Richards, Robert J.; Daston, Lorraine (Hrsg.): *Kuhn's Structure of Scientific Revolutions at Fifty. Reflections on a Science Classic*. Chicago: University of Chicago Press 2016. ISBN: 978-0-226-31720-5; 202 S.

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There are ideas in science studies that have had a strong, long-lasting impact on the field. Undoubtedly, Thomas Kuhn's concept of paradigms presented in his famous book „The Structure of Scientific Revolution" of 1962 is one of them. The book has contributed much to the way we think about science today, transcended disciplinary boundaries, and influenced scholars in the history, philosophy, and sociology of science. It makes sense to reflect on such rare classics from time to time as the field continues to develop, and the anthology edited by Robert Richards and Lorraine Daston is such an endeavor. It neither intends to give a systematic introduction into „The Structure" nor does it unfold a systematic perspective on its reception. Instead, the editors gave the contributors „complete freedom as to what aspect of Kuhn's book they wished to address" (p. 8). My review will focus on three recurring aspects: First, the intellectual contexts and origins of „The Structure", second, the question of the compatibility of Kuhn's work with social constructivist perspectives, and third, the fruitfulness of the concept for recent research in the field.

The intellectual origins of „The Structure" are the topic of George Reisch's, Peter Galison's, and David Kaiser's contributions, which, to some extent, are complementary. Galison provides an overview of the various fields of study Kuhn was interested in prior to the publication of „The Structure", ranging from such diverse topics like quantum physics and counter-radar-research to his readings in linguistics, philosophy, cybernetics, and development psychology. Jean Piaget's work on child psychology was of particular interest to Kuhn. He transferred Piaget's development theory of perception with incommensurable world views to the development of science. Kaiser elaborates on yet another aspect of Kuhn's engagement with psychology. Kuhn borrowed the idea of a gestalt shift taking place in the perception of scientists during paradigm changes from the works of experimental psychologists Heinz Werner, Jerome Bruner and Leo Postman. George Reisch focuses on the time when Kuhn first had the basic idea for his book. Reisch goes back to a situation Kuhn called the Aristotle experience at the beginning of the Cold War in 1947: When reading Aristotle's Physics, he suddenly understood that „Aristotle seemed a very good physicist indeed but of a sort I'd never dreamed possible" (p. 13). His work made a lot of sense but only in the context of an array of basic theoretical concepts that differed from later theories in physics in a fundamental way. With this insight, the idea that science proceeds in a noncumulative way was born. Aside from this experience, Reisch is also interested in the link between Kuhn's concept and the political climate of that period. During the early Cold War, left intellectuals were commonly regarded as mired in a hopeless position because their ideology led to mental captivity causing biased perception and impaired judgements (p. 20). Kuhn gave the assessment a different spin as he understood paradigms in science analogous to political ideologies: they shape the perception of problems, possible solutions and the interpretation of experiments.

The second point I found interesting while reading the book under review is how the contributors discuss the connection between Kuhn's concept and constructivist perspectives like the strong program and the sociology of knowledge that came up with a later generation of scholars. At first sight, Norton Wise seems to explain key elements and terms of Kuhn's work by referring to first-hand-personal experience. Seen from a broader perspective, however, it becomes clear that Wise aims to sharply distinguish between Kuhn's work and more relativist approaches, the Edinburgh school of the Sociology of Scientific Knowledge, in particular. He argues that Kuhn's concept of paradigms does not deal with social but psychological categories in the first place (p. 39). Kaiser's analysis of the correspondence between Kuhn and members of the psychology community points in the

same direction, concluding that „several psychologists read Kuhn's book as a treatise on how individuals think" (p. 85). This seems to be close to how Kuhn wished his work to be understood: as a study about the individual perception of scientists. But there is also a trace in the book that also evoked a sociological interpretation: „certainly not all readers found only lessons about individual cognition in the book" (p. 88). For example, Kuhn's idea that a shared cognitive structure dominates the field in periods of normal science is appealing for social constructivist readers. Thus, the strength of „The Structure" that explains its success can also be regarded as its main weakness: It is open to different interpretations.

Reading Andrew Abbott's citation analysis about the impact of the book, one can come to a pessimistic interpretation regarding the fruitfulness of „The Structure" for current developments in the field of science studies. Although its impact is enormous, evidenced by 15,635 citations the book has received until 2012, its current influence is put into perspective by the fact that the lion's share of citations (94%) comes, with increasing tendency, without any page information. For Abbott, the results indicate that „the majority of those who have cited the book have not read most – or perhaps any – of it" (p. 175). Arguably, „The Structure" is more and more cited for iconic reasons and to refer to a commonplace idea. Other contributors still regard Kuhn's work a valuable tool of analysis. Interestingly, they all refer to the core of the concept: paradigms as examples or, in Kuhn's words, as 'exemplars.' He regards shared exemplars as key for normal science because they provide a model or a modus operandi from which solutions, methods and instrumentation for remaining problems can be derived. Following Ian Hacking, the role of examples for arguments is not well reflected in philosophy and the blurriness of the term is traced back to the work of Aristotle. While Kuhn did not provide a study on the role of examples in the production of knowledge, he made „brilliantly novel use of an ancient idea" (p. 109). Lorraine Daston writes with some nostalgia that Kuhn's successors – current historians of science – predominantly choose their peer historians as the primary audience and weaken the interdisciplinary discourse between historians, sociologists and philosophers of science; an observation that I would consider to be true for sociologists of science as well. Daston does not end with a pessimistic take on the state of the affair though. To her, Kuhn's emphasis on shifting paradigms suggests a mode of knowledge, learning and problem-solving that is „less systematic or less analyzable than knowledge embedded in rules, laws, or criteria of identification" (p. 126). This insight is still very productive for the history of knowledge and beyond, she argues. Angela Creager makes the interesting point that, other than in physics, exemplars do not play an important role in biomedical research. Instead, „model systems", i.e. well-studied research organisms like drosophila, specific bacteria or mice work in a similar way as more abstract exemplars in physics do. In contrast to paradigms, in terms of theory, model systems do not lead to different worldviews but orientate experimentation in the sense of handling „the world differently" (p. 155). Creager's comparison is instructive but also leads to further questions, in particular as to whether there are other features in science serving as functional equivalents to exemplars.

My overall conclusion is that Kuhn's 'Structure of Scientific Revolutions' at Fifty is a fine collection worth reading, not only for specialists of Kuhn's work but also for scholars in the interdisciplinary field of science studies more generally. To the latter, it provides a welcome invitation to reread or, in fact, read Kuhn and reflect on different facets of his work against the background of their own research practice.

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