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Dossier Pierre Duhem

Pierre Duhem's Philosophy and History of Science

Introduction

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We are pleased to present in this issue a tribute to the thought of Pierre Duhem, on the occasion of the centenary of his death that occurred in 2016. Among articles and book reviews, the dossier contains 14 contributions of scholars from different places across the world, from Europe (Belgium, Greece, Italy, Portugal and Sweden) to the Americas (Brazil, Canada, Mexico and the United States). And this is something that attests to the increasing scope of influence exerted by the French physicist, philosopher and historian.

It is quite true that since his passing, Duhem has been remembered in the writings of many of those who knew him directly. However, with very few exceptions (Manville et al. 1927), the comments devoted to him exhibited clear biographical and hagiographic characteristics of a generalist nature (see Jordan 1917; Picard 1921; Menétré 1922a; 1922b; Humbert 1932; Pierre-Duhem 1936; Ocagne et al. 1937). From the 1950s onwards, when the studies on his philosophical work resumed, the thought of the Professor from Bordeaux acquired an irrevocable importance, so that references to *La théorie physique: Son objet et sa structure* became a common place in the literature of the area. As we know, this recovery was a consequence of the prominence attributed, firstly, to the notorious Duhem-Quine thesis in the English-speaking world, and secondly to the sparse and biased comments made by Popper that generated an avalanche of revaluations of the Popperian "instrumentalist interpretation". The constant references Duhem received from Philipp Frank, translator of *L'évolution de la mécanique* into German as early as 1912, certainly cannot be disregarded (see Duhem 1912 [1903]). As it happened, the reception of Duhem's ideas conditioned the subsequent debate on the prevailing preferences in the English-speaking world, namely, the thesis of underdetermination of theories by data, the merely representative value of theories, the criticism of the inductive method, and, especially, the holism and criticism of the crucial experiment, culminating in the volume edited by Sandra Harding (1976).

The case of Duhem shows that the value of original reprints and translations cannot have their impact overlooked. *La théorie physique* was translated into English by Philip P. Wiener in 1954, and it was not until 1981 (and therefore exactly 67 years after the previous one) that it received, thanks to the efforts of Paul Brouzeng, its first reprint, made from the second edition in French (in the following year, Brouzeng

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introduced the facsimile publication of the original edition of *Σύζειν τὰ φαινόμενα: Essai sur la notion de théorie physique de Platon à Galilée*). It is difficult to define whether this reprint was the cause or a simple epiphenomenon of a larger and steady growing of interest that would once and for all consolidate the studies on Duhem, henceforth concentrated in large publications devoted entirely to him. This point of inflection resulted from researches of an easily identifiable group of interpreters. Among the main publications are those by Stanley L. Jaki (1984, 1991), Roberto Maiocchi (1985), Paul Brouzeng (1987), Alfredo Marcos (1988), Anastasios Brenner (1990) and Russell N. D. Martin (1991), in which should be added some special issues of journals (Ariew and Barker 1990a; 1990b; Brenner et al. 1992). The interpretations of Duhem's work have become thereafter more *balanced*, since the realistic aspects of Duhemian philosophy have gained appreciation, in addition they have become more complete, as the religious and political motivations and consequences of his thought have begun to receive unprecedented attention. To this new context we must recognize two essential features of the work of the French author – its *complexity* and *unity*.

If almost all the publications aforementioned persist as a reference source, in the present century a new generation (still diffuse) of scholars, equipped with a bibliography already advanced (Stoffel 1996) and sources previously little explored, has imposed interpretive restrictions on the previous generation. Inspired by Martin's style and indirectly by Harry W. Paul (1979), Jean-François Stoffel (2002) has emphasized the apologetic aspects imbricated in the production of the French philosopher and, largely supported by Duhemian correspondence, has outlined more clearly the personal relationships nourished by Duhem in an academic environment that was admittedly unfavorable. Paul Needham, in an extensive series of articles (see, for example, 1996; 2002; 2008), and Stefano Bordoni (2012) have devoted mainly, but not exclusively, to the scientific works of Duhem, concerning chemistry and thermodynamics respectively. Needham is also responsible for translating Duhem's important scientific works into English (Duhem 2002; 2011).

It seems to us that two thorny issues have stood out among the experts in recent decades. One of them, more widespread, concerns the determination of the place due to Duhem in the debate on scientific realism: in this case, it is the constant attempts to conciliate realistic and instrumentalist theses in his philosophy, and among those who incline for the realistic interpretation, of the exact definition of its alleged realism. The second, concerning the historical links of philosophy embraced by the French philosopher, refers to his distant methodological affiliation, identified almost always alternately, now in Aristotle, sometimes in Pascal. In addition, this preoccupation is associated with another, that is, of his theological option, which makes him to be inserted among the neo-Thomists or among the modernists, or even excluded from both categories, given the peculiarity of his Catholicism. The present issue of *Transversal* contemplates and prolongs the questions posed by this new generation of scholars.

The reader will soon note that some of the articles presented here instigate new reflections because they have a critical tone, such as the one written by Marie Gueguen and Stathis Psillos, which call into question the Duhemian distinction between theoretical representation and explanation, essential for a second distinction, this time between physics and metaphysics, and for the establishment of his historical continuity. In the same vein, Michael Liston criticizes Duhem's attempt to use evolutionary standards derived from the history of physics as an expedient for the justification of methodological judgments, since, he argues, such patterns are always easy to find. Other articles are in charge of doing justice to some aspects of Duhemian thought. Paul Needham's contribution seeks to demonstrate the reasonableness of our physicist's position by criticizing the atomism of his time, on which a "general skepticism" would stand, and by not distinguishing physical atomism from chemist, deriving this indistinction from the non-methodological unificationism of Duhem. Víctor Manuel Hernández Márquez makes a thorough analysis of the roles that the *finesse* and geometry minds play in the Duhemian style, and insists at the same time that the scope of the second is greater than one thinks and, conversely, that the Pascalian influence on the formation of the author's thought is less than some interpreters suspect. In turn, Eduardo Barra and Ricardo Santos argue that Duhem's critical exam of the Newtonian method, in spite of the replications and amendments received, still remains generally valid, and that, after all, Newton and Duhem tried to defend, with different terminologies, the autonomy of physics in the face of metaphysics. A similar spirit stirs up the article by Amélia Oliveira, when she tries to acknowledge contemporaneity, never sufficiently recognized – particularly by Thomas Kuhn –, of the historical methodology defended and practiced by Duhem, that would approach the so called "new historiography of science." More neutral analyzes are made by José Chiappin and Cássio Laranjeiras, who focus on the question of methodological constraints (such as the refusal of mechanism,

the demands of theoretical testability and continuity) demanded by Duhem for theories to evolve according to an acceptable standard of rationality. For his part, Roberto Olguin, in a suggestive way, examines the historical and conceptual clusters between the very important Duhemian notion of *bon sens*, which links the philosopher directly to Pascal, and the Aristotelian notion of *noûs*, supposedly situated at the root of the other, when apprehending the first principles. Reading Duhem with “Duhemian eyes,” Stefano Bordoni seeks to link Duhem to a tradition whose philosophical and historical sophistication, in which scientific practice would be taken seriously, would go back to Cournot, Naville, and Paul Tannery. Following this same path of contextualization, João Príncipe elaborates an analysis of the crisscrossing genesis of Poincaré and Duhem philosophies, relying on the thesis of the existence of a consensus among philosophers of the late nineteenth century about the hypothetical nature of theories. Roberto Maiocchi compiles the references to Duhem in the period before the First World War in the Italian academic sphere, marked by idealism, and reveals to us the indifference or hostility with which his epistemology was received. Finally, three book reviews close the number: Damián Islas Mondragon presents *Pierre Duhem: Between physics and metaphysics*, a collection of texts edited by Víctor Hernández Márquez in Spanish in 2016, with the participation of experts in Duhemian thought from Latin America. Jean-François Stoffel analyzes the new electronic edition of *La théorie physique* edited by Sophie Roux. Stoffel also signed the book review of Stefano Bordoni’s book *When historiography met epistemology: Sophisticated histories and philosophies of science in French-speaking countries*. This book deepens many of Bordoni’s ideas contained in his article mentioned above.

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