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FORUM: KUHN'S *STRUCTURE* AT FIFTY

INTRODUCTION

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Anyone who works at the interstices of intellectual history and philosophy and the history and philosophy of science will be quick to rank Thomas Kuhn's *The Structure of Scientific Revolutions* amongst the most influential works of the last half-century. But its influence extends well beyond these disciplines as well. First published in 1962 as a contribution to the *International Encyclopedia of Unified Science*, over the last fifty years it has enjoyed a rich afterlife, leaving in its wake an immense if contested inventory of ideas whose significance has transcended the well-policed boundaries that often separate the natural sciences from the social sciences and the humanities. Even more surprising for a book of its academic character, it has enjoyed a reception in popular discourse that exceeds its disciplinary bailiwick. Its trademark terms—not only the celebrated ideas of a *paradigm* and a *paradigm shift* but also more technical themes such as *normal science*, *incommensurability*, and *anomaly*—have been naturalized into mundane English with a degree of success that puts to shame just about any other work of recent scholarship. Paraphrasing one of its characteristic claims, one may be temped to observe that, since the publication of Kuhn's *Structure*, we all live in a different world.

As David Hollinger observed almost thirty years ago, "Kuhn's theory of *science* speaks to, and for, historians as few works of philosophy of *history* ever have."[1] This is perhaps unsurprising when we recall that its key contribution is nothing less than a model of historical change. According to Kuhn, the collective practice of scientific research in the everyday sense can only proceed if it cleaves to a certain rudimentary model or framework (a paradigm) that determines in advance what can count as a legitimate scientific problem. Within the confines of a given

[1] David A. Hollinger, "T.S. Kuhn's Theory of Science and Its Implications for History," *American Historical Review* 78/2 (April 1973), 370, original emphasis.

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paradigm the everyday business of theory building and experimentation (normal science) can proceed without major interruption through a subtle process of elaboration and refinement that may strike the historian as little more than "puzzle solving." But the delicate spadework of normal science will gradually unearth phenomena that poorly fit within the bounds of the given paradigm. Though at first ignored or dismissed as mere errors of experimentation, such phenomena (anomalies) must eventually push normal science into a phase of crisis, a phase that finds its true resolution only when a new paradigm is proposed that can account for the anomalies and thereby gains epistemological authority within the scientific community.[2] The revolutionary shift of paradigms effects such a dramatic change of perspective as to belie our more conventional notion of scientific change as a slow and steady process of accumulating knowledge. It is rather more like a gestalt-switch, an abrupt modification in collective perception. Indeed, such a modification is sufficiently radical to call into question our confidence that the succeeding paradigm is in any simple sense superior to the one preceding it. Because scientific explanation depends on the extant paradigm, and because the language by which scientists assess the accuracy of a theory is internal to its paradigm, there just is no common language by which to compare any two theories that are separated by the historical divide of a scientific revolution. Scientists lack a common measure of comparison and such theories are therefore quite literally incommensurable.

Though quite familiar today, Kuhn's model of scientific revolution provoked a storm of protest when it was first presented in 1962. In retrospect the controversy may strike us as surprising not only because post-Kuhnian theorists have taken more radical turns but also because Kuhn was hardly the most radical theorist of his own time: Norwood Russell Hanson's *Patterns of Discovery* had already appeared in 1958, and Paul Feyerabend's *Against Method* would be published 1974. But for the historical profession in general, Kuhn's *Structure* captured the imagination in a way these other theories could not. Part of the explanation may be that its understanding of the underlying "structure" of historical change—as sudden rather than gradual—confirmed the basic lessons of the other intellectual revolution that was sweeping across the social sciences in Europe: structuralism. Claude Lévi-Strauss's early masterpiece in structuralist anthropology, *The Savage Mind*, was published in the very same year as Kuhn's *Structure*. Michel Foucault's quasi-structuralist (more accurately, archaeological) portrait of historical knowledge, *The Order of Things*, was published only four years later. *Structure* and structuralism shared a common basic model of historical change as effecting sudden ruptures or breaks in the rules of intelligibility. In the

[2] Though without the later theoretical armature, Kuhn had given a brilliant example of this process at work in *The Copernican Revolution* (Cambridge, MA, 1957).

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later 1960s and over the next decades historians took this new model with such enthusiasm that incommensurability would eventually become a commonplace tool of the historical profession. Ironically, a discipline that devoted itself to the explanation of change over time incorporated the idea of radical discontinuity into the arsenal of its own "normal science."

In the history of Kuhn's genesis and reception this is only one irony among many. The editors of this forum consider the fiftieth anniversary of *Structure* a suitable occasion for taking stock of the book's boundless legacy. To describe that legacy as complex would be an understatement—any selection of suitable themes will fail to do justice to its ramified meaning. A major problem that must confront any such effort is the gap between intention and reception: What Kuhn himself may have wished to achieve or what he may have *intended* in his analysis of scientific revolutions does not begin to exhaust the book's significance in the changing intellectual history of our own time.[3] In an essay with the delightful title "Being There with Thomas Kuhn: A Parable for Postmodern Times," the Warwick sociologist Stephen Fuller presented Kuhn as a kind of Chauncey Gardner, the guileless innocent played by Peter Sellers in *Being There*, the film inspired by Jerzy Kosinski's novel.[4] Just as Chauncey's rustic observations pass for profundity in the highest circuits of media and government, so too Kuhn's remarks in *Structure* have assumed a stature, Fuller claims, that surpasses and may even conflict with the author's original meaning. The comparison is humorous but casts a bad light on what is after all a familiar and important process of intellectual history: for anyone interested in the inner life of ideas, the most powerful books may be those that endure precisely because they leave themselves open to multiple readings rather than standing as if inert within a single horizon. To understand what *Structure* was, we must also strive to comprehend what *Structure* has become.

The essays that follow may be taken as a collective homage to Kuhn's book at its semicentennial. More importantly, they contribute to our understanding of its significance from multiple perspectives: Michael Friedman directs our

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3 Of the most relevant literature, the following deserve mention: For philosophical treatments, see Paul Hoyningen-Huene, *Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science* (Chicago, 1993); and Thomas Nickles, ed., *Thomas Kuhn* (Contemporary Philosophy in Focus) (Cambridge, 2003); an accessible introduction to Kuhn's place in the philosophy of science is Wes Sharrock and Rupert Read, *Kuhn: Philosopher of Scientific Revolutions* (New York, 2002). The most consequential historical treatment is Steve Fuller, *Thomas Kuhn: A Philosophical History for Our Times* (Chicago, 2000); a powerful historical assessment of Kuhn's place in postpositivist philosophy is John H. Zammito, *A Nice Derangement of Epistemes: Post-positivism in the Study of Science from Quine to Latour* (Chicago, 2004).

4 Steve Fuller, "Being There with Thomas Kuhn: A Parable for Postmodern Times," *History & Theory* 31/3 (Oct. 1992), 241–75.

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attention to the underappreciated philosophical affiliation between Kuhn and key theorists in the traditions of neo-Kantianism and logical positivism. Joel Isaac reconstructs the philosophy of education that inspired Kuhn's model of scientific learning as presented in *Structure*. Deborah Coen maps out some of the disciplinary controversies that have prompted historians of science to move away from *Structure*'s idealistic and theory-driven portrait of science in favor of the more recent materialist emphasis on technology and technique. And I address the contested status of realism and "the real" in the recent history and philosophy of science from Kuhn to Foucault. These four essays speak to the significance of *Structure* on several registers—philosophical, historical, disciplinary, and institutional. What is perhaps most instructive, however, is that the essays do not all cohere into a single vision: there was more than one road that led to *Structure*, and more than one road that led from *Structure* to the present day.

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