 'Gavagai' example, it would be a mistake to conclude that he already had a fully worked-out indeterminacy thesis when he wrote "On Ontologies" in 1949. Quine's account in *Word and Object* is more sophisticated because it is based on a more detailed analysis of empirical meaning. The distinction between occasion, observation, and standing sentences, the notion of stimulus meaning, and the concept of analytical hypothesis all first appear in Quine's work from the late 1950s, allowing him to argue that linguists involved in radical translation crucially rely on observation sentences and that 'Gavagai!' and 'Lo, a Rabbit' have the same stimulus meaning, regardless of whether we take 'gavagai' to be referring to rabbits or undetached rabbit parts.[31] Linguists, Quine now argues, use analytical hypotheses to "push radical translation beyond the bounds of mere observation sentences" and to hypothetically equate "conveniently short recurrent parts" of the native's occasion sentences (e.g., 'gavagai') to English words and phrases ('rabbit') (1958, 15). Translation is indeterminate, then, because linguists can come up with mutually incompatible systems of analytic hypotheses conforming to the native's speech dispositions, such that each of them facilitates smooth communication between speakers of the two languages. Different linguists can equate 'gavagai' with "any of the disparate English terms 'rabbit', 'rabbit stage', 'undetached rabbit part', etc., and still by compensatorily juggling the translation of numerical identity and associated particles, preserve conformity to stimulus meanings of occasion sentences":

> The thesis is then this: manuals for translating one language into another can be set up in divergent ways, all compatible with the totality of speech dispositions, yet incompatible with one another. In countless places they will diverge in giving, as their respective translations of a sentence of the one language, sentences of the other language which stand to each other in no plausible sort of equivalence however loose. (1960, 27, 54)

On a more abstract level, however, Quine's argument still closely resembles his above-discussed diagnosis in "On Ontologies" (Section 4). In his 1949 paper, Quine had formulated his view in terms of a tension between wholes and parts. We only have access to the truth conditions of the Carib's observation sentences "as a whole" but there are different ways to break these sentences into component parts, such that we can translate them as talking about lizards and hammocks or as about subhammockily lizardizing shades of green: "it is the sentence primarily, and words only derivatively that are the vehicles of meaning".[32] In *Word and Object*, a similar conflict between wholes and parts reappears on the level of the translation manual. Following his seminal conclusion that "the unit of empirical significance is the whole of science" (1951, 42), Quine now argues that two systems of analytical hypotheses may "fit the totality of verbal dispositions to perfection and yet conflict in their translations of certain sentences" (1960, 78). While "two systems of analytical hypotheses are, as whole, equivalent so long as no verbal

[31] See Quine (1958, section 2) and *Word and Object*, sections 7–9.

[32] "On Ontologies", 1949, WVQP, Box 103, Item 2981, p. 8.

behavior makes any difference between them" the two systems may be incompatible to the extent that they offer different translations of the language's component sentences (1960, 78). Or, as Quine expressed it eight years later in "Ontological Relativity":

> If the English sentences of a theory have their meaning only together as a body, then we can justify their translation … only together as a body. There will be no justification for pairing off the component English sentences with component … sentences [in the alien language] except as these correlations make the translations of the theory as a whole come out right. Any translation of the English sentences … will be as correct as any other, so long as the net empirical implications of the theory as a whole are preserved … [I]t is to be expected that many different ways of translating the component sentences, essentially different individually, would deliver the same empirical implications for the theory as a whole. (1968a, 80)

7. Lost in Translation

Despite Quine's elaborate framework, it would be his gavagai *example* and not his underlying analysis that came to dominate subsequent debates about indeterminacy. Many commentators, Quine complained ten years after the publication of *Word and Object*, saw the example as "the ground of the doctrine" and hoped to "cast doubt on the doctrine" by "resolving the example" (1970, 178). While his indeterminacy thesis relied on abstract considerations about empirical meaning, the debate primarily focused on the intricacies of his Gavagai case. Indeed, it is quite revealing how much literature from this period makes note of the "confusion" regarding "the source and significance of … Quine's thesis" (e.g., George 1986, 489). There was "considerable disagreement not only as to whether the thesis is true", Føllesdal remarked, "but also as to what the thesis is" (1973, 289).

Yet the gavagai scenario was not just a source of confusion because commentators took it to be an argument instead of an illustration. Quine later came to believe that the example itself is problematic too, such that it occasionally led him astray when he was writing *Word and Object*. One problem with the example is that 'gavagai' is both an occasion *sentence* and a *term* in the native's language. As an observation sentence, the translation of 'Gavagai!' is determinate and stimulus synonymous with 'Lo, a rabbit' but as a term it is not. As such, the gavagai example does not even illustrate the indeterminacy of translation. It is an example of the indeterminacy of *reference*, a distinction Quine fails to make in *Word and Object*.[33] The former is the thesis that

[33] See e.g., Quine (1970, 182): "The *gavagai* example was at best an example only of the inscrutability of *terms*, not of the indeterminacy of translation of *sentences*. As sentence, *Gavagai* had a translation that was unique to within stimulus synonymy; for the occasion sentences 'Rabbit',

there may be multiple, mutually incompatible translation manuals for an alien language, each fully compatible with the native's behavioral dispositions. The latter is the thesis that there is no fact of the matter as to what the native's terms refer to. These two types of indeterminacy both involve translation, but the former involves the translation of sentences as a whole—and is therefore sometimes called "holophrastic indeterminacy" (Quine 1992, 51)—while the latter involves the translation of a sentence's component terms. It derives from the two types of conflicts between parts and wholes discussed above: two systems of analytical hypotheses may fit the totality of verbal dispositions but conflict in their translations of individual sentences (holophrastic indeterminacy) and two translations of a sentence may be stimulus synonymous yet conflict in their translations of the native's terms (the indeterminacy of reference).[34] The distinction between holophrastic indeterminacy and indeterminacy of reference is made in all of Quine's mature writings but is missing in *Word and Object* and "Ontological Relativity". The gavagai example seems to have obscured Quine's thinking on this front.[35]

A second problem, Quine submits, is that the gavagai example hindered him from seeing that there is a much simpler, more straightforward argument for the indeterminacy of reference. In the 1960s and 1970s, Quine developed quite a long list of illustrations to convince his sceptical readers that there is no fact of the matter as to what our terms refer to.[36] Only in the 1980s, however, he began to argue that the indeterminacy of reference "admits of trivial proof" (1998, 728). One can demonstrate that "two ontologies are equally supported by all possible data", Quine now held, by expressing "a one-to-one-correlation … between them" (1997, 189). An example of such a correlation is the proxy function mapping all objects of a theory onto their spatio-temporal complements. If we reinterpret all predicates accordingly, a sentence like "the rabbit is sitting on the grass" is guaranteed to have the same truth-value as "the complement-rabbit is complement-sitting on the complement-grass". Quine would have probably have seen this, he later argued, if

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'Rabbit stage', and 'Undetached rabbit part' are stimulus-synonymous and holophrastically interchangeable".

[34] See Hylton (2007, 220), who has best expressed this point: "Seen abstractly, holophrastic indeterminacy arises in the same way as indeterminacy of reference: we have constraints on wholes which do not determine translations of the parts… In the case of indeterminacy of reference, the wholes [are] sentences, and the parts [are] sub-sentential. In the case of holophrastic indeterminacy, the whole is our total theory, or a large chunk of it, and the parts are individual sentences".

[35] See Quine to Premack, 13 November, 1986, WVQP, Box 31, Item 872: "*Gavagai* did not even present a problem of translation … stimulus synonymy fixes the translation of an observation sentence (e.g., *Gavagai*) without *of itself* fixing the reference of any terms therein (e.g., *gavagai*)". Note, though, that Quine came close to drawing the distinction when he argued that the "stimulus synonymy of the occasion sentences 'Gavagai' and 'Rabbit' does not even guarantee that 'gavagai' and 'rabbit' are coextensive terms" on page 51 of *Word and Object*.

[36] These include, i.a., the case of the Japanese classifiers and the argument that there are two alternative translations of the French construction 'ne … rien' (1968a, 30, 35–8; 1970, 182).

there had been one-to-one correlations between rabbits, rabbit parts, and rabbit stages. The problem with Quine's original example, however, is that no such mapping is available. In order to preserve "conformity to stimulus meanings" between rabbits and temporal rabbit stages, one has to make adjustments in the translation of phrases expressing identity and diversity:

> [The problem is that] the *gavagai* case has nothing to do with proxy functions. Rabbit parts aren't … in one-one correlation with rabbits [but] the cosmic complement is a proxy. Unlike proxies, the choice in the *gavagai* case affects the structure of the language and the translation of 'part', 'identical', and more, if it doesn't just bog down in frustration.[37]

Quine, in sum, changed several, in some cases quite fundamental aspects of his original indeterminacy thesis in the decades following the publication of *Word and Object*. He introduced the distinction between holophrastic indeterminacy and the indeterminacy of reference, he adopted a new, more straightforward argument for the latter thesis, and he distanced himself from his Gavagai example. It should be no surprise, therefore, that he eventually came to view his early writings on the subject as "foggy" (Section 1). In a letter to David Premack, Quine confessed that "it has happened repeatedly in my philosophical writing that the proper bearing of one of my theses becomes clearer to me only long after I expounded it and I see only long afterward how much simpler and more effective my original presentation could have been". "One case", Quine writes, was "Ontological Relativity", where "my proxy functions should have been my knock-down argument … Another case was *gavagai*".[38]

8. Naturalism

Finally, let us turn to Quine's evolving views on the *significance* of his indeterminacy theses. Even the casual reader of his substantial oeuvre will notice a shift of emphasis in his writings over time. Quine extensively writes about indeterminacy in the 1960s and 1970s but includes just a couple of paragraphs about his theses in *From Stimulus to Science* (1995). This seems to have been a deliberate choice. In a letter to Alex Orenstein, Quine says that "the whole matter of indeterminacy of translation reduces, in the new book, to pp. 72–74", noting that this "should give … a better-proportioned conception of my philosophical outlook.[39] While some of his contemporaries saw indeterminacy as his most important intellectual legacy, predicting that it had set into motion a "process of thinking and rethinking what we mean by *translation* [… that will] go on for a very long time—perhaps for centuries" (Putnam 2002, 274, original emphasis), Quine himself

[37] Quine to Alex Orenstein, 2 August, 1996, WVQP, Box 29, Item 800.
[38] Quine to Premack, 13 November, 1986, WVQP, Box 31, Item 872.
[39] Quine to Orenstein, 22 February, 1996, WVQP, Box 29, Item 800.

downplayed its significance, noting that, in hindsight, "translation was not really a primary concern of *Word and Object*" in the first place.[40]

The above reconstruction of the evolution of Quine's writings on radical translation may help us understand why he came to downplay the significance of his conclusions. Both indeterminacy theses, we saw, were the outcome of a decades-long development in which translation scenarios were used for a variety of purposes: to shed light on the thesis that logic is true by convention (1937), to answer the question how much of our theory of reality is a "contribution made by language" and how much of it is a "contribution made by the world" (1949), and to challenge the intelligibility of intensional notions such as synonymy and analyticity (1958). Translation itself, however, never seems have been his primary concern. In fact, even the opening paragraph of *Word and Object* suggests that the indeterminacy of translation thesis is an offshoot of a more fundamental project:

> Language is a social art. In acquiring it we have to depend entirely on intersubjectively available cues as to what to say and when. Hence there is no justification for collating meaning, unless in terms of men's dispositions to respond overtly to socially observable stimulations. An *effect* of recognizing this limitation is that the enterprise of translation is found to be involved in a certain systematic indeterminacy; and this is the main theme of Chapter II. (1960, ix, my emphasis)

What connects Quine's aforementioned projects, is that they are all attempts to think through the epistemological and ontological implications of a fully naturalized philosophy of language. Radical translation scenarios are a suitable instrument to demonstrate that we have nothing to go on except 'intersubjectively available cues' because they help us isolate "the ultimate evidence for linguistic meaning, namely observable … behavior, verbal and other otherwise, in observable circumstances" (1994, 447). It is only when we recognize the limits of our evidential situation that we can start questioning certain myths about language: that understanding a sentence involves grasping a meaning, that it makes sense to talk about pre-logical people, and that we can strictly distinguish between what we say and how we say it.

Quine's indeterminacy theses, therefore, are first and foremost a by-product of a naturalized perspective on language. Once we think through the implications of our evidential situation, we have to accept that reference is inscrutable and that there may be multiple correct manuals of translation for alien languages.[41] This naturalized philosophy of language, in turn, is

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[40] Quine to Premack, 13 November, 1986, WVQP, Box 31, Item 872.

[41] I write 'may' because Quine later came to qualify the (holophrastic) indeterminacy of translation as a "conjecture" (1994, 447). Though there is no principled reason why we should expect there to be just *one* correct translation manual, no one has ever demonstrated that there are in fact multiple incompatible yet equally successful translations for alien languages. The indeterminacy of reference is not a conjecture. It admits, in Quine's view, "of trivial proof" (see Section 7).

just one component of Quine's larger project to develop a comprehensive naturalist worldview—i.e., a picture of inquiry in which we "start in the middle", assimilating our inherited world theory of "middle-sized, middle-distanced objects", and in which we are always "working from within", modifying the system while relying on its best theories and methods. (Quine 1960, 3–4, 25; Verhaegh 2018, 63). It is small wonder, therefore, that Quine later came to regret the excessive focus on indeterminacy. It distracts from some of the larger points he tried to make. Commentators viewed his reflections on radical translation as an argument for indeterminacy, rather than as an instrument to help us isolate 'the ultimate evidence for linguistic meaning'.

One may object that the extensive literature on indeterminacy is warranted even if Quine's theses are just a "by-product" of his naturalized philosophy of language. Especially the thesis that there is no fact of the matter as to whether we are referring to rabbits or rabbit stages when we talk about 'rabbits' seems disturbing no matter what role it plays in his overall philosophical system.[42] Interestingly, though, Quine again appealed to his naturalism in explaining why we should not be too alarmed by the indeterminacy of reference. While he took his proxy functions to demonstrate that it is pointless to ask whether we are referring to rabbits or rabbit-complements, it never affected his "unswerving belief in external things":

> My methodological talk of proxy functions and inscrutability of reference must be seen as naturalistic … The setting is still the physical world, seen in terms of the global science to which, with minor variations, we all subscribe. Amid all this there are our sensory receptors and the bodies near and far whose emanations impinge on our receptors. Epistemology, for me, or what comes nearest to it, is the study of how we animals can have contrived that very science, given just that sketch neural input. It is this study that reveals that displacements of our ontology through proxy functions would have measured up to that neural input no less faithfully. To recognize this is not to repudiate the ontology in terms of which the recognition took place. We *can* repudiate it. We are free to switch, without doing violence to any evidence.… But it is a confusion to suppose that we can stand aloof and recognize all the alternative ontologies as true. (1981, 21)

Much as Quine dissolved worries about our ontological commitment to lizards and hammocks in "On Ontologies" (Section 4), he downplayed the consequences of the indeterminacy of reference in later stages of his career. To give up on rabbits in light of his indeterminacy thesis is to confuse

[42] This seems to have been Putnam's point when he wrote that the indeterminacy theses are Quine's most important legacy. He viewed the indeterminacy of reference as a *reductio ad absurdum* of naturalism, arguing that "any doctrine that leads to the conclusion that there is no fact of the matter as to what our terms refer to must be wrong" (1992, 396). Quine's naturalism ought to be rejected, Putnam argued, because there is "not ... any hope" that one can accept it "without being driven to the radical theses of indeterminacy of translation and ontological relativity" (2002, 279).

"truth with evidential support". Naturalism implies that we must always "speak from within a theory, albeit any of various" (1981, 21–2).

9. Conclusion

When Quine was invited to come to Stanford to participate in a series of conversations on his philosophy in February 1986 (Føllesdal and Marschall, this volume), his indeterminacy theses were at the height of their fame. Dozens of books and papers had appeared on Quine's "infamous doctrine" (Gibson 1982, 65), resulting in what Alexander George has called a "gavage of gavagais" (1986, 489).[43] Indeed, when Quine travelled to Spain for a conference a few weeks later, he received copies of the first two issues of *Gavagai*, "a thick semiannual periodical on philosophy of language", only to discover upon his return that David Premack had published a book with the same title.[44] Dagfinn Føllesdal, who organized the Stanford meeting, was interested in the topic, too. He had published several papers on indeterminacy (e.g., Føllesdal 1973; 1982) and proposed to discuss topics such as "the problem of empirically equivalent theories and its relation to problems of indeterminacy of translation and inscrutability of reference" at the event.[45]

Quine, however, had become quite reluctant to put indeterminacy front and center. His letters from this period indicate that he had come to regret the excessive focus on the topic (Sections 7–8) and one can detect a similar attitude in the transcripts of the Stanford conversations. He argues that the "way to look at indeterminacy of translation really is just that we should recognize what there is to go on in translating" (page 248, this volume) and that "the 'Gavagai' example which loomed so large in the polemical literature and also in *Word and Object* … is at the term level" and does not even "touch the question of indeterminacy of sentences" (page 251, this volume). A few months later, Quine repeated this position in a paper conveniently titled "Indeterminacy of Translation *Again*" (my emphasis), noting that the thesis, despite the "frequent criticism", is just "a consequence of my behaviorism". Any behaviorist ought to recognize that there is "nothing in linguistic meaning ... beyond what is to be gleaned from overt behavior in observable circumstances", and such a behaviorist perspective is mandatory for any self-respecting empiricist: "In psychology one may or may not be behaviorist, but in linguistics one has no choice" (1987, 5).

Yet Quine, we have seen, had not always been this reluctant. This paper has tried to shed some light on his evolving views on radical translation and indeterminacy by tracing some of the key developments in his thinking between 1937 and 1986. I have argued that radical translation scenarios played a prominent role in Quine's philosophy from very early on (Sections 2 and 4) but that he used them for different purposes at different stages of his career. I have contextualized

[43] See Bruschi (1986) for an overview of the secondary literature on Quine indeterminacy theses.

[44] Quine to Premack, 13 November, 1986, WVQP, Box 31, Item 872.

[45] Føllesdal to Quine, 18 February, 1986, WVQP, Box 12, Item 363

Quine's appeal to translation scenarios by connecting them to his frequent references to anthropological work by Sapir, Whorf, and Lévi-Bruhl (Section 3) and I have detailed how his use of such scenarios gained momentum when they started to play a role in his debate with Carnap (Section 5), eventually leading to the introduction of the gavagai example in *Word and Object* (Section 6). Most importantly, I have explained why Quine gradually came to distance himself from his 'foggy' writings on indeterminacy in his *magnum opus*, tracing his evolving views on indeterminacy (and the 'gavagai' example) in the decades following its publication (Section 7).[46] Quine, we saw, never abandoned his theses but he did come to downplay their significance in his overall philosophical project (Section 8). The indeterminacy of translation is a consequence of a naturalized philosophy of language but a thoroughly naturalist perspective will also help us see why there is no need to despair. The indeterminacy of translation does not "impugn translation"—there are still good and bad translation manuals—nor does the indeterminacy of reference "cast doubt on the reality of the world as science increasingly reveals it" (1994, 448). To presuppose that it does is to wrongly assume that we can transcend the perspective that led us to recognize the indeterminacy in the first place.

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[46] Unfortunately, I did not have space to examine all relevant developments. A more comprehensive account would also have discussed Quine's evolving views on the notion of 'fact of the matter', the relation between indeterminacy and Chomsky's theories of language learning, and the development of Quine's naturalist and behaviorist commitments. On these, see, e.g., Taylor (2017), George (1986), King (2019), and Verhaegh (2018; 2019ab).

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