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Identity versus determinism: Émile Meyerson's neo-Kantian interpretation of the quantum theory

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ABSTRACT

Despite the praise his writing garnered during his lifetime, e.g., from readers such as Einstein and de Broglie, Émile Meyerson has been largely forgotten. The rich tradition of French épistémologie has recently been taken up in some Anglo-American scholarship, but Meyerson—who popularized the term épistémologie through his historical method of analyzing science, and criticized positivism long before Quine and Kuhn—remains overlooked. If Meyerson is remembered at all, it is as a historian of classical science. This paper attempts to rectify both states of affairs by explicating one of Meyerson's last and untranslated works, Réel et déterminisme dans la théorie quantique, an opuscule on quantum physics.

I provide an overview of Meyerson's philosophy, his critique of Max Planck's interpretation of quantum physics, and then outline and evaluate Meyerson's neo-Kantian alternative. I then compare and contrast this interpretation with Cassirer's neo-Kantian program. Finally I show that, while Meyerson believes the revolutionary new physics requires "profoundly" modifying our conception of reality, ultimately, he thinks, it secures the legitimacy of his thesis: that science seeks explanations in the form of what he calls "identification." I hope my research will enable a more general and systematic engagement with Meyerson's work, especially with a view to assessing its viability as a philosophical method today.

1. Introduction

There is recent and growing interest in retelling the history of the split between "analytic" and "continental" traditions that, in retrospect, seems to inaugurate twentieth century philosophy.[1] These traditions, and the historical fact of their mutual incomprehension, have roots in the upheavals in the sciences of the early twentieth century and the differing philosophical reactions they engendered.[2] Accordingly, "in between" figures such as Ernst Cassirer, who wrote extensively on the developments in logic, mathematics, and physics in an idiom less alien to continentalists than that of Carnap and Russell, seem increasingly to offer hope for a *via media* in today's intellectual culture.[3] In particular, such figures provide models for approaches recognizable *as* philosophy by those working in the analytic tradition, while not restricting its methodology to that of logical analysis.

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[1] For Anglo-American treatments, see especially Friedman (2000) and Gordon (2012). In the French context, the endeavor takes the form of resuscitating key figures in the early development of French philosophy of science or *épistémologie*, against which "post-structuralist" philosophers might be contrasted. Brenner (2003) is a model for such work. The urgency of this task seems to derive from a desire for a new image of French philosophical culture—one rooted in epistemological, as opposed to post-structuralist, problematics.

[2] It is too infrequently acknowledged that early twentieth century "continental" philosophers shared this preoccupation with their analytic counterparts. E.g., Bachelard's *épistémologie* takes root in the *ruptures*, or the "fundamental mutation in our concepts" wrought by Einsteinian and, later, quantum physics (Bachelard, 1984, p. 45). Husserl frames his phenomenological program in the context of the "crises" in the foundations of mathematics and physics (see especially Husserl, 1970), while Heidegger, *inter alia*, offers his own fundamental ontology—what he calls a "pre-scientific" investigation—in contradistinction to the Marburg neo-Kantian program, which sought to assimilate the developments of early twentieth century physics into a broadly Kantian epistemology. See in this connection Heidegger (1992, 2002), as well as Friedman (2000).

[3] See especially Friedman (2000), who finds in Cassirer a "middle-way" between Carnap and Heidegger. Appropriately, given this historical background, Friedman's research is complemented by systematic work that endeavors to evaluate the Einsteinian and quantum revolutions within a framework indebted to Reichenbach and Carnap. See Friedman (2001).

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But are there philosophers other than Cassirer who can take up the mantle? At least one such figure, also a neo-Kantian of sorts, remains overlooked in this connection. A Polish-born chemist, trained in Germany, Émile Meyerson was an autodidact in philosophy who held no academic position. He combined a deep knowledge of the history of science with an idiosyncratic blend of philosophical influences—from German idealism, positivism (old and new)[4] and French neo-Kantianism, to Medieval Jewish philosophy—in epistemological works that were cited and praised by intellectuals as diverse as Albert Einstein, Louis de Broglie, Ernst Cassirer, Walter Benjamin, and John Dewey.[5] Meyerson was also an important figure in the intellectual culture of early twentieth century Europe, especially Paris, his adopted home.[6] Many of those who attended his *salons* (e.g., Alexandre Koyré, Hélène Metzger, and Léon Brunschvicg) went on to exert important, if overlooked, influences on the history and philosophy of science both in France and abroad.[7] Other members of this Meyerson Circle included such luminaries as André Metz, André Lalande, Lucien Levy-Bruhl, Louis de Broglie and Paul Langevin.[8]

Despite his prominence—e.g., Einstein praised Meyerson's *La déduction relativiste* (*DR*), and de Broglie wrote effusive prefaces for two of his other books[9]—the acclaim garnered by his writing up until his death in 1933 gave way to critical dismissals and a near total eclipse of his legacy in the postwar period.[10] The rich traditions of French *épistémologie* have lately begun to enjoy some much-deserved scrutiny, but Meyerson's own role remains obscure.[11] Where his role is recognized, it is often construed too narrowly as "epistemologist" or historian—even though his writings cover an enormous range of topics (from Hegel and *Naturphilosophie*, to religion, and sociology), and serve an explicitly philosophical purpose. Particularly overlooked are Meyerson's final two untranslated works: the magisterial, three volume *Du cheminement de la pensée* and *Réel et déterminisme dans la théorie quantique* (*RD*).[12]

What follows is a critical exposition of one of Meyerson's last works, an opuscule on quantum physics that attempts to assimilate the revolutionary theory into his broadly neo-Kantian epistemology. This work is notable for historical reasons. If Meyerson is remembered today, it is for his historical analyses of the classical sciences. *RD* (along with *DR*) provides a corrective to this view; it also enriches our understanding of the philosophical engagements with the new physics during the early twentieth century. *RD* is thus indispensable for any attempt to come to terms with Meyerson's philosophy overall. But it also offers a suggestive interpretation of quantum physics that has relevance for philosophy of science today. In what follows, I will provide an overview of Meyerson's philosophy before offering a resume and critical discussion of the arguments he puts forth in this work, arguments that Meyerson concedes require modifying some of his more deeply held philosophical convictions, but ultimately secure the legitimacy of his central thesis: that science is always more or less explanatory, conforming to what he calls "the principle of identity."

2. Overview of Meyerson's project and the turn to the quantum theory

Émile Meyerson's corpus amounts to a large-scale critique of positivism—in its canonical forms i.e., the writings of Auguste Comte, as well as its more unconscious, even insidious expressions, from Hegel to Bergson. In fact, one of Meyerson's central theses is that positivism is at root a *tendency*, not a specific philosophical school or methodology, and is thus exhibited by otherwise diverse philosophical approaches. The tendency consists in characterizing scientific theories as providing mere "descriptions" (as opposed to "explanations")—in the paradigm case, for the purposes of "action" or prediction—thus ignoring their ontological import.[13] Whether with a view to reducing knowledge to the observable (as in Comte) or to making room for a robust metaphysic to which the natural sciences are subordinate (as in Hegel), Meyerson believes that positivism amounts to an impracticable program that will inevitably lead to a misunderstanding of history and scientific practice.[14] In the extreme, and worst of all, positivism leads to a regressive epistemology[15] that facilitates ill-fated conflicts between the claims of philosophic and scientific modes of reason.[16]

This critique of the positivist tendency is undertaken under the auspices of an a posteriori method of analysis—"preached," Meyerson says, "but not practiced by Auguste Comte"[17]—, which seeks to determine the nature of the human mind. In particular, Meyerson's method seeks to uncover the conditions for and basic features of scientific reason by investigating its development over

[4] Meyerson is both an ambivalent heir to the Comtean a posteriori method and a student of Poincaré and Duhem. See, for example, Meyerson (1962, p. 9).

[5] The first reference in the prologue to Benjamin's first work on the *Trauerspiel* is to Meyerson's *De l'explication dans les sciences*. See Benjamin (2003). I am indebted to Peter Fenves for the latter reference. Einstein wrote a glowing review of Meyerson's *La déduction relativiste* (see Meyerson, 1985), and Louis de Broglie wrote prefaces for Meyerson's last book, and a posthumous collection of essays (Meyerson, 1933, 1936). See also Meyerson (2009) for his correspondences with Einstein and de Broglie. Meyerson's unpublished correspondences include letters with John Dewey, Edmund Husserl, Paul Valéry, and C. D. Broad, among others. I am grateful to Stephen Nazaran for tracking down many of these unpublished letters.

[6] See Meyerson (2009). André Metz writes: "by the orientation of his thought, Mr. Meyerson is […] indeed within the tradition of French philosophy" (Metz, 1934, p. 9), my translation.

[7] In the post-war period Alexandre Koyré is likely the most direct channel for Meyerson's influence. Although in his preface, Thomas Kuhn explicitly cites Meyerson and his circle for offering a "new image" of historiography (Kuhn, 1996, p. viii). See also Friedman (2010, p. 183). Another post-War American philosopher who cites Meyerson at a crucial juncture is W. V. O. Quine. The last reference in "Two Dogmas of Empiricism" contains the following quote from the end of Meyerson's *Identité et réalité*: "L'ontologie fait corps avec la science elle-même et ne peut en être séparée" (Quine, 1980, p. 45. See Meyerson (1962), p. 384). This quote is remarkable for drawing a parallel between two thinkers who might otherwise seem far apart. See also Fruteau de Laclos (2009b) and Laugier (2009). Finally an unlikely, though favorable, reference may be found in Nagel (1979, p. 126).

[8] The notion of a "Meyerson Circle" I owe to discussions within the department of History and Philosophy of Science at the University of Notre Dame, especially, Stephen Nazaran, Anna Rafalski, and Don Howard. See also Howard (2011).

[9] See Meyerson, (1933, 1936, 1985).

[10] My hypothesis, which must be tested on another occasion, is that Bachelard's critique of Meyerson was instrumental in the eclipse of Meyerson's legacy, at least in France. For a similar view, see Fruteau de Laclos (2009b). For a sample of Bachelard's critique, see Bachelard (1929, 1984, 2002, 2004). For an evaluation, see Mourélos (1962) and Wetshingolo (1996).

[11] Chimisso (2008) refers to a growing project in France to reestablish Meyerson's rightful place in the prehistory of French *épistémologie* (e.g., Bensasude-Vincent, 2005, 2008; Fruteau de Laclos, 2009a, 2009b). I would be happy to have my own research considered an expansion of this project into an Anglo-American context. Classic English language treatments of Meyerson include: Boas (1930), Kelly (1937), Loewenberg (1932), and LaLumia (1966). More recent work includes: Zahar (1980, 1987), Biagioli (1988), Gale (2003), and Chimisso (2003). There is considerably more literature in French, although there one also sees a sharp decline after the Second World War.

[12] Fruteau de Laclos (2009a, 2009b) are welcome exceptions.

[13] For a more recent account of a similar distinction in epistemological understandings of scientific explanation, see Nagel (1979, Chap. 6, Section 4).

[14] Meyerson (1962, p. 21).

[15] This is exemplified for Meyerson by Comte's denunciation of certain research programs e.g., those involving the microscope or the observation of stellar bodies (Meyerson, 1962, pp. 20–21).

[16] Such conflicts are exemplified by certain philosophical claims made by the romantics' *Naturphilosophie* and, at times, the spiritualism of Boutroux and Bergson. See Meyerson (1991, pp. 526–527).

[17] Meyerson (1962, p. 439).