

The following is a *corrected* version of my article which appears as:

“Willard Van Orman Quine”. 2006. *The Philosophy of Science: An Encyclopedia*. J. Pfeifer and S. Sarkar, eds. Routledge Press.

First, in the published version of my essay (and throughout the two volume set), wherever ‘Quine, Willard Van Orman’ or ‘Willard Van Orman Quine’ should appear, ‘Quine, Willard Van’ or ‘Willard Van Quine’ (no ‘Orman’) appear instead. This included the title and header of my essay, the opening and closing sentences of my essay, every reference to my essay in the two volume set, and as far as I could tell, every other occurrence of Quine’s name in the two volume set.

Second, on page 661 of my essay, in the midst of a paragraph where I am stressing the import of “Two Dogmas” and the fact that it fell right in the middle of the 20th century, there is a line which reads, “The date of Quine’s death, moreover, nearly perfectly marks the silver anniversary of ‘Two Dogmas’.” Silver is the 25th anniversary, not the 50th. The whole theme of those few sentences was half-centuries, 50 years... My original text read: “nearly perfectly marks the semi-centennial of ‘Two Dogmas’”.

I have made these corrections to the text, and offer this, the intended version, on my website.

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# WILLARD VAN ORMAN QUINE

(25 June 1908–25 December 2000)

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Willard Van Orman Quine was born in Akron, Ohio, and died in Boston, Massachusetts. He took an undergraduate degree in mathematics from Oberlin College in 1930. In 1932, he completed a Ph.D. at Harvard University with a dissertation in logic that generalized and simplified a portion of Whitehead and Russell's *Principia Mathematica*. From 1932–1933, traveling on a fellowship in Europe, Quine spent five months in Vienna, where he attended meetings of the Vienna Circle and met such notables as Schlick, Waismann, Gödel, Hahn, Reichenbach, and Ayer (see Vienna Circle). Six weeks in Prague brought the beginning of the famous personal and professional relationship between Quine and Rudolf Carnap (see Carnap, Rudolf). Quine then studied logic with Tarski, Leśniewski, and Łukasiewicz while in Warsaw for six weeks. In 1936, following three years as an inaugural Junior Fellow at Harvard, Quine took a faculty position at Harvard, teaching there (but for his service in the United States Navy during World War II) until his retirement in 1978. Quine published prolifically throughout his career until the year of his death.

Quine emerges from a tradition within analytic philosophy that has been called scientific philosophy. This tradition is characterized by a concern for the epistemology and ontology of science, logic, and mathematics; the exploitation of developments in logic and set theory; and an antipathy toward speculative metaphysics (Hylton 2001). In particular, Quine's work is best understood against the backdrop of Vienna Circle logical empiricism, especially the work of Carnap. Allowing for some necessary simplification, the logical empiricists were concerned to portray science as a unified system of knowledge, including not only logico-mathematical knowledge and the so-called hard sciences, but also psychology, sociology, and history (see Logical Empiricism). While the positivist conception of science was broader than typically portrayed, it is, of course, not the case that every claim of every discipline qualified as scientific. To so qualify, a claim or statement had to pass a test of cognitive significance by being either analytic (true solely in virtue

of the meanings of constituent terms) or synthetic (empirically confirmable or disconfirmable) (see Cognitive Significance). Any claim that was neither analytic nor synthetic was considered cognitively meaningless, thus unscientific.

This conception of the analytic and the synthetic served a number of interrelated ends in the logical empiricist program. First, the claim that the truths of logic and mathematics are analytic provides an empirically respectable account of the supposed a priori status of logico-mathematical knowledge. The relevant claims are true in virtue of meaning alone, so no particular state of the world is relevant, and thus no appeal to observation is relevant. Yet neither is an appeal to special intuition or nonempirical realms required—understanding of the language is the key justifying component of such knowledge.

Second, the empiricist characterization of synthetic claims was central to providing an account of the unity of the a posteriori portion of science. In the early days it was thought that every synthetic claim would strictly reduce to (translate into) some claim in a basic observational language. This language would include vocabulary sufficient for logic, set theory, and some form of observational claim. The exact nature of the observational claims was much debated, even after strict reductionism had been abandoned. If feasible, this would show that all genuinely synthetic claims are ultimately about possible or actual observations. But strict verificationist reducibility of theoretical claims to observational claims is not to be had (see Reductionism; Verifiability). The required relation had to be loosened to some form of implication of observational claims by the theoretical (Carnap 1936–1937). In any case, the requirement that synthetic claims must be related to observable circumstances in ways to be made clear through logical analysis supports the notion of the unity of science (see Unity and Disunity of Science)—for every nonanalytic claim would bear the same (type of) relation to observational claims, and the process of confirmation would be fundamentally the same. Thus,

with no fundamental epistemological or ontological distinctions made among synthetic claims, no fundamental distinctions of methodology or ontology were made among the sciences. Whether one is considering physics, psychology, sociology, or whatever else, to be scientific, the claims of the discipline had to be either analytic or synthetic.

Third, in this understanding of legitimate theorizing, much traditional philosophy was to be swept aside as unscientific. One might wield the requirement of cognitive significance like a scythe—cutting down any claim that failed to be either clearly analytic or clearly synthetic, thereby eliminating a host of metaphysical claims and problems. Or one might take a more considered, clinical approach, as Carnap did. Many traditional philosophical disputes (idealism versus realism, for example) were seen as pseudoproblems—situations in which what appear to be contradictory claims regarding matters of fact are, according to Carnap, more fruitfully viewed as disagreements over which language (linguistic framework) should be adopted. Since adoption of a language is logically prior to the process of meaningful inquiry, nothing decidable by inquiry (that is, no matter of fact) is at issue. Rather it is a question of which language to adopt for the purposes of inquiry, and competing proposals can be assessed only on pragmatic (and, so, for Carnap, nonfactual) grounds. Thus, what traditionally would be taken as a deep dispute requiring metaphysical inquiry is cast by Carnap as a question not of truth, but of methodological and linguistic efficacy. Provided a proponent is clear about the structure of the language, tolerance reigns when considering the very loosely constrained questions of how perspicuous, simple, and fruitful the proposed framework might eventually prove.

While this view substantially deflates the status of philosophy as queen of the sciences, it does not completely relegate her to the position of intellectual handmaiden. The logical empiricists maintained a role for philosophy in the use of logic, set theory, and mathematics to analyze, clarify, and simplify the ground, structure, and results of empirical theorizing. Since those disciplines were understood to be analytic, philosophy itself is understood to be analytic (or the pragmatic investigation of analytic frameworks) and is not expected to make synthetic claims, or produce knowledge—such is the job of (and only of) unified science. Rather, philosophy is an a priori discipline of linguistic and conceptual analysis, maintaining a status independent of and methodologically distinct from empirical science. Far from playing a passive or merely organizing part, however, the analytic

work of philosophy was projected to play a significant role in the advance of knowledge by illuminating the epistemology of science and helping to diagnose, cure, and prevent outbreaks of pseudoproblems.

Quine emerges from this tradition and inherits its concerns, but in rejecting the analytic/synthetic distinction he radically transforms the manner in which they are addressed. The conception of analyticity was central to the logical empiricists' semantics, epistemology, and dismissal of metaphysics; moreover, it marked the frontier between science and what remained of philosophical inquiry. In place of the picture sketched above, Quine offers a holistic semantics and epistemology that allows for only a difference of degree (not type) between so-called analytic and synthetic sentences. All meaningful sentences (including those of logic and mathematics) have at least remote observational import, not when taken individually, but only insofar as they are part of a set of claims (up to the whole of science) having observational implications. Quine's rejection of analyticity and the holistic epistemology and semantics anchor his naturalism—a view of science and philosophy as fundamentally similar in subject and method, differing only in degree of contact with empirical considerations. Mathematics and logic are viewed, not as analytic a priori, but as central strands of ongoing theorizing, thus participating in the empirical content of the whole theory. Philosophy and science (and “common sense”) are on a continuum. In a sense, philosophy becomes science—though, as will be shown, this is a misleading turn of phrase.

Although Quine's importance is little disputed, there is much disagreement over the success and exact import of his rejection of analyticity and transformation of logical positivism and philosophy. Critical views of Quine range from those who aim to reject semantic holism (Fodor and Lepore 1992) and/or defend some form of the analytic/synthetic distinction (Boghossian 1997; Grice and Strawson 1956; Katz 1966) to those who read Quine as the revolutionary who could not, himself, see the full implications of his break with tradition (Rorty 2001). These disputes will be important at various points in this essay.

### “Two Dogmas”, Analyticity, and Philosophy

“Two Dogmas of Empiricism” (Quine [1951] 1980) is often looked to as the decisive moment in Quine's rejection of analyticity, and, indeed, as a (if not *the*) decisive moment in the development of twentieth-century analytic philosophy. Rorty (2001), with

typical enthusiasm, hails it as the most important article of the century and writes that it “rocked the audience back on its heels”. Such folkloric status is enhanced by its appearance right at the midpoint of the century—Quine presented the paper in December 1950 to the American Philosophical Association in Toronto, and it was published in *Philosophical Review* in January 1951—dividing the calendar perfectly. The date of Quine’s death, moreover, nearly perfectly marks the semicentennial of “Two Dogmas”. Yet, while it does contain the famous arguments against analyticity and the striking initial pronouncement of Quine’s holism, and has been discussed and translated perhaps more than any other English-language article in philosophy, “Two Dogmas” must not be considered in isolation from its surrounding works. It constitutes only a part of Quine’s attack on analyticity, and, in truth, contains only a sketchy statement of his metaphysical and epistemological views. Thus, a discussion of the article can be a starting point, but by no means an endpoint.

Quine opens “Two Dogmas” by proposing to examine the notion of analyticity (that certain truths are true in virtue of meaning and independently of fact) and the notion of reductionism (that each meaningful sentence is equivalent to some claim in an observational language). The ensuing criticisms strike at the center of the logical empiricist conceptions of science, the a priori, and philosophy.

Quine divides supposedly analytic truths into two classes: the logical truths and those that can be transformed into logical truths by appropriate substitution of synonyms (whether this classification exhausts the supposed analytic truths has been questioned; see, e.g., Boghossian 1997; Katz 1966). Quine proposes initially to take the first class for granted and focus on the second class of analytic sentences. Thus, “Two Dogmas” has very little explicit discussion of logical truths, even though his criticisms of the analyticity of logic are more fundamental than much of what goes on in “Two Dogmas”—this issue will resurface in greater detail further on. Since Quine focuses on statements that can supposedly be transformed into logical truths by appropriate substitution of synonyms, the initial problem is to gain a relevant understanding of synonymy, or sameness of meaning.

Definition is surveyed and rejected as helpful in explicating synonymy—for, Quine argues, definitions either depend on preexisting synonymies, thereby failing to explain them generally, or are explicit introductions of notational variants, again failing to explain the synonymy relation generally.

Next, Quine considers the condition of interchangeability *salva veritate*: Two terms are synonymous if they can be interchanged in all contexts without change of truth value. The problem Quine finds is that in order to secure a relation stronger than mere coextension, one must either include a necessity operator in the language or modify the interchangeability requirement from preservation of truth value to preservation of analyticity. The latter is a nonstarter, as analyticity is what wants explanation. The former, though less obviously, is equally a nonstarter according to Quine. The only way he sees to make sense of a necessity operator is essentially to presuppose an understanding of analyticity; thus, again, one must presuppose what wants explaining. Quine concludes that explaining analyticity by way of synonymy fails.

Quine next considers an attempt to define analyticity directly, at least for artificial languages, via semantical rules. His complaint here is that while there are various ways of distinguishing a subset of the truths of some artificial language  $L$  and labeling them “analytic for  $L$ ”, this provides no understanding of what “analytic” means generally, for there is no indication of how this would generalize across languages (“ $S$  is analytic for  $L$ ”, with variable  $S$  and  $L$ ), nor is there any indication of how the specific notion of analytic for  $L$  relates to the notion of analyticity for natural languages. Even if there were a specification of “analytic for  $L$ ” that captured intuitions concerning natural language analyticities, no clarity would be gained, for the attempt to explain the natural language case was abandoned in hopes that an appeal to artificial languages would be more illuminating (though more on this below). As an alternate approach, the analytic truths of  $L$  might be specified by appeal to the semantical rules of  $L$  (for analyticity is supposed to have something to do with meaning relations). Then “ $S$  is analytic for  $L$ ” for variable  $S$  and  $L$ ) becomes “ $S$  is true in virtue of the semantical rules for  $L$ ”. But, of course, “semantical rules for  $L$ ” wants explaining in a general way, for any recursive specification of a set of truths of  $L$  could be labeled as semantical rules. Again, the proposal gives no way of identifying what the rules or analytic truths of one language supposedly have in common with those of other languages, no way of explaining a general notion of analyticity. Quine (1980, 37) concludes that belief in analyticity is an “unempirical dogma”.

Quine then discusses reductionist verificationism. If, as the reductionist view claims, each meaningful statement could be translated into some statement in a logico-observational language, then

there would be an eminently clear criterion of statement synonymy (translating into the same observational claim), from which a criterion of term synonymy could be derived. This understanding of synonymy would then yield an understanding of analyticity. This strict form of semantic reductionism had already been discredited by the date of “Two Dogmas”, but Quine claims that the notion that a sentence has a specifiable content independently of other sentences still survives in the doctrine of analyticity. That doctrine encourages the idea that each sentence has a clearly specifiable content, while the idea of specifiable sentential content (left over from strict reductionism) encourages the idea that some sentences lack empirical content, that what content they have is not at all empirical but purely a question of meaning relations. Thus, discrediting the notion of specifiable sentential content discredits the notion of analyticity, for Quine sees the two as inextricably linked. Moreover, by underlining the failure of strict reductionism and extending its moral to the then current doctrines concerning the empirical content of supposedly synthetic claims, Quine is criticizing both sides of the logical empiricists’ conception of the analytic/synthetic distinction.

In place of the notion of specifiable sentential content, Quine offers an early version of his semantic and epistemic holism. There is a strong remnant of logical empiricist verificationism here—Quine (1980) continues to countenance the notion of empirical content, but not of sentences taken individually: “The unit of empirical significance is the whole of science” (42). Following Duhem and Neurath (see Neurath, Otto; Duhem Thesis), Quine emphasizes the holistic nature of theory. Since no hypothesis has observational implications independently of a host of auxiliary hypotheses, there is, for Quine, no sense in which any theoretical claim is meaningful independently of the theory in which it is embedded. Moreover, since only a conjunction of hypotheses has observational implications, a failed prediction falsifies not a specific hypothesis, but a conjunction of hypotheses. Where the theory should be modified in order to defuse the implication and maintain consistency is underdetermined by the evidence. The falsification determines only that one or more of the conjuncts must be rejected or changed, but nothing determines which. On the basis of this underdetermination Quine claims that in the face of failed prediction, any sentence may, in principle, be maintained by making the necessary adjustments elsewhere in the theory. Conversely, any sentence may be revised, again, so long as the concomitant

adjustments are made elsewhere. Quine even countenances the possibility of rejecting logical or mathematical laws in order to defuse the inference. All that is necessary, initially, is to block the inference leading to the false predictions. If rejection of a law of logic or mathematical claim will defuse the inference, then such an avenue is open. Since logic alone cannot determine how a theory must be revised, Quine claimed that pragmatic considerations (including conservatism and simplicity) figure into the choices made. Again, this follows Neurath’s emphasis on the role of pragmatic concerns in theorizing. Neurath’s conception of those concerns, however, was much broader than Quine’s—for Neurath included social, economic, and political issues among the relevant considerations (Neurath 1983).

This latter claim of radical revisability is often taken as a further argument against the analytic/synthetic distinction, especially given the linkage of analyticity to apriority. For, if analyticity and apriority coincide (as the logical empiricists would have it) and if a priori claims are unrevisable (as is, perhaps, intuitive), then radical revisability would imply that there are no a priori truths, and so no analytic truths. Such a reading is encouraged by the opening of a famous paragraph of “Two Dogmas”. Quine (1980) has been discussing holism:

If this view is right, it is misleading to speak of the empirical content of an individual statement—especially if it is a statement at all remote from the periphery of the field. *Furthermore it becomes folly to seek a boundary between synthetic statements, which hold contingently on experience, and analytic statements, which hold come what may.* Any statement can be held true come what may, if we wish to make drastic enough adjustments elsewhere in the system. Even a statement close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of excluded middle has been proposed as a means of simplifying quantum mechanics; *and what difference is there in principle between such a shift and the shift whereby Kepler superseded Ptolemy, or Einstein Newton, or Darwin Aristotle?* (43)(emphasis added)

The first italicized portion suggests that Quine is appealing to mere revisability in his rejection of the analytic/synthetic distinction. But this common interpretation fails to account for the final lines of the paragraph and to take into account the views of Carnap, the main target of Quine’s criticisms. Unrevisability was no part of Carnap’s view of analyticity. Indeed, a central pillar of Carnap’s

view was that competing analytic frameworks could be chosen or revised based on pragmatic considerations and that such changes are in principle different from changes made in the synthetic portions of theory. This is the heart of Carnap's deflation of metaphysics and the notion of the constitutive a priori. If Quine is appealing only to the revisability of supposed analytic claims, then this criticism flies wide of Carnap's conception. Thus, there must be more going on in the preceding paragraph, and it occurs in the final lines. Quine is appealing not just to revisability, but to there being no principled difference between the revision of supposedly analytic claims (e.g., logical laws) and supposedly synthetic claims (e.g., that planets move only in perfect circles).

The point for Quine is that any revision made to the overall theory is supposed to improve its fit with sense experience while maintaining as much simplicity and usability as possible. This is just what a theory is for Quine—a linguistic construct facilitating interaction with—and understanding of—the world, constrained by predictive test and pragmatic considerations of simplicity and efficacy. There is no difference of type in the considerations that might lead to the revision of a law of logic and those that might lead to the revision of a so-called synthetic claim. Rather, there are only differences of degree—a difference in how directly linked to observations a claim is, and a difference in the amount of readjustment a revision would require in the rest of the theory. The natural (and pragmatic) tendency toward conservatism and simplicity inclines theoreticians away from revising logic and mathematics and toward revising claims more closely linked to observation. Given this conservatism, revision of the more fundamental portions of theory (mathematics, logic, ontology), though always an option, will be considered only when either prediction meets with gross and extended failure in some domain, or some important and widespread gain of theoretical simplicity is in the offing (or both). Despite this difference in degree, and despite the difference in intellectual focus it occasions when revising theory, every decision to revise or accept a theory is a question not of this or that specific hypothesis, but of the whole theory. And any such decision is constrained by a combination of pragmatic and empirical considerations. Hence, for Quine, there is no difference of the kind Carnap conceived—no distinction between kinds of revision, between the analytic and the synthetic, between the purely pragmatic and the fully factual. Thus, setting aside some qualifications to be addressed below, Quine's holism and radical

revisability do generate a further argument against analyticity. But it is the lack of a principled difference in kind of revision, not mere revisability itself, which is operative.

Finally, having rejected reductionism in favor of holism regarding empirical content, there is no need for analyticity as a special explanation for the supposedly nonempirical, a priori claims of logic and mathematics. Despite being linked to observation only remotely, logic and mathematics participate in the empirical content of the whole system, for they are ubiquitous in and essential to the inference of observational consequences from sets of hypotheses. The apparent unrevisability, apriority, and necessity of logic and mathematics are explained via the unwillingness to revise such central strands of theory and the usual availability of simpler revisions.

Note that despite how Quine opens "Two Dogmas", holistic considerations do address the analyticity of logic (the first class of analytic claims). Indeed, the arguments against the semantic rule conception also address the analyticity of logic, though this may not be entirely transparent while reading "Two Dogmas". But the full-fledged attack on the analyticity of logic and math occurs in "Truth by Convention" (Quine [1936] 1976a) and "Carnap and Logical Truth" (Quine [1960] 1976b).

It is in these pieces straddling "Two Dogmas" that some heavy work is done in attempting to dismantle Carnap's conception of analyticity. Indeed, it has been argued (most recently by O'Grady [1999] and George [2000], but see also Gregory [2003]) that "Two Dogmas" actually does very little to damage Carnap's conception of analyticity and the use to which he puts it. The main problem is that Carnap was not, ultimately, interested in explaining and grounding an analyticity distinction applicable to natural language, nor was he interested in a general definition of analyticity applicable across artificial languages. As Carnap ([1952] 1990) notes, all he himself is after is a formally articulated distinction within an artificial language that, to some extent, though by no means perfectly, captures intuitions regarding analyticity and that, more importantly, clearly delineates framework commitments from theoretical commitments. This is consonant with Carnap's overall metaphysical deflationism and his view of philosophy as a discipline of linguistic analysis aimed at clarifying and examining analytic frameworks. In order to contribute to the advance of knowledge by helping to diagnose, cure, and prevent outbreaks of pseudo-problems, a concept of analyticity may not need to be grounded in natural language or generalizable

across artificial languages. All that “analytic for  $L_0$ ” need do, it seems, is adequately formalize and identify those sentences taken to be most fundamental to whatever theoretical conception is under examination. If “analytic for  $L_1$ ” does the same for an alternate theoretical conception, then sufficient clarity has been gained for pragmatic issues of framework choice to be considered. If this view of Carnap’s program is correct, then Quine’s criticisms of analyticity for artificial languages appear simply to miss their mark. For the upshot of Quine’s criticisms is that analyticity for artificial languages fails either to be nonarbitrary and generalize across languages or to capture and explain the concept of analyticity for natural languages. But on the above account, neither full generality nor explanation of natural language analyticity is required.

The situation is not so simple, however—for, along with the explication and comparison of competing theoretical frameworks, Carnap wanted to hold a deflationary stance toward the choice of analytic frameworks. As noted, such choice was understood as governed by purely pragmatic considerations such that framework decisions carry no genuine metaphysical import. Thus, the analyticity distinction is crucial to Carnap’s antimetaphysical program and to the conception of philosophy as unique in its method of analysis. But it is not entirely clear that these aspects of the view evade the conjunction of the “Two Dogmas” criticisms with those extracted from “Truth by Convention” and “Carnap and Logical Truth”. In those works Quine argues (among other things) that the method of legislative postulation (as it is called in the later article), while promising to establish certain sets of sentences as true by convention or analytic, can easily be extended beyond logic and mathematics, beyond what is taken to be fundamental to a theory proposal, to include even empirical truths—indeed, every supposed truth of the theory in question. There is no principled stopping point to the legislative postulation of truths. Thus, there is no principled stopping point (on this account) to the circumscription of analytic truths. That is, if one wished, one could define the whole of a theory as analytic (this point is implicit in the “Two Dogmas” criticism of semantical rules). This is no problem for Carnap’s explicative aims. One can still delineate competing theories, restricting the postulation of truths to those sets of sentences the proponents of a theory take to be most fundamental. This, surely, will facilitate understanding and pragmatic comparison of theories, thereby aiding the advance of science.

The lack of a principled analytic/synthetic distinction is, however, a problem for Carnap’s metaphysical deflationism. The notion of analyticity was supposed to support the deflation of metaphysics by distinguishing sets of sentences whose acceptance is a matter of pure pragmatic decision from sets of sentences whose acceptance constitutes a judgment of truth. The former are the analytic sentences of the language, and, as their acceptance is supposed to be logically prior to all meaningful inquiry in that language, their acceptance cannot constitute a judgment of truth—rather, it is supposed to be a pragmatic decision regarding which tool to use. But if the exact delineation of a set of analytic sentences is constrained, not by some logical principle or any deep understanding of natural language synonymy, but by only what seems fundamental to the supporters of a particular proposal, then the metaphysical deflationism loses its force. This is because the distinction between pragmatic framework decision and synthetic judgment carrying metaphysical import is essentially arbitrary and can be varied at will. The whole of a theory might be defined as analytic, or none of it, or some proper portion.

If the whole is taken to be analytic, then any change in theory is supposed to count as a purely pragmatic framework decision, where such decisions are constrained by simplicity, coherence, facility of use, and the overall empirical fit of the theory. But, since the whole theory is analytic, no other kind of change can be made. So there is no distinction here between pure pragmatic decision and genuine judgment. If none of the theory is taken as analytic, then any change is supposed to count as a genuine judgment of truth. But, again, such changes will be constrained by overall simplicity, coherence, facility, and empirical fit. No real distinction is being made here either. If one of the many middle roads is taken, then nearly any proper portion of the theory may be taken as analytic. However, without some principled ground (in logic or natural language) for analyticity, all this amounts to is the assigning of provisional protected status to certain sets of sentences, such that revising *those* sentences is taken to be a more fundamental sort of revision than revising others. But, depending on current pragmatic and empirical concerns, including the intuitions of the theoreticians involved, exactly which portion of the theory is so protected can be varied at will. Such a view, Quine (1976a, b) argues, supports a distinction not of metaphysical status, but only of the theoreticians’ current willingness to revise certain portions of the theory as opposed to others—a willingness that can

evolve as theory, evidence, and pragmatic concerns evolve. If this is correct, then, for want of a principled analytic/synthetic distinction, Carnap's deflationary metaphysics collapses into a view nearly identical to that of section 6 of "Two Dogmas"—a view that accords equal metaphysical import to all truths of the theory, distinguishing them mainly by the theoreticians' willingness to revise (Gregory 2003).

In addition to attempting to undermine Carnap's deflationism, Quine's rejection of analyticity is supposed to result in an erasure of the logical empiricists' distinction between philosophy and science. Quine still has a conception of the unity of science, but now this includes mathematics, logic, and philosophy—these being understood not as analytic disciplines, but as empirically meaningful in virtue of their contribution to the whole theory. Metaphysical deflationism is rejected, but Carnap's explicative aims persist. Logico-mathematical analysis of theoretical proposals is still central to the practice of philosophy, but the judgments and decisions based on such analysis are not considered devoid of metaphysical import. Thus, Quine reinflates metaphysical inquiry, but only so long as the claims of such inquiry participate in the empirical content of the whole theory. Moreover, it is not only the philosopher who recognizably engages in such philosophical activity, it is open to any self-conscious theorizer. The main differences among the layperson, the scientist, and the philosopher are simply in the frequency and degree of sophistication with which that individual engages in abstract reflective analysis. Thus, while philosophy becomes science, science is recognized as having always been philosophical.

It is not easy to be clear on what this means. There are two natural, yet polarized, ways of misinterpreting the impact of Quine's rejection of analyticity and re-inflation of metaphysics. On one side, there is the view that Quine (re)instates a certain liberalism regarding metaphysics and philosophy. On the other is the view that Quine has rejected philosophy altogether in favor of a rigid scientism. In the liberalist interpretation, Quine's rejection of logical empiricist constraints on inquiry reopens the door to traditional metaphysics; or, in conjunction with his stress on pragmatism, it opens a new door to a hypertrophic pragmatism in which inquiry is constrained only by social practice. In the scientistic interpretation, Quine's rejection of the boundary between science and philosophy and his insistence on empirical significance leave no room for philosophical inquiry—all is science, and science is all.

Both interpretations mistake what Quine took to be the nature of his own views. Against the liberalist interpretation, Quine consistently maintains the importance of observational constraints on inquiry and that even despite observational underdetermination of theory, these constraints can distinguish better from worse theories (1969, 1975, and 1998). Moreover, Quine is best understood as a form of metaphysical realist—at least in the internalist sense. For Quine claims that there is no standard transcending the best scientific methodology from which to make meaningful claims of anti-realism regarding ongoing theory (Quine 1981b, d; [1990] 1992). The scientistic interpretation is closer to being accurate but ignores both Quine's attitude toward current science and the way in which he is trying to reconceive philosophy. On the first count, the charge of scientism implies a blind faith in the methodology and deliverances of science or scientists, but Quine accounts for both the possibility of large-scale theoretical change (taking even foundational commitments as tentative), as well as small- and large-scale methodological change (see below). Quine (1981c, 22–23; [1990] 1992, 20–21) even countenances the possibility of rejecting physicalism and empiricism (though not intersubjective testability). On the second count, to view Quine as plumping for science and dismissing philosophy is to maintain a simplistic distinction between the two, such that one must, by embracing science, be rejecting philosophy. But, as the discussion of analyticity begins to reveal, Quine sees no fundamental distinction between the two, and not simply because what is best or acceptable in philosophy is what is scientific. Rather, it is because scientists and philosophers alike speculate and theorize about the world in an attempt to understand it; and any such theorizing is constrained by holistic empirico-pragmatic concerns. The more closely tied to observation inquiry is, the more scientific it is; conversely, the more remote from observation, the more philosophical—it matters not what academic department one reports to. Philosophy does not disappear; indeed it is understood as ubiquitous. The grain of truth in the scientistic interpretation is that Quine was thoroughly (though in principle tentatively) committed to the findings and methodology of science. Moreover, Quine was deeply committed to the notion that as one's distance from intersubjective checkpoints increases, so does one's risk of moving beyond science or philosophy, into fantasy or gibberish. The scientistic interpretation fails, however, to recognize that Quine, via philosophical analysis and argument, maintained a unique caution and skepticism regarding science,



based in large part on his (very philosophical) recognition of how tenuous is the connection between intersubjective checkpoints and the vast theoretical structures erected upon them.

### Observation, Theory, and Naturalized Epistemology

At the most general level of description, Quine has a hypothetico-deductive model of science. Hypotheses are generated and sets of them tested by the observational predictions deducible from those sets. When prediction is successful, then so far so good—confidence should always be tentative. When prediction is not successful, then new or revised hypotheses are called for. Given Quine's naturalism, understanding the details of hypothesis generation and testing is a task for science itself. Many subdisciplines will be relevant—physics, neurology, psychology, evolutionary biology, linguistics, history of science, etc.—especially on the generative side of the tale. But Quine ([1990] 1992, 2) believed he had “by means of little more than logical analysis” shed significant light on the structure of prediction and testing. The observation sentence is central to this analysis.

Observation sentences are supposed, in some sense, to be those sentences most closely associated with concurrent sensory stimulation and on which members of a language community will largely agree when presented with the same stimulus situation. To make this more precise, three criteria pick out observation sentences relative to a community of speakers. First, observation sentences are occasion sentences. That is, they are true at some times and places, and false at others (e.g., “There's a dog”). This is in contrast to standing sentences, which are true always or false always (e.g., “Electrons carry negative unit charge”). Second, a sentence is observational for an individual speaker if that speaker responds affirmatively (at the time of stimulation) for some range of stimulations of the speaker's sensory receptors, and negatively for some other range (there may also be a range in which the speaker is noncommittal). Stimulation of a subject on a given occasion is understood as “the temporally ordered set of all those of his exteroceptors that are triggered on that occasion” (Quine [1990] 1992, §2). Given this definition of stimulation, two subjects cannot share the same stimulation unless they share nerve endings. Hence, a careful way of stating the component of communitywide agreement is needed. So, third, a sentence is an observation sentence for the community if it is observational for each member individually and if

community members would agree in their verdicts upon witnessing the same (or a similar) occasion of utterance (Quine [1990] 1992, §§2, 15–16). Thus, an abbreviated definition might run: An observation sentence is an occasion sentence that commands assent or dissent outright upon query in a given stimulus situation, and this pattern of assent and dissent is consistent across a community.

Observation sentences have a dual semantical and epistemological importance for Quine. Semantically, they are both the locus of empirical content and the first rung on the ladder of language acquisition. Epistemologically, they are the intersubjective checkpoints of science. The very same intersubjectivity of utterance and prompting occasion that normalizes usage and affords a way into language for the neophyte also allows for the testing of sets of hypotheses. Since hypotheses consist mainly of standing generalizations, they do not imply individual observation sentences (particular occasion sentences). Rather, sets of hypotheses imply observation categoricals. These are generalized conditionals of observation sentences (e.g., “Whenever there's an apple, then it's red”). Indeed, observation categoricals are a sort of minimal hypothesis, expressing generalized or habituated expectation. Unlike observation sentences, they are testable—one instantiates the antecedent and checks to see if the consequent obtains. If it does, then so far, so good. If not, then the conjunction of implying hypotheses is falsified, and revision is called for. Outside of his definition of observation sentences and categoricals, Quine takes a rather straightforwardly Popperian and Humean line on the logic of testing (see Popper, Karl Raimund). The testing of sets of hypotheses via the testing of observation categoricals they imply can, strictly speaking, only refute the conjunction of hypotheses. The continued success of predictions embodied in implied observation categoricals reinforces the habit of reliance on and confidence in the categoricals and their implying hypotheses (Quine 1981a, 28; [1990] 1992, §§5–6).

It is important to avoid some misunderstandings regarding observation sentences. Though Quine saw them as playing the role classical empiricists had wanted of sensory evidence, they are not Humean impressions, nor Russellian sense data. Nor, in contrast to certain logical empiricist conceptions of protocol sentences, are they reports of sensory phenomena. They are occasion sentences so strongly associated with ranges of stimulation that utterance or assent/dissent is practically immediate. Such immediacy is supposed to minimize, though by no means eliminate, reliance on learned

theory. Viewed as undifferentiated wholes (holophrastically), observation sentences are nontheoretical responses to stimuli. This is part of what allows the novice to acquire a language. But observation sentences are not simply undifferentiated wholes. They contain terms that appear in more theoretical sentences, and it is in virtue of these shared terms that observation categoricals are implied by hypotheses. This dual nature has a number of implications. First, though when taken holophrastically they appear theory neutral, observation sentences are theory laden in virtue of the inferential connections to and terms shared with theoretical sentences. Second, in addition to direct conditioning, observation sentences may be learned via description and inference. Third, observationality of a sentence is relative to the community specified. What counts as observational for one community (“That’s a red giant”, “That’s a middle C”), in virtue of the members’ spontaneity of judgment in a stimulus situation, may not count so for a broader community. At any given time, however, the more specialized speakers could instruct those less specialized, in part by reverting to observation sentences common to both. It should also be stressed that observation sentences are not incorrigible. Assent to the utterance of an observation sentence may be rescinded either in the face of further observation or as the result of theoretical considerations. Thus, while observation sentences play a fundamental role in the testing of hypotheses, they are not a form of sensory given or simples forming an incorrigible foundation for knowledge.

Thus, logical analysis and some armchair psychology yield the prediction and testing side of the story, at least in outline. The generative side of the story, however, is highly unconstrained by logic and observation. Understanding the generation of expectations, projections, and hypotheses thus requires more than just logical analysis.

On the one hand, theoretical claims cannot be deduced from observations because there is no logic of ampliative inference, nor do logical constraints determine how to revise in the face of failed prediction. On the other hand, the rejection of analyticity, apriority, and reductionism involve repudiating both the Cartesian goal of externally justifying scientific methods and the Carnapian goal of rationally reconstructing the logico-empirical structure of science (Quine 1969). The natural sciences themselves are to be used to “address the question how we, physical denizens of the physical world, can have projected our scientific theory of that whole world from our meager contacts with it” (Quine 1995, 16). Thus, it is not that ampliative

inference is devoid of all system or structure. Rather, what system or structure can be imputed to it will be largely extralogical—a matter of the evolution of innate similarity standards in the species, in the cognitive development of individuals, and in the community’s ongoing theorizing. In the earliest pronouncements, such as “Epistemology Naturalized”, Quine (1969) focuses especially on psychology as the science wherein this project is to be pursued. In later writings, such as *Pursuit of Truth* (Quine [1990] 1992), neuroscience, evolutionary genetics, and the history of science are included. The epistemologist is to investigate the complex and various ways humans actually do arrive at theories, including neurological, psychological, sociological, and historical factors.

Interestingly, despite arguing in favor of the naturalization of epistemology, Quine engaged in no hands-on investigation of the sort he urged. Perhaps this was a consequence of his professed dislike of laboratory work and enjoyment of popular science literature (see Hahn and Schilpp 1998, 5, 43; Quine 1985, 37). He did, however frequently theorize on how to gather behavioral evidence of a subject’s similarity standards and their evolution, including, of course, the development of language (see e.g., Quine 1974 and 1981c). Foley (1994) takes this as a sign that Quine was not doing epistemology in any new way, but unless one accepts a naive distinction between philosophy and science, it should not be expected that all naturalistic epistemologists be lab rats as opposed to abstract theorizers.

Three interrelated objections have typically been raised regarding Quine’s naturalized epistemology—the circularity objection, the normativity objection, and the change-of-subject objection. As the responses to these objections are also interrelated, it is worth considering them en masse. If epistemologists are to engage in a scientific study of science, then it seems that the results must be circular, thereby vitiating the normative/justificatory project of epistemology (the circularity objection). Given the circularity issue, and the fact that science is a purely descriptive endeavor, no scientific epistemology could ever be a normative epistemology, but the normative aspect is a crucial part of any philosophical epistemology (the normativity objection). While the epistemology Quine advocates may be of interest to psychologists, it is not a properly philosophical epistemology, since, being circular and purely descriptive, it fails to address the fundamental normative questions of traditional epistemology—Quine is simply changing the subject. These will be addressed in reverse order.

It is correct that in some sense Quine is attempting to change the subject, to motivate a departure from or reconception of traditional epistemology, but it is naive to conclude that naturalized epistemology is no longer philosophical, losing all contact with traditional issues. This maintains the simplistic dichotomy between science and philosophy that Quine was repudiating, and it seems to treat traditional formulations of questions as somehow sacrosanct. Quine's importance, and that of his naturalism, rests in the attempt to reconfigure the field of inquiry in a philosophically and scientifically fruitful manner. Hence the change-of-subject objection has the air of mere dismissal, as opposed to critical engagement.

The normativity objection presupposes that science is purely descriptive, that all a scientific investigation of belief and theory formation can do is list the various and sundry things that go on. But scientific theory and practice have significant normative dimensions, as evidenced by idealizations used in theory development and testing and the normative role of theory in engineering. Moreover, these norms are applied to scientific practice itself, allowing differentiation of practices according to their measure along different parameters. As these measures of instrumental efficacy are theoretical claims, they are fallible and open to revision. Quine cited predictive success as the ultimate parameter. So, naturalized epistemology is the assessment of the instrumental value of cognitive and social practices toward the goal of predictive success. Quine supports this through his analysis of the structure of theory and evidence, which reveals that prediction of intersubjectively available checkpoints is the fundamental norm of science. Since, as science reveals, information comes through the five senses, success in sensory prediction is the "final arbiter". As mentioned during the discussion of his alleged scientism, Quine ([1990] 1992, 20–21) recognized the possibility of admitting sources of information and testing other than the senses (extrasensory perception, revelation), were this ever warranted. He stopped short of speculating about giving up on intersubjective predictive tests altogether.

One further point bears mentioning. Clearly, to say that predictive success is the end against which methods are assessed is not to say that predictive success is the goal of science or cognition. It is likely one of the goals, but truth, understanding, and aesthetic enjoyment are surely others. Finding value in various practices, even if only distantly or loosely connected to predictive success, is entirely consistent with taking predictive success as the test parameter.

The obvious circularity of this approach is not a problem from Quine's point of view. The rejection of analyticity and apriority and the view of common sense, science, and philosophy as continuous imply that inquiry (epistemological or otherwise) cannot begin from a position independent of all theory. Hence any such inquiry is ultimately circular. But this is not to be understood as defeatist resignation. It is not that the demand for an independent justification of science and its methods is well grounded, but, alas, it cannot be met. Rather, the point is that such a demand is itself based in a misconception of the nature of theory and language—a misconception of epistemology. Quine tried to offer a better conception. There is a further worry that because natural epistemology begins from within ongoing scientific theory, it is doomed to reinforce the norms already at work in science. But this, while not impossible, is as unlikely as the possibility that no new theories will be developed, because all inquiry begins from within ongoing theory. Theory changes in the light of new evidence and new understandings of old evidence and theory. Methodological norms are fallible and may change with developing theory. It is no more likely that natural epistemology will become stuck in a loop of blind stagnation than that science in general will. For Quine, the epistemology of science is on a par with science itself (Gregory 1999; Quine 1969 and [1990] 1992).

## Conclusion

It is worth illuminating points of contact with a few other philosophies of science. There are, of course, the connections to and departures from logical empiricism. The stress on falsification links Quine with Popper, as noted above, though Quine never maintained a sharp criterion of demarcation between science and pseudoscience. Quine's recognition of a lack of purely logical constraints on theory change, his assertion of the theoretical nature of normative constraints, his holism, and his stress on conservatism while recognizing the possibility of fundamental revisions—all these suggest that theory development will usually be a rather mundane affair but that given extended and serious failure in some domain, dramatic and very loosely constrained change will occur. This is all perfectly consonant with Kuhn's account of normal science and paradigm change (see Kuhn, Thomas). Of course, Quine's view idealizes theories as formal linguistic structures and conceives of theory change as modification of such structures. Kuhn's view of theory change is much richer, paying detailed

attention to sociological, technological, and practical issues. Moreover, in Quine's view, revolutionary change is more highly constrained (mainly by predictive test) than in the typical reading of Kuhn. Finally, views of philosophers such as Lakatos (1977), who distinguish portions of theory that are less apt to be revised and are revised only under special circumstances, are less in tension with Quine's views than it might appear. Quine's views can countenance distinctions among sentences of more or less protected status, and naturalized epistemology is supposed to illuminate the nature of those distinctions. Tensions arise only insofar as such distinctions are taken to ground metaphysical and epistemological conclusions antithetical to Quine's naturalism. This is not to deny the presence of tensions between Quine's views and others' or to deny the possible value in rejecting Quine's naturalism. But it is important to note that while Quine is notorious for rejecting or blurring conceptual boundaries, his views can countenance certain kinds of distinctions.

Quine's criticisms of analyticity heralded the waning of logical empiricism. His holistic naturalism offers a unique view of philosophy as progressive, metaphysically committed, and continuous with science. His articulation of a version of naturalized epistemology was one of the major impetuses for the development, in philosophy, of naturalistic studies of science and cognition. Whether one accepts his naturalism in detail, in outline, or not at all, Quine's importance cannot be overestimated. Willard Van Orman Quine shaped philosophy and philosophy of science in the second half of the twentieth century.

PAUL A. GREGORY

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**See also Analyticity; Carnap, Rudolf; Duhem Thesis; Logical Empiricism; Neurath, Otto; Popper, Karl Raimund; Reductionism; Verifiability; Vienna Circle**