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## **Epistemology Historicized: The French Tradition**

Anastasios Brenner

### **Abstract**

Following the standard view, scientific theories are formal systems, which receive empirical content by way of certain correspondence rules. The task of philosophy of science is then to make explicit the structure of such systems. In contrast to this view, one can point to the French tradition in philosophy of science. What characterizes this tradition is recourse to historical study, which has evolved from an attempt to bridge the fields of philosophy of science and history of science by a closer integration of conceptual and historical methods. My aim in this paper is to explore the emergence of historical epistemology in France and its later revival at an international level. Attention is directed at the presuppositions and motivations underlying such an approach.

### **1. Introduction**

According to an influential view, the aim of philosophy of science is to provide an analysis of science as encapsulated in theories by means of formal methods. Ideally, theories are axiomatic systems whose empirical content is provided by a definite set of correspondence rules. As stated, this view has of course met with criticism: one should be attentive to the principles guiding scientists in their choice of hypotheses; furthermore, theories should be embedded in larger structures (global theories, paradigms or research programs). This means turning to history of science and taking into account scientific practice. Uncertainty remains however as to the degree of revision required with respect to the methods of philosophy of science as well as its agenda.

In response to this situation a number of scholars are currently promoting what is called “historical epistemology”. One can mention Ian Hacking, Lorraine Daston, Hans-Jörg Rheinberger among others. Now, the term historical epistemology employed by these scholars is explicitly borrowed from a group of earlier French thinkers who had formulated a philosophy of science based on history of science. It was coined some forty years ago in reference to Gaston Bachelard, Georges Canguilhem and Michel Foucault. My aim is to examine how this approach came into existence, what its purpose was and how this French tradition is related to current developments taking place in Berlin, Toronto, New York or elsewhere.

These questions are meant as steps leading to a more fundamental issue: what we may hope to gain from the historical study of science, or in other words the role history should play in philosophy of science. The expression epistemology historicized in my title is to be understood as alluding to Willard Van Quine’s article “Epistemology Naturalized”. He initiated a reorientation of analytic philosophy by denouncing the two dogmas of earlier logical empiricism, namely atomicity and the analytic-synthetic dichotomy. Following

thereon post-positivists, such as Thomas Kuhn, Imre Lakatos and Paul Feyerabend, strove to show that the standard view of theories as pure axiomatic systems did not fit the facts. My proposal could be viewed, in a sense, as pushing naturalization further, to include the scientific past. I come then to concur with Rheinberger, who in a recent book, *On Historicizing Epistemology*, calls for a convergence: the historicization of the philosophy of science and the epistemologization of the history of science (Rheinberger 2010, Introduction). I do not propose to provide here and now a study of the French tradition in isolation. My target is the relation of this tradition to mainstream philosophy of science. How can we benefit by taking interest in French philosophy of science, in terms both of positive results and critical insights?

The philosopher is confronted today with a number of challenges. Scientific knowledge has increased greatly, whole new fields of research have come into existence, and novel methods have been set forth. Ensuing technologies have multiplied our means of intervention; they touch more and more directly upon ourselves, upon our bodies and minds. It could be that the tools the philosopher has at his disposal are not sufficient for the task, that what we were taught is in need of been updated. Perhaps philosophy of science is going through a crisis.

Historical epistemology is often contrasted with logical analysis. Yet one may acknowledge the fruitfulness of the latter, while arguing that an exclusive focus on so-called rational reconstructions or formal methods may keep us from grasping some important facets of scientific activity. First, science in its entirety cannot be equated with an axiomatic system. At best it is a series of such systems, and these are continually improved on – hence the dynamics of scientific research. This involves at least some history. Furthermore, logic is a formal science, neighboring on mathematics; it may not provide us with all the adequate tools for understanding the complete encyclopedia of our knowledge.

## **2. The origins of historical epistemology**

In order to characterize more precisely historical epistemology, let us turn toward the context of its introduction. The expression appears in 1969 in the title of a book by Dominique Lecourt, *L'épistémologie historique de Gaston Bachelard*. It designates then Bachelard's method, a philosophical reflection on science that draws on history of science. In response to the debates that this expression gave rise to, Lecourt has more recently provided some explanation of his reasons for having coined it and what he meant thereby. In a book published in 2008, he attributes the paternity to Canguilhem, describing the background in the following terms:

“During the 1960s, when Canguilhem's teaching at the Sorbonne was in particular favor among the students, it became usual to present his work as belonging to the “French” sort of historical epistemology. Precise historical studies have now shown that such a tradition exists, that it developed on the margin and, in some

instances, in opposition to what is called Anglo-Saxon epistemology marked by the legacy of the Vienna Circle, logical positivism and the philosophy of language.” (Lecourt 2008, p. 51, trans. AB.)<sup>1</sup>

As regards history this passage contains several remarks that need to be unpacked: the mood of the 60s, the interpretation of Bachelard’s legacy and the criticism of Anglo-American thought. But let us, at present, follow Lecourt in bringing out the claims Canguilhem was making: the theoretical priority of error, the depreciation of intuition and the concept of the object as a perspective of ideas (Canguilhem 1957). The philosophical orientation is rationalist, Platonist and discontinuist; in addition, there is an inclination to emphasize action. Science is conceived as an elaboration, an overcoming of obstacles, a producing of results, a collective enterprise. Connections were possible with Marxism, which strongly influenced the students of those years. Shortly after introducing historical epistemology, Lecourt went on to include not only Canguilhem, but also Foucault within this category (Lecourt 1972). Because of limited space I cannot provide a complete account of this first stage. Let it suffice to recall one of the arguments Canguilhem gave in favor of recourse to the history of science:

“The specifically philosophical reason hinges on the fact that without recourse to philosophy of science (*épistémologie*) a theory of knowledge would be a meditation on emptiness, and that without any relation to history of science a philosophy of science would be an entirely superfluous double of the science of which it claims to speak.” (Canguilhem 1968, p. 11)

This passage, taken from the introduction to a volume of historical and philosophical studies dealing mainly with the life sciences, was written in 1968. Three years later, in the context of post-positivism, Lakatos similarly denounced this separation of philosophy of science and history of science, in his well-known dictum: “Philosophy of science without history of science is empty; history of science without philosophy is blind” (Lakatos 1971, p. 102). Canguilhem deserves credit as an early proponent of the philosophy of the life sciences (Canguilhem 1943, Delaporte 1994). The Bachelardian school thus drew interest to areas of science generally neglected by logical empiricists<sup>2</sup>. Foucault offered, in turn, a philosophy of the social sciences.

As originally developed in the context of French thought, historical epistemology was opposed to logical empiricism. This is not the only possible option. Hacking suggests that history can be conceived as pursuing conceptual analysis by other means. It is clear that the authors who have adopted historical epistemology more recently are not merely seeking to reproduce the work of those forerunners I have mentioned. Rather they have found here inspiration for opening up new paths, for providing answers to persistent difficulties in philosophy of science today. My intention is to move on to a definition of historical epistemology that is both comprehensive and fruitful.

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<sup>1</sup> Among the historical studies Lecourt mentions (Bitbol and Gayon 2006), (Brenner 2003).

<sup>2</sup> There are exceptions to this generalization as well as differences between the doctrines of the Vienna Circle and the later versions of logical empiricism it inspired; see, for example (Hofer 2013).

### 3. The reception of historical epistemology

We have noted a convergence between historical epistemology and post-positivism. This convergence was however not fully acknowledged at the time. These two currents of thought developed for the most part independently. Canguilhem eventually came across Kuhn's *Structure of Scientific Revolutions*. But his brief and sporadic remarks are highly critical, which will come as a surprise to today's readers (Canguilhem 1977). He was more struck by the differences in their historical approach than their agreement to have recourse to the history of science. Canguilhem appears to have been impatient with Kuhn's reasoning: Bachelard had opened the way for historical philosophy of science some thirty years earlier and it was needless to discuss the theses of the logical empiricists, which were, in his opinion, based on an ill-chosen philosophical option<sup>3</sup>. In turn, Kuhn called exclusively on earlier French thinkers such as Pierre Duhem, Léon Brunschvicg and Émile Meyerson, while ostensibly avoiding any mention of later figures with the exception of Alexandre Koyré (Kuhn 1977). It was only belatedly that Anglo-American authors began to take an interest in the contemporary productions of the French tradition. Browsing through the works of Lakatos, Feyerabend and Hilary Putnam, I found hardly any references to the French authors we have been examining. The exception is a passage in which Putnam mentions the claim that some scientific theories cannot be overthrown by experiment and observations alone, a view he had been defending: "The view is also anticipated by Hanson, but it reaches its sharpest expression in the writings of Thomas Kuhn and Louis Althusser"<sup>4</sup> (Putnam 1975, p. 259).

Kuhn mentions Michel Foucault merely in passing in a late article "What are Scientific Revolutions", in connection with Carl Hempel, Joseph Sneed and Wolfgang Stegmüller: "The resulting picture of linguistic strata shows intriguing parallels to the one discussed by Foucault in *The Archeology of Knowledge*" (Kuhn 1987/2000, p. 14). His most significant statement is in reaction to the query of a journalist for an interview in the French daily paper *Le Monde*:

"Reading Foucault I came to the conclusion that we are not as proximate as some have suggested. We share indeed the idea that a worldview is determined by a language, which we acquired from Koyré. But there are many differences between my concept of 'paradigm' – a word I have in fact ceased to use, not wishing to endorse all the interpretations that were given to it – and Foucault's notion of episteme. For instance, Foucault never explains how one passes from one episteme to another." (Kuhn 1995, p. 13, trans. AB)

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<sup>3</sup> Although Kuhn and post-positivists often have only cursory and polemic observations to offer on logical empiricism, there are some attempts at a discussion; see (Suppe 1977).

<sup>4</sup> Althusser was primarily a political philosopher, but some of his texts relate to philosophy of science and contribute to the development of historical epistemology. Teaching for some forty years, until 1980, at the École normale supérieure, he exerted a strong influence on a whole generation of students. See (Althusser 1974).

I shall leave the responsibility of this remark to Kuhn, noting that Foucault has a whole section in his *Archeology of Knowledge* devoted to “Change and Transformations” (Foucault 1969, part IV, ch. 5). Be that as it may, we can say that Anglo-American post-positivists and French historical epistemologists did not really hit it off.

French historical epistemology then did not have an immediate impact abroad. This movement yielded several works that were viewed with some caution at first. After Foucault’s early death in 1984 this school lost its momentum. It has altogether disappeared in France, to be revived elsewhere. Of course there have been offshoots, later developments relevant to historicizing epistemology<sup>5</sup>. But this is another story.

To be sure the initial program encountered difficulties. French philosophers of science failed to bring their historical method to bear on the debates taking place on the international scene. But more profoundly one perceives in their works a polemic attitude toward formal analysis, which need not be taken up: we can grant that logic is a fruitful tool for philosophy, without sacrificing history; it has become part of the curriculum in France as elsewhere. Why oppose logic and history? One may logically reconstruct the reasoning behind a historical explanation; conversely, one may submit logic to a historical study<sup>6</sup>.

A revival took place. Ian Hacking in his *Historical Ontology* has some instructive remarks to give on the topic (Hacking 2002, p. 9). He tells us that he hit on the term historical epistemology in the 1990s, in seeking to question some received claims in analytic philosophy, only to learn that it had already been employed. The term came to express a new sensitivity shared by several scholars such as Daston, Mary Poovey and Arnold Davidson (Daston 1991, Poovey 1998, Davidson 2001). Foucault was read with enthusiasm, and there was an effort to go back to Canguilhem and even Bachelard.

But it must be understood that the scholars belonging to this group have their own concerns. They are engaged in debates over precise issues with analytic philosophers of science. Hacking brings out the difference with respect to Daston and her followers:

“They study epistemological concepts as objects that evolve and mutate. Their work would be more truly named were it called ‘historical meta-epistemology’. Where Bachelard insisted that historical considerations are essential for the practice of epistemology, the historical meta-epistemologist examines the trajectories of the objects that play certain roles in thinking about knowledge and belief [...]. Historical meta-epistemology, thus understood, falls under the generalized concept of historical ontology<sup>7</sup> that I am now developing.” (Hacking 2002, p. 9)

The protagonists of this view are more interested in following the evolutions and mutations of concepts than in setting out the history of successive episteme or vast systems of knowledge. One could also turn

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<sup>5</sup> For an overview of some recent trends – philosophical semantics, rhetorics of science, historical ontology – see (Brenner 2009 and 2011).

<sup>6</sup> Lakatos (1971) offers an example of the former, and we have several histories of logic that give full importance to factors such as the context of elaboration and the chronological development.

<sup>7</sup> Hacking borrows this expression from Foucault to designate a study of “the ways in which the possibilities for being arise in history” (Hacking 2002, p. 23).

around Hacking's expression and speak of a *meta*-historical epistemology, that is a second stage of this movement, quite different from the first.

What has happened then in the past ten or fifteen years? This new historical school has produced a large number of works; it has attracted a good deal of attention. Conferences have been staged, bringing together scholars from different parts of the world and different backgrounds. The Max Planck Institute for the History of Science in Berlin has become a prominent center in this respect, having launched a series of conferences on the historical epistemology of the sciences as early as 1995. In a recent study, *Histories of Scientific Observation*, Daston and Lunbeck present their project in the following manner:

“Observation is the most pervasive and fundamental practice of all the modern sciences, both natural and human [...]. Yet scientific observation lacks its own history: why? Countless studies in the history of philosophy of science treat one or another aspect of observation: observation through telescope and microscope, observation in the field or in the laboratory, observation versus experiment, theory-laden observation. But observation itself is rarely the focus of attention and almost never as an object of historical inquiry in its own right” (Daston and Lunbeck 2011, p. 1).

The editors refer to Foucault among their sources of inspiration. They direct their criticism at the logical empiricists, adding that post-positivists did not go far enough: historical inquiry as pursued here aims to question the dichotomy between theory and observation from a different angle. Not only are facts to be seen as theory-laden, but fact collecting, observing and experimenting are the result of a practice or activity that has come to acquire its current form through a drawn-out historical process.

The sphere of historical epistemology is expanding more and more. Philipp Kitcher, for example, appears willing to join company (Kitcher 2011). But it would be good to specify his evolution of thought: well versed in analytic philosophy, specializing in philosophy of mathematics, he seeks in his more recent books to open up philosophy of science to ethical and political issues<sup>8</sup>. So historical epistemology has come to designate a large array of research, tending to include whatever departs from a strictly formal philosophy. But one may ask whether there is a genuine historical inquiry here?

Before going on to voice my worries, let me linger a bit on this fashionable trend. We have learned that our scientific worldview is the result of a long, arduous and sometimes sinuous path. It is difficult then to employ the ordinary concepts of philosophy of science without stopping to think of their history. We start placing quotation marks around these concepts. They no longer have an obvious meaning and accepted use. They have become problematic.

It could be that, in a broad sense, this research has started to infuse the works of those who do not explicitly acknowledge their debt. If we take for example a late work of a stolid analytic philosopher such as Bas Van Fraassen, *Scientific Representation*, we note that he does not hesitate to recall the debates of the end of the 19th century, in order to clarify the concepts he is directing toward current scientific issues, in

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<sup>8</sup> See (Kitcher 2001, p. XI. Cf. p. 91); significantly, he refers to Foucault at (*id.*, p. 53).

particular in quantum theory. This return to philosopher-scientists such as Hertz, Maxwell and Duhem allows him to formulate an alternative to mainstream views – his particular brand of empiricist structuralism (Van Fraassen 2008, pp. 80, 92). He even goes back to Renaissance painting and perspective as an important factor in the construction of the scientific representation he is examining. One cannot help recognizing that quite a bit of history goes into some recent variants of analytic philosophy of science.

#### 4. Historical reflexivity

In developing their program, current advocates of historical epistemology draw freely on previous endeavors. This should not keep us from inquiring into the context in which this program was originally formulated. After all, a historical inquiry should be thorough as regards the evidence at our disposal. What should we think of Canguilhem's reading of Bachelard? He was careful to bring out a significant evolution of thought. According to Canguilhem, Bachelard moved away from the idealism that had dominated earlier philosophy of science. The "applied rationalism" and "instructed materialism" of his later thought made it possible to truly take into consideration other aspects of science. His "phenomenotechnics" could be seen as a call for a precise description and careful analysis of the material aspects of science. This led to an interest in machines and technology that his followers were to take up. After highlighting these themes in Bachelard's thought, Canguilhem gave this summary: "Scientific proof is labor because it reorganizes the given, because it provokes effects that have no natural counterpart, because it constructs its sense organs" (Canguilhem 1968, p. 192).

Let us seek to locate this reading in the setting of French philosophy after World War II. I do not believe that Canguilhem was claiming to give a precise rendition of Bachelard; he was pursuing his own philosophical agenda (Canguilhem 1977, p. 9). So, it appears important to go back to Bachelard's original thought. Studying his early texts, we learn that he derived many ideas from Poincaré, Duhem and Abel Rey. He thus shared with the logical empiricists some sources of inspiration. Furthermore, one does find references to logical empiricism in his works. These are sparse but generally favorable. Bachelard was impressed by the interpretations Schlick and Reichenbach offered of Relativity theory, even if he went on to introduce his own claims (Bachelard 1929, p. 188; 1934, p. 65). It appears that his followers were responsible for giving a polemic twist to his thought.

One should broaden the scope of the inquiry. For the issues we are concerned with involve many other thinkers. We must reach back at least to the debate between Poincaré and Russell. Furthermore, historical epistemology could well be applied to the works of Bachelard's teachers, Léon Brunschvicg and Abel Rey<sup>9</sup>. What I am suggesting is that we need to do more historical inquiry in order to understand what went on here, for it is a major problem, that of the divide between the analytical approach and the historical approach. And I believe this is what one expects of a historical epistemology that pursues its method to a full degree<sup>10</sup>.

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<sup>9</sup> For a recent study of Brunschvicg, see (Chimisso 2008).

<sup>10</sup> One can draw here on various studies devoted to the history of logical empiricism on the one hand and French philosophy of science on the other. See (Uebel 2003), (Brenner 2003).



Historical epistemology is an open program. One may add on to the various histories of objects, concepts and practices, with a view to drawing up a new encyclopedia, each entry comprising its historical section. More in-depth studies are indeed called for. Daston and Galison have written a well-informed and significant history of the concept of objectivity. After reading the book, one may still ask what lies behind their choice of topic, what makes their study relevant for us. For sure, contemporary science aims at objectivity. But this is only one among several rational values or epistemic virtues. Objectivity is no different from other constitutive values such as accuracy, consistency, simplicity or predictive power. One should then submit all these different values to a careful scrutiny. They are the result of a historical process. Now, these notions are not unrelated to the development of the axiomatic outlook. Indeed, the axioms or postulates of a theory are freely chosen. They would be arbitrary if we did not have values to guide us. Daston and Galison's study is thus related, albeit polemically, to this conception. But they do not bring out clearly enough the connection. My point is that we need a self-conscious and explicit history of philosophy of science as a means of locating our position, that is the perspective from which our inquiry is carried out.

## 5. Conclusion

Should my demand for historical detail appear punctilious, let me evoke a few concrete concerns. Having worked with practicing scientists, I know that a philosopher may have difficulty in responding to their requests. Scientists tend to be surprised if not bored by finessing on observation sentences. They are reluctant, when philosophizing, to add an extra layer of formalization with mathematical logic. They tend to be more interested in history, and often even the pre-paradigmatic history of their discipline. Here they find intriguing metaphysical problems, unfamiliar ontologies. This is not only more enjoyable for them, but also more useful in their endeavor to go beyond received solutions and current frameworks. By concentrating on the context of justification, philosophy of science has led us away from the quintessence of scientific activity, that is discovery, invention and innovation.

Furthermore, philosophy is taught in secondary education in France as well as in Italy and other European countries. Our job as university professors also includes training students who will later be teaching at this level. Philosophy of science belongs to this curriculum. And we would surely be making our task difficult if we were to restrict ourselves to a strictly logical analysis directed to the structure of axiomatic systems. To give an enlightening picture of science and its consequences – methodological, ethical and political – we need to approach it from many directions. Bachelard and Canguilhem had taught at *lycées* before holding university chairs. They were very attentive to the issue of bringing a young audience to an understanding of their specialty<sup>11</sup>. Their qualms over a formal philosophy of science excluding historical comprehension are undoubtedly rooted in this preoccupation, and their criticism deserves to be recalled. We should then conceive the method of philosophy of science with this in mind. We also encounter the question of bringing into contact the different philosophical traditions. This is a central problem in the context of the European

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<sup>11</sup> See for example (Bachelard 1938, ch. 12). Canguilhem wrote an international survey on the teaching of philosophy: (Canguilhem et al. 1953).

union as a democratic entity. How can we formulate a critical reflection on science and technology, a free inquiry into these activities, which are deeply changing our everyday lives? As a means of clearing up misunderstandings and developing a broad scope, I believe that historical epistemology or epistemology historicized remains an essential tool.

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