Comment

Scientists' Imagined Pasts and Historians' Appreciation of Scientific Thought

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Abstract: Historians should heed Adrian Wilson's call for deeper study of the "imagined pasts" of science, but they should avoid thinking of those pasts as corrupted versions of professional history. The past (and future) that historians of science have often imagined for themselves casts them in a heroic role within the history of science, destined to diagnose and dispel flaws in scientists' broadly accepted ideas about the nature of their enterprise. Abiding by this narrative with respect to scientists' imagined pasts would lead historians to presume that flaws in scientists' historical understanding are reflections of flaws in scientists' thinking more generally. Simon Schaffer's work on the evolution and "end" of natural philosophy is exemplary of the historiographical rewards to be expected from careful research into the totality of scientific figures' understanding of their own work.

Adrian Wilson is correct that what he refers to as scientists' imagined pasts are very much worth historians' consideration.[1] These pasts can offer insights into scientists' historical views on questions such as what made their methodologies powerful or what promise they understood their work to hold for their society. At the same time, historians should beware of regarding imagined pasts as corrupted and essentially propagandistic versions of proper histories. To do so would be to misconstrue the essential social and cognitive role of imagined pasts, as well as the fact that those pasts could never reflect the full depth of scientists' thought. If historians are tempted to compare scientists' appreciation of their past with the products of professional history, I would assert that that temptation derives in large part from the imagined past that historians have constructed for themselves.[2]

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[1] For convenience, I use the term "scientists" generically, including for figures for whom the label is anachronistic.

[2] This essay follows in the spirit suggested in Will Provine, "No Free Will," *Isis*, 1999, *90*:S117–S132, on pp. S127–S128: "I have found it necessary to understand the history of science that is so real to scientists themselves. Even though the anecdotes may be demonstrably wrong . . . the story may nevertheless carry a deep insight into the scientific and personal issues that give the anecdote so much meaning to scientists. We should perhaps approach the history of modern science with more modesty—a worthy history of science precedes us." I thank Floris Cohen for pointing out this reference.

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THE SIGNIFICANCE OF THE IMAGINED PAST

Imagined pasts are important because, at least sometimes, they speak to questions such as who we are, how we came to be in the circumstances in which we find ourselves, how we relate to others, and what we should do now. In fact, imagined pasts seem to be so cognitively and sociologically important that society is constantly awash in half-articulated stories comprising half-remembered facts, anecdotes, and fictions, all hastily strung together in a web of received wisdom. In spite of these pasts' lack of reliability, scientific cultures seem to rely on imagined pasts particularly heavily.

Through their cited references, all scientific papers construct what we can call epistemic pasts. An epistemic past brings coherence to an investigation by placing it within a lineage of evidence and ideas of variable finality and reliability. The objective of the investigation is to resolve at least some of the open questions that the epistemic past bequeaths. Occasionally such pasts may rise in significance to take on a more coherent, legendary form. For instance, Richard Staley has observed that it was Albert Einstein himself who was responsible for framing the special theory of relativity as a solution to a series of investigations concerning the ether, even though those investigations were peripheral to Einstein's own path to the theory. Staley points out that the construction of this alternative history allowed Einstein to engage the interests of established physicists more effectively and thus encourage them to engage with his work.[3] In the long run this received history of relativity required substantial scholarly clarification and revision, but in the short run it did its job.

In this brief essay, though, I want to concentrate on what we could call mythic pasts, which are distinguishable from epistemic pasts in that their primary function is to forge identity, solidarity, and a sense of purpose. I am borrowing here from Georges Sorel's famous discussion of "myths" in his 1907 letter to Daniel Halévy. For Sorel, myths provided narratives that motivated action. As a syndicalist, he specifically believed that the myth of a general strike to come was essential to motivating the working classes to a violent overthrow of capitalism. And he explicitly saw the power of myths as separate from their realism, writing that it was important "not to make any comparison between accomplished fact and the picture people had formed for themselves before action." For him, to undermine the myth through rational historical analysis was tantamount to undermining the syndicalist movement.[4]

Scientific figures' mythic pasts often seem to involve the development of a methodological or metaphysical insight that enables their work to rise above intellectual traditions characterized by confusion and error. Wilson is correct to cite Simon Schaffer's observation that discovery narratives can function as models of social and methodological rectitude and Augustine Brannigan's observation that these narratives tend to emphasize rupture (though they could indeed also emphasize continuity with a deep past). Often such mythic pasts also anticipate a mythic future not unlike Sorel's general strike. Such a future might be accomplishing a long-term intellectual goal, such as formulating a physical "theory of everything" or decoding heredity. Or it might entail the fulfillment of a social purpose, such as the realization of a technological revolution or, for a social science, the facilitation of social harmony. Such mythic narratives, as we might call these combined pasts and futures, reinforce scientists' convictions about the virtue of their enterprise.

Mythic narratives can certainly offer insights into why scientists make some of the choices that they do. It is likely that scientists will see what they regard as the traditional virtues of their enterprise as obvious and convincing and so will incorporate narratives illustrating those virtues

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[3] Richard Staley, *Einstein's Generation: The Origins of the Relativity Revolution* (Chicago: Univ. Chicago Press, 2008), pp. 309–319.

[4] Georges Sorel, *Reflections on Violence*, trans. T. E. Hulme (London: George Allen & Unwin, 1915), p. 22.

into their rhetoric. Mythic narratives may even inform practical choices—for instance, choices about how to train students or how to enforce norms of proper conduct. At the same time, though, historians need to recognize that mythic narratives are insufficiently detailed to inform most of the choices that scientists must make in their day-to-day lives.

Quotidian life demands drawing on a vast and intricate network of ideas, some borrowed, some invented, and many of which are only loosely and sporadically articulated. But these ideas must exist in at least a tacit form if scientists are to make reasonably consistent choices about such questions as how to design an experiment, how to analyze data, how to structure a publication, how to manage professional relations, and so on. It does not seem likely that mythic narratives could so much as provide guiding principles for making such intricate decisions. In fact, a useful task for historians would be to establish to what extent the ideas guiding scientists' quotidian practices were consistent and inconsistent with the ideas embodied in mythic narratives and what the consequences of inconsistency might have been. These consequences could include scientists setting unreasonable expectations about their work for themselves and others or simply failing to develop more cogent descriptions of their enterprise by adhering too slavishly to more familiar mythic conceptions.

THE CONSEQUENCES OF HISTORIANS' OWN MYTHIC NARRATIVES

Historians can play an important role by supplementing imagined pasts with more accurate history and by showing how ideas derived from such pasts can clash with ideas that could lead to more informed choices. However, they face a severe hermeneutic danger in supposing that imagined pasts necessarily suffer from their failure to conform to professional historical standards. To understand why historians of science may be unusually tempted to criticize scientists' imagined pasts, and to understand how this can hurt historical scholarship, it is helpful to consider their own mythic narratives.

Interestingly and alarmingly, the primary mythic narrative of the history of science profession seems to be intimately connected with historians' mythic conceptions about the scientists they study. Specifically, historians are apt to regard scientists, and society more generally, as heavily burdened by misconceived and injurious ideas about the nature of science. In turn, historians regard themselves as destined to dispel such ideas through careful, critically informed scholarly research and advocacy. Going back centuries, one could find many examples of this narrative being deployed. Suffice it here to note the very first sentence of Thomas S. Kuhn's *Structure of Scientific Revolutions*: "History, if viewed as a repository for more than anecdote or chronology, could produce a decisive transformation in the image of science by which we are now possessed."[5]

This mythic notion was amplified in the 1970s and 1980s as first sociologists of science and then historians of science began to assert that their fields were undergoing a revolution in methods and attitude.[6] For instance, Michael Mulkay decided that Mertonian scientific norms were primarily ideological devices that scientists use to promote their work, not phenomena of any true sociological importance. David Bloor cast prior generations of sociologists as lacking the "nerve" to apply their analytical methods to the production of scientific knowledge—his "strong program" would fix that. More than anyone, Steven Shapin brought this conceit into the history of science. Initially terming the new approach "naturalism," he suggested that prior history had

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[5] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: Univ. Chicago Press, 1962), p. 1.

[6] Note that in this essay I am commenting only on the narrative in which these methodological critiques were ensconced and not on the critiques themselves, which had significant merits.

been built up around idealized conceptions of science meant to buttress its authority. Henceforth, historians would describe science and its social relations simply as they were.[7]

Implicit within this notion that historians were freeing themselves from scientist-derived conceptions of science was the idea that scientists had indeed traditionally—and thus historically—misconceived or dissembled about their work. But this was initially a narrative without historical detail. One of the remarkable things about Shapin and Schaffer's *Leviathan and the Air-Pump* is that they explicitly styled it as an origin story about the misconceptions surrounding science. In their concluding pages they wrote that they had shown that seventeenth-century natural philosophers had to suppress the socially contingent aspects of experimentation to make experimental evidence carry epistemic authority. They further supposed that this unstable "settlement" managed to persist until the "late twentieth century," when it was finally "called into serious question."[8]

The implication of this multicentury narrative was that Shapin and Schaffer's otherwise esoteric study of seventeenth-century science would enable readers to discuss all science with a newfound maturity and poise.[9] Such a claim should arouse suspicion. Every historian knows to beware of "whig" narrative structures in which history leads progressively toward the enlightened present. They are perhaps less sensitive to the dangers of narratives in which historical actors stumble episodically forward until historians arrive to diagnose the flaws in their ideas.[10] By articulating a mythic narrative that wedded the history of science profession to the past and future of science itself, Shapin and Schaffer offered historians a cogent assurance about the importance of their enterprise. It is perhaps little wonder that their book is still recognized as one of the most important in the field.[11]

Although historians' mythic narratives represent a very informal aspect of their culture, those narratives' moral lessons do sway professional historical writing. As I have written elsewhere, "A historiography that regards itself as a harmonizing force in science–society relations is heavily incentivized to depict the history of those relations as plagued by ideologies that have brought them systematically into discord."[12] It would be far too much to say that historians' mythic narratives have rendered their work hopelessly corrupt. The narratives' influence is neither pervasive nor insidious enough to have such bleak consequences. However, the narratives do insinuate themselves into many of the important choices that historians make, such as what subjects are worthy of attention and what research and expository methods to employ. Thematically, the narratives establish an expectation that scientists will have great difficulty reflecting critically on their work and establishing it securely within society. Thus, for instance, historians are much

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[7] Michael J. Mulkay, "Norms and Ideology in Science," *Social Science Information*, 1976, *15*:637–656; David Bloor, *Knowledge and Social Imagery* (London: Routledge & Kegan Paul, 1976), p. 4; Barry Barnes and Steven Shapin, "Introduction," in *Natural Order: Historical Studies of Scientific Culture*, ed. Barnes and Shapin (Beverly Hills, Calif.: Sage, 1979), pp. 9–13; and Shapin, "The History of Science and Its Sociological Reconstructions," *History of Science*, 1982, *20*:157–211.

[8] Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, N.J.: Princeton Univ. Press, 1985), p. 344.

[9] This has been a consistent theme in Shapin's work. Note the title of his career retrospective—Steven Shapin, *Never Pure: Historical Studies of Science as if It Was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority* (Baltimore: Johns Hopkins Univ. Press, 2010)—and the message of its introductory essay—"Lowering the Tone in the History of Science: A Noble Calling."

[10] I am indebted to David Edgerton's concept of the "inverted whig" narrative. See David Edgerton, *England and the Aeroplane: An Essay on a Militant and Technological Nation* (Basingstoke: Macmillan, 1991), pp. xv–xvi; see also Edgerton, "Tilting at Paper Tigers," *British Journal for the History of Science*, 1993, *26*:67–75.

[11] See, in particular, the "second look" at the book: *Isis*, 2017, *108*:107–144.

[12] William Thomas, *Rational Action: The Sciences of Policy in Britain and America, 1940–1960* (Cambridge, Mass.: MIT Press, 2015), p. 297.

more apt to study fractious boundary disputes than scientists' capacity to foster assent, more likely to root out scientists' epistemic preconceptions than to trace their reasoning. Historians should be wary of these biases.

RECOVERING HISTORIES OF SELF-CONSCIOUS SCIENCE

If historians' own mythic narratives tempt them to regard scientists' mythic narratives as distorted or corrupted versions of proper professional history, that would be part and parcel of historians' larger propensity to regard scientists' thinking as unworthy of sustained scholarly analysis. This can have serious consequences for how historians treat certain historiographical challenges, including the one Wilson addresses concerning the fate of natural philosophy. Wilson observes that Schaffer's "Scientific Discoveries and the End of Natural Philosophy" and Andrew Cunningham's "Getting the Game Right" offer differing portraits of what it meant for natural philosophy to end and how quickly it did so. Yet both Schaffer and Cunningham apparently regarded the end of natural philosophy as essentially a coup secured through propagandistic narratives that recast older traditions of inquiry to make them seem continuous with the new models.

The question that ought to be asked is to what degree such changes in the sciences were indeed propagandistic achievements and to what degree these changes were accepted as intelligently engineered solutions to pressing intellectual, practical, cultural, and institutional problems. Schaffer himself has seemed equivocal on this question. He is unquestionably a major proponent of the historical importance of propaganda—his actors are continually doing hard rhetorical "work" to see their views accepted. Yet across most of his early oeuvre Schaffer also made clear that natural philosophers fully recognized and actively debated the links between philosophical claims (particularly those concerning matter theory); those claims' moral, religious, and political significance; the propriety of different varieties of philosophical performance; and the search for patronage. This awareness made natural philosophers into talented critics and reformers of their own enterprise.

Thus, Schaffer's early conception of natural philosophy was that it was in a state of constant, painstakingly deliberated reinvention. For instance, in his important 1983 paper "Natural Philosophy and Public Spectacle in the Eighteenth Century," he argued, "Philosophical or conjectural history, the characteristic form of the late Enlightenment, *deliberately* denied the power of simple representation, and *equally deliberately* traced the history of natural knowledge and morality in order to define a new pattern of epistemological control."[13] Similarly, in "Scientific Discoveries and the End of Natural Philosophy," Schaffer described a more profound transition from a social arrangement dominated by concerns about entrepreneurial philosophical performance to one dominated by concerns about training and disciplined labor. I feel that these accounts work against the mythic narrative he developed with Shapin at the end of *Leviathan and the Air-Pump*: of an enterprise that actively avoided self-conscious consideration of its social and epistemic foundations for three whole centuries.

We need not necessarily agree with all of Schaffer's specific arguments to recognize the historiographical importance and ingenuity of his early work. The kind of attention that Schaffer dedicated to the intricacy and sophistication of natural philosophers' thinking is important not only for historians' understanding of what natural philosophy was and how it evolved and ended. There are certainly analogous situations permeating the entire history of the sciences. Historians are used to investigating the links between scientific knowledge, research practices, genre conventions, institutional structures, and cultural priorities. They are, I feel, less attuned to how sci-

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[13] Simon Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *Hist. Sci.*, 1983, *21*:1–43, on p. 31 (emphasis added).

entists themselves have thought about, engineered, and re-engineered these links. Perhaps that is why Schaffer's early work, which analyzes all this thinking and engineering in great esoteric detail, has not garnered more attention.

Historians should study scientists' imagined pasts as one of many windows into scientific thinking. However, they should beware of any supposition that imagined pasts offer complete or uniquely important insights into that thought. Such suppositions would tend to reinforce historians' propensity to play down the depth of scientists' worldviews. Moreover, they would tend to reinforce the implacable, mutual suspicion and condescension that historians' own mythic narrative too often places between themselves and today's scientific community. While that narrative grants historians a heroic role vis-à-vis science, it may be that it actually serves to make them less engaged with scientists' ideas. This would render their work less relevant to the future of science, not more. Imagined pasts need not be deleterious, but sometimes they can be.