# Kuhn as Empiricist[1]

The following will dispatch with the egregious misunderstanding of Thomas Kuhn's general stance. Scholarship, somewhat curiously, focuses on what Kuhn says about theory, but without also acknowledging the weight empirical data has in the larger scope of his thought on theory. The problem in trying to understand Kuhn on the basis of theory alone is that his history and philosophy of science is embedded in the realm of empirical data. The strategy of what follows is to illustrate how empirical work sets revolutions in motion, and to illustrate how data is essential to Kuhn's description of science.

To begin with, it is important to note that an "anomaly" is a piece of empirical data that stands outside of the anticipated empirical data; so anomalies may include data that is dismissed as experimental error, some data noticed but dismissed as irrelevant, or, possibly, data that goes unnoticed. Scientists have to discriminate between data by way of some set of standards, because "[t]he scientist who pauses to examine every anomaly he notes will seldom get significant work done" (*The Structure of Scientific Revolutions* 82). Kuhn may even be understating the case, here, as the early scientists working on something as simple as the physics of a pulley would quite literally have gotten nothing done, had they examined ever jostle, audible perturbation, and erratic jump of the pulley's wheel. The point is that Kuhn's image of the scientist is as an empiricist, and it is the unexpected relevance of new data that is the starting point for Kuhn, in *The Structure of Scientific Revolutions*. The unexpected nature of such data, whether wholly new or numbered among those types dismissed, in conjunction with that data's further relevance to science, is what brings about the possibility of a scientific revolution.

There should be no confusion on what has been stated so far, because it is nothing more than the typical scientist-in-training is familiar with: there are standards in place, some implicit by way of training, others explicitly stated (e.g., how to determine insignificant noises made by meerkats, when trying to understand information exchange among a group), which are used to sift out the significant data from the rest. It is not the case that any and every data set is a cause for crisis. Kuhn states, "If awareness of anomaly plays a role in the emergence of new sorts of phenomena, it should surprise no one that a similar but more profound awareness is prerequisite to all acceptable changes in theory" (*The Structure of Scientific Revolutions* 67). The fact that the "anomaly" stands as a class of empirical data cannot be stressed enough. Confusion, somehow, and for whatever reason, seems to be the result not acknowledging that the "anomaly" is a very specific, proper subset of all empirical data. The import anomalies come in their ability to shatter common conceptions within the scientific community held about the world —or, less dramatically, force the empiricist to reconfigure how she or he understands the world. The manner in which Kuhn words it is: "[Anomalies] are the tradition-shattering complements to the tradition-bound activity of normal science" (*The Structure of Scientific Revolutions* 6). A relevant piece of data, though not taken to be itself a counter-instance of a theory, is potentially critically problematic for normal science, and this potential often manifests when numerous anomalies cannot be accounted for within accepted theory. In other words, large amounts of data that stand in contest to scientific understanding tend to induce a crisis.

Kuhn's discussion of response to crisis reflects the same kind of embedding in empirical data. For a moment, consider Kuhn's comment on the status of paradigms: "Paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to recognize as acute" (*The Structure of Scientific*

*Revolutions* 23). This text comes before his discussion of crisis and crisis reconciliation, but it demonstrates just how coherent and patently empiricist Kuhn's thought is, because he explicitly states the necessary qualitative element that distinguishes the paradigm prior to and following a revolution. Moreover, those problems mentioned in the quote just given include the subset of data, the anomalies, which need working into the scientists understanding of the world. Crises arise as a result of data, crises are resolved so as to account for data and maintain consistency between data and theory. To emphasize this, it only seems appropriate to cite Kuhn's quote of Hanson, in which Hanson describes what happens after a revolution: "'…handling the same bundle of *data* as before, but placing them in a system of relations with one another by giving them a different framework'" (*The Structure of Scientific Revolutions* 85) (emphasis added). Drawing on Hanson, it is clear that Kuhn, himself, places data at the heart of all science, and that the empirical component of science is what his history and philosophy of science centered on.

Among the most important points in all of Kuhn's literature, and throughout it, is the role empirical data plays in constraining theory. Contra those scholars who have sought to turn Kuhn into a relativist, or those who sought to bring ruin to Kuhn on the basis of that understanding of him, Kuhn's history and philosophy of science adheres to what the data say. Kuhn says this explicitly, saying, "Observation and experience can and must drastically restrict the range of admissible scientific belief… (*The Structure of Scientific Revolutions* 4)." "Restricting the range" is the kind of phrase that tends to get Shapere-minded philosophers agitated, because they want more than mere constraint. The reality is that any given data set does not uniquely determine the theory that is to accompany it. The mistake is to see Kuhn as being a theory-first philosopher. This kind of thinking creates a false impression when considering his ideas on revolution. For instance, Lakatos says, "The change [in scientific opinion over theories] is a

bandwagon effect. Thus *in Kuhn's view scientific revolution is irrational, a matter for mob psychology*" (Lakatos 178) (italics in the original). However, when Kuhn is describing what scientists do, he is describing what they do *with respect to data*; and where the data can do no further work, Kuhn merely gives a report on what scientists do under those circumstances. Again, hearkening back to underdetermination, Kuhn says, "Unfortunately, however, theories cannot always be discriminated in terms of accuracy. Copernicus's system, for example, was not more accurate than Ptolemy's until drastically revived by Kepler more than sixty years after Copernicus's death" (*Objectivity, Value Judgment, and Theory Choice* 213). One should note that Kuhn only allows extra-empirical factors in when theories are struggling to account for the data at hand, and the scientists are fully thrown into a state of crisis, which requires human creativity and rational debate (with a mind toward the data!) to resolve —and this is consistent with historical accounts. Kuhn's account sticks with empiricism until the data cannot do anymore work; and it is from there that one must keep in mind that, even in revolution, Kuhn sees the scientists as trying to account for empirical data. That is why the proper view of Kuhn is as an empiricist.

## **Works Cited**:

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