The Darwinian Revolution as Evidence for Thomas Kuhn's Failure to Construct a Paradigm for the Philosophy of Science

Kuhn's goal in *The Structure of Scientific Revolutions* is to propose his ideas as a paradigm for the philosophy of science. He disapproves of the "textbook model" of scientific history in which all discoveries follow the simplified pattern of observation, hypothesis, experimentation, and acceptance (Kuhn 1). Instead, Kuhn proposes an original examination of the process by which scientific ideas evolve. If Kuhn's ideas are indeed a paradigm, they must possess the paradigmatic characteristics that he describes. One of these characteristics is explanatory power for all observations; Kuhn's suggestion must describe accurately the form taken by all scientific revolutions. If a scientific revolution occurred that does not follow Kuhn's structure, then the structure is flawed. In his essay titled "The Kuhnian Paradigm and the Darwinian Revolution in Natural History," John C. Greene attempts to fit the Darwinian Revolution to Kuhn's ideas. However, he must contort his discussion of this scientific revolution to force it to conform to Kuhn's suggestion. Because Kuhn's structure fails to describe satisfactorily the form of the Darwinian Revolution, Kuhn has not formulated a paradigm for the philosophy of science.

Kuhn's ideas can be evaluated for paradigm status only if his field is a science; therefore we must establish a definition for science under which to examine Kuhn's proposal. Perhaps the definition that most clearly applies to Kuhn's field is Ernest Nagel's: "the sciences seek to discover and to formulate in general terms the conditions under which events of various sorts occur" (Nagel 4). Kuhn's goal is to do just that: to identify the circumstances under which scientific revolutions occur. However, tempting as it is to use this definition as evidence that Kuhn's field is science, Kuhn's ideas only apply to what *he* believes are sciences. Kuhn calls science "the constellation of facts, theories, and methods collected in current texts" (Kuhn 1).

Kuhn studies methods for examining science; his ideas contribute to the "constellation...of methods." Based upon his own definition, his field is scientific, and therefore ought to base investigations upon a paradigm. Kuhn states that "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" (Kuhn 23). Presumably, each scientist who conceives of a new idea wishes for it to have greater explanatory power than previous ideas - and thus to become a paradigm. Therefore Kuhn proposes his idea as a paradigm for the study of scientific revolutions.

Changes in paradigms occur in response to anomalies; when the current paradigm cannot account for an observed phenomena, a new paradigm must be adopted (Kuhn 53). The new paradigm is therefore a *response* to the old paradigm. It does not arise from research under the previous paradigm, but is instead a new idea that forms as a reaction to the previous paradigm's shortcomings. If Kuhn's model is accurate, then it can predict retroactively the form that prior revolutions took - for example, the Darwinian Revolution. Based upon Kuhn's conjecture, prior to the adoption of Darwin's paradigm, natural historians must have followed a different paradigm that did not include evolution. Kuhn's formula predicts that Darwin hypothesized evolution in response to an anomaly he observed under the previous paradigm. When he published *The Origin of Species*, the new evolutionary paradigm was accepted, and the previous paradigm discarded.

The previous paradigm whose existence Kuhn's model suggests is the Linnaean concept of natural history. As John C. Greene describes, Linnaeus' form of natural history does indeed resemble a paradigm. It provided a foundation upon which to conduct research, it facilitated communication among natural historians, and "it dominated the field of natural history for nearly

two hundred years and helped to prepare the way for a far different, far more dynamic kind of natural history" (Gutting 299). Linnaeus' natural history was static, and its goal was merely to identify and classify organisms. Thus far, Kuhn's model applies, and would predict the following course of events: upon observing speciation, Darwin uncovered an anomaly under the Linnaean paradigm, namely that Linnaeus could not be correct that natural history is static. Darwin concocted the theory of evolution in response to this anomaly, and because evolution had greater explanatory power than the static Linnaean model, Darwin's theory became the new paradigm.

However, the events that actually transpired were much different than what the Kuhnian model predicts. Darwin's theory of evolution was *not* a response to Linnaeus. Instead, Darwin built upon previous scientists' work: "Darwin himself made no claim to have invented the idea of organic evolution" (Gutting 314). Buffon and Lamarck, for example, both embraced a dynamic form of natural history in which all species are related to varying degrees and change over time in response to changes in the environment (Gutting 301, 307, 314). These ideas were a precursor to Darwin's version of evolutionary theory, and indeed, "the revolution in natural history had been prophesied for more than a century" before Darwin's paradigm emerged (Gutting 315). If Darwin's paradigm emerged as a continuation of previous research, and not in response to an anomaly under the previous paradigm, then the Darwinian Revolution does not follow Kuhn's structure.

Furthermore, it is unclear whether Linnaeus' school of thought truly is a paradigm. According to Kuhn, a paradigm is the foundation for an *entire* field, and therefore each field must possess only *one* unique paradigm (Kuhn 10). However, the Linnaean paradigm was not unique: "natural history acquired *two* paradigms in rapid succession in the mid-eighteenth

century" (Gutting 302). The Count de Buffon also proposed a paradigm for natural history; his was the dynamic view that eventually gave rise to Darwinian evolution. As do the Linnaean ideas, the Buffonian ideas possess the characteristics of a Kuhnian paradigm; they were sufficiently compelling to explain all observed phenomena, they left room for further exploration, and they attracted a wide base of followers (Kuhn 10). It certainly seems that the Linnaean and Buffonian schools of thought were two concurrent paradigms. The coexistence of two opposing ideas most closely resembles Kuhn's pre-paradigmatic stage, in which several groups pursue different courses of study. But this is not a satisfying description because both the Linnaean and Buffonian ideas were considerably stronger than pre-paradigmatic hypotheses. Absent the other, either of the two ideas would be considered a paradigm. Kuhn's model does not allow for the simultaneous development of two very different paradigms, one of which becomes predominant as a result of a revolution. Thus, Kuhn's model once again falls short in portraying the structure of the Darwinian Revolution.

Faced with the example of the Darwinian Revolution, we must conclude that Kuhn's idea is not entirely successful as a model for scientific revolutions. Certainly it is sound as a general pattern that many revolutions have followed; Kuhn provides ample evidence for this. But it cannot be a paradigm for his field. Rather than providing a model that suffices for all revolutions, Kuhn's idea's "adequacy as a conceptual model for that development seems doubtful" (Gutting 317). The road leading up to the Darwinian Revolution was one involving two distinct paradigms - Kuhn's model allows for only one. Darwin's based his revolutionary theory upon past research - Kuhn's model necessitates that revolutions are entirely novel suggestions. Kuhn scorns the "textbook model" of scientific research - observation, hypothesis, experimentation, acceptance - but his proposition is no less simplified: observation of an

anomaly in the current paradigm, hypothesis for a new paradigm, experimentation to corroborate the validity of the new paradigm, acceptance of the paradigm. Kuhn's discussion provides reason to believe that the history of science is a more complicated study than the "textbook model" conveys. But his particular analysis does not sufficiently demonstrate this complexity.

Bibliography

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