

Discussion of an Identity Phylum

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Abstract. Are we right to attribute an a priori value to what we call *French epistemology* or the French tradition of epistemology? For a person educated in this country, it is difficult to answer in the negative. It's a bit like discrediting French wine, French cheese, or the French school of mathematics with its abnormal number of Fields Medals. Yet the various dignities just mentioned are obviously incomparable.

On a more serious note, for me the notion of French epistemology overlaps three things and gives rise to at least two guilty feelings.

Keywords. French epistemology, historical epistemology, neo-Kantianism, mathematics.

§ 1. — Three faces and two guilts.

1) For many, the French school of epistemology coincides with the school of historical epistemology. The originality of the epistemological work carried out in France would simply consist in the adoption of a historical perspective. But this raises the question: are we really that much of a historian? From what I have observed, Italian academics, on almost all occasions, are more deeply attached to the historical point of view than the French. Either historical sensibility is not sufficient to recognize French epistemology, or the claim to national excellence is difficult to defend.

2) French epistemology is also seen by many as the antidote to the epistemology of the Vienna Circle, or more broadly to analytic

epistemology. Admittedly, the school's leading authors were also those who drew the attention of French philosophers to the new epistemological and philosophical style (particularly the two most recent, Granger and Vuillemin). The use of French epistemology *against* the logicist style of analytic epistemology nonetheless exists, and may still constitute a major reason for adherence. The difficulty here is that it is not immediately clear what competing principles so-called French epistemology opposes to the doctrine of Carnap, for example. If there is an antidote, it is not linked to an explicit critique or a similar counter-proposal. Rather, one gets the impression that French epistemology and the epistemology of the Vienna Circle, or the contemporary analytic epistemology that emerged after it, are not in the same league.

3) In a third way, the distinctive feature of French epistemology can be seen as its relationship to a Kantian philosophical background. From Brunschvicg to Granger and Vuillemin, French epistemologists seem to brood over Kant, seeming to search tirelessly for the amendment to the *Critique of Pure Reason* that will bring critical philosophy into line with the development of science. Indirect proof is provided by the following quotation from Thomas Kuhn:

"There have been philosophers of science, generally those with a vague neo-Kantian tinge, from whom historians can still learn a great deal today. I recommend that my students read Émile Meyerson, and sometimes Léon Brunschvicg. But I recommend these authors for what they have seen in the historical material, not for their philosophy, which I reject, in agreement with the majority of contemporary specialists"⁽¹⁾.

Thomas Kuhn does not name France, but we do read that he refers to Koyré as his main master in terms of the historical motive⁽²⁾. In our passage, he reliably mentions Brunschvicg and Meyerson, in whom Frédéric Fruteau de Laclos recognises the

⁽¹⁾ Cf. Thomas Kuhn, *La tension essentielle*, trans. franç. M. Biesunski, P. Jacob, A. Lyotard-May and G. Voyat. Voyat, Paris, Gallimard, 1990, p. 44 [all quotations in the article are translated from French].

⁽²⁾ He writes: "The men who did most to establish the tradition that flourishes today in the history of science — I am thinking in particular of A.O. Lovejoy and, above all, Alexandre Koyré — were philosophers before they turned to the history of scientific ideas. It was from them that my colleagues and I learned to recognise the structure and coherence of systems of ideas that were not our own" [*La tension essentielle*, p. 43].

founding fathers of the French epistemological spirit⁽³⁾ : the former has such a status officially and notoriously, the latter holds it more clandestinely and in relation to a slightly different posterity⁽⁴⁾. In any case, Kuhn has no hesitation in identifying what our philosophers of science have in common, which is precisely the Kantian element.

Such would be the three figures, or such would be the three faces that the notion of French epistemology would superimpose, giving rise to a philosophical problem by its very identity. Earlier, I also spoke of two types of guilt. So what did I have in mind?

The first, and most obvious, is to ask for special attention, perhaps even exceptional esteem and favour, for a body of work that has no constitutive character other than its belonging to a national context. Is it enough for an epistemology to be recognised as French for it to merit a study aimed at recognising its value?

The guilt envisaged and confessed here is not far removed from chauvinism, which seems clearly a “sin against the spirit”, to use the Christian nomenclature furtively.

The problem is made all the more intense by the polemical function attributed to “French epistemology”: it is said to represent the possibility of a rebellion against the international model of epistemology, which was constructed in the analytical academic space in the wake of the work of the Vienna Circle, often taking advantage of the emigration of its first masters (we know that Carnap was Quine’s master, as well as his colleague and interlocutor).

Let’s face it: one may have been hoping, for a long time, that any conference on any epistemological subject would also give the floor — or even half the floor — to French epistemology. But there inevitably comes a time, it seems to me, when such person rebels against the favour thus accorded: shouldn’t we rather listen to all the strong and interesting contributions, without worrying about their national tone? For my part in any case, it has become clear to me over the years that it is impossible to presuppose that the “French” contribution is as such essential. As an intellectual immersed in an international society of research and study, I can

⁽³⁾See Frédéric Fruteau de Laclos, *La connaissance des autres*, Paris, Cerf, 2021, especially p. 335- 344.

⁽⁴⁾Typically, according to Fruteau de Laclos again, that of historical psychology (cf. Frédéric Fruteau de Laclos, *La psychologie des philosophes — De Bergson à Vernant*, Paris, PUF, 2012).

only consider a priori all sources as legitimate and likely to promise the best.

What I observe with some surprise is that, nevertheless, French sedimentation continues to interest me as such. I persist in wanting to understand how trends, approaches and paradigms have succeeded one another and blended, according to complex constellations and genealogies, within the small national space I inhabit. And it is not just for the obvious fact that this history determines me, to the point of governing more than I can imagine the work I am likely to accomplish. The French affair continues to arouse a specific curiosity in me, after I have ceased to attribute any a priori superiority to it. And in particular, after I have ceased to minimise in any way the developments proposed in the vast arena of contemporary analytic philosophy.

Let us try, then, to take the measure of this corpus of French epistemology, or “à la française”, as it is sometimes called. After more than a century, this corpus is more extensive than one might suppose.

§ 2. — From historicism to mathematism.

Which authors do we have in mind, to begin with? The founding fathers, as we said earlier, referring to Fruteau de Laclos, would be Brunschvicg and Meyerson. Although Fruteau de Laclos rightly persuades us, with good reason, to emphasise the “complement” provided by Meyerson, thereby succeeding in describing a quasi-externalistic modulation of French epistemology that is most often ignored or minimised, we have to concede that the filiation in question is most often seen in terms of Brunschvicg⁽⁵⁾. After him, Bachelard is generally counted as an exemplary and/or significant expression of the current. Beyond these two emblems, names linked to the epistemology of mathematics (Cavaillès, Lautman, Desanti, Granger, Vuillemin) or, differently, to the epistemology of biology or the human sciences (Canguilhem, Foucault) come to mind. To these names could be added that of Althusser. In these series, I have forgotten Michel Serres, who is no stranger to what we

⁽⁵⁾ A reviewer points out the equally fundamental role played by Henri Poincaré and the Boutroux circle. Henri Poincaré’s personality seems to me to be fundamental: he embodies — by playing both roles at once — a pride typical of our movement, that of eliciting the agreement of the scientists themselves.

are talking about. I have also neglected the epistemology of physics, whose importance cannot be denied (from Duhem to Bitbol and Soler, via D’Espagnat).

The methodological element common to these many proper names is undoubtedly the historical perspective. French-style epistemology is very often characterised as that which substitutes history for logic in order to “frame” the study of science.

We remember, however, that Kuhn saw, behind the consideration of history, the neo-Kantianism congenital to French researchers. Whether or not we agree with him on this point, perhaps we should say that it is not necessarily attention to history that characterises our national school, but rather the desire to understand the status of scientific knowledge on the basis of its style of historical variation. It is as if French epistemology instinctively reconstructed the essence of science on the basis of its historically observable variation. We would have a kind of differential equation $ds = f(t) dt$, where s is science, ds its infinitesimal variation, t is time and f is a function of time that allows us to calculate ds at time t . In this way, if F is a primitive of f , $F(t)$ would express science at time t , to within a constant. Except that, in this daring symbolisation, we replace finite variation by infinitesimal variation.

In the French context, such a historicising vision undoubtedly comes into conflict or competition with a determination of the essence of science that is otherwise known and learnt, the one provided by the Kantian system. And this is where we come across the Kuhnian evaluation. It seems to me impossible to say that Kantian determination takes science or scientificity as a function of time. The association or conjugation identified by Kuhn therefore seems to involve an impossibility or a paradox.

At the same time, as we know, the Kantian system was historically motivated by Newton’s scientific breakthrough. In his *Prolegomena to All Future Metaphysics*, Kant explains that he can give two accounts of his transcendental system of knowledge. The first exposition constructs science as a priori knowledge, and elaborates its conditions and moments on the basis of its concept: it is an *architectonic* exposition in the sense of the section “Architectonics of Pure Reason” in the second half of the *Critique of Pure Reason*⁽⁶⁾. The second exposition starts from Newtonian science, and simply

⁽⁶⁾In this section, Kant contrasts a technical organisation and an architectonic organisation of a statement: whereas the former allows its branching structure to be dictated by the data encountered, the latter unfolds a form that is that of the

attempts to reconstruct the normative structure of such knowledge in a regressive manner. If, then, the Kantian system is susceptible to such an exposition, this means that it is not radically alien to the historical perspective on science, or, at least, that it is in its own way sensitive to the events and refoundations of science.

Starting from the premise that French epistemology is as much a debate with the Kantian heritage as the adoption of the historical perspective, we can immediately add a second parameter that is less often emphasised than the historical parameter, but which could just as well characterise French approaches: that of “mathematism”, if we allow ourselves such a neologism.

Beginning with Brunschvicg, and continuing uninterrupted through to Granger and Vuillemin, and including significant cases such as that of Albert Lautman, French epistemology stands out as an epistemology that accords a certain privilege to the function of mathematics in the natural sciences. The analyses of French philosophers of science emphasise the idea that science, in its sometimes revolutionary progress, manifests itself as a break with common sense, and that it can only do so by relying on a mathematical imagination of the world. Instead of conceiving of science as a common sense whose logical structure is closely monitored — as may still be the case with logical empiricism — French epistemology sees science as a mathematical construction with an empirical spin-off. The author who emblematises this option is undoubtedly Bachelard⁽⁷⁾.

This epistemology’s attention to historicity is even deduced from mathematism: science emancipates itself from its own theoretical frameworks to propose new ones, typically by reworking the mathematical structure chosen for the construction of the world. So what we need is a historical investigation that identifies the discontinuities in the mathematical fabrication of reality.

As much as the historical perspective, our filiation basically attempts to add to the Kantian system the vision of a permanent mathematical reconstruction of the world (a vision that is clearly in harmony with the Kantian understanding of scientificity). The above concerns physics first and foremost, but French epistemologists are also concerned, in the same way, with understanding the specific historical nature of mathematics.

idea of the whole of anticipated knowledge, and which is therefore a rationally necessary “schema”. Cf. A 832–851, B 860–879, Ak III 538–549.

⁽⁷⁾Gaston Bachelard, *Le rationalisme appliqué*, Paris PUF, 1949, 2004, p. 133.

In what follows, I would like to extend what I have just said by giving a more precise presentation of neo-Kantianism, which seems to me to be the main thrust of French epistemology.

§ 3. — French nenokantism: a reconstruction.

In my experience, and especially in the light of a recent reading of Jules Vuillemin's *Philosophie de l'algèbre* and *Physique et métaphysique kantienne*⁽⁸⁾, it seems to me that French neo-Kantianism can be characterised by five convictions or options, five philosophical operations perhaps.

Of course, this would require a study of the various authors of the filiation, highlighting the accuracy of such a reconstruction on the basis of the texts. I dispense with this, hoping that at least some readers familiar with the philosophers of science mentioned above will recognise in my reconstruction the atmosphere that is common to them. So here is my list.

1) *The historicist option.* Our authors in France are extremely sensitive to the profound changes that occurred at the end of the 19th century and the beginning of the 20th century (pluralisation of geometries, inauguration of set theory and formalism, theories of relativity, quantum theories). They deduce from this constellation of crisis events the idea that science must essentially be understood as self-revolutionary, which would force us to reckon with an intrinsic historical ingredient. The mutability of the scientific fact requires of us a "historicist" approach: not just the addition of historical examination to the study of theoretical constructs, but also the vision of scientific theorising as including in itself its own historicity. As if the scientific mind were an exemplary case of becoming. Thus, commenting on Lagrange's dissertation on algebraic equations, Vuillemin presents his contribution as going beyond the first Italian works (del Ferro, Cardan, Tartaglia), and as anticipating the Galoisian construction⁽⁹⁾.

2) *The dynamic rationalist option.* This second point is close to the first, and largely dependent on it. Insofar as the historical declension is conceived here as not affecting rational deployment from the outside, but rather as a major trait of the rational essence, we can think,

⁽⁸⁾See Jules Vuillemin, *Physique et métaphysique kantienne*, Paris, PUF, 1955; *Philosophie de l'algèbre*, Paris, PUF, 1962.

⁽⁹⁾Cf. Jules Vuillemin, *Philosophie de l'algèbre*, op. cit. p. 37–47.

and neo-Kantian philosophers of science do, that the critical movement revealed by the historical perspective clarifies for us the radical nature of scientific rationalism. Studies of science that are attentive to this movement are therefore precisely the magnifying glass that reveals rationality at its most distinctive. Once again, Vuillemin understands the overcoming of Cardan et alii and the announcement of Galois as the very essence of Lagrangian rationalism (motivating, moreover, in this respect, an analogy⁽¹⁰⁾ with Fichte).

3) *The “anti-intuitivist” option.* According to the analyses of our French philosophers, the correct understanding of the self-overcoming gesture of science requires the rejection or disqualification of intuition. The “fault” of intuition is that it is supposed to deliver to us, as it were, the object of which it is the intuition. The notion of intuition thus lends credence to the idea of an evident given (on the object side: a given; on the subject side: an evidence of the gift), and it is for this reason that it is judged to be bad and unsuited to the reading of the sciences. Indeed, the sciences do nothing more than go beyond any moment of obvious donation of this kind. They are constantly resorbing intuitive content, in order to take it up again in a systematic articulation that is constantly being reworked and rearranged. This option is linked to the vision of the “architectonic” function of reason already mentioned (cf. note 6). The attitude we are describing is indeed a “neo-Kantianism”, which claims to be Kantian, at the very moment when analyses are being promoted that seem to prove him wrong or depart from him. In Vuillemin’s case, the criticism under point 3) takes the form of a challenge to what he calls *extrinsic intuitionism*⁽¹¹⁾.

4) *The “mimetic” option.* Another aspect of our neo-Kantian philosophy of science is that we ascribe two levels of truth to the discourse of science. At the first level, it is “true” in the sense of the classical notion of truth: it proposes a theoretical organisation of the world that reflects its actual organisation, at least as long as the court of experience does not denounce this proposition. But at a second level, we have a kind of Heraclitean meta-truth: science surpasses itself, and thus appears as an organism in the process of becoming. In this way, it mimetically embraces an “absolute” becoming, which is the metaphysical core conquered as the essence of being by Heracliteanism. Our philosophers even have the impression that by recording the scientific movement in its language, the philosophy of science makes this movement its

⁽¹⁰⁾ Cf. Jules Vuillemin, *Philosophie de l’algèbre*, op. cit. p. 48–55.

⁽¹¹⁾ Cf. Jules Vuillemin, *Philosophie de l’algèbre*, op. cit. p. 77–88.

own, and participates in the scientific meta-truth⁽¹²⁾. The vision of such a meta-truth can already be seen in Brunschvicg⁽¹³⁾, and in Vuillemin⁽¹⁴⁾. It is not only that reason recognises itself as essentially dynamic and that its own movement is apprehended at the level of science (as stated in point 2), it is also that becoming is recognised as the fundamental ontological evidence, and that science and the philosophy of science are assigned the task of corresponding to such a mobile essence, of apeing it, as it were.

5) *The physical-mathematical coupling*. That science is, par excellence, physical-mathematical is, in many respects, exactly the Kantian message, explicitly underlined in *Metaphysical Foundations of Natural Science*⁽¹⁵⁾. In the reading of our philosophers, the mainspring of the critical movement of science, of its perpetual self-depassment, lies in the resorption of the given and the obvious in favour of architectonic elaboration. But they see this gesture as identical between physics and mathematics. Mathematics abrogates the intuitive primacy of Euclidean geometry and reconstructs geometric contents as plural systematic developments. Physics goes beyond the given of the orthogonality of time to space, which corresponded to our intuitive apprehension of the dimensions of presentation, to entrust the thought of space-time to the theoretical system of Minkowskian geometry. In the end, mathematics and physics are the same thing, or mathematics is the language of going beyond the evidence of the given, which is at the same time the language of physics, and whose operation is verified in both disciplines. It is not only that our neo-Kantianism sees a continuity between physics and mathematics; it is also that it identifies the

⁽¹²⁾Can a philosophy that claims this kind of mimicry at the same time inherit a method like Gueroult's structural method? I leave the answer to more learned people.

⁽¹³⁾In "La philosophie nouvelle et l'intellectualisme" [*L'idéalisme contemporain*, Paris, F. Alcan, 1921, pp. 98–185], Brunschvicg argues that the criterion of truth emanates from the development of science, and that this immanence is precisely what Kant would have given us. Brunschvicg also describes scientific explanation, constantly renewed by criticism, as a way of making reality continuous.

⁽¹⁴⁾Here, for example, is a significant quotation: "In the critical system, the thought of movement commands the movement of thought" [Jules Vuillemin, *Physique et métaphysique kantienne*, Paris PUF, 1955. P. 41]. We can see that the conception leading to the conception of such a meta-truth is imputed to Kant himself.

⁽¹⁵⁾Cf. Immanuel Kant, *Premiers principes métaphysiques de la nature*, trans. J. Gibelin, Paris, Vrin, 1982, p. 11 (Ak, IV 470).

two disciplines by identifying their movement. Once again, this tendency can already be seen in Brunschvicg⁽¹⁶⁾.

§ 4. — The very French anti-Kantism of neo-Kantism.

There is a coherence and strength to the system expressed by the five options. And the advantage of such a reconstruction is that, if you have been educated in France and have grown up in the hexagonal atmosphere, you will soon discover that you adhere or have adhered to some of these options. The five points do not give rise to a series of propositions to each of which you are likely to give your approval in a contingent and independent manner: rather, they determine a fragment of the national philosophical spirit, by which you find yourself influenced, even if unwittingly. The adage that in politics everyone has been, is or will be a Gaullist can be transposed to the field of the philosophy of science: everyone has been, is or will be a Neo-Kantian in the sense of the proposed reconstruction.

I am also convinced of the depth of this shared destiny by Alberto Gualandi's PhD thesis, published as a book by Hermann in 1998⁽¹⁷⁾. The author describes French philosophy in the xx^e century in terms of the epistemological orientation determined by Brunschvicg. He sees this as an extension of Kantian criticism which offers an alternative to the one favoured by the Vienna Circle and, by extension, by analytic philosophy as a whole. He describes how authors such as Brunschvicg and Bachelard internalised the

⁽¹⁶⁾ Here is a passage, for example, in which Brunschvicg attributes the superposition of mathematics and physics to Kant himself: "We should go even further: the 'fragmentary' formation of critical philosophy provides a means of seeing how, under the influence of Newtonian physics, whose rational value it was later to serve to justify, the idea of mathematics underwent in Kant a kind of unconscious shift, the result of which was to make the demonstrations of arithmetic or geometry relate directly to things that are numbered or figures that are drawn. Later, no doubt, when he composed the *Critique* or the *Prolegomena*, Kant would believe that he was moving from 'pure mathematics' to physics; but the question is whether he did not begin by substituting for the notion of pure mathematics a conception of applied arithmetic and applied geometry, so that the passage from arithmetic or geometry to physics will in fact be no more than the passage from a simple form to a more complex form of applied mathematics" [cf. Léon Brunschvicg, *Les étapes de la philosophie mathématique*, Paris, F. Alcan, 1922, pp. 257–258].

⁽¹⁷⁾ Cf. Alberto Gualandi, *Le problème de la vérité scientifique dans la philosophie française contemporaine. La rupture et l'événement*, Paris, L'Harmattan, 1998.

need for philosophy to follow the movement of science in order to reproduce or reflect it in itself.

And he makes this desire to embrace the external becoming indicated by the revolutions of science the major trait of French philosophy: this trait, in the end, passes from the philosophy of science to philosophy in general. So much so that Alberto Gualandi can describe the interventions of Deleuze and Lyotard as echoes of epistemological historicism: their discourse obsessed with the event and the metamorphic rupture transposes the national epistemological orientation to a philosophy of subversion. Gualandi goes so far as to name the work of Michel Serres as the intermediary through which this “generalisation” is accomplished.

In order to appreciate the regulatory nature of the system presented in relation to national intelligence, it is worth considering it in the wider context of the reception of Kantianism in France. To this end, we have at our disposal two extraordinary summaries recently written by Laurent Fedi and Pietro Terzi. These works of over 600 pages describe the adventure of Kantian reception, from 1854 to 1986 in the case of the latter, and from 1795 to 1940 in the case of the former⁽¹⁸⁾. Both show the paradox that constitutes the “Kantian favour” in France: although reference to Kant and the study of Kant very quickly became quasi-institutional parameters for philosophy in France, this does not mean that the readings and positions taken confirm or validate the Kantian message. On the contrary, the atmosphere of this reception was immediately polemical. The most official continuators of Kantianism, such as Renouvier and Brunschvicg, were opposed to it on essential points. In particular, none of the concertists of the French post-Kantian symphony validated exactly his conception of the transcendental.

For those who look at the five options listed just now, this opposition is, I think, quite clear. Very officially, the reference to history and the adoption of a certain historicism are presented by French neo-Kantian philosophers of science as additives to Kant, or as corrections to Kantianism. Vuillemin puts it this way in the following passage:

“(…) how is the transcendental constitution to be conceived, if the correlate of the Cogito is no longer the universe of rational

⁽¹⁸⁾ Cf. Laurent Fedi, *Kant, une passion française 1795–1940*, Olms, Georg AG, 2018; Pietro Terzi, *Images de Kant et formes du criticisme dans la philosophie française contemporaine, 1854–1986*, doctoral thesis from the University of Paris Nanterre and the Fondazione San Carlo in Modena, January 2020.

Mechanics, but the world of historical experience? How can the unity of knowledge be preserved without doing violence to the dissociation of vulgar and scientific experience? How can we finally reconcile the true with the relative, and, in the incessant variation of the methods and principles of the most exact sciences, ensure the certain foundations of philosophy?"⁽¹⁹⁾.

A formulation that is both measured and perplexing.

The disapproval of intuition is also presented as the liberating element that saves science from the prisons in which Kantianism wanted to keep it. Vuillemin expressly points out the Kantian doctrine of intuition as a case of bad *extrinsic intuitionism*⁽²⁰⁾, Bachelard, according to the Bachelardians, only wants to consider worked intuition as a component of scientific value, and therefore cannot validate Kantian pure intuition, understood as immediate.

On the other hand, the vision of science as an architectonic whole striving ever more to unfold reason from itself is clearly what our authors retain from Kant, what they take from him and in the name of which, moreover, they feel they must shake the epistemological edifice of the first critique.

On the other hand, the alignment of mathematics with physics, a consequence of the reference to the architectonics of pure reason and, strangely enough, of the "mathematism" of the French school itself, once again constitutes a head of opposition to Kant. 'Mathematism' tends to reduce physics to the mathematics that plays within it, but the result is that the separation and autonomy of mathematics, affirmed with rare clarity in Kant, is abandoned or forgotten. We quoted Brunschvicg a little earlier on this subject (note 13): in the corresponding passage, the author's discomfort (with respect to the Kantian precedent) seems quite noticeable.

To conclude, this was one of the points we wanted to make: the school of French epistemology is an emblematic example of how French philosophy has managed to perpetuate its paradoxical game with Kant. On the one hand, this school participates in the institutionalisation of criticism and transcendental thought — to the

⁽¹⁹⁾ See Jules Vuillemin, *Physique et métaphysique kantienne*, Paris, PUF, 1955, p. 360.

⁽²⁰⁾ We read, for example, the following, which illustrates the notion of extrinsic intuitionism in context: "This is especially the case with Kantian philosophy, when it demands that the concepts of the understanding relate to intuitions that are necessarily sensible, and whose pure form therefore relates to the exteriority of space and time" Jules Vuillemin, *Philosophie de l'algèbre*, op. cit., p. 78.

extent that Desanti can still, quite recently, complain about it⁽²¹⁾ — while, on the other hand, it displays a resolute opposition to Kant. But as we said, this is the dual aspect that has characterised the French reception of Kant from the outset, across all branches of philosophy.

§ 5. — French neo-Kantianism and analytic epistemology.

Finally, it may be appropriate to take into consideration once again what was mentioned at the beginning of this article, namely the confrontation with the logical empiricism of the Vienna Circle (or even with analytic epistemology in general).

Among us, but also to some extent outside us, according to the vision of members of other nations, European or non-European, French epistemology functions — at least sometimes — as an antidote to an international epistemology whose first crystallisation was the empiricism of the Vienna Circle, and which has since given rise to reformulations or often critical clarifications (starting, spectacularly, with an author like Quine)⁽²²⁾.

Is this the right way to understand the lineage of authorship discussed from the beginning of this article?

In a sense, the answer must be in the affirmative, because our French authors perceived what was going on in logical empiricism as far as epistemological matters were concerned, and more often than not expressed a distance or reticence. Brunschvicg had already criticised Russellian logistics, in terms that seemed to be aimed at all mathematical formalism⁽²³⁾. Meyerson wants to understand science in terms of a kind of psychological device of which it is a symptom, and takes the liberty of confronting his views with the Hegelian model⁽²⁴⁾, adopting an approach that is totally incompatible with the new Carnapian norm. Lautman and Cavaillès

⁽²¹⁾ Here's a quote: "This is the third form of 'internalization' of science into philosophy. Inaugurated by Kant in a well-defined epistemological field, it has long outlived him; and even today it continues to nourish, in France at least, certain approaches to school philosophy" [Jean-Toussaint Desanti, *La philosophie silencieuse*, Paris, Le Seuil, 1975, p. 21].

⁽²²⁾ I am thinking here of his famous "The Two Dogmas of Empiricism".

⁽²³⁾ See Léon Brunschvicg, *Les étapes de la philosophie mathématique*, op. cit. pp. 421–426.

⁽²⁴⁾ Notably in *De l'explication dans les sciences* (Paris, Fayard, 1921, 1995).

take into account the views of the new epistemology, but oppose them with the movement of science and the image they favour. Granger and Vuillemin regard Frege, Russell and Carnap as important milestones to be discussed indefinitely, but refuse to establish the philosophy of science once and for all in the “positive”, “naturalistic” and “analytical” language of the new movement. In his entry *Epistemology* for the *Encyclopædia Universalis*, Granger discusses the possibilities and challenges of epistemology using names as diverse as Russell, Bachelard, Kuhn, Descartes and Kant, without forgetting to include Foucault’s *Archéologie du savoir* in his bibliography: this is a far cry from the restricted space of the analytic debate⁽²⁵⁾.

But in another sense, the current of French epistemology, as we have assessed it, has features in common with the school that grew out of logical empiricism. Both sides turn against transcendental epistemology, seeing it as a straitjacket that has unfoundedly claimed to imprison science in one of its historical states. This conclusion was first asserted in the name of the pluralisation of geometries during the 19th century, understood as the irremediable refutation of Kantian transcendental aesthetics (an argument found in both series of texts). Admittedly, the emphasis of this disapproval was not the same: on the French side, the axiomatic character of all geometrical discourse is emphasised; on the side of logical empiricism, claims are made either for the inaccuracy of the underlying cognitive psychology (it is not true that three-dimensional Euclidean geometry is “wired into us”⁽²⁶⁾), or for the *principle of tolerance*, authorising the scientist to fire any logical-mathematical systematisation, as long as he integrates experimental data by means of it.

If we look more closely at the currents over the long term, instead of sticking to what may have been their “original” contrast, it seems to me that the difference in tone between, on the one hand, a French-style philosophy of science obsessed with history and change and, on the other hand, an analytical epistemology stemming from logical empiricism and more concerned with the methodological characterisation of the transhistorical figure of scientific knowledge,

⁽²⁵⁾ Cf. Gilles-Gaston Granger, *Epistemology*, in *Encyclopaedia Universalis*, vol. 7, 1985, p. 61–68.

⁽²⁶⁾ As Carnap says, for example, in “Dreidimensionalität des Raumes und Kausalität” (*Annalen der Philosophie und philosophischen Kritik* 4, 1924, p. 105–130).

although noticeable at the outset, is tending to fade. Quine's article⁽²⁷⁾ on the two dogmas of empiricism, already mentioned, was a turning point. From this point onwards, the adjustment between the a priori (even if logical) and the a posteriori (denounced as less immediate than first assumed) is now conceived on both sides in a dynamic and historical manner⁽²⁸⁾. The fact that the Duhem-Quine thesis has this double name seems to indicate or confess a convergence⁽²⁹⁾. Kuhn should also be cited here, as we did at the beginning of this article.

The idea of dynamic adjustment suits, it seems to me, a Hegelian-dialectical vision of the mind and its adventure. But American pragmatism, with an author like Dewey, started from there⁽³⁰⁾, and some recent specialists — developing a philosophy of experience that is originally a philosophy of language — return to the same point, such as McDowell or Brandom⁽³¹⁾.

French epistemology should perhaps not be read solely and essentially as an antidote to the analytical orientation that has prevailed in the world since the Vienna Circle.

⁽²⁷⁾ Cf. W.O. Quine, "Les Deux dogmes de l'empirisme", *De Vienne à Cambridge*, transd. franç. P. Jacob, Paris, Gallimard, 1980, pp. 93–121.

⁽²⁸⁾ Quine's article shows the bridge he builds in its very temporal organisation. In the first four sections, Quine investigates, in the purest analytical logico-linguistic style, the possibility of rigorously separating analytical judgements from synthetic judgements, considering criteria and counter-examples. He thus considers synonymy, definitions and semantic rules. Addressing the second dogma — that of reductionist semantic verificationism — in the fifth section, he leads the discussion more along the lines of the history of philosophy, evoking Carnap, of course, but also Locke, Hume and Bentham. Finally, in the sixth and last section ("Empiricism without dogma"), acknowledging that the first search is futile, he comes to describe the overall situation of the sciences in their confrontation with reality, outlining the arc of the collaboration of several disciplines (at least logic, mathematics and physics), and taking into account recent data such as quantum developments. In this way, it seems to embrace an attitude that is at once historical and philosophical of culture, which was natively that of French epistemology.

⁽²⁹⁾ The postulation of such an overlap can undoubtedly be criticised. It is true that Quine, on the other hand, fully embraces the "naturalism" claimed by the new epistemological school, notably in his essay "L'épistémologie devenue naturelle" (*Relativité de l'ontologie et autres essais*, trad. franç. J. Largeault, Paris, Aubier-Montaigne, 1977, pp. 83–105).

⁽³⁰⁾ Cf. J. Dewey, *Darwin's Influence on Philosophy, and Other Essays on Contemporary Philosophy*, trans. franç. Lucie Chataigné-Poutego, Claude Gauthier, Stéphane Madelrieux and Emmanuel Renault, Paris, Gallimard, 2016.

⁽³¹⁾ Cf. J. McDowell, *L'esprit et le monde*, trans. franç. C. Alsaleh, Paris, Vrin, 2007; and R. Brandom, *L'architecture des raisons*, trans. Claudine Tiercelin and Jean-Pierre Cometti, Paris, Cerf, 2009.

§ 6. — Concreteness of epistemology.

That said, there is still one element that could complete the portrait of this movement to which we are attached without really knowing why. This would be the element of concreteness, or attachment to the particular. This element is circumstantially linked to the adoption of the historical perspective, but in my view it goes beyond it. The underlying question would be the following: is a philosophy of science supposed to reflect something of the particular scientific affairs on which it constructs a theoretical position, or must it stick to the general constituent features of this position in the conceptual and argumentative space of the philosophy that expounds it?

It seems to me that the spontaneous practice of French epistemologists is to give in to the particularity of the scientific moments commented on: this can be done by highlighting a historical context, by emphasising a biographical aspect of the scientist in question — Newton, Cantor, Einstein, etc. — or by elaborating a fragment of the technical content of the scientific event in question. Whatever philosophy's appetite for generality and universality, the French tradition senses that, when it comes to talking about science, it is also important to capture something of the particular case we are dealing with. Because, perhaps, the genius of science lies in the specificity of its procedure or its arrangements.

This does not mean that "French-style" epistemology refuses to speak at the most general level, that of a philosophy of knowledge in search of its conditions. It does so, as several of the authors already mentioned bear witness. But it does so by tolerating a kind of multi-modality in its texts, which is a constituent of their stretching. The writings of French epistemology are very often marked by a kind of tension between two extremes: they are expressed at the metaphysical level, where one wonders how a discourse can correspond to the fabric of being (or formulate the need for a fictional order), but also at the quasi-anecdotal level where one tries to grasp from the inside the approach of this or that great name of science grappling with this or that difficulty.

My last word will be to underline the extraordinary and in many respects "perfect" precedent provided by Albert Lautman's work, in the case of mathematics. In his *Essay on the Unity of Mathematics*, we find on the one hand the formulation of a more or less complete philosophy of mathematics (with a theory of mathematical

objectivity and a theory of mathematical change at least)⁽³²⁾, on the other hand a fairly precise analysis of several recent developments in mathematics at the time he was writing and working⁽³³⁾, and finally some interpretative gestures at the level of the history of philosophy, intended to give us a better understanding of the conceptual elements involved⁽³⁴⁾.

For me, ending with such a tribute to Lautman is also a way of avoiding any self-satisfaction in the field we are dealing with. If there is a French tradition of epistemology of some value, that does not immediately mean that we can live up to the model thus drawn. Rather, it seems to me that what Albert Lautman achieved not so long ago has become very difficult for us to repeat or match, for a whole series of reasons that could include our own inertia.

Jean-Michel Salanskis,
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⁽³²⁾See in particular Albert Lautman, *Essai sur l'unité des mathématiques et divers écrits*, Paris, Union générale d'éditions, 1977, pp. 135–147.

⁽³³⁾See in particular Albert Lautman, *Essai sur l'unité des mathématiques et divers écrits*, op. cit. pp. 31–82.

⁽³⁴⁾See Albert Lautman, *Essai sur l'unité des mathématiques et divers écrits*, op. cit. pp. 205–209 and 143–146.