

Thomas Kuhn: the man who changed the way the world looked at science

Before Kuhn, our view of science was dominated by philosophical ideas about how it *ought* to develop ("the scientific method"), together with a heroic narrative of scientific progress as "the addition of new truths to the stock of old truths," or the idea that new theories increasingly got closer the truth. Before Kuhn, in other words, we believed that past researchers, theorists and experimenters had engaged in a long march, if not towards "truth", then at least towards greater and greater understanding of the natural world. Imagine a collection or pile of objects with each object representing some bit of scientific "knowledge." Each new experiment, each new theory just added to this pile, according to the traditional view.

Kuhn's version of how science develops differed dramatically from that old version. Denying the view of science as a continual building process, Kuhn held that a revolution is a destructive as well as a creative act. Where the traditional view saw steady, cumulative "progress", he saw discontinuities – a set of alternating "normal" and "revolutionary" phases. During "normal" phases, there was an accumulation of knowledge that was similar to the old traditional view in which scientists simply add knowledge to the pile mentioned before. During "revolutionary" phase, though, old theories, models, assumptions, understandings and approaches can be called into question: the entire intellectual framework is questioned. During these phases, the entire "pile" can be destroyed and replaced with a new accumulation of knowledge. This is similar to how we build our understanding of history through revisionism and the emergence of a new consensus over time.

Three Characteristics of Scientific Revolutions

- (1) The community's rejection of one time-honored scientific theory in favor of another incompatible with it.
- (2) A shift in the problems available for scientific scrutiny and the standards by which solutions should count as admissible or legitimate.
- (3) A transformation in scientific imagination on how scientific work was done. Such changes, together with the controversies that always accompany them, are the defining characteristics of scientific revolutions.