
Review for the book: *Science after the practice turn in the philosophy, history, and social studies of science*

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Scientific practice, in all its dimensions, has been the focus of considerable interest to philosophers, historians, and social scientists for some years now. The book *Science after the practice turn in the philosophy, history, and social studies of science* reflects precisely this trend in contemporary literature, all wrapped up in a neat edition. Unlike other edited books, here we find a collection of articles each having its own critical response. Such dialectical structure facilitates communication between different traditions and communities, at the same time moving discussions forward. Now, precisely because there is no common approach to what the practice turn is, each article -and its response- is self contained. This is, to my mind, an appreciative advantage of the book as it favors variety. Unfortunately, it also unbalances it, as the book ends up lacking a continuum throughout the discussions. As a result, we get articles ranging from theoretical studies on the practice turn (e.g., chapters 1, 2, 3, and 9) to more example-centered ones (e.g., chapters 4, 5 and 8), including a rich amalgam that thrive from both kinds. From a different angle, the book profits from studies on chemistry (chapter 2), values in engineering (chapter 6), mathematics and history of mathematics (chapter 7 and 8, respectively), and ethics (chapter 5).

Space is constrained, though I would like to give a quick overlook of each chapter. This leads me to apologize to the authors for being unable to do full justice to their articles and responses. All ten pieces -including the introduction- excel in quality, creativity, and importance, regardless of the specificity of topic addressed. All ten pieces make this book a rich and valuable addition to the literature interested in the practice turn. What comes is a summary of the general flow of the book.

The introductory chapter is an illuminating historical reconstruction of the current studies on the practice turn in science studies. Although there is no general thesis -it is an introduction after all-, the authors nicely tie up each topic with an article in the book. This self reference is a welcome move by the authors, as it situates the reader in the overall structure of the book. The authors divide the introduction into six sections, including the aims, scope, and genesis of the book (section I), and a short discussion on the diversity of studies included under the phrase ‘the practice turn’ and ‘science studies’ (section II). Sections III to V address the question of how the practice turn emerged from the sociology and philosophy of science, the possibilities of a (dis)unified identity of the practice turn, and the shifts introduced that differentiate it from traditional perspectives on science. One important aspect of the introduction that should not be overlooked is their sensitivity to all sides of the story, from the positivist viewpoint to the constructivism and relativism programs. Finally, section VI is a careful reconstruction of each article with its main thesis. Unfortunately, it does not include a reconstruction of the response, which in many cases proved to be a good complement to -and even a clarification of- the main article. To my mind, this is a minor, although still notable slip of the editors.

Chapter one addresses the question of what counts as ‘practice’. This is a good kick-off article, since the notion of ‘practice’ is a recursive keyword throughout the book. According to Salanskis, the author of this chapter, there has been a damaging tendency “to regard anything as practice”, and therefore a clarification follows. In this vein, he tailors the notion of practice to the notion of ‘action’, making the latter the main category of interest. Unfortunately, this latter notion is convoluted and hard to follow. The reviewers share

this opinion, as they list nine different interpretations for the concept and try to figure out where Salanskis stands.

Chang, author of chapter two, builds on his own previous work on the *philosophical grammar of scientific practice*. That is, a structured and precise philosophical framework for thinking about scientific practices. The main task is to articulate concepts such as ‘epistemic activity’, ‘system of practice’, ‘aims’, and ‘coherence’. Each concept plays a specific role in Chang’s framework for activity-based analysis. In addition to his philosophical grammar, Chang offers a final section on how to apply his framework to history, philosophy, and sociology of science. A detailed and cogent review is done in the commentary section, mostly pointing out inherent difficulties in Chang’s project as well as potential ways out.

In chapter three, Lynch offers an historical appreciation of the practice turn and its aftermath in STS. In this respect, he outlines ten current trends that followed from, succeeded, or displaced the practice turn. But perhaps the most prolific discussion is Lynch’s notion of ‘expertise’ as a normative category. To him, “expertise is bound up with political actions and discourses in which social scientists participate.” This discussion triggers the objection of his reviewers, who claim that, although largely correct, Lynch’s normative stand is too crude to provide an answer to problems in STS.

Chapter four is a careful and detailed reconstruction of how the practice turn has modified our conception of science and the way we analyze it. Drawing from the establishment of the periodic law in the 19th century, Woody shows how the practice turn also focuses on theoretical science and not merely on experiments. An analysis of the periodic table is then inevitable, and Woody capitalizes on it by showing the forms of practices it enables and sustains -tailored to scientific representation and explanation-, and how it is meshed with the skills, interests, aims, and background knowledge of the chemical community. Although largely convinced, her reviewers requested a more refined conceptualization of the chemists’ practices.

Chapter five reverts to the question of scientific practices by focusing on the *malpractices* -just another face of the same coin. Andersen identifies and offers an analysis for preventing different forms of distrust, misconduct, and the ‘grey zone’. The core argument is that these actions go beyond research ethics, and include an epistemological side, one where scientists depend on each other’s results, methods, etc. The reviewer articulates Andersen’s contribution and supplies his own suggestions, focusing more on the latter. The reviewer, then, presents a finer grained discussion of malpractices in science.

Readers interested in engineering education will find chapter six quite appealing. It focuses on an ethnographic approach to engineering practice. A core issue here is the mismatch between current engineering curricula and the daily practice of professional engineers. Two deficiencies in the engineering curricula emerge: first, it neglects the presence of teamwork in daily practice; second, it neglects the fact that technical creations end up in society and have a social impact. Bucarelli and Kroes propose how to deal with, overcome, and integrate such deficiencies. In addition, they suggest how engineering education may be considered a socio-technical system that meets the needs of contemporary engineering practice. The reviewer’s main value is to show how Bucciarelli and Kroes’ work belongs to the practice-turn paradigm.

Chapter seven shifts the focus from science to mathematics. Van Bendegem offers a panorama of the different approaches to mathematical practice -which should not be confused with traditional philosophy of mathematics. The core question is whether mathematics enjoys a special epistemic status as a practice. To this, the author answers positively although warning us about the negative prospects of a practice-based mathematics. To him, such a practice has barely penetrated the hard core of traditional philosophy of mathematics. There is, however, hope, and it comes in the form of a fruitful interaction between the two. The response works as complementary section, as the reviewers specify further what mathematical practice means, and how it can be integrated with a practice-based science.

Chapter eight advances an argument for the description of mathematical practices as a means for interpreting ancient texts of which the source provides only indirect evidence. Chemla, the author, shows how the description of mathematical practice facilitates interpreting clues for a scarce source, to perceive changes in the knowledge possessed by actors, and to discover core questions for such actors. The article focuses on the history of two ancient Chinese books on mathematics, and develops to reach the article’s aims nicely combining

mathematical practice with conceptual history. The reviewers opt for reconstructing Chemla's main argument while raising some fundamental question.

The last chapter brings us back to philosophical speculation. Rouse's main concern is to determine how the so-called 'scientific image' -in Sellars' sense- should be modified in a naturalistic way in order to accommodate the practice turn -with a special emphasis on biological contexts. The strategy is to show that an emphasis upon science as practice forces a revision of the notion of 'scientific understanding'. A core lesson is that this notion is not primarily representational, as it has been claimed by many pre-practice turn philosophers. Several implications and objections of Rouse's reconceptualization of scientific image, scientific practice, and scientific understanding are advanced by the reviewer.