'Working in a new world': Kuhn, constructivism, and mind-dependence

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In *The Structure of Scientific Revolutions,* Kuhn advanced the following bold claim: "though the world does not change with a change of paradigm, the scientist afterward works in a different world" (Kuhn 1962; third ed. 1996, p. 121). By latching onto the work of Nelson Goodman and *Gestalt* psychology, Kuhn argued that scientists never engage in the simple activity of interpreting given data. Instead both the data themselves, the regularities they display, and the laboratory manipulations of those data are substantially different before and after a scientific revolution. Experimental data cannot provide a hook to mind-independent reality because laboratory manipulations and measurements are themselves paradigm-dependent. Moreover, different paradigms display different conceptual resources that make possible for scientists (before and after a scientific revolution) to see the world differently.

Kuhn contented for example that Galileo saw the swinging stone differently from Aristotle because "he measured only weight, radius, angular displacement, and time per swing, which were precisely the data that could be interpreted to yield Galileo's laws for the pendulums…Given Galileo's paradigms, pendulum-like regularities were very nearly accessible to inspection…Regularities that could not have existed for an Aristotelian (and that are, in fact, nowhere precisely exemplified by nature) were consequences of immediate experience for the man who saw the swinging stone as Galileo did" (*ibid*. p. 124). It is the conceptual switch from motion as the distance *to* a final end point, to motion as the distance *from* the origin that "underlies and gives sense to most of his well-known 'laws of motion'" (*ibid*.). These jointly (paradigm-dependent) regularities *and* conceptual parameters were in turn made possible by a series of crises and intellectual changes that had occurred in the Medieval impetus theory and Neoplatonism, among others. The other example Kuhn mentioned in relation to the claim of "working in a new world", is the passage from affinity theory to Dalton's atomic theory, whereby the gas mixtures were reinterpreted in terms of specific combinations of whole-number ratios of atomic elements. Kuhn claimed that Dalton successfully operated the conceptual switch from mixtures to compounds because he was a meteorologist, for whom the absorption of gases by water remained a mystery that affinity theory could not explain, and as such he was immune from the chemical paradigm of his time (*ibid.* pp. 133-5).

Kuhn's view has been at the center of a philosophical literature that has tried to make sense of his bold claim of "working in a new world". Hacking ('Working in a New World: the Taxonomic Solution', in P. Horwich (ed.), 1993, *World Changes. Thomas Kuhn and the Nature of Science;* Cambridge, Mass.: MIT Press, pp. 275–310) has argued that the world consists of individuals, and as such it does not change during a scientific revolution. Yet, the world scientists work in and act upon is not a world of individuals but a world of kinds, and kinds typically change during a scientific revolution, because Kuhn's taxonomies force scientific kinds from distinct paradigms to be untranslatable (*ibid.,* p. 289). Boghossian, in a recent book (2006, *Fear of*

Knowledge. Against relativism and constructivism, OUP), has listed Kuhn in good company with Goodman, Putnam and other fact-constructivists, who claim that "prior to the use of those descriptions, there can be no sense to the idea that there is a fact of the matter 'out there' constraining which of our descriptions are true and which are false" (*ibid*., p. 32; see also pp. 118-125).

The goal of this paper is to clarify what sort of constructivism is licensed by Kuhn's bold claim. I will go back to Kuhn's examples about Galileo's swinging stone and Dalton's compounds and elucidate the sense in which it can make sense to say—as Kuhn did—that scientists before and after Galileo (or Dalton) *saw* the swinging stone (or chemical compounds) differently. I will then draw conclusions about the implications of Kuhn's view for the debate between realists and constructivists by ruling out some prominent senses of 'mind-dependence', which have typically been associated with Kuhn. To this purpose, I will distinguish among different senses of 'mind-dependence' (ontological, semantical, epistemological). I will argue that the semantical constructivism licensed by Kuhn's view is less worrisome than other varieties available on the market (primarily, social constructivism), yet less palatable than a milder epistemological variety, which realists too could accept.