Abstract: Traditionally, philosophy has been considered the science of disciplinary foundations, primarily as the subdisciplines of metaphysics and epistemology. But in the 20th century, philosophy's traditional interdisciplinary authority was challenged from two directions, first by positivists, and then by neo-pragmatic and postmodern skeptics. Today metaphysics thrives as the study of the most general presuppositions of science. Foundational epistemology survives the demise of its stronger, monolithic version by acknowledging the holistic interdependence of all elements of belief.

Philosophy and the Logic of Meta-disciplinary Study

Traditionally, philosophy was the premier example of interdisciplinary inquiry. Because it tackles questions that are fundamental and universal, it touches on a variety of disciplines. Indeed, by way of metaphysics and epistemology, philosophy was considered the science of disciplinary foundations. But in the 20th century, philosophy's traditional interdisciplinary authority was challenged from two directions, first by positivists, and then by neo-pragmatic and postmodern skeptics. Those critiques misunderstand its metadisciplinary authority.

First philosophy and the adjudication of knowledge

By the time of Aristotle, philosophy was already interdisciplinary and normative for all sciences. Aristotle's Metaphysics, which became known as "first philosophy," was a mélange of basic principles overlapping the interests of ontology (the science of being), epistemology (theory of knowledge), and methodology.

Aristotle's theory of causation is a good example of the fuzzy boundaries of his metaphysics. Aristotle famously theorized four basic kinds of causation and claimed that most everything could be analyzed in terms of those four kinds (material, efficient, formal, and final). Those categories have typically been considered categories of being, but they have substantive methodological and epistemological implications as well. That became clear when scientists noticed that modern quantitative methods seemed to render final causation methodologically invisible and epistemologically superfluous, i.e., science can't see final causes and no one should miss them.

From the traditional perspective, in any case, philosophers were the scientists of the foundational principles of being and knowing.

Positivism and the elimination of metaphysics

In the wake of scholasticism's collapse, the success of the natural sciences convinced many that nature could provide more reliable foundations for knowledge than the conceptual abstractions of traditional metaphysics. Where metaphysics had claimed to offer fixed truths, empirical scientific knowledge evolves. Through all of science's revisions, what stayed the same was "the scientific method," which empiricists supposed to be the true foundation of knowledge. Modern Rationalists tried to revive the classical ideal of necessary and certain conceptual foundations, but they were routed by Hume and the increasing prestige of science. The rise of experimental science and the decline of conceptual speculation led to the positivist belief that experiential verification was the only valid method for science, culminating in A. J. Ayer's notorious call for the "elimination of metaphysics" as a goal for 20th century philosophy.

If all empiricists would not eliminate philosophy along with metaphysics, many would see it taken down a peg or two. Locke had already spoken of philosophy "underlaboring" for the sciences, i.e., describing and clarifying what scientists were doing as the real producers of knowledge. In their theoretical way, in fact, the logical positivists hoped to discover the logical structure of empirical knowledge, thereby adding to the store of science. In any case, philosopher underlaborers were hardly the imperial judges of the disciplines supervising from above. Rather, the scientific method was simply there for all to use – the ultimate epistemological tool – and anyone in any discipline could use it autonomously. Having once been the patriarch of the sciences, philosophy was now the loquacious by-stander, explaining the truth of what others practiced.

Philosophy: metadisciplinary or interdisciplinary?

In a different possible world, the collapse of positivism in the mid-20th century might have had the effect of restoring the prestige of philosophy as epistemological supervisor of the disciplines, but, ironically, it had the opposite effect. In Richard Rorty's landmark critique, positivism was simply the final chapter of philosophy's supervisory pretensions. Where philosophy had mistakenly conceived itself as metadisciplinary, it was actually only interdisciplinary. Interdisciplinary inquiry places itself between the disciplines while metadisciplinary inquiry places itself above them. Philosophy has been interdisciplinary, not by being superior to the other disciplines, but by raising general questions and basic problems.

According to Rorty, philosophy's true calling really is interdisciplinary, i.e., to facilitate understanding between the different sciences, a role Rorty called hermeneutic rather than epistemological. Influenced by Kuhn's theory of paradigm gaps and incommensurability, Rorty conceived philosophy as a hermeneutic midwife of mutual understanding across paradigm shifts, and by implication, between disciplines. Unlike the specialists, the generalist (the

philosopher) must oversee boundaries between special sciences, a role that allows acquaintance with a variety of vocabularies.

Not dead yet

Neither Ayer's attack on metaphysics nor Rorty's attack on epistemology has proven convincing.

In retrospect, Ayer's hope of eliminating metaphysics grossly misunderstood the status of metaphysics in an age of science. Modern physics has famously shown that there are plenty of live issues surrounding such concepts as causation, verification, explanation, substance, and property, issues that cannot be resolved by key experiments within a single discipline. Metaphysical inquiry does not merely describe the presuppositions of what scientists do, it helps set the parameters of explanation for scientific inquiry, thus giving philosophers a place at the table alongside the producers of evidence.

Regarding the fate of epistemology, Rorty was correct, I believe, that philosophy's aim is interdisciplinary and interpretive. Furthermore, I support Rorty's belief that worldview commitments express local preference (personal or social) insofar as worldviews are partly metaphorical, and the meanings that attach to metaphors are often relative to cultural background.

But the subjectivity of worldview choices is a psychological fact, it is less damaging to epistemology than Rorty believed. Rorty underestimated the recalcitrance of universal and objective constraints on knowledge, an oversight that led to his epistemic relativism and his premature denial of philosophy's adjudicatory role.

Post-strong foundationalism

The term "postmodern," though pretentious and controversial, properly marks the end of classical epistemology in our time. The Greek paradigm of science grounded knowledge in first principles that were supposed to be necessary, certain, and universal. That view has been called *strong foundationalism*. In the modern period, strong foundationalism bifurcated between Rationalist and Empiricist versions, with the Rationalists warming over the classical faith in necessary and certain concepts and the Empiricists substituting sensory givens and experimental verification for conceptual certainty. With the discrediting of positivism, analytic philosophers have turned against the strong foundational model of science, largely due to the influence of epistemological "holism," which challenges the autonomy of foundational principles.

In brief, epistemic holism is the view that epistemic authority does not simply derive from foundational principles, but pervades the whole of a belief system. Foundational principles are more influential than other elements, but even first principles depend on remote particulars: each element derives support from its coherence with the other elements. In that case, no foundations have absolute privilege. Where sensory givens, apriority, and verification had each been extolled as an impartial and universal standard of epistemic authority, deconstructive holists (Sellars, Quine, and Kuhn) showed that each was relative to concepts that interpreted them, and different uses to which knowledge is put. Rorty's great splash resulted from his extension of the relativity of first principles – originally applied within systems of belief – to the adjudication of whole disciplines and worldviews, and especially philosophy itself: just as no one principle in the knowledge system has absolute leverage over the others, so philosophy does not stand in judgment of the special sciences.

Holism does show the problem with strong foundationalism's monolithic notion of epistemic authority. But even so, it does not discredit epistemology as a science of foundations.

Semiotics, phenomenology, and the heterogeneity of meaning

Neo-pragmatists and postmodern skeptics have suggested that conventionalist hermeneutics is the natural alternative to strong foundationalism. Rorty has explicitly rejected the objectivist ideal of knowledge and Continental deconstructors have made hay with the "slippage" of meanings with shifting linguistic contexts. Underlying this latest global skepticism is an assumption that the loss of strong foundations renders all knowledge contextually relative in two ways. First, as already noted, holism entails that elements within a belief system are interdependent both in their meaning and in their epistemic value. Second, worldviews are incommensurable to each other insofar as there is no way to "get outside our heads" (Rorty) in order to compare them impartially and objectively. If all epistemic elements derive their value from the whole, and if wholes are relative to personal and social prejudices, then knowledge is inevitably subjective (or intersubjective). In other words, since our perspectives on the world cannot be neutral or universal, and since all of our knowledge is interdependent, holism implies that worldviews are inherently subjective, thus localizing the authority of all their elements.

Peirce saw the threat of subjectivism in James' interpretation of pragmatism and he resisted it with a systematic view of philosophy chastened by fallibilism and a foundational pluralism. By accounting for different types of meaning, he was able to handle both the subjectivity of belief and the nondiscretionary constraints that epistemology discovers. On the one hand, for instance, Peirce's semiotics held that all thought is interpretive and fallible, and his logic implied that worldview choices were partly subjective. On the other hand, far from showing that objectivity is impossible, his philosophy shows how philosophy's universal and objective foundations underlie the subjective whole.

For instance, semiotics shows that, whereas conventional symbols (e.g., flags, religious icons) are freighted with social and personal meanings, causal *indices* (weather vanes, thermostats, other effects of physical forces) signify objective meanings regardless of linguistic relativity. Systematic philosophy could not, then, be *either* objective *or* subjective, but must acknowledge both subjective and objective meanings.

Such an objectivist response to relativism can be found in early critiques of Kuhn's incommensurability thesis. As Stephen Toulmin pointed out, the radical relativism of *some* meanings does not imply the radical relativism of *all* meanings, in which case incommensurability can never be total. Theoretical meanings may shift radically across the boundaries of paradigm shifts, but practical meanings remain much the same: for instance, laboratory procedures remain stable despite such shifts because, despite changes in underlying concepts, indices continue to indicate the same forceful effects. To that extent, scientists on different sides of paradigm shifts do not (pace Kuhn) live in different worlds.

Peirce's phenomenology was even more universal in its foundational implications. Whereas semiotics theorized the sorts of signs that are possible, Peirce's phenomenology theorizes the elements of experience that are necessary. The complexity of reflective experience, he concluded, is comprised of three kinds of elements: three place relations (representations of something for someone), two place relations (forces acting on consciousness), and one place relations (qualia immediately appearing as themselves). These relations are more primitive than those of semiotics as these are found in all experiences. Like semiotics, moreover, phenomenology has a critical thrust. By accounting for the range of meanings, semiotics helps identify false totalizations, as when subjectivists ignore objective grounds by focusing on symbols rather than indices. By seeking a universalism of experiential elements, phenomenology shows how contrasting aspects of experience are equally basic, thus setting aside the false dilemma of subjective or objective foundations.

The examples of semiotics and phenomenology suggest that there objective and universal foundations. On the other hand, they do not presuppose strong foundationalism insofar as they take their meaning and authority from the conceptual systems of which they are parts.

Critical metaphysics: the case of gene-centric biology

In the wake of positivism, metaphysics too shows some critical bite in the case against gene-centric biology.

According to the neo-Darwinian synthesis of the mid-20th century, the functions of genes were subordinate to serving the organism. Beginning in the 1970s, a group of biologists began to argue that evolution ought to be conceived as if it was a contest between genes to maximize their proliferation, with organisms being vehicles for the spread of what Richard Dawkins called

"selfish genes." The selfish epithet referred to those instances where genes appeared to proliferate at the expense of their hosts, examples that seemed to deny the subordination of gene maximization to the benefit of the organism. The landmark success of this school was William Hamilton's explanation of how altruistic behavior by members of a species might not primarily serve the interests of the group – the traditional explanation – but rather maximize the spread of the altruist's genes.

Whereas proponents of the gene-centric view touted the problem-solving power of that view, some of their critics suspected that their agenda was essentially a metaphysical one. Defenders of the biomolecular view such as Jacques Monod and Dawkins argued that the unit of evolution ought to be decided in favor of invariance, and that genes were the most invariant feature of the organism. In short, theirs was an atomistic and mechanistic conception of causal explanation, a neo-Newtonian reduction of biology to "necessity and chance," with organic functionality being nothing but the cumulative effect of mechanistic causes at the molecular level.

Despite some heuristic interest, however, critics noticed some conceptual fuzziness. First, the functionality and even the physical boundaries of genes are not as invariant as the gene-centrists pretended. Second, attributing selfishness to genes puts struggle in the wrong place. Only organisms struggle to survive; in fact, the patterns of gene-proliferation are only correlations of the organism's success. And finally, recent developments in evolutionary research show that higher level (epigenetic, behavioral) causal mechanisms are shaping genes more than was previously believed, and in ways that serve the health of the organism, not the proliferation of specific genes.

In retrospect, the debate proves not to have been about what the evidence is, but how to interpret it. The fiction of the selfish gene allowed the imposition of a ground-up, atomistic, and invariance-privileging view of causation. To the contrary, developments in complex systems theory and epigenetic mechanisms are restoring not only the primacy of organic organization, but even an updated notion of teleology. Given the metaphysical stakes, it is no wonder that the implications involve theories applying to self-organizing systems ranging from the material to the social.

Philosophy as metadisciplinary explanation

In the postmodern giddiness of the late 80s and early 90s, one heard critics proclaiming that they were "against hierarchy," as if that was not a hierarchical claim. In retrospect, one can see how the demise of strong foundationalism might invite such anarchic thoughts, but epistemic holism does not so much eliminate hierarchies as reinterpret them. True, epistemic hierarchies are not as imperial as they used to be, though holism is not exactly democratic either. In a

democracy, everyone is formally identical whereas epistemic holism is more like a collaboration of diverse specialists. Paradoxically, the specialty of philosophy is the generalist's perspective. That role gives the philosopher a kind of superiority of scope, although that superiority does not denote less liability to error or greater autonomy. The critical thrust of holism lies in the insight that greater generality involves a greater interdependence.

Contrary to anti-foundationalist radicals, philosophy is in a better position than ever to define the foundations of knowledge. But rather than assessing the conclusions of the special disciplines, the philosopher will help those disciplines define their starting points, i.e., their metaphysical assumptions, working in tandem to create the most coherent possible worldview.

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