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## Dossier Pierre Duhem – Book Review

Bordoni, Stefano. *When historiography met epistemology: Sophisticated histories and philosophies of science in French-speaking countries in the second half of the nineteenth century.* – Leiden; Boston: Brill, 2017. – x, 335 p. – (History of modern science; 2). €149,00 ISBN: 9789004315228

### Reviewed by:

Jean-François Stoffel<sup>1</sup>

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Dedicated to a book which has long been considered a classic, and which, from the *Traité de l'enchaînement des idées fondamentales dans les sciences et dans l'histoire* (1861) by A.-A. Cournot to *L'évolution des théories physiques du XVII<sup>e</sup> siècle jusqu'à nos jours* (1896) by P. Duhem, takes us on a tour of 35 years of intellectual history, this review offers three objectives. Firstly, to present the author's broader arguments. Secondly, considering that, on the one hand, its contents are not immediately apparent (at least not from its Table of Contents) and that, on the other hand, the method used consists in providing (while remaining as faithful to the text as possible) a critical interpretation and commentary on the selected publications, to provide a brief introduction to the authors and the themes addressed. Lastly, owing to its publication within a dossier specifically dedicated to P. Duhem, to further explore the main arguments and ideas, which occupy nearly a third of the work, centered around this illustrious scholar.

French historical epistemology can be defined as the conviction whereby a genuine and authentic historical perspective is seen as essential in order to establish a constructive dialogue between science and philosophy, and in order to construct an epistemology which better conforms to the reality of scientific approach. According to the traditional view adopted chiefly by A. Brenner and C. Chimisso, it originated, depending upon the chosen emphasis, either during the last decade of the 19<sup>th</sup> century with the works of H. Poincaré, P. Duhem and G. Milhaud (A. Brenner), or during the 1930s and 1940s with G. Bachelard as the key figure in this case (C. Chimisso).

Without disputing the importance of the discussions conducted at the end of the 19<sup>th</sup> century, the point of this book consists in correcting the chronology that we just mentioned: this historicization of the epistemology or, to put it differently, this onset of a mutual engagement, both profound and sophisticated, between historiography and epistemology occurred during the 1860s, thus in the second half of the 19<sup>th</sup> century and not, as is commonly stated, at the extreme end of the 19<sup>th</sup> century, and certainly not during the first half of the 20<sup>th</sup> century. Consequently, it becomes instantly evident that H. Poincaré and P. Duhem, rather than constituting the starting point (A. Brenner) or even representing part of its ancestry (C. Chimisso), should be seen as a destination point (albeit provisional), which is particularly true for Duhem in as much as

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<sup>1</sup> Jean-François Stoffel is a Professor at the Haute École Louvain-en-Hainaut. Address: Département paramédical du Campus de Montignies, 136 rue Trieu Kaisin, 6061 Montignies-sur-Sambre, Belgium. Email: [jfstoffel@skynet.be](mailto:jfstoffel@skynet.be)

he personifies the fulfillment and consolidation of a project which had hitherto been conducted by A.-A. Cournot, Cl. Bernard and E. Naville.

However, this is not to suggest that the sole interest of this work is to postpone the starting point, by a couple of decades, of this intellectual movement, which, by promoting the belief that science is a complex historical and philosophical process instead of considering it as simply ruled by logic and/or experience, resulted in the progressive substitution of a more sophisticated history of science and a more critical epistemology of the scientific approach, for naïve historical reconstructions and simplistic, dogmatic epistemological concepts. Indeed, beyond the mere question of chronology, it involves, on the one hand, recognizing the qualities of a tradition (inspired by Pascal) designed to find the right balance between a naïve and dogmatic ‘scientism’ and an ineffective scepticism and, on the other hand, promoting the idea that — in opposition to the normative and simplistic epistemologies that we have grown used to — the revival of such an aspiration is not only desirable but still possible. Let’s discuss each of these two assertions.

Regarding the first (reviving Pascalian inspiration), in this work one might find the prominence of Pascal’s personage surprising, especially in contrast to the influence that I. Benrubi intended to attribute to Kant. Aside from the arguments traditionally put forward to account for this Pascalian presence — the discovery of the original manuscripts of *Pensées* and the effectiveness of his ideas in counteracting the prevailing scientism — the author introduces the idea that, during the last few decades of the 19<sup>th</sup> century, the debate about determinism and reductionism took place within a context (modern science being of sufficient maturity) which allowed for this illustrious 17<sup>th</sup> century thinker’s voice to be heard, but within a situation where such subversive ideas could only remain inaudible.

As to the second (the resurgence of this inclination towards a refined and well-balanced stance), this is enabled by the author himself. His conviction that the history of scientific thinking is not only characterized by a progressive accumulation of knowledge and by the occurrence of scientific revolutions, but also by a third component: the “buried memories”, namely, the historical process by which isolated research projects, or even broad intellectual traditions, entirely disappear from prevailing considerations despite their heuristic fecundity, only to reappear at a future time in a slightly different form and within a new historical context. Recognizing that this submersion is precisely what had happened to the sophisticated thinkers he studied, St. Bordonni suggests that their intellectual trends had nonetheless been revived by such diverse figures as A. Koyré, N. R. Hanson and Th. Kuhn. Through this philosophy of history, which we would readily describe as typically Duhemian due to its mixture of optimism and unpredictability, the author suggests that studying intellectual life during the second half of the 19<sup>th</sup> century, is not only about providing a means to better understand that of half of the 20<sup>th</sup> century, but also about preserving a precious heritage that should not be definitively condemned to perpetual imprisonment in the annals of history.

Having covered the general theme, let us briefly consider the contents of the book. After a lengthy introduction, aimed at, on the one hand, outlining the broader context of this era marked by a profound transformation of life, being as much material as intellectual, and, on the other hand, presenting the historiographic theme which is to be developed upon throughout the work, the first six chapters are devoted to two fundamental questions which, between the beginning of the 1860s and the middle of the 1890s, animated many scientific discussions among French thinkers largely influenced by scientism. These initially dealt with determinism (considered from the perspective of reconciliation with human free will) and reductionism (conceived as, firstly, legitimately bringing the social sciences back to the model represented by the natural sciences and, secondly, reducing the natural sciences themselves to the archetype represented by classical mechanics). In this book, the reason for such detailed discussions on determinism and reductionism is that they clearly demonstrate the conflict between a naïve scientism and the emergence of newer and more sophisticated historical and philosophical reconstructions. The first three chapters, which are devoted to reductionism, include a substantial section on the refined (yet largely overlooked, since premature) ideas of A.-A. Cournot — undoubtedly one of the author’s preferred scholars, along with E. Naville and P. Duhem — but also include those of Cl. Bernard, as well as É. Boutroux’s radical yet minority antireductionism and, conversely, the reductionism of J. Soury whose personal and intellectual evolution seems representative of that of his entire era. Determinist discussions are the subject of three consecutive chapters chronicling, as central figures, J. Boussinesq with his multidisciplinary, original research program, and the philosopher and theologian E. Naville with his flexible and dynamic epistemology. Since the emergent intellectual movement was characterized by a new awareness of the historical and philosophical complexity of the scientific process, it is to be expected that this realization would give rise, aside from those

originating in traditional historiography, to further research in the history of science conducted according to a new historiographic framework. Chapter 7 is also devoted to the history of science, with three personalities corresponding to three different stages: M. Berthelot typifying a radical and naïve historiography of Comtean inspiration, which is however somewhat tempered by the collective nature of its endeavour; P. Tannery typifying a history of science based on multiple skills and largely devoid of any hagiographic or ideological perspective; and lastly, G. Milhaud typifying an attempt to summarize the erudite research of his predecessor, and to combine history and philosophy of science. Since Duhem personifies, through the original ideas he developed within the context of his firsthand experience in scientific research, the very essence of the sophisticated alliance between science, history and philosophy, this study naturally culminates in two chapters dedicated to him. Finally, it is worth noting the existence of an “epilogue”, which, although of somewhat heterogeneous content, is nonetheless invaluable.

We would like to conclude this review by focusing more specifically on the role attributed to P. Duhem. Having previously evoked the fact that Duhemian *physics* issued from the scholars who preceded him (*Taming complexity: Duhem's third pathway to thermodynamics*, 2012), St. Bordoni — as foreseen — continues his enquiry by examining those elements of Duhem's scientific philosophy which are ascribable to his numerous philosophic and scientific forefathers. From the onset we notice the emergence of an intriguing and distinct behavioural difference: there is Duhem-the-physicist who never hesitated to acknowledge the existence of the relevant scientific tradition from which he drew his inspiration, and then there is Duhem-the-philosopher who never explicitly referred to the scholars and philosophers who, just prior, had entertained similar beliefs and ideas. This difference is all the more astonishing since the appearance of the scientific tradition, from which it is inspired, and that of the philosophical tradition, from which it could have been inspired, are contemporary. Among the various causes which could account for this difference, St. Bordoni points to the fact that Duhem relied primarily on the dual influence of Aristotle and Pascal, far more than on that of his immediate predecessors. In order to summarize this dual influence — and most certainly worth a direct quotation here — the author formulates the following magnificent explanation: “Duhem found in Aristotle the awareness of the complexity of natural processes, and he found in Pascal the awareness of the complexity of scientific practice” (p. 241). Lastly we would like draw the readers' attention to the ideas advanced with respect to natural classification (a particularly fragile concept), and to a certain Duhemian deviation (jeopardizing his sophisticated philosophy of science by succumbing to the appeal of a more comfortable finalism).

By positioning itself chiefly in relation to the historiographic theories advanced by I. Benrubi, A. Brenner et J. Renn, by distrusting the legislators of scientific practice, and by urging us not to idealize the adjectives ‘naïve’ and ‘sophisticated’, which it fortunately coined itself, this book constitutes, on the whole, a veritable and most welcome plea in favour of recognizing the complexity of the natural world, as well as the no less important historical and philosophical complexity of the scientific approach which is called to investigate it!