SERRC
Social Epistemology
Review & Reply Collective

http://social-epistemology.com
ISSN: 2471-9560

Introduction to the Farsi Translation of *Kuhn vs. Popper*

Steve Fuller, University of Warwick, S.W.Fuller@warwick.ac.uk

---

Fuller, Steve. 2023. "Introduction to the Farsi Translation of *Kuhn vs. Popper*." *Social Epistemology Review and Reply Collective* 12 (9): 15–21. https://wp.me/p1Bfg0-85i.

SERRC
Social Epistemology
Review & Reply Collective
12 (9): 15–21. 2023.
https://wp.me/p1Bfg0-85i

2023 marks the twentieth anniversary of my book, *Kuhn vs. Popper: The Struggle for the Soul of Science*. This introduction to the Farsi translation provides an excellent opportunity to reflect on the significance of their disagreement, considering how the intellectual world has changed in the interim. Karl Popper and Thomas Kuhn were the two most influential philosophers of science of the second half of the twentieth century. The peak of their academic influence may have passed, but they remain the best-known philosophers of science in the wider culture, largely because they were preoccupied with defining and justifying the unique character of science as a human endeavor. Most philosophers of science simply take for granted science's existence and legitimacy, and then proceed to analyze in more detail its various concepts, theories and practices. In contrast, both Kuhn and Popper felt the need to defend from first principles what they called 'science', even though they largely meant opposing things by it. This point came out clearly on the only occasion that they faced each other—in London in 1965, the centerpiece for my book.

Disruption or Privilege?

Popper saw science as the disruptor of epistemic tradition, whereas Kuhn saw science as itself a privileged epistemic tradition. Both were deep readers of the history of science and took the seventeenth century 'Scientific Revolution' in Europe as a watershed moment in the definition of science. However, Popper focused on Galileo the disruptor of tradition, while Kuhn focused on Newton the founder of tradition. For Popper, science broke away from religious authority, whereas for Kuhn, science replaced religious authority. Both Kuhn and Popper alighted upon Francis Bacon as a pivotal figure in the origin of modern science. Popper located Bacon's key contribution in his call for 'crucial experiments' to decide the empirical difference between opposing theories in a manner that all could see. In contrast, Kuhn identified the Baconian legacy with the Royal Society of London, the first autonomous scientific institution, whereby scientists decide matters among themselves, including the lines of inquiry that they should—and should not—collectively pursue.

Even this crude formulation suggests that Popper operates at a meta-level from Kuhn when talking about science. Specifically, Kuhn would affirm and Popper deny the proposition that science amounts to whatever scientists do. Popper could easily imagine that most scientists behave unscientifically in a way that Kuhn could not. Put another way, Popper held that *anyone* acts scientifically if they subject their fundamental beliefs to rigorous testing on a regular basis. Professional scientists by no means enjoy a monopoly over such an attitude towards their beliefs. This point is especially relevant in our 'post-truth' times, when the authority of science—and expertise more generally—appears to be challenged at every turn and from every ideological direction.

Consider the diverse constituencies that have been mobilized against the following three positions, which enjoy general agreement within the Western scientific establishment: Darwin's theory of evolution as an account for the origin of life, the efficacy and safety of vaccination against potentially deadly diseases, the anthropogenic nature of near-irreversible global climate change. It is common for Western academics to diagnose dissent of this kind

in terms of the public's ignorance of science and/or their prejudice against science because it conflicts with their religious and political beliefs. And Kuhn would probably concur with that judgement, given the special epistemic status that he accords to science as a *social institution*. For Kuhn, science is governed by what he notoriously called 'paradigms'. But a paradigm is not simply a theory or even a worldview—or even a worldview attached to a prescribed set of methods. Most crucially, a paradigm possesses a canonical way of reproducing itself over vast expanses of time and space. This explains the emphasis that Kuhn places on how scientists are trained and credentialed. For Kuhn, one can become a scientist only through other scientists.

Nevertheless, our post-truth condition is largely about challenging the reliability of established institutions, including scientific ones. A consistent finding of Western 'public understanding of science' surveys for more than thirty years is that people have a much greater faith in science than in scientists. In that respect, they are closer to Popper than Kuhn. The situation today is not so different from the dawn of Protestant Christianity in early sixteenth century Europe. This was a time when Christians openly challenged whether the Church of Rome was an adequate custodian of their faith, with some going so far as to question whether a church was needed at all, given the tendency of churches to stress ritual and dogma over leading a 'life in Christ'. But these early Protestants were by no means atheists; rather, they were seeking more direct ways of knowing God than through the priesthood that claimed to speak on God's behalf. The Protestants were enormously aided by the recent invention of the printing press, which enabled large numbers of Bibles to be published in the languages that people normally spoke, which became the 'modern' European languages. While the Church of Rome initially tried to censor and even prevent the publication of these Bibles, the strategy proved futile, resulting in Christianity's current multi-denominational landscape, whereby 'Roman Catholicism' coexists with an indefinite number of self-described 'Christian' churches.

To see the relevance of this history to the Kuhn-Popper debate today, you should replace 'Christianity' with 'science', 'Church of Rome' with 'academia', 'God' with 'truth', and 'Bible' with 'internet'. The result what I have called 'Protscience' (short for 'Protestant Science'), the epistemology of the post-truth condition.

Regarding Protscience

A characteristic feature of Protscience is that people take science into their own hands by making it integral to their lives. The spirit here is like that of the original Protestants who literally took the Bible into their hands and made sense of it without the help of priests and church theologians. In practice, it means that 'Protscientists' would prefer to live—and sometimes die—by whatever science makes sense to them than to defer to experts whose science they neither trust nor sometimes even understand. From conventional understandings of science's role in society, the attitude of the Protscientists may seem perverse, if not pigheaded. However, much has changed in the world since the time that 'science' in the modern sense first came to enjoy its special epistemic standing in society. After all, the term 'scientist' to designate to someone professionally trained and academically

SERRC
Social Epistemology
Review & Reply Collective
12 (9): 15–21. 2023.
https://wp.me/p1Bfg0-85i

accredited in science only dates to the 1830s, largely through the efforts of William Whewell to incorporate the experimental study of nature into the Cambridge curriculum. In that respect, even though Kuhn's account of dynamics of science was meant to apply to the entire history of science, his sociological account really applies to science starting in the mid-nineteenth century, once Whewell's reforms began to be institutionalized. It was only then that a privileged channel was established through which one became, behaved and exerted influence as a 'scientist' in the sense we recognize today.

However, much has changed since Whewell's times along three dimensions of knowledge:

> (1) A significant increase in the sheer access to education, including in the natural sciences, medicine and engineering;
>
> (2) Academic knowledge has been subject to both popularization and greater public scrutiny, especially once the state began to tie its own fortunes to the future of 'science', now understood as the dual-purpose engine of prosperity and security;
>
> (3) The advent of the internet, especially after the launch of the World Wide Web in the mid-1990s, provided unprecedented access to a variety of perspectives on any field of knowledge, at multiple levels of entry.

Taken together, these three developments have emboldened people to become Protscientists. They accept responsibility for what they believe and, more importantly, expect those who command epistemic authority—the so-called 'scientific experts'—to bear a special responsibility to consider alternatives to their own default beliefs, precisely because others defer to their authority.

At the epistemic level, Popper would have no problem with this Protscientist demand because for him no scientific knowledge claim—however fundamental—is ever permanently settled. Thus, 'real' scientists are always trying to test the limits of their knowledge claims, which presumes that the current paradigm does not necessarily have the final word. However, Protscientists, again in the spirit of the original Protestants, would add an ethical spin to Popper's epistemic point by associating the failure to pursue alternative interpretations of the same data with the illegitimate suppression of dissenting points of view, a failure to exercise what the British analytic philosopher Bernard Williams originally called 'negative responsibility'. In short, the more power you have, the more you are obliged to understand what is within your gift to allow and prohibit (or enhance and diminish), which in turn gives you less excuse to claim ignorance when you fail to act as well as you could.

In my more recent work on post-truth, I have associated negative responsibility with what I have called 'modal power', which is the general capacity to control what is and is not possible. In *Kuhn vs. Popper*, I argue that Kuhn suffered from a massive failure of negative responsibility by failing to speak out against the deployment of science during the Cold War.

Indeed, he failed to comment at all, which partly related to his views about his role as a historian (more about which below). This attitude was an outlier among his contemporaries, including Popper, who regularly—and sometimes quite publicly—denounced what even US President Eisenhower called in the climax to Cold War tensions the 'scientific-military-industrial complex'.

The Ambiguity of Evidence

It is worth observing that at least at the level of principle, most philosophers of science would agree that the same body of data may be subject to even mutually conflicting interpretations, depending on how research in the target field is projected into the future. The US logician Quine dubbed this situation the 'underdetermination of theory by data'. Thus, most philosophers would follow Popper in saying that logic *per se* does not compel us to restrict the range of viable scientific hypotheses to those that conform to the fundamental assumptions of the dominant paradigm. It results in what I call 'belief by decision' in *Kuhn vs. Popper*. In other words, evidence is never sufficient to compel belief because it is always ambiguous, and so one must take a decision on how to read the evidence and thereby orient action, based on background normative considerations about the aims of the inquiry.

In this context, I suggested that Popper may have been influenced by the recently translated (into German) Danish Existentialist Søren Kierkegaard. Such a view was also shared by US Pragmatism, as outlined in William James' famous 1896 lecture, 'The Will to Believe'. However, most philosophers would not go as far as Popper, for whom this logical openness obliges an open-minded approach to hypothesis formation, which his radical follower Paul Feyerabend dubbed 'Let a thousand flowers bloom!' Instead, they have seemed content—somewhat like economists when discussing technological innovation—to promote the virtues of 'path dependency'. To be sure, there is always a resource tradeoff: One must either distribute resources across several developmental pathways or concentrate resources on one such pathway. The latter has the advantage of allowing inquiry to proceed more purposefully, at least in the sense of following through all the ramifications of an initial point of departure, which invariably involves constructing an infrastructure that enables the invention to fully mature into a proper 'innovation', in the sense that Joseph Schumpeter popularized, with Henry Ford in mind. Thus, Ford quickly eliminated his early rivals to become the trailblazer in automotive transport.

Kuhn saw matters very much as Schumpeter did, but now applied to science. Kuhn openly conceded that a certain 'tunnel vision' is required for scientists to be single-minded in their attempt to solve the puzzles left in their paradigm; hence, the intellectual 'infrastructure' provided by professional scientific education. It also explains why scientists only start to take seriously the idea of a radical change in course once the puzzles have remained unsolved—if not compounded—for too long. Nevertheless, as it turns out, the intellectual resources needed to launch a 'scientific revolution' on the back of such persistently anomalous data do not need to be created from scratch. On the contrary, most of the fundamental criticisms of that eventually bring down a paradigm had been typically known for decades, if not centuries—indeed, sometimes from the very onset of the paradigm's hegemony. However,

12 (9): 15–21. 2023.
https://wp.me/p1Bfg0-85i

these early voices were marginalized if not suppressed over the years by the scientists responsible for maintaining the paradigm as 'the establishment'.

The most famous case in point involves the breakdown of Kuhn's main example of a scientific paradigm, Newtonian mechanics. Objections to Newton's absolute conception of space, time and causality were already voiced in his day by, among others, Leibniz and Berkeley. But they had little effect, once a scientific consensus was forged around Newton's vision of physical reality. At that point, these critics were demoted from proper 'scientists' to mere 'philosophers'. Nevertheless, their voices were revived once the paradigm fell into crisis two centuries later, resulting in the dual revolution in relativity theory and quantum mechanics. Crucial in this revival was Ernst Mach's *Science of Mechanics*, first published in the 1880s, which presented the history of physics as a series of missed opportunities to change course from the Newtonian orthodoxy. The book was widely read among young physicists at the dawn of the twentieth century, not least Einstein, Bohr and Heisenberg, the 'revolutionaries' who overturned the orthodoxies in their field.

While Kuhn was well aware of history's potentially radicalizing role in shaping the future, he insisted on restricting the historian's domain to that of 'dead' science, namely, paradigms that have been already superseded. In effect, he opposed what Michel Foucault popularized at roughly the same time as the 'history of the present', which would trace 'genealogically' (Nietzsche's term) or 'archaeologically' (Foucault's own preferred term) how the present came to be as it is. It invariably results in an account very much at odds with the 'official' histories in terms of which the present has been legitimized. Indeed, Kuhn believed that these official histories were required to motivate successive generations to the task of solving the paradigm's remaining puzzles, especially as its work became increasingly technical and the results increasingly marginal, if not inconclusive.

It is worth noting that by the 1970s, a younger generation of German philosophers and sociologists of science under the influence of Jürgen Habermas, who otherwise accepted Kuhn's account of the dynamics of science, argued that once a mature paradigm exhibited such 'diminishing returns' at its research frontier, it should no longer be allowed to carry on research in its current form. Instead, it should be redeployed into socially and commercially beneficial applications. This proposal, known at the time as 'Finalization' (*Finalisierung* in German), generated enormous controversy, especially (and perhaps ironically) from German followers of Popper, who worried that its 'socialist' overtones would undermine the autonomy of science. In effect, they argued that if natural scientists cannot be trusted to organize their own inquiries properly, why should we expect that social scientists would do it for them better? Nevertheless, the Popperian objection points to something positive: namely, that Finalization might serve as a kind of 'metascientific' rationality based on a higher sense of scientific autonomy—one that is sensitive to what economists call 'sunk costs' and 'opportunity costs' in organized inquiry. After all, there is nothing especially rational about continuing a line of inquiry simply because it has been followed for a long time if it has increasingly failed to deliver on its original promises.

Scientific Authority?

In the 1990s, the positive side of the Finalizationist proposal was extended by the US political scientist Donald Stokes as 'Pasteur's Quadrant', by which he meant the style of innovative research associated with Louis Pasteur, who laid the foundations for microbiology in the late nineteenth century by working on practical problems involving the spoilage of milk and wine when produced at industrial levels, and the contraction of disease by those regularly exposed to animals in both agricultural and military contexts. While neither Popper nor Kuhn mention Pasteur at all, the Pasteur's Quadrant was quickly picked up by science policy makers around the world looking for a post-Cold War science policy horizon. It started with the US National Science Foundation, which in 2002 issued a twenty-first century vision statement that focused on 'converging technologies', each currently working on practical problems, which working together could serve to radically transform our understanding of the human condition, resulting in what I have called 'Humanity 2.0'. The anticipated convergence involved nanotechnology (i.e., purpose-made molecules), biotechnology, information technology and cognitive science (including neuroscience). Each of these fields had been well funded over the previous decade, if not longer, but largely to address practical matters, ranging from cleaning the environment to curing intractable diseases. The 2002 report suggested that now was the time to consolidate research in these fields with the aim of laying the foundations of a 'transdisciplinary' science capable of projecting a 'transhuman' future. While state commitment to the converging technologies agenda has been intermittent over the years, certain aspects of it (e.g., the reversal of ageing, cyborganization) have been picked up enthusiastically by the commercial sector and spread in the wider culture.

In the end, *Kuhn vs. Popper* was about how to explain change in 'science', where 'science' refers not only to how scientists organize their business but also to the epistemic authority they exert over society as a whole. In both cases, the autonomy of scientific inquiry is central, but that leaves a conundrum: How can one claim authority over others if one's judgement is clearly influenced by those others? Popper and Kuhn offered two reasonably clear answers to this question.

Popper proposed that scientists exert their 'negative responsibility' by endlessly engaging in a kind of self-criticism that tests the limits of their fundamental beliefs. It is an open question whether this activity is conducted best by individual scientists or the scientific community as a whole. In any case, such an 'ethics of inquiry' is designed to preclude the need for some external agency to awaken scientists from their 'dogmatic slumbers', to recall what Kant said reading Hume did for him. On the contrary, given Popper's wider political support for what he called the 'open society', his sense of scientific autonomy might set a standard for liberalism in society at large.

In contrast, Kuhn's sense of scientific autonomy was a much more institutional matter, the benchmark of which was set by the Charter of the Royal Society of London. It amounted to a pact of mutual non-interference, whereby scientists would not comment on politics and politicians would not comment on science, but both may engage in contractual arrangements to mutual benefit. This is closer to the Plato-inspired 'double truth' doctrine of the Middle

SERRC
Social Epistemology
Review & Reply Collective
12 (9): 15–21. 2023.
https://wp.me/p1Bfg0-85i

Ages, especially as championed in the Islamic world by Ibn-Rushd (Averroes), who in turn provided the backdrop against which Thomas Aquinas developed a Christian version of the doctrine. It may also explain Kuhn's reluctance to speak out against US science policy during the Cold War.

Nevertheless, while I believe that Popper would cope better than Kuhn in today's post-truth world, both would be caught off guard by its radically anti-expert stance, which casts aspersions on anyone who claims a privileged epistemic standpoint. After all, in one way or another, both Kuhn and Popper believed that scientists themselves would ultimately determine whether a dominant research trajectory needs rivals, if not outright replacements. Where they differed was that Popper would have scientists be much more proactive than Kuhn in generating such alternatives to the status quo. Indeed, Kuhn held that paradigms change because the single-mindedness of scientific inquiry drives paradigms to self-destruction. But the Protscientists who inhabit today's post truth condition basically don't trust professional scientists to do the right thing regarding science. They believe in what I called a quarter-century ago in *The Governance of Science*, 'cognitive euthanasia' for fields whose intellectual and material resources might be better redeployed elsewhere. Like Finalization, this process might be administered by the state, but now more emphatically understood as the instrument of democratic authority rather than simply the imposition of a new (social scientific) expertise. How such 'democratic authority' might be assembled, legitimized and deployed remain open questions.

Let me conclude by thanking Adel Gheidari and his mentor Dr Fahrad Balash for their diligent work in making this translation possible, which will hopefully inform Iranian readers of the very open future that awaits scientific inquiry.