

INTRODUCTION

Pierre Duhem (1861–1916) was a French physicist who wrote extensively on the history and philosophy of science. From a contemporary perspective, the attractive and unusual feature of Duhem's thought is its combination of original historical research and philosophical analysis. His most important works in history and philosophy of science are: *La théorie physique, son objet et sa structure* (Paris, 1906); *Sozein ta phainomena: Essai sur la notion de théorie physique* (Paris, 1908); *Etudes sur Léonard de Vinci*, 3 vols., (Paris, 1906–13); and *Le Système du Monde*, 10 vols., (Paris, 1913–59).

Duhem's philosophical works had an immediate influence. They were discussed by the founders of twentieth-century philosophy of science, including Ernst Mach, Henri Poincaré, the members of the Vienna Circle, and Karl Popper. A second wave of interest in Duhem's philosophy began with W. V. O. Quine's reference (Quine 1953) to Duhem's thesis that experimental evidence alone cannot conclusively falsify hypotheses. (This and related theses are referred to in the literature as the Duhem–Quine thesis.) As a result, Duhem's predominantly philosophical works were translated into English – as *The Aim and Structure of Physical Theory* and *To Save the Phenomena* (Duhem 1954 and 1969). Moreover, the Librairie Philosophique J. Vrin, a leading French publisher, reissued both volumes in 1981–82.

By contrast, few of Duhem's far more extensive historical works have been translated, with five volumes of the *Système du Monde* actually remaining in manuscript form until 1954–59. Lately, two volumes of Duhem's predominantly historical work have appeared in translation – as *The Evolution of Mechanics* and *Medieval Cosmology* (Duhem 1980 and 1985).

There has been a recent resurgence of interest in Duhem's history and philosophy of science, as evidenced by the publication of numerous articles and several books dealing with Duhem, for example, those of Stanley Jaki (1984), Roberto Maiocchi (1985), and Niall Martin (forthcoming).

The current interest in Duhem's work can be attributed to a change of climate in the history and philosophy of science. While the dominant methodology in philosophy of science was logical analysis, discussion of the Duhem-Quine thesis strayed further and further from any real contact with Duhem. The decline of logic-based philosophy of science, and the emergence of new historical approaches, has reopened many issues addressed by Duhem at the turn of the century: the relation between history of science and philosophy of science, the nature of conceptual change, the historical structure of scientific knowledge, and the relation between science and religion.

In his historical studies, Duhem argued that there were no abrupt discontinuities between medieval and early modern science (the so-called continuity thesis); that religion played a positive role in the development of science in the Latin west; and that the history of physics could be seen as a cumulative whole, defining the direction in which progress could be expected. Although Duhem's coverage of primary sources in the medieval and early modern periods is rivaled perhaps only by Thorndike's *History of Magic and Experimental Science*, his work has not been effectively incorporated into the continuing dialogue. There are several reasons for this. Unlike his philosophical work, Duhem's historical work was not sympathetically received by influential contemporaries, notably George Sarton. His supposed main conclusions were rejected by the next generation of historians of science who presented modern science as discontinuous with the science of the middle ages. This view was echoed by historically-oriented philosophers of science who, from the early 1960s, emphasized discontinuities as a recurrent feature of historical change in science (Thomas Kuhn in *The Structure of Scientific Revolutions*, for example). However, the rejection of Duhem's conclusions occurred before the majority of his historical works were fully published or translated.

We feel the time is ripe for a reevaluation of Duhem's positions in the history and philosophy of science. Recently philosophers have begun to show a genuine interest in historical work. Duhem's historical corpus is now available in its entirety, and significant portions of it have been translated. New commentaries are being written on Duhem's thought, but that work is still isolated and uncoordinated. Historians and philosophers alike are beginning to reject the picture of science as an activity lurching from one scientific revolution to another, especially for the period of the Copernican revolution, the chief focus of Duhem's work.

The relations between science and religion are again a matter of active scholarly interest. In all of the areas Duhem may be seen as a potential contributor to current debates.

In March 1989, we held a conference entitled "Pierre Duhem: Historian and Philosopher of Science" at Virginia Polytechnic Institute and State University, as a way of bringing together historians, philosophers, and others with an active interest in the range of issues sketched above. Before the conference we circulated our translations of two essays: 'Logical Examination of Physical Theory', and 'Research on the History of Physical Theories', corresponding to the second and third parts of Duhem's summary of his own work supporting his candidacy for the Académie des Sciences. These are reproduced at the beginning of the present issue. The balance of the present work consists of an edited selection from the papers presented at the conference. We regret that limitations of space have made it impossible to present all the contributions to the conference. In several cases the papers have been substantially revised by their authors. We have followed a topical arrangement, grouping together papers on related subjects, and those that comment on each other.

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