

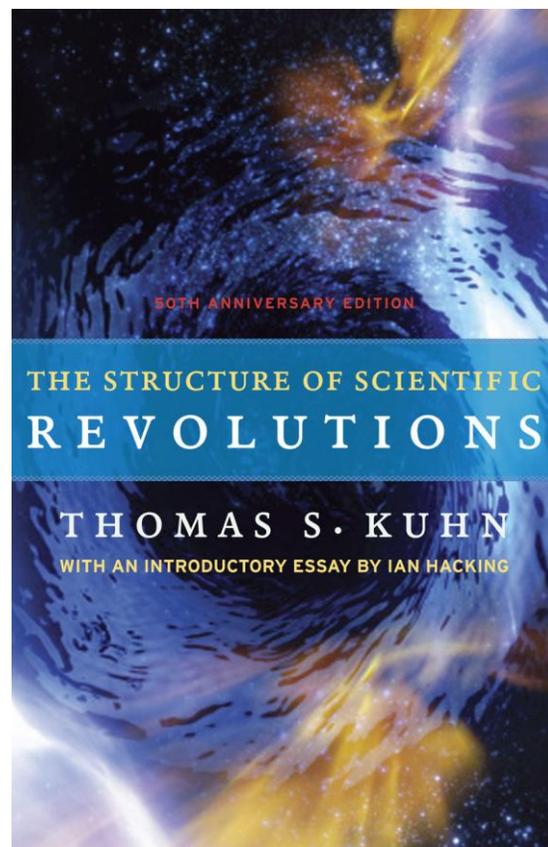
# **The Structure of Scientific Revolutions**

**Thomas Kuhn**

Book Review

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Fifty years ago, Thomas Kuhn wrote a thin volume entitled *The Structure of Scientific Revolutions*. Kuhn challenged the traditional view of science as an accumulation of objective knowledge toward an ever more ‘truthful’ understanding of nature. Instead, he argued, that there is no ‘Truth’, what scientists discover depends to a large extent on the sorts of questions they ask, which in turn depend in part on scientists’ philosophical commitments. Sometimes, the dominant scientific way of looking at the world becomes obviously replete with problems; this can give birth to radical and irreversible scientific revolutions that Kuhn described as “paradigm shifts” — introducing a term that has been much used and abused by the social scientists especially those trying to bring forth a social change. Paradigm shifts interrupt the linear progression of knowledge by changing how scientists view the world, the questions they ask of it, and the norms they use to understand it. Since scientists’ worldview after a paradigm shift is so radically different from the one that came before, the two cannot be compared according to a mutual conception of reality. Kuhn described this as ‘incommensurability’. He concluded that the path of science through these revolutions is not necessarily toward truth but merely away from previous error. Hence the new paradigm solves the problems of the previous paradigm but comes along with its own new problems.

In the ninth chapter of his book titled, “The Nature and Necessity of Scientific Revolutions” Kuhn defines that, “Scientific Revolutions are here taken to be those non-cumulative developmental episodes in which an older paradigm is replaced in whole part or in part by an incompatible new one”<sup>1</sup>. Kuhn essentially compares the scientific revolutions to the political revolutions. He states that in political and scientific revolutions “the sense of malfunctioning that can lead to crisis is prerequisite to the revolution”<sup>2</sup>. As a political crisis deepens, many individuals commit themselves to

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<sup>1</sup> Kuhn, 92

<sup>2</sup> Kuhn, 93

the reconstruction of the society with a new outlook. At that point, they come into opposition with those seeking to maintain the on-going system of the society. And once the “polarization occurs, political recourse fails”<sup>3</sup>. Hence at this point the revolution takes place. The case for the scientific revolutions is much similar. In that, often the revolution brings about a new field of research and study with its own set of problems to be solved.

Kuhn describes, “Normal science as research based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice”. Whenever there is a scientific revolution or a paradigm shift normal science takes the place which it creates for further research. Kuhn states that, “Aristotle’s *Physica*, Ptolemy’s *Almagest*, ... - these and many other works served for a time implicitly to define the legitimate problems and methods of a research field for succeeding generations of practitioners”<sup>4</sup>. Hence therefore the science and practices carried out by the successive scientists after these paradigm shifts is categorized as the normal science or one that is carried out within limited framework of a paradigm. Kuhn uses an example of the physics of theory of light to illustrate the concept. He states that, “Before it was developed by Plank Einstein and others early in this century, physics texts taught that light was transverse wave motion”<sup>5</sup>. However after several paradigm shifts in it, today the textbooks say that light is photons. Therefore the research being made on light today will be categorized as normal science because it is being conducted within the framework of that paradigm: light is natured as photons.

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<sup>3</sup> Kuhn, 94

<sup>4</sup> Kuhn, 10

<sup>5</sup> Kuhn, 12