

From Lynn Hankinson Nelson and Jack Nelson, *On Quine*

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Better to discover how science is in fact developed and learned than to fabricate a fictitious structure to similar effect.

– W.V. Quine¹

The Argument for Naturalizing Epistemology

“Epistemology Naturalized” and “Natural Kinds” were published in 1969, the third and fifth essays in *Ontological Relativity and Other Essays*. Although the essays launched what are today substantial research programs, Quine’s arguments for and vision of naturalized epistemology remain deeply controversial in some philosophical quarters. In one sense, the controversy is not surprising. Viewed in light of the history of epistemology and the philosophy of science, Quine’s suggestion that these enterprises be recognized and pursued as part of science (“as a chapter of psychology”) is startling. It recommends against epistemology as generations of philosophers have pursued it (and as some continue to pursue it)—as a “first science” that is independent of science and the goal of which is to justify science. Quine argues, to the contrary, that epistemology is part and parcel of science, is science gone self-conscious.

But given Quine’s views on topics we have already explored, the suggestion that traditional epistemology be abandoned in favor of self-

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conscious science is not startling at all. It follows close on the heels of Quine's recognition that the project Carnap undertook in *Aufbau* cannot be completed, and it reflects Quine's doubts (as early as 1936) that sentences of logic and mathematics are true by definition. Both figure in the arguments of "Epistemology Naturalized." Moreover, Quine's rejection of the analytic/synthetic distinction makes the alleged non-empirical status of epistemology a non-starter. Finally, naturalized epistemology as Quine envisions it is a natural outcome of empiricism as Quine has sought to reconstitute it.

The opening pages of "Epistemology Naturalized" locate the sources of Quine's arguments for naturalizing epistemology in the failure, in the first half of the 20th century, to fulfill Hume's mandate to show that every truth can be accounted for either on grounds of logic (for logic and mathematics), or on grounds of sensory experience (for empirical truths). Quine's focus in this essay is, of course, the second project; but he begins by discussing the first. This enables him to later draw parallels between the failure of the first project (generally recognized by the time Quine published "Epistemology Naturalized"), and the failure he sees as inevitable (but not yet generally recognized) for the second. Commentators too often ignore these opening pages.

Quine notes that there were two focuses in studies into the foundations of mathematics. "Conceptual studies" were to show that the concepts of mathematics can be defined in the terms of logic. "Doctrinal studies" were to show that mathematical truths can be derived from the "obvious or at least potentially obvious... truths of logic" (70). The two projects are, of course, linked. If mathematical concepts are definable in the terms of logic, then the truths of mathematics are, in the end, truths of logic. If the latter are self-evident, so are the former.

The project failed, on both the conceptual and doctrinal sides, Quine notes, because it turned out that mathematics does not reduce to "logic proper," but "only to set theory" (70). This was a deep disappointment for two reasons.

[T]he end truths, the axioms of set theory... have less obviousness and certainty to recommend them than do most of the mathematical theorems we would derive from them. Moreover, we know from Gödel's work that no consistent axiom system can cover mathematics even when we renounce self-evidence (70).

Thus, the reduction of mathematics to set theory does not "reveal the ground of mathematical knowledge," does not "show how

mathematical certainty is possible" (70).

Against this background, Quine turns to efforts to identify the foundations of (recognizably) empirical science. Here there is also a conceptual project and a doctrinal project. The conceptual project, dating back to Hume, is to define sentences about physical bodies in terms of something directly linked to (or identical with) sensory experience. In this project, there has been progress. For Hume, bodies were to be identified with bundles of sense impressions, an approach Quine describes as "bold and simple." The subsequent shift from impressions to sentences as the bearers of empirical meaning (the second "milestone" of empiricism) shifted the focus of the conceptual project. The goal was now to show that sentences about bodies derive from or reduce to sentences about immediate sensory experience.

But, again it turned out that set theory was needed. And, as in studies into the foundations of mathematics, set theory compromised the conceptual project. Comparing the recourse to set theory with that of recognizing sentences as the bearers of meaning, Quine notes that

The two resorts are very unequal in epistemological status. Contextual definition is unassailable. Sentences that have been given meaning as wholes are undeniably meaningful, and the use they make of their component terms is therefore meaningful, regardless of whether any translations are offered for those terms in isolation... Recourse to sets, on the other hand, is a drastic ontological move, a retreat from the austere ontology of impressions (73).

Quine's earlier discussion of studies into the foundations of mathematics is now brought to bear. The reason that recourse to set theory in studies of the foundations of empirical science was not generally recognized as a retreat from empiricism, Quine argues, is precisely the "deceptive hints of continuity between elementary logic and set theory" (73). These hints led Russell to be willing to define the conceptual project as that of accounting "for the external world as a logical construct of sense data," a project that Carnap's *Aufbau* came "nearest to executing" (74).

Even if Carnap's project had been successful, it would not have aided the *doctrinal* project. To show that the sentences of science can be so reconstructed does not show that these sentences "can be *proved* from observation sentences by logic and set theory" (74). "On the doctrinal side," Quine notes, "I do not see that we are farther along today than where Hume left us" (72).

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Yet, Quine acknowledges that there were reasons to continue with the conceptual project, even in light of the abandonment of the doctrinal project and of the retreat that the recourse to set theory represented. One could still hope that the rational reconstruction of a sense datum language would “elicit” and “clarify” the sensory evidence for science, even if the steps between such evidence and scientific theories “fall short of certainty” (75). The reconstruction would contribute to understandings of how “all inculcation of meanings of words must rest ultimately on sensory evidence,” for had Carnap or others succeeded, “the sensory content of discourse would stand forth explicitly” (75). It was not even necessary for Carnap to be able to demonstrate that the construction he arrived at was “the right one.”

The question would have had no point. He was seeking what he called a *rational reconstruction*. Any construction of physicalistic discourse in terms of sense experience, logic, and set theory would have been as satisfactory if it made the physicalistic discourse come out right. If there is one way there are many, but any would be a great achievement (75).

But, for reasons we earlier considered, Carnap did not succeed. In “Two Dogmas of Empiricism,” Quine proposed holism as a counter-suggestion to applying verificationism. With that proposal the stage is set for Quine’s suggestion in “Epistemology Naturalized” that the conceptual project be abandoned altogether.

But why all this creative reconstruction, all this make-believe? The stimulation of his sensory receptors is all the evidence anybody has to go on, ultimately, in arriving at his picture of the world. Why not just see how this construction really proceeds? Why not settle for psychology? (75).

The turn to psychology (and Quine himself also appeals to linguistics and evolutionary theory) does represent a “surrender of the epistemological burden” to science; but this is appropriate given the abandonment of the doctrinal project.

If the epistemologist’s goal is validation of the grounds of empirical science, he defeats his purpose by using empirical science in the validation. However, such scruples against circularity have little point once we have stopped dreaming of deducing science from observations. If we are out simply to understand the link between observation and science, we are well advised to use any available information, including that provided by the very science whose link with observation we

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are seeking to understand (75-76).

Suppose, however, that we lower our sights on the conceptual side, seeking only to show that sentences of science can be *translated* into sentences involving sense data, logic, and set theory. If possible, such translation would further the Humean project by demonstrating “the essential innocence of physical concepts,” showing them to be “theoretically superfluous.” In so doing, “it would legitimize them—to whatever degree the concepts of set theory, logic, and observations are themselves legitimate” by demonstrating that “everything done with the one apparatus could in principle be done with the other” (76). The project might also retain a role for philosophy.

If psychology itself could deliver a truly translational reduction of this kind, we should welcome it; but certainly it cannot, for certainly we did not grow up learning definitions of physicalistic language in terms of a prior language of set theory, logic, and observation (76).

The problem, Quine notes, is that Carnap’s project did not succeed even in terms of translation. The point at which it becomes clear that Carnap’s translation will not succeed, Quine argues, “comes where Carnap is explaining how to assign sense qualities in physical space and time” (76). In “Two Dogmas,” we have seen, Quine argues that Carnap is unable to show how to translate a “statement of the form ‘Quality q is at $x;y;z;t$ ’ [a point instant]... into [his] initial language of sense data and logic” (40). Thus, Carnap is forced in subsequent writings to settle for “reduction forms,” something far less than straightforward translation. In “Epistemology Naturalized,” Quine notes that, rather than providing a way to eliminate the terms of one sentence by translating it into another, these forms

do not in general give equivalences; they give implications. They explain a new term, if only partially, by specifying some sentences which are implied by sentences containing the term, and other sentences which imply sentences containing the term (77).

This is a far cry from the outcome that translation “of the sterner kind” would have generated. To give up the project of defining (via translation) physical concepts in terms of observation, logic, and set theory, is to give up “the last remaining advantage that we supposed rational reconstruction to have over straight psychology,”

namely, the advantage of translational reduction. If all we hope for is a reconstruction that links science to experience in

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explicit ways short of translation, then it would seem more sensible to settle for psychology. Better to discover how science is in fact developed and learned than to fabricate a fictitious structure to similar effect (78).

As he did in “Two Dogmas,” Quine suggests that the source of the failure of the various projects just summarized is that most sentences do not have their own empirical meaning. The problem is not that “the experiential implications of a typical statement about bodies are too complex for finite axiomatization, however lengthy,” but

that the typical statement about bodies has no fund of experiential implications it can call its own. A substantial mass of theory, taken together, will commonly have experiential implications; this is how we make predictions. We may not be able to explain why we arrive at theories which make successful predictions, but we do arrive at such theories (79).

Since most of the sentences to be reduced or translated do not have their own empirical meaning, if we persist in translation projects, we will need to focus on the “significantly inclusive portion” of a theory that has empirical meaning, axiomatizing “all the experiential difference that the truth of the theory would make” (79). This, Quine suggests, would be a “queer translation” because it would involve translating “the whole but none of its parts” and, indeed, perhaps ‘translation’ is not even the correct description. What we will have, in the end, might better be termed the “observational evidence for theories,” their empirical meaning (79-80).

But we would do still better to give up translation projects all together. This is because, as we saw in the last chapter, the indeterminacy of translation plagues “even ordinary unphilosophical translation, such as from English into Arunta or Chinese.” Here, Quine repeats the argument he offered in “Speaking of Objects” that “we can justify [the translation of sentences of English] into Arunta only together as a body,” that there will be translations that will preserve the empirical implications of the theory we are translating (the observation sentences and observation categoricals it implies), and thus there will be no grounds for saying one is correct. That is, if holism holds, indeterminacy of translation follows for everything but observation sentences and their kin.

If we recognize with Peirce that the meaning of a sentence turns purely on what would count as evidence for its truth, and if we recognize with Duhem that theoretical sentences have

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their evidence not as single sentences but only as larger blocks of theory, then the indeterminacy of translation of theoretical sentences follows. And most sentences, apart from observation sentences, are theoretical (81).

In the end, then, holism dictates the abandonment of the various conceptual projects to identify a foundation for science in sense data. In contrast to those who see “the irreducibility” involved as “the bankruptcy of epistemology,” Quine suggests “it may be more useful to say rather that epistemology still goes on, though in a new setting and a clarified status.” Epistemology “or something like it, simply falls into place as a chapter of psychology and hence of natural science” (82).

Epistemology in Its New Setting

What precisely is the new setting of epistemology? Although Quine mentions empirical psychology each time he suggests abandoning “the old epistemology,” neither his own work subsequent to “Epistemology Naturalized,” nor the balance of the essay, suggests that philosophers will or should abandon epistemological questions all together. Rather, both suggest “an interplay” between psychology (as well as all other relevant sciences) and “the new epistemology.” Epistemology, engaged in by psychologists or philosophers, just is science gone self conscious; it is the use of the resources of science that marks the “conspicuous difference between old epistemology and epistemology in its new setting” (83). It is worth quoting at length two passages which suggest such interplay. In the first, Quine uses broad strokes to sketch the project of the new epistemology. Notice that his description presupposes a physicalist notion of experience, underdetermination, and other aspects of empiricism as he has sought to reconstitute it.

Epistemology, or something like 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. The relation between the meager input and the torrential output is a relation we are prompted to study for somewhat the same reasons that always 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 (83).

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That the input accorded the species is meager relative to our output, and that the input consists in the firings of sensory receptors, are implications of the output (theories) we deliver in response to those firings. That is, psychology is itself part of the bridge we have built to explain and predict such firings.

The old epistemology aspired to contain, in a sense, natural science; it would construct it somehow from sense data. Epistemology in its new setting, conversely, is contained in natural science, as a chapter of psychology. But the old containment remains valid too, in its way. We are studying how the human subject of our study posits bodies and projects his physics from his data, and we appreciate that our position in the world is just like his. Our very epistemological enterprise, therefore, and the psychology wherein it is a component chapter, and the whole of natural science wherein psychology is a component book—all this is our own construction or projection from stimulations like those we were meting out to our epistemological subject (83).

Thus, Quine concludes, “there is... reciprocal containment, though containment in different senses: epistemology in natural science and natural science in epistemology.”

In the balance of “Epistemology Naturalized,” Quine explores how using the resources of psychology might help clarify the notion of an observation sentence, and how such clarification will contribute to the conceptual and doctrinal projects of naturalized epistemology. Some hints are contained in the broad sketch of naturalized epistemology, earlier quoted. Notably absent from the project are experiences of which we are aware. This reflects Quine’s view of the implications of empirical science (that sensory evidence just is firings of sensory receptors) and the kind of empirical investigations called for on the basis of this implication. Approaching observation sentences in terms of the firings of sensory receptors both dissolves some old philosophical questions and reflects the abandonment of the project to justify science. No longer concerned with the latter project, “awareness ceased to be demanded”; observation can be defined “in terms of the simulation of sensory receptors, let consciousness fall where it may” (84).

We have devoted considerable discussion in earlier chapters to Quine’s notions of experience and observation sentences, and turn now to “Natural Kinds.” Here, Quine engages in the kind of epistemology just outlined. “Natural Kinds” is a complex and substantial essay, and it

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warrants more extensive discussion than we can provide. We focus on the ways in which it exemplifies and clarifies naturalized epistemology. Its topics are two hallmarks of human reasoning—“our sorting of things into kinds” (116) and induction—the relationship between them, and what explains them. Each, in one sense, is a problem. On the one hand, it is an implication of research in psychology and linguistics that there is “nothing more basic to thought and language than our sense of similarity, our sorting of things into kinds” (160). Sorting by resemblance—in terms both “of a resemblance between the present circumstances and past circumstances” in which a word is used, and in terms of phonetic resemblance—is necessary to language learning. Moreover, induction itself depends on the first sort of sorting and “our tendency to expect similar causes to have similar effects” (116-117).

A standard of similarity is in some sense innate. This point is not against empiricism; it is a commonplace of behavioral psychology... Without some prior spacing of qualities, we could never acquire a habit; all stimuli would be equally alike and equally different... Moreover, in this behavioral sense it can be said equally of other animals that they have an innate standard of similarity too. It is part of our animal birthright (123).

On the other hand, “the notion of similarity or kind,” so basic to human thinking and induction, “is alien to logic and set theory” (121) and “characteristically animal in its lack of intellectual status” (123). Moreover, “the relation between similarity and kind is less clear and neat than could be wished” (121). Having spent considerable time in the essay to establish these several points, Quine’s question is this:

For me... the problem of induction is a problem about the world; a problem of how we, as we now are (by our present scientific lights), in a world we never made, should stand better than random or coin-tossing chances of coming out right, when we predict by inductions which are based on our innate, scientifically unjustified similarity standard (127).

The question, we have seen, presupposes results in several sciences which suggest innate quality spacing in both our own and other species. It also presupposes Quine’s efforts, and those by Carnap, to make the notion of “kind” respectable by using logic and set theory. Quine takes these efforts to fail: “definition of similarity in terms of kind is halting, and definition of kind in terms of similarity is unknown” (121). Finally, Quine’s version of the problem of induction reflects the results of science, and of naturalizing epistemology.

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It is reasonable that our quality space should match our neighbor's, we being birds of a feather; and so the general trustworthiness of induction in the ostensive learning of words was a put-up job. To trust induction as a way of access to the truths of nature, on the other hand, is to suppose, more nearly, that our quality space matches that of the cosmos. The brute irrationality of our sense of similarity, its irrelevance to anything in logic and mathematics, offers little reason to expect that this is somehow in tune with the world—a world which, unlike language, we never made... Why should our subjective spacing of qualities have a special purchase on nature and a lien on the future? (125-26)

The answer Quine proposes is two fold. First he suggests that “Darwin’s natural selection is a plausible partial explanation” (perhaps “almost explanation enough” (127)) for our innate quality spacing and our use of induction.

If people’s innate spacing of qualities is a gene-linked trait, then the spacing that has made for the most successful inductions will have tended to predominate through natural selection. Creatures inveterately wrong in their inductions have a pathetic but praise-worthy tendency to die before reproducing their kind (126).

What makes natural selection “perhaps enough of an explanation” is that it can also explain induction’s “conspicuous failures” (127). Sorting by color, for example, seems endemic to the species and explicable in terms of its survival value (for example, it is useful for food-gathering). At the same time, our most serious theories of nature suggest that colors do “not qualify as kinds” and that the “distinctions that matter for basic physical theory are mostly independent of color contrasts” (127).

This sets the stage for the second part of Quine’s answer.

One’s sense of similarity or one’s system of kinds develops and changes and even turns multiple as one matures, making perhaps for increasingly dependable prediction. And at length standards of similarity set in which are geared to theoretical science. This... is a development away from the immediate, subjective, animal sense of similarity to the remoter objectivity of a similarity determined by scientific hypotheses and posits and constructs. Things are similar in the later or theoretical sense to the degree that they are interchangeable parts of the cosmic machine revealed by science (134).

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Science both reveals innate similarity space and dispositions to induction, and explains them (via Darwin's theory of natural selection). At the same time, analyses of science's development and success, of the sort Quine here engages in, suggest that "things about [our] innate similarity sense that are helpful in one sphere [*e.g.*, color to food gathering] can be a hindrance in the other [the search by science for "more significant regularities"]" (128). As a result, we learn that

Evidently natural selection has dealt with the conflict by endowing man doubly: with both a color-slanted quality space and the ingenuity to rise about it.

He has risen above it by developing modified systems of kinds, hence modified similarity standards for scientific purposes. By the trial-and-error process of theorizing he has regrouped things into new kinds which prove to lend themselves to many inductions better than the old (128).

Indeed, Quine suggests, "we can take it as a very special mark of the maturity of a branch of science that it no longer needs an irreducible notion of similarity and kind" (138).

Thus, naturalized epistemology as Quine engages in it is both an explanatory and a normative enterprise. It can both explain and evaluate the innate dispositions science reveals, and assess the maturity of the specific sciences in light of our best going theories, "our theory of the world itself" (135), which suggest that we do well to move beyond the notions of similarity we have inherited. It is our going theory of nature which indicates that the development from innate similarity spacing to theoretical similarity is an advance, and that we might hope for the disappearance altogether of the notion of similarity in our most refined theory of nature. "The career of the similarity notion," Quine suggests, "is a paradigm of the evolution of unreason into science" (138). This is, of course, a normative assessment, an evaluation of both common-sense theorizing and scientific theorizing. It draws on knowledge provided by the sciences and simultaneously assesses scientific theorizing on the basis of that very same knowledge.

Thus, the epistemologist who engages in science gone self-conscious is, like everyone else, working from within our best going theory of nature, and using aspects of it to evaluate our progress in rebuilding the ship in which we are afloat.

Endnotes

¹ Epistemology Naturalized, 78.