

Introduction

Perhaps no contemporary American philosopher has had greater influence than W.V. Quine. Working solidly within the Anglo-American “analytic” tradition that was initiated by Bertrand Russell and developed in Vienna positivism, he made substantial contributions to his first love, mathematical logic, contributions which pale as compared to the influence of his work in general philosophy, marked by his seminal 1951 “Two Dogmas of Empiricism.”¹ This essay advanced theses, developed in arguments which culminated in his 1990 book *The Pursuit of Truth*,² which had remarkable consequences: They powerfully assisted in what became a frontal attack on some of the main claims of the dominant logical empiricist epistemology and philosophy of science stimulating new forms of what might be called ‘pragmatism’ and anti-realism in the philosophy of science.³ They spawned both materialist and reliabilist versions of naturalistic epistemology.⁴ And even more directly, Quine’s arguments inspired an American version of post-modernism, which in turn, seemed to converge with Continental post-structuralist semiotics and the denial of what Derrida called ‘the metaphysics of presence.’⁵ And finally, these theses became central to the currently very fashionable, if too often uncritically held idea that the world is a human creation.

The Two Dogmas of Empiricism

What were the dogmas of the famous “Two Dogmas” essay and what did Quine offer in replacement of them? I quote him:

Modern empiricism has been conditioned in large part by two dogmas. One is a belief in some fundamental cleavage between truths which are *analytic*, or grounded in meanings independently of matters of fact, and truths which are *synthetic*, or grounded in fact. The other dogma is *reductionism*: the belief that each meaningful statement is equivalent to some logical construct upon terms which refer to immediate experience (p. 20).

Since it permitted modern empiricism to expunge necessity from nature and confine it to language, the analytic/synthetic distinction was the center of logical empiricism (‘logical positivism,’ ‘positivism’).⁶ Putting aside formally true sentences (e.g., p or not-p), the truth of analytic statements is guaranteed by meaning, where meaning (or intension) is sharply distinguished from ‘extension,’ (reference), defined as ‘the class of all entities of which a general term is true.’ For example ‘creature with a heart’ and ‘creature with kidneys’ are unlike in meaning even if they are alike in extension.

For Quine ‘extension’ is a perfectly clear idea, meaning is not. As he notes, “meaning is what essence becomes when it is divorced from the object of reference and wedded to the word.” Meanings are presumably ‘meant entities’ (‘intentions,’ as Brentano had it).⁷ Worse, the notion of analyticity requires that we have a clear idea of synonymy, ‘sameness of meaning. But, insists Quine, we do not.

Quine considers alternative routes to solving the problem, definition, perhaps. But, except where one is stipulating, ‘let us take F to mean G,’ definition presupposes synonymy. Similar problems beset the idea that two terms are synonymous if they are interchangeable *salva veritate* (without a change in the truth value of the sentence). If we assert: ‘Necessarily all and only bachelors are unmarried men,’ we beg the central question since ‘necessarily’ is presumed to apply only to analytic statements. If our language does *not* contain modal words like ‘necessarily’ (and other words which do not behave extensionally), then interchangeability guarantees *extensional equivalence*—the truth is preserved, but it cannot guarantee *cognitive synonymy*, sameness of meaning. Similarly, we can construct semantical rules for a language that make them analytic in that language, but, unfortunately, this sheds no light on analyticity. “We understand what expressions the rules attribute analytic to, but we do not understand what the rules attribute to those expressions” (p. 33).

Perhaps the solution is to be found in the second dogma, in general terms, “the verification theory of meaning,” often attributed to Peirce but certainly a central pillar in the dominating logical empiricism. On this view, “the meaning of a statement is the method of empirically confirming or infirming it” (p. 37). It is hard to overstate the influence of this doctrine especially as regards still very widely held notions of science. Presumably, the difference between making reference to photons or quantum jumps is very different than making reference to gods or witches, else there is nothing to the “

objectivity of science. Presumably, the empirical meaning of ‘photon’ is guaranteed by the ability to confirm or disconfirm hypotheses which make reference to them. But seeing that this requirement was not directly satisfied—one tests theory by deductively elaborating and testing the empirical consequences of theory, empiricists were led, in a story not to be told here, to a series of moves by Carnap, Hempel and others (e.g., partial interpretation, correspondence rules) to find a satisfactory way to link theory and experience, finally acknowledging that one could not draw an absolute boundary between the theoretical and the observational.⁸ Nonetheless, the verifiability principle remains (despite gestures in the direction of Quine) part of the lore of hypothesis, theory and “operational definition” for social scientists who seek to emulate the methods of “hard science.” More important, perhaps, the verification theory of meaning has been the main weapon against beliefs whose meanings seemed not to answer to the test: sentences which are metaphysical, ethical, political and aesthetic. “Value judgments,” e.g., on this view, are not “cognitively meaningful,” that is, they are neither true nor false.⁹

The verification theory then implies that “statements are synonymous if and only if they are alike in point of method of empirical confirmation or infirmation” (*ibid.*). So indeed the two dogmas collapse into one. But this raises a new problem, viz., what is “the nature of the relation between the statement and the experiences which contribute to or detract from its confirmation?” (p. 38). It would seem that truth “depends upon both language and extralinguistic fact, so that one is tempted to suppose that “the truth of a statement is somehow analyzable into a linguistic component and a factual component” (p. 36). But can this analysis be carried out?

Quine notices that Carnap's first efforts at what Quine calls 'radical reductionism' not only failed but failed in principle. Whether the statement was to be translated (reduced) into a statement about "sense data as sensory events" or "sense data as sensory qualities," in the artificial language which Carnap employed talk about physical objects could not be reduced (p. 40). (On Quine's account, Carnap's language was "parsimonious," even if "empiricists there are who would boggle at such prodigality.") But he observes, even with the abandonment of this austere (procrustean?) program, "the dogma of reduction survives in the supposition that each statement, taken in isolation from its fellows, can admit of confirmation or infirmation at all" (p. 41).

This was indeed the master insight: "Empiricism without dogmas" could proceed:

The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a made-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experiences. . . .Reevaluation of some statements entails reevaluation of others, because of their logical interconnections—the logical laws being in turn simply further statements of the system, certain further elements of the field. . . .But the total field is so underdetermined by its boundary conditions, experience, that there is much latitude of choice as to what statements to reevaluate in the light any single experience. No particular experiences are linked with any particular statements in the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole (pp. 42f.).

This vision of knowledge as "holistic" both caught the imagination of philosophers and provoked Quine's subsequent research program. Notice here that as regards the quoted text, it is unclear whether in the first place, Quine had in mind belief and/or meaning as a "fabric" and second, whether *all* belief (or meaning) was underdetermined by experience, or whether, as in Pierre Duhem, his concern was only with scientific theories as they were then generally understood. That is, were there many fields or one large field (perhaps common sense?) with subfields interspersed? ¹⁰

Pragmatism and Naturalism

His "pragmatism" was present in the "Two Dogmas" in his account of physical objects. Quine wrote:

As an empiricist I continue to think of the conceptual scheme of science as a tool, ultimately for predicting future experience in the light of past experience. Physical objects are conceptually imported into the situation as convenient intermediaries — not by definition in terms of experience, but simply as irreducible posits comparable, epistemologically, to the gods of Homer. For my part I do, qua lay physicist, believe in physical objects and not in Homer's gods; and I consider it a scientific error to believe otherwise. But in point of epistemological footing the physical objects and the gods enter our conceptions only as cultural posits. The myth of physical objects is superior to most in that it has proved more efficacious

than other myths as a device for working a manageable structure into the flux of experience (p. 44).

But the essay left another set of tensions that, I think, both seem unresolved and perhaps also gave readers ample room for interpretation—and misinterpretation. One tension, a seemingly technical one, regards physical objects and especially their status as regards his empiricism and theory of language; another is the question of relativism. Suppose we agree that “the myth of physical objects” is superior ... as a device for working a manageable structure into the flux of experience,” what rules out other “myths” which seem very well to help cultures work “manageable structures into the flux of *their* experience”? What about, e.g., explanations that appeal to God’s will? Who, more generally, is the “our” in “our culture” and why should “science” be “privileged” epistemologically?

Quine’s John Dewey Lectures, “Ontological Relativity” (1968) offer the most direct way into the key doctrines of the later writings, and the now famous Quinean themes: “the inscrutability of reference” and “the indeterminacy of translation.”

The lecture begins with a statement of some strong connections to Dewey. He notes that he is “bound to Dewey by the naturalism that dominated his last three decades,” and shares with Dewey, that “knowledge, mind and meaning are part of the same world that they have to do with, and that they are to be studied in the same empirical spirit that animates natural science.” Moreover, as with him, “meanings are, first and foremost, meanings of language;” and, critically, “language is a social art which we all acquire on the evidence solely of other’s people’s overt behavior under publicly recognizable circumstances.”¹¹ As Dewey had insisted: “Meaning... is not a psychic existence; it is primarily a property of behavior.”

So far Quine and Dewey are “naturalists,” and as such, both stand clearly opposed to various “mentalist” conceptions of meaning, well characterized by Quine:

Uncritical semantics is the myth of a museum in which the exhibits are meanings and the words are labels. To switch languages is to switch labels... Now the naturalist’s primary objection to this view is not an objection to meanings on account of their being mental entities, though that could be objection enough. The primary objection persists even if we take the labeled exhibits not as mental ideas but as Platonic ideas or even as the denoted concrete objects. Semantics is vitiated by a pernicious mentalism as long as we regard a man’s semantics as somehow determinant in his mind beyond what might be implicit in his dispositions to overt behavior. It is the very facts about meaning, not the entities meant, that must be construed in terms of behavior (p. 186).

Putting aside for the moment the troublesome notion of “behavior” (and whether intentional objects, “the entities meant,” are dispensable), we see that once we are committed to a behavioral view of meaning, “we give up assurance of determinacy.” Indeed, when we do this, we see not only that there are some indeterminate cases, but that indeterminacy is pervasive --Quine’s famous “indeterminacy of translation.”

Indeterminacy of Translation

What is the gist of the argument and what are the consequences? The argument begins with famous artificial example of ‘Gavagai,’ introduced in his 1960 *Word and Object*.¹² We are to imagine a field linguist seeking a translation for the native word, ‘Gavagai.’ There is no vocabulary or manual since it is just his job to create one. All he has is the behavior of natives. Now, it is a fact that “a whole rabbit is present, when and only when an undetached part of a rabbit is present; also when and only when a temporal stage of a rabbit is present” (meaning by this last, there are definite space and time coordinates for his location). Ostension (pointing) will not suffice since, there will be no behavioral difference to be discerned in the speaker’s assent to ‘gavagai’: It might, accordingly, mean ‘rabbit,’ *or* ‘undetached rabbit part,’ *or* ‘rabbit stage.’ This is Quine’s famous “inscrutability of reference.”

It may be supposed that there is a non-ostensive means available once our linguist has developed a grammar for the language, a grammar that includes decisions on plural endings, the ‘is’ of identity, etc. Eventually, by abstraction, he gets a system for translating. Then, “insofar as the native sentences and the thus associated English ones seem to match up in respect to appropriate occasions of use, the linguist feels confirmed in these hypotheses of translation—what I call analytical hypotheses” (“Ontological Relativity,” p. 190). Quine notes that this route is both “laudable in practice and the best we can hope for,” but it does not allow us to settle the indeterminacy. And it does not because of the holistic character of meaning: There is no reason to believe that there isn’t another, perhaps several other translation manuals, which are wholly consistent with all the behavioral data (p. 190)!

But if this were not sufficiently provocative, Quine argues that it can also be shown that “radical translation begins at home,” and that inscrutability of reference pervades the home language itself. Our usual “domestic rule” of translation is “homophonic:” We equate the same string of phonemes in our own mouths with similar strings in others. But we all employ “a principle of charity,” construing “a neighbor’s word heterophonically now and then if thereby we see our way to making his message less absurd” (p. 199).¹³ Indeed, things are even worse, for the “inscrutability of reference is not the inscrutability of fact: there is no fact of the matter. But if there is really no fact of the matter, then the inscrutability of reference can be brought even closer to home than the neighbor’s case; we can apply it to ourselves” (p. 200). Quine balks:

We seem to be maneuvering ourselves into the absurd position that there is no difference on any terms, interlinguistic or intralinguistic, objective or subjective, between referring to rabbits and referring to rabbit parts or stages; or referring to formulas and their Gödel numbers. Surely this is absurd, for it would imply that there is no difference between the rabbit and each of its parts or stages... Reference would now seem to become nonsense not just in radical translation but at home” (p. 200).

Quine asserts that the answer is readily at hand: “reference is nonsense except relative to a coordinate system.” It is nonsense to ask absolutely whether ‘rabbit,’ or ‘rabbit part’

“really refer respectively to rabbits, rabbit parts... We can only ask this relative to some background language” (*ibid.*). Quine knows, of course, that this threatens a regress, indeed, an infinite regress. *Practically speaking*, to be sure, the regress ends with our “home language”: “by acquiescing in our mother tongue and taking words at face value” (p. 201). *Philosophically speaking*, this would seem to be a disappointing result, one which, in his subsequent writings, Quine tried valiantly to remedy. In *Theories and Things* (1981), reference became relative to a “translation manual,” but the problem remained. In his 1990 *The Pursuit of Truth* we read: “If,” he argued, “we choose as our manual of translation the identity transformation [which pairs off each term off with itself], thus, taking the home language at face value, the relativity is resolved” (p. 52). It hard to see how this differs from “acquiescing in our mother tongue”?

Barry Stroud has argued that we can admit that “there is no place for an internal ‘museum’ of meanings,” that speakers of a language do have knowledge which enables them to respond appropriately to the sayings of others, and that the only evidence for this is behavioral.”¹⁴ But he insists that the behavior in question “must be described using intensional terms: like ‘says that p’, ‘believes that p’, and so on.”¹⁵ Sentences which contain them behave intensionally; that is, they fail to satisfy the conditions of extensionality (above, note 5). In the famous example, “Tom believes that Cicero denounced Cataline,” substituting ‘Tully’ for ‘Cicero’ (who is one and the same person) does not preserve the truth of the compound since Tom may not know or believe that they are one and the same.

Canonical Notation

In *Word and Object*, Quine noted that the “Brentano thesis of the irreducibility of intensional idioms is of a piece with the thesis of the indeterminacy of translations” (p. 221). One then could accept the Brentano thesis “either as showing the indispensability of intentional idioms and the importance of an autonomous science of intention [as per Husserl, e.g.] or as showing the baselessness of intentional idioms and the emptiness of a science of intention” (*ibid.*) Although, indeed, intentional idioms may well be “practically indispensable,” Quine chooses the latter—and his reasons are of some importance. They help us to see how his commitment to the Russellian task of clarification with the use of formal methods remains critical to his general philosophy. And they help us also to clarify his naturalism.

Admitting intensional idioms into the language requires, for him, “a bifurcation in “canonical notation” (*ibid.*) Although elaborating what Quine believes creates this problem would take us deep into arguments in logical theory,¹⁶ the main point is clear enough. The predicate calculus with identity (substantially, a truncated version of Russell and Whitehead’s *Principia Mathematica*) is a demonstrably powerful tool for analysis and clarification. “Reducing to canonical form,” then, is simply the translation of ordinary English into the most economical schema in the extensional language of the predicate calculus.

Two points are additionally critical: First, “on the whole the canonical systems of logical notation are best seen not as complete notations for discourse on special subjects [for example, physical theory], *but as partial notations for discourse on all subjects*”

(*Word and Object*, p. 160, italics added). Second, “A *maxim of shallow analysis* prevails: *expose no more logical structure than seems useful for the deduction or other inquiry at hand*” (*ibid.*). Indeed, “the quest of a simplest, clearest overall pattern of canonical notation is not to be distinguished from a quest of ultimate categories, a limning of the most general traits of reality” (p. 161).

These philosophical prepossessions both enabled and constrained Quine’s inquiry. For example, through the use of “canonical schema,” he was able to resolve rigorously existence questions: “to be is to be the value of a variable.” “Existence is what existential quantification expresses. There are things of kind F if and only if $(\text{Ex})\text{Fx}$.”¹⁷ Accordingly, we can determine if there are classes or numbers or wombats by seeing if these putative objects must occur as the bound variables of quantifiers. Of course, to say that “there are things of kind F if and only if $(\text{Ex})\text{Fx}$ ” is “as unhelpful as it is undebateable, since [by recursion to “the home language”] “it is how one explains the symbolic notation of quantification to begin with.” On the other hand, “the fact is that it is unreasonable to ask for explication of existence in simpler terms” (p. 97). Simplest, perhaps, but the metaphysician in many of us may want more?

But the inquiry is also constrained: Intensional idioms do not behave extensionally, but he insists that their exclusion is not a disaster. Since “we are limning the true and ultimate structure of reality, the canonical schema for us is the austere scheme that knows no quotation but direct quotation and no propositional attitudes but only the physical constitution and behavior of organisms” (p. 221). It is not for the sake of logicians that large chunks of the analysis in *Word and Object* and in “Ontological Relativity” (as many, many of Quine’s essays), require “translating” ordinary notions into the constructed language of the predicate calculus or why he can so easily move from ordinary examples to similar examples in mathematical theory, e.g., the difference between a formula and a Gödel number.¹⁸ On the other hand, if one is interested in humans and in *human* language, as presumably part of the natural world, then why confine matters to “the physical constitution and behavior of organisms”?

Naturalistic Epistemology

The foregoing suggests that Quine’s naturalism at least waffles towards a materialism and a reductive one at that. The connection to the foregoing discussion of language and method is easily seen in his brief, but also very influential “Epistemology Naturalized.”¹⁹ Quine asserts that “epistemology is concerned with the foundations of science” (p. 69). Grant that the effort to “ground” science explains the epistemological problem in its modern form, and putting aside current connotations of “foundations,” most writers would say that epistemology is concerned with knowledge, including, of course, the knowledge which presumably is produced by the practices of the sciences. Quine has persistently run the two ideas together, a consequence of ambiguity regarding the application of his holism (above). Drawing then on questions familiar to inquiry into the foundations of mathematics, he notes that there are two linked sorts of inquiry, “conceptual studies,” concerned with meaning, and “doctrinal studies,” concerned with truth. On the doctrinal side, Quine sees little progress from where Hume left us. On the conceptual side, however, progress has been made (p. 72).

In his efforts to accomplish Russell's program, viz., "to account for the external world as a logical construct of sense data," Carnap provided the most successful effort on the conceptual side of the project.²⁰ Of course, he failed, but even had he succeeded, he would not have solved the doctrinal problem. Carnap was seeking a "rational reconstruction," and "any construction of a physical universe in terms of sense experience, logic, and set theory would have been seem as satisfactory if it made the physicalist discourse come out right." But "if Carnap had successfully carried out such a construction..., how could he have told whether it was the right one?" (p. 75). As Quine insists, every language (natural or artificial) has materials to settle questions of reference, existence, and truth. But why choose any one, if there are potentially others?

Quine's response to this dilemma, odd as it may seem, takes him straight to naturalistic epistemology as he conceives it. He asserts:

But why all this creative reconstruction, all this make believe? The stimulation of sensory receptors is all the evidence anybody has had to go on, ultimately, in arriving at his picture of the world. Why not see how this construction really proceeds? Why not settle for psychology? Such a surrender of the epistemological burden to psychology is a move that was disallowed in earlier times as circular reasoning. If the epistemologist's goal is validation of the grounds of empirical science, he defeats his purpose by using psychology or other empirical science as the validation. However such scruples against circularity have little point once we have stopped dreaming of deducing theories from observation (p. 75).

It is hard to see, here as in Quine's earlier treatment of relativist regress, how abandoning the "dream of deducing theories from observation" undermines scruples against circularity. In any case, to pick up on his argument, given the failure of the empiricist program to *translate* science into "logic, observation terms and set theory" (p. 76), and "to settle for a kind of reduction that does not eliminate, is to renounce the last remaining advantage that we supposed rational reconstruction to have over straight psychology." (p. 78).

Quine and Dewey are both naturalists in the sense that Quine identified in the Dewey lectures (above), but there are naturalisms and there are naturalisms. I have already noted problems regarding description of behavior in terms of intentions. As there are naturalisms and there are naturalisms, there are psychologies and there are psychologies. A problem symmetrical to the problem of describing behavior arises as regards all the "evidence" we have.

Carnapian austerity was evident in *Word and Object* where Quine insisted that "it was important to think of what prompts the native's assent to 'Gavagai?' as stimulations not rabbits" (p. 31). He spoke of "visual stimulations" in terms of patterns of "chromatic irradiation of the eye" (p. 31). This was not quite adequate however. "Better," he noted, "to take as the relevant stimulations not momentary irradiation patterns, but evolving radiation patterns of all durations up to some convenient limit or *modulus*" (p. 32).²¹ Indeed, why not rabbits—keeping in mind that even if what we mean by 'rabbit' is not what our native might mean by 'Gavagai.' Wouldn't a psychologist seek to explain how we see, if not a rabbit, perhaps a physical object or an animal that is furry, four legged,

etc.? Plainly the force of “see” is at issue here, but there is no consensus either in philosophy or in the psychology of perception on this.²²

But however these causal questions get to be answered, if we are to have an epistemology (and not merely a psychology), we need somehow to get to evaluative (or normative) issues. One obvious way to do this is to show (non-circularly) that science does generate truths, and that, accordingly, if we better understood it, we could abstract and generalize those features that make it successful (however that is to be understood?). Many people have read Dewey as holding to some such view. But it is clear enough in any case that Dewey’s most persistent effort in this direction was his little read (and understood) *Logic: The Theory of Inquiry* which both disavowed the pursuit of truth, replacing it with “warranted assertability,” and which rejected wholly the then dominant logical empiricist conception of both logic and science.²³ Or one might simply *assume* the practices of the several sciences and then use them to seek an understanding of how humans arrive at the beliefs they have. But unless we can say what counts as true belief (and why) it is hardly clear that the project is *epistemology*. For reasons, already noted, Quine is less than clear on some of these critical issues.

In “Epistemology Naturalized,” after telling us that “epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science,” he offers that this means that it studies “a natural phenomenon, viz., a physical human subject”: “This human subject is accorded a certain experimentally controlled input –certain patterns of irradiation in assorted frequencies, for instance—and in the fullness of time the subject delivers as output a description of the three-dimensional external world and its history.” We do this, he says, for “somewhat the same reasons that prompted epistemology; namely in order to see how evidence relates to theory, and in what ways one’s theory of nature transcends any available evidence” (p. 82f.).

Even as a purely scientific project, what is quite obviously omitted in this remarkable research program is any reference whatever to the intentional and social features of knowledge. It would not be denied that humans, wherever they are found, relate symmetrically to the external world, that “reality” is the source of all our primitive sensory inputs.²⁴ But it would surely seem that getting to concepts and to belief will require more than a neurophysiological psychology? And on the side of epistemology, it is surely the case that all groups generate languages. But on Quine’s own arguments, there is no reason to believe that these languages all converge into one which is isomorphous to what is real, and which, accordingly, “get it right.”

The Objectivity of Science

Chapter One of *The Pursuit of Truth* is entitled “Evidence.” ‘Evidence’ is a term of logic in just the sense that evidence counts for (or against) some belief—even if, to be sure, the logical empiricist dream of an “inductive logic” remains entirely unsatisfied. Empiricism requires that belief be grounded in “observation sentences.” “The observation sentence is the means of verbalizing the prediction that checks a theory.”²⁵ “An observation sentence is an occasion sentence [which may true on some occasions and false on others] on which speakers of the language can agree out-right on witnessing the occasion” (p. 4).

There is still the causal problem of getting from “stimulations” to “observation sentences.” Further (and as an unacknowledged part of this problem), there is the question of the “theory-ladenness” of observation. On this issue, Quine sees no real difficulties. “There is a sense... in which [observation sentences] are all theory-laden, even most primitive ones, and there is a sense in which none are, even the most professional ones” (p. 7). The “primitive ones,” e.g., ‘Rabbit’ or ‘The salt dissolved in the water’ need to be seen “holophrastically,” that is, as whole expressions. Then, “as conditioned to stimulatory situations, the sentence is theory-free; seen analytically, word by word, it is theory-laden” (*ibid.*) But the same is true of the very sophisticated observation sentences assented to by special communities. “What qualifies them...is still their holophrastic association with fixed ranges of sensory stimulation, however that association be acquired” (p. 8).

Nor, as above, is holism a problem. It remains the case that “the test of a hypothesis...hinges on a logical relation of implication” (p. 8), but this is two-sided. “On the one side, the theoretical, we have the backlog of accepted theory plus the hypothesis. This combination does the implying. On the other side, the observational, we have an implied generality that the experimenter can directly test, directly challenge...”(p. 9f.). “A generality that is compounded of observables in this way—‘whenever this, that’--is what I call an *observation categorical*” (*ibid.*) Holism shows that “the falsity of the observation categorical does not conclusively refute the hypothesis.” “Over-logicizing” (sic) we are asked to consider a set of truths which jointly imply the false categorical. We rescind the one “which seems most suspect, “ heeding a maxim of minimum mutilation.” Having “diffused” the implication, we now track down the sets of sentences that imply our newly rescinded beliefs until consistency has been restored (p. 14f).

On its face, the foregoing suggests first, that Quine’s interest is in saving *science* against the widespread and frequently injudicious attacks on its objectivity and, second, that in point of fact, he has not himself strayed very far from the “received view.” Taken together, if true, this is, of course, paradoxical. It was precisely the task of the logical empiricists to provide a “foundation” for science (and like Quine, they always had in mind physical science, and particularly physics at that). Quine needs no foundation, but even given his refutation of analyticity and the verifiability theory of meaning, his conception of science has a definite logical empiricist cast. In the end, Rorty may be more correct in judging that, despite his best efforts to the contrary, Quine has not fully appreciated the revolutionary impact of his work. For Rorty, of course, we are “at home” in our language; and “our” civilization has developed modern science. For him, at least, that is all that can be or needs to be said?²⁶

¹ In Quine, *From a Logical Point of View*, 2nd Edition, revised (New York: Harper Torchbooks, 1961).

² W.V. Quine, *The Pursuit of Truth* (Cambridge: Harvard University Press, 1990).

³ As for example, in Larry Laudan, e.g., *Science and Relativism* (Chicago: University Press, 1990) and Bas Van Fraassen, e.g. *Laws and Symmetry* (Oxford: Oxford University Press, 1989). Strictly speaking the “classical” pragmatists, beginning with C.S. Peirce had no philosophy of science in the modern sense; but what they had to say about science is nevertheless a long way from what current “pragmatists” have to say. For some discussion, see my “Pragmatic Philosophy of Science and the Charge of Scientism,” *Transactions of the C.S. Peirce Society*, Vol. XXIV, No. 2 (Spring 1988) and “John Dewey and American Social Science ,” in Larry Hickman (ed.) *Reading Dewey* (Bloomington: University of Indiana Press, 1998).

⁴ For examples of both, see Hilary Kornblith (ed.) *Naturalizing Epistemology* (Cambridge: MIT Press, 1985).

⁵ See the various writings of Richard Rorty, perhaps especially, *Consequences of Pragmatism* (Minneapolis: University of Minnesota Press, 1982).

⁶ ‘Empiricism’ because it was a development of British empiricism from Bishop Berkeley, and ‘logical’ because it was committed to using the tools of Russell and Whitehead’s *Principia Mathematica*. Also termed ‘positivism’ following the usage of Comte, the inventor of the term. A positivist rejects metaphysics as no part of science. Scientific explanations (in contrast to metaphysical or theological explanations) depend only upon of “laws,” rendered as “invariable relations of association and resemblance.” This last, a Humean conception of causality and a deductivist notion of explanation remain key features of most accounts of science.

⁷ As regards meaning, older accounts contrasted ‘extension’ (also denotation), or what terms are true of, and ‘intension’ (or connotation). Quine collapses into ‘intension,’ both intention, which involves mental states and sometimes psychic objects, and/or what Russell called, “propositional attitudes,” e.g., ‘believes,’ ‘knows.’ ‘Intension,’ accordingly, is a wider concept than ‘intention.’ See Joseph Margolis’s very brief and useful, *Philosophy of Psychology* (Englewood Cliffs: Prentice Hall, 1984).

The notion of an extensional language is critical as regards all of Quine’s work, as we shall see. A language is extensional only if (a) “any two predicates which agree extensionally (that is, are true of the same objects) are interchangeable *salva veritate*, (b) for its compound sentences, the truth value is a function wholly of the truth values of the components (i.e., the “connective is truth-functional”) and (c), for the components of a compound, (a) is satisfied. In modern logic, the predicate calculus is extensional. All natural languages have a host of terms that do not behave extensionally. In addition to verbs expressing propositional attitudes, modal words, like ‘necessarily,’ and ‘possibly’ and verbs like ‘causes’ do not satisfy the foregoing definition of extensionality. See below.

⁸ As almost everyone now says, “facts are theory-laden.” A very good discussion both of Quine’s role and of the efforts to repair the damage to “the received view” is found in Frederick Suppes’ introduction to his edited volume, *The Structure of Scientific Theories*, 2nd Edition (Urbana: University of Illinois Press, 1977). Suppes also summarizes alternatives, beginning rightly with Stephen Toulmin’s 1953 *The Philosophy of Science: An Introduction* (London: Hutchinson) and including Hanson, Popper, Kuhn and others. Notably absent is the radical redrawing of the central issues in the work of Rom Harré, *The Principles of Scientific Thinking* (Chicago: University of Chicago Press, 1970). In this book, Harré challenged “deductivism” and in later writings, Humean causality.

⁹ The most readable statement remains A.J. Ayer's *Language, Truth and Logic* (New York: Dover, nd.). First published in 1936, the Dover edition contains Ayer's valuable new introduction. In it, Ayer noticed that the theory did not provide a general theory of meaning since it did not "cover the case of sentences which did not express any propositions at all," that is, sentences, like 'God is dead,' which in the terms of the verification theory, had no truth value whatsoever.

¹⁰ This (ambiguous?) holism is sometimes referred to as the Duhem-Quine thesis. Pierre Duhem, arguing from "conventionalist" premises, had argued that isolated hypotheses are not severally verifiable by experience. Symmetrically, theory is "underdetermined by observations." The idea is found also in Mary Hesse's 'network model' of theories. Hesse notes that "Quine seems to obscure unnecessarily the radical character of his own position by conceding too much to more traditional accounts" (*The Structure of Scientific Inference*, Berkeley: University of California Press, 1974, p. 27). See below. There is also a relation to Kuhnian "incommensurability. One way to state the difference would be to say that Quine tends to remain with a verifiability theory, but in contrast to the received view, it is holistic. On most readings, at least, Kuhn is more radical.

¹¹ W.V. Quine, "Ontological Relativity," *Journal of Philosophy*, Vol. LXVf, No. 7 (April 4, 1968) and reprinted in *Ontological Relativity and Other Essays* (New York: Columbia University Press, 1969).

¹² Willard Van Orman Quine, *Word and Object* (Cambridge: MIT Press, 1960).

¹³ This idea is now also very well established in the literature, but in terms of the 'indexical' character of utterances. See especially the Wittgensteinian influenced work of Garfinkel and ethnomethodology.

¹⁴ Here the appropriate comparison is to "classic" American naturalism, in G.H. Mead, *Mind, Self and Society* (Chicago: University of Chicago Press, 1967) and Dewey, *Experience and Nature, The Later Works, 1925-1953*, Vol. 1 (Southern Illinois Press, 1981). For some discussion, see several of the essays in John Ryder (ed.), *American Philosophical Naturalism in the Twentieth Century* (Amherst: Prometheus Books, 1994), including my "Nature and Culture." Although this cannot be pursued here, the critical move in Mead and Dewey is to not to deny that intentions figure in communication, but to argue that meaning cannot be explained in terms of intentions (psychic or otherwise). Thus, if someone is to be taken, as e.g., making a request, as James Tiles (in his clear exposition of Mead/Dewey) writes:

he has to be taken to have responded to the object not as a stimulus but from the point of view of the [other]. And what establishes the possibility of thus adopting the standpoint of the other is the recognition of the regularity of the relationship between gesture and completed act (J.E. Tiles, *Dewey* (London and New York: Routledge and Kegan Paul, 1988), p. 49).

Mead called his behaviorism 'social' for very good reasons.

¹⁵ Barry Stroud, "Quine on Exile and Acquiescence," in Paolo Leonardi and Marco Santambrogio (eds.), *On Quine: New Essays* (Cambridge: Cambridge University Press, 1995), p. 49.

¹⁶ See, e.g., "Reference and Modality," in *From a Logical Point of View*.

¹⁷ "Existence and Quantification," in *Ontological Relativity and Other Essays* (New York: Columbia University Press, 1969). p. 97.

¹⁸ In "Ontological Relativity," he asks us to picture ourselves "at home in our language, with all its predicates and auxiliary devices. This vocabulary includes 'rabbit', 'rabbit part', 'rabbit stage', 'formula', 'number', 'ox', 'cattle'; also the two-place predicates of identify and difference, and other logical particles' (p. 200). This is not *my* language, to be sure, since my language contains, in addition to the so-called "propositional attitudes," words like 'necessarily', and 'causes'. This last is worth mention:

'Putting salt in water causes it to dissolve' becomes 'If salt is put in water, it dissolves.' 'If-then' in the canonical notation is truth-functional, but there is no way to "reduce" 'causes' in the ordinary sense to "canonical form." Most philosophers are content with this, since, having already accepted a Humean conception of causality as constant conjunction, 'If p, then q' suffices. Of course, this leaves the problem of counterfactuals and thus the analysis of dispositions handicapped; worse, cause in a realist sense is expunged from science!

¹⁹ In *Ontological Relativity and Other Essays*.

²⁰ In *Der logische Aufbau der Welt* (1928).

²¹ It is this sort of argument which makes Quine the background inspiration for the "scientific" naturalistic epistemologies of S. Stich's "no-belief" theory and the "eliminative materialism" of Patricia and Paul Churchland. For discussion see Susan Haack, *Evidence and Inquiry* (Oxford: Basil Blackwell, 1995), chapter 8. As she summarizes matters: "what is on offer is, on the one hand, evidence which, it is claimed, shows that the sciences of cognition can provide explanations of action without positing beliefs, desires, etc. and, on the other, in-principle arguments allegedly showing that this is no accident, since the ontological bona fides of intentional states are at best doubtful" (p. 159).

²² I have in mind here the continuing argument between Gibsonians who hold to a version of what is called "direct perception" against "representationalist" views. See e.g., M.T. Turvey, R.E. Shaw, E.S. Reed, and W.M. Mace, "Ecological Laws of Perceiving and Acting: in Reply to Fodor and Pylyshyn," *Cognition*, Vol. 9 (1981).

²³ John Dewey, *Logic: the Theory of Inquiry, Later Works, 1925-1953*, Vol. 12 (Carbondale: Southern Illinois University Press, 1986). See Thomas Burke *Dewey's New Logic: A Reply to Russell* (Chicago and London: University of Chicago Press, 1994). Among the many treasures of Burke's account is his Deweyan criticism of representational and computational models of cognition and his defense of an "ecological psychology" as inspired by Gibson.

²⁴ This is a critical, but always ignored feature of the work of the *bete noir* of "analytic epistemologists," naturalistic or otherwise, of the so-called "strong programme in the sociology of knowledge." See P. T. Manicas and A. Rosenberg, "'Naturalism, Epistemological Individualism and the 'Strong Programme' in Sociology of Knowledge," *Journal for the Theory of Social Behavior*, Vol. 15 (1985).

²⁵ W.V. Quine, *Pursuit of Truth*, p. 4

²⁶ The concluding paragraph of *Pursuit of Truth* reads: "What the indeterminacy of translation shows is that notion of propositions as sentence meanings is untenable. What the empirical underdetermination of global science shows is that there are various defensible ways of conceiving the world" (p. 102).