



François, K., Löwe, B., Müller, T., Van Kerkhove, B., editors,  
*Foundations of the Formal Sciences VII*  
Bringing together Philosophy and Sociology of Science

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# Knowledge, the context distinction and its impact on the relation between philosophy and sociology of science

SABINE AMMON

Nationaler Forschungsschwerpunkt eikones “Bildkritik. Macht und Bedeutung der Bilder”,  
Rheinsprung 11, 4051 Basel, Switzerland  
E-mail: [Sabine.Ammon@unibas.ch](mailto:Sabine.Ammon@unibas.ch)

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## 1 Introduction

The relation between philosophy and sociology of science can be characterized by an impressive gap, which seemed to be unbridgeable for several decades. This might be astonishing as both disciplines deal with the same subject matter and both disciplines try to understand what science is. Indisputably, there are various overlaps between the two disciplines and one would expect a lively, interdisciplinary discussion. However, the opposite is the case. To this day, there are persistent obstacles, which hamper a fruitful exchange. Bringing together philosophy and sociology of science, but also history of science, to a joint interdisciplinary field remains a desideratum. Since the early 1970s, there has been progress in establishing science studies, which include historical, sociological, ethnological, psychological, cultural, political and economical aspects. However, to this day there have been serious difficulties to integrate mainstream philosophy of science into this dialogue. The historians of science Schickore and Steinle state that

exchanges between philosophy of science, history of science and science studies have been rather sparse; in fact, the disciplines have drifted further and further apart. (Schickore and Steinle, 2006a, p. ix)

Consequently, Weingart, a sociologist of science, concludes that

the differences between the formal orientation of theory of science and the empirical orientation of sociology of science are too large,

*Received by the editors:* 24 January 2009; 18 November 2010; 5 April 2011.  
*Accepted for publication:* 14 April 2011.

and the institutional interests of the developed fields relate to these differences. (Weingart, 2003, p. 12; translation by the author)<sup>1</sup>

These quotations show us a concise, but rather depressing diagnosis of the status quo. However, we should not leave it at that diagnosis, as the loss for both, philosophy and sociology of science, is remarkable. A pressing, present-day problem, which demands for a joint treatment, is the question of knowledge in its relation to science and society. Especially in the German-speaking context, a virulent debate in social science on the effects of the knowledge society is taking place.<sup>2</sup> Knowledge has become a key concept for analysing especially the fields of education, research, science and politics. However, despite its prominent role the notion of “knowledge” usually remains diffuse and vague. Philosophy of science could be the ideal partner for sociology of science to tackle this problem, as clarifying concepts is a genuine philosophical endeavour. Nevertheless, philosophical treatises on theory of knowledge rarely enter into writings of sociology of science or sociology of knowledge. Why is this so? At first glance, some causes are ready at hand. The debate in Epistemology and Philosophy of Science on theory of knowledge<sup>3</sup> is confusing (not only for insiders) as we find a great variety of positions. The majority of debates centre on the notion of knowledge as “justified true belief” in search of necessary and sufficient conditions. The price of this approach is a very narrow notion limited to propositional knowledge (e.g., Steup, 2008; Baumann, 2002, esp. pp. 40 ff.). Many occurrences of knowledge like knowing-how, knowledge by acquaintance or the difference between manifestations of knowledge and personal knowledge cannot be covered by these definitions,<sup>4</sup> which result in fragmented conceptions of knowledge. Therefore, most of the analysis done in theory of knowledge seems unsuitable for use in social studies. By discussing the relation between society, individuals, science and knowledge, sociology

<sup>1</sup>German original: “Zu groß sind die Unterschiede zwischen der formalen Orientierung der Wissenschaftstheorie und der empirischen Orientierung der Wissenschaftssoziologie, und mit diesen Unterschieden verbinden sich die institutionellen Interessen der gewachsenen Fächer.”

<sup>2</sup>For an overview, cf., e.g., Weingart (2003, pp. 127–141), Knoblauch (2005, pp. 255–284), Maasen (2009, pp. 77–83).

<sup>3</sup>Bringing together Philosophy of Science and Epistemology means bridging another far-reaching gap lurking in theoretical philosophy, which should be mentioned here but will not be discussed further. With the beginning of the 20th century, Philosophy of Science and Epistemology started to drift apart and developed into different fields. Therefore, the discussion of problems of knowledge—which is crucial to both fields—has led to different approaches, which remain mostly unrelated. A proposal for how to solve many problems concerning theory of knowledge by bringing together Philosophy of Science and Epistemology can be found in Ammon (2009), which develops a procedural notion of knowledge.

<sup>4</sup>As, e.g., argued in Gottschalk-Mazouz (2007, pp. 22 ff).

of science needs a comprehensive theory of knowledge, which is able to explain how different forms of knowledge interact, how knowledge changes in history or how knowledge depends on cultural and societal influences.

Given these facts, the need for an integrative discussion of philosophy and sociology of knowledge for opening traditional lines of argumentation and analysis is clear. This is astonishing as one can observe an increasing mutual interest during the last two decades.<sup>5</sup> In epistemology, the field of social epistemology emerged, which acknowledges and investigates the social dimensions of knowledge with influential writings by Steve Fuller (1988), Alvin Goldman (1999) or Helen Longino (2002)—to mention only some protagonists. In philosophy of science, we could for example observe a re-evaluation of the discovery process by the “friends of discovery”<sup>6</sup> and an evolving literature on the epistemology of experimentation when we look at texts like Nickles (1980a,b), Hacking (1983), Franklin (1986) or Rheinberger (1997). However, in spite of this body of literature, mainstream debates appear rather reluctant when it comes to a renewal of discourse concerning the problem of knowledge. There seem to be obstacles deeply anchored in the disciplinary discourse, going beyond different methodological approaches.

Therefore, the aim of this article is to single out one of these obstacles in the field of theory of knowledge which must be seen in close relation to the context distinction. The establishment of the context distinction—as the separation into a context of discovery and a context of justification—goes back to the beginning of the 20th century and leads to a specific handling of problems in theory of knowledge.<sup>7</sup> Using the example of Carnap’s *Aufbau* (1928), it is possible to show a reconstructive attitude, which is not only paradigmatic for the traditional theory of knowledge in philosophy<sup>8</sup> but also contributes to the isolation of epistemological from sociological points of view to this day. However, the discussion of Carnap’s approach can also fuel the search for a solution for how to overcome this obstacle. The writings of Nelson Goodman, who has developed the epistemic concept of the *Aufbau* further, can serve as a point of departure, and allow us to contrast the *reconstructive* approach to a *constructive* emphasis. Based

<sup>5</sup>The conference FotFS VII at which this paper was presented can be seen in this line as well; cf. also Ammon et al. (2007a).

<sup>6</sup>Cf. Sintonen and Kiikeri (2004, pp. 214 ff.); according to Schickore and Steinle, the expression “friends of discovery” goes back to Ronald Giere (Schickore and Steinle, 2006a, p. viii).

<sup>7</sup>For a detailed overview of the different usages of the notion “context distinction”, cf. Hoyningen-Huene (1987, 2006).

<sup>8</sup>To be more precise, Carnap’s *Aufbau* exemplifies a common approach to theory of knowledge in Philosophy of Science: The *Aufbau* develops a notion of knowledge originating from the notion of system. Herein lies an important difference: Theories of knowledge in epistemology usually originate in discussing the conditions of knowledge of a person (as it occurs in the standard expression “*S* knows that *p*”).

on a dynamic plurality of knowledge systems, a shift in theory of knowledge becomes possible, allowing us to adjust the relation of philosophy and sociology of science.

## **2 The relevance of the context distinction for the relation of philosophy and sociology of science**

The separation into context of discovery and context of justification became a paradigm for philosophy of science in the 20th century. Although not explicitly addressed, the context distinction is up to now highly influential for the disciplinary attitude. Schickore and Steinle (2006a, p. vii) observe that

[the context distinction] still informs our conception of the content, domain, and goals of philosophy of science. The fact that new developments in philosophy of experimentation and history and sociology of science have been marginalized by traditional scholarship in philosophy indicates that the context distinction still pervades philosophical thinking about science.

The context distinction draws a demarcation line between anything that relates to the process of discovering insights and a justification of the knowledge gained in these processes. Nevertheless, it is more than a line between different research areas as only the latter is usually of interest for philosophy of science. According to Schickore and Steinle (2006a, p. vii), one can expect two effects of this demarcation line. On the one hand, it limits the scope of philosophy of science and hence, one can characterize its domain and fix its methods. On the other hand, it is possible to adjust the relation of philosophy of science to other disciplines. As a consequence, philosophy of science becomes a self-assured discipline, which deals with the results of science on a meta-level. Rival disciplines, which also deal with science as a subject matter, but concentrate on the process of discovery, do not need to be considered.

Although there are earlier manifestations of the context distinction, it rose to fame through Reichenbach's "Experience and Prediction" (1966). Reichenbach claims that epistemology should limit itself to "rational reconstruction" of epistemic processes. What is of interest is a logically based reformulation of the insights achieved in epistemic processes, not the thought process itself that has led to the result. Reichenbach stresses the point that there are differences in the form "in which thinking processes are communicated to other persons" and the form "in which they are subjectively performed" (Reichenbach, 1966, p. 6). As an example, he discusses the results of the work of a mathematician or of a physicist. There is, he states, "the well-known difference between the thinker's way of finding this theorem and

his way of presenting it before a public” (Reichenbach, 1966, p. 6). And he continues:

I shall introduce the terms *context of discovery* and *context of justification* to mark this distinction. Then we have to say that epistemology is only occupied in constructing the context of justification. (Reichenbach, 1966, pp. 6 f.)

Due to the difference in ways of discovery and ways of justification, Reichenbach concludes that it is possible to investigate the context of justification in isolation. The context of discovery that mingles with psychological and social aspects can be left aside. By this, it was possible to separate epistemology from psychology, which was a strong concern in that era (Richardson, 2006, p. 41). Nevertheless, not only psychological, also social and political considerations could be excluded—a motivation targeted at Otto Neurath, Philipp Frank, and the left wing of the Vienna Circle, as Don Howard (2006) argues. Finally yet importantly, Reichenbach intended to establish “scientific philosophy” as a proper discipline and to guarantee the autonomy of epistemology by his argumentation (Schiemann, 2006, pp. 23 f.).

In fact, the distinction became not only extremely influential for the foundation of the discipline of philosophy of science; it also set the standard for handling systematic problems in theories of knowledge. The *justification* of knowledge through epistemological analysis became a major focus. The genesis of knowledge can be neglected—only those aspects that relate to the results of the processes are of epistemic interest. This, in turn, leads to the establishment of the gap between the disciplines mentioned above: On one side of the gap, historians and sociologists concentrate on questions related to discovery and usually ignore the ongoing discussions in philosophy.

[H]istorians and sociologists have largely ignored epistemological concepts and debates in their historical studies and thick descriptions of specific scientific episodes. (Schickore and Steinle, 2006a, pp. ix–x).

On the other side of the gap, the exclusive concentration on the results of epistemic processes in philosophy of science leads to a stereotypical notion of knowledge, which is far from reality.

[P]hilosophers working in the analytic tradition continue to exclude historical as well as sociological and psychological studies of science from philosophical reflection. [...] Many [...] simply presuppose that investigations of the material culture, the historical changes, and the cultural and social environments of science lack epistemological significance. (Schickore and Steinle, 2006a, p. x).

Indisputably, there is a long tradition of mutual neglect in both disciplines. As argued before, it is important to bridge this gap; but why are the

communities still so reluctant to build this bridge? The answer seems simple. As long as theorists of knowledge can argue, as Schickore and Steinle have pointed out, that the context of discovery lacks epistemological significance, there is no need for building a bridge. The crucial question is therefore, why should discovery matter for epistemology? The situation changes if it is possible to show that a theory of knowledge exclusively based on the context of justification turns out to be inconsistent. In fact, many problems haunt traditional theory of knowledge. If it is possible to show that many of those problems vanish when the context of discovery is reconsidered for justification, a strong argument against the context distinction would be found.

### 3 A reconstruction of knowledge

In order to gain further clarification, it helps to go back to the roots of the problem. The method of *rational reconstruction*, to which Reichenbach is referring, originally stems from (Carnap, 1928). We do not only owe the terminology of the method to him, but also a first paradigmatic formulation of the context distinction.

It must be possible to give a rational foundation for each scientific thesis, but this does not mean that such a thesis must always be discovered rationally, that is, through an exercise of the understanding alone. After all, the basic orientation and the direction of interests are not the result of deliberation, but are determined by emotions, drives, disposition and general living conditions. ... The *justification*, however, has to take place before the forum of the understanding; here we must not refer to our intuition or emotional needs. (Carnap, 1928, p. xvii)

Carnap's aim is to ground knowledge on a firm basis, separating it from findings that are wrong, senseless or meaningless: that is to say, no knowledge at all. The thrust is twofold: on the one hand, knowledge should be characterized; on the other hand, a critique of metaphysics should show what cannot qualify as knowledge. The intention is to unmask so-called pseudoproblems and to free epistemology from pure speculation. Carnap talks of purification and cleaning; he stresses the point that it is important to lock out feeling, instinct, disposition or circumstances of one's life. They might be relevant for the genesis of knowledge, but not for the justification of knowledge.

In order to realize his aim, Carnap goes on to collect all findings that exist at a certain time in a unifying system. The focus is language-based: knowledge is characterized as coming in statements that relate to each other. Therefore, *rational reconstruction* is a reconstruction in language by using means of modern logic. By choosing basic concepts, it is possible to develop

a so-called family tree of concepts. Within the “constructional system”<sup>9</sup>, it is possible to derive any meaningful concept from the basis. Carnap’s way of approaching the problem promises a breakthrough for theory of knowledge. Any meaningful statement can be reformulated—and the reformulation uses only precisely determined concepts. A complex system emerges which can integrate not only any currently available knowledge, but also any future knowledge. It is possible to draw an unambiguous line between statements that represent knowledge and statements that are false or meaningless. Knowledge claims which can be reformulated within the system count as knowledge. On the other hand, those which cannot, are revealed as metaphysics as one does not succeed in tracing them back within the constructional system.

Obviously, it is Carnap’s procedure to build constructional systems, which implements the context distinction. *Rational reconstruction* can be described more precisely according to the terms involved. On the one hand, the method used is a rational procedure. That is, it follows certain criteria considered as rational. It simplifies, idealizes, systematizes and it follows the requirements of logic. On the other hand, the method comes as a reconstruction: Carnap chooses a retrospective perspective to systematize all available knowledge. To be fair, Carnap gives priority to epistemological primacy in this process of reconstructing. However, this is not mandatory, and Carnap stresses the point that the genesis of knowledge is not to be considered; what matters is its justification.

In a certain respect, Carnap’s way of handling the problem of knowledge is paradigmatic. His *rational reconstruction* reveals a solution for a classical problem within the new framework provided by the linguistic turn. Knowledge becomes a system of statements that evolve from some fundamental units and principles. These circumstances lead to a notion of knowledge which can be characterized as follows: (a) knowledge can be reformulated within a system of statements; the focus is therefore on propositional knowledge; (b) the aim is to draw a strict line between what proves to be knowledge and that what is senseless, false and therefore not knowledge; this can be attained by an appropriate procedure of justification; (c) knowledge turns out to be true and certain as it has passed a rigorous procedure of justification; (d) therefore, knowledge is timeless and objective; as a consequence, it accumulates.

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<sup>9</sup>In order to find an equivalent for the original German term “Konstitutionsystem”, the English translation of Carnap’s *Aufbau* from 1967 by Rolf A. George (Carnap, 2003) uses the expression “Constructional System”; and already Goodman (1951) introduced the terms “construction” and “constructional” when discussing the *Aufbau*. Therefore, the notion “Constructional System” is widely used in the secondary literature on the *Aufbau*. However, this translation is rather misleading as Carnap names the method employed for system-building “rational reconstruction” which differs significantly from a construction. Nevertheless, for sake of consistency, this article uses the established English terminology.

Although ways and means vary in the ongoing discussion, it is the implicit reconstructive attitude within these characteristic features that remains highly influential and sets the direction for theory of knowledge to this day. In this line of argumentation, it is possible to dismiss any criticism which refers to the limited scope of the notion of knowledge or to the lack of social and historical aspects as it remains external. Its internal setting is consequential and conclusive. As the *reconstructive perspective* on knowledge only works with the *results* of the process of knowing, it causes ahistoricity and the ignorance of social questions in theory of knowledge. For the setting of the system of knowledge, the process of discovery does not need to be considered. By this, rational reconstruction not only reinforces the context distinction. The reconstructive perspective also leads to an immunization of traditional theory of knowledge.

At first sight, the only problem for traditional theory of knowledge is to give an account of the justification of knowledge. However, this problem is not easily solved. The solution of Carnap's *Aufbau* is not satisfying in the long run. Problems of foundations, testing and verification make clear that it becomes impossible to attain the certainty wanted. For example, sentences are embedded in a holistic setting of other sentences; they are involved in dynamic practices and use. The process of drawing a line between knowledge and non-knowledge turns out to be less strict and certain. Especially language, which seemed to be such an appropriate means, creates many problems. Language is no neutral means for reformulating statements of knowledge: on the contrary, it turns out to be full of assumptions. Language itself represents knowledge that captures the world in its notions and structures. In the train of uncovering the prerequisites of language and its relation to the world, modes of acquisition, translation and construction come into focus. In order to ground knowledge on a solid basis, it seems essential to clarify these prerequisites first.

#### 4 Constructing understanding

Not astonishingly, there are many attempts to resolve the deficiencies of traditional approaches in theory of knowledge. An especially fruitful example is represented by the writings of Nelson Goodman, as his ideas evolve through a critical analysis of Carnap's *Aufbau*. Goodman's own treatment of constructional systems lays the foundation for a revised epistemology in his late writings, especially in "Ways of Worldmaking" (Goodman, 1978) and "Reconceptions in Philosophy and other Arts and Sciences" (Goodman and Elgin, 1988). In these works, Goodman demonstrates the shortcomings of classical theory of knowledge that led his way from reconstructive systems to constructional systems and from knowledge to understanding.

An important insight precedes Goodman's epistemological shift. It is the fact that we can find cognition in manifold processes: when we analyse and synthesize, when we observe and create, when we discern, order, weigh or structure. The "cognitive work" is done

with achieving a firmer and more comprehensive grasp, removing anomalies, making significant discriminations and connections, gaining new insights (Goodman and Elgin, 1988, p. 158).

The notion of understanding summarizes all these processes. What they share is a novel epistemic focus, a change in current structures and systematizations that relates to epistemic merit. According to Goodman's approach, cognitive functioning relates to symbols. With this, he opens a broad range for epistemology. From this point onwards, not only language-based systems are worth considering, but also any symbol system found in science, in our every-day world or in the arts.

Goodman describes the processes of understanding as ways of constructing which are equivalent to the usage of symbol systems. However, it is not just any construction that is the sought-after cognitive activity. It is important to single out those ways of constructing which lead to epistemic success. Therefore, the search for rightness of construction is of primary concern in the novel epistemic focus. The model of justification developed by Goodman (1954) became famous under the heading of *reflective equilibrium* (cf. also Rawls, 1971; Elgin, 1996, pp. 106 ff.; Elgin, 1999, pp. 49 ff). Rightness is to be found with the help of a reflective equilibrium between existing structures and new changes.

Since rightness is not confined to those symbols that state or describe or depict, the fitting here is not a fitting *onto*—not a correspondence or matching or mirroring of independent Reality—but a fitting *into* a context or discourse or standing complex of other symbols. (Goodman and Elgin, 1988, p. 158)

New symbols are brought in interplay with existing symbol structures in an active and creative process. Changes are made, often on both sides. If the procedure succeeds, if it is possible to attain a new structuring, we have gained a new understanding.

To appreciate the implied dynamics it is important to notice that the process never finds a definite ending. Goodman and Elgin describe the processes that lead to a reflective equilibrium, such as searching, testing and trying out. Novel circumstances, alterations in assessment, or new findings put the established usage in question, which, in turn, leads to a reassessment of the reflective equilibrium. Therefore, those processes never really come to an end. Granted, there are well-entrenched constellations that hardly

lead to adjustments—but in principle, any element of established systematizations can become part of the equilibration. Additionally, the criteria of rightness can change. Being part of the processes, they are implicitly tested while probing and examining the fitting of a novel structure. If necessary, the changes not only affect symbols and systems, but also the criteria themselves. Thereby, gaining insights turns out to be an ongoing process of transformation.

Goodman and Elgin (1988, pp. 161 f.) call both the process of constructing and its results “understanding” in order to stress the novel focus in epistemology. However, the chosen terminology conceals the crucial difference between the process and its results. Therefore, in the following argumentation, “understanding” will be restricted to the cognitive process, whereas “knowledge” will be used to describe the results of the process of understanding.<sup>10</sup> Consequently, the novel focus in epistemology leads to a revised notion of knowledge which can be characterized as follows: (a) the scope of knowledge is wide-ranging as knowledge is no longer limited to systems of statements but embraces all symbol systems; (b) the rightness of knowledge is found in a dynamic equilibrium process; the drawing of the line between what proves to be knowledge and what does not prove to be knowledge is therefore dynamic as well; (c) knowledge is now described as inherently dynamic: it is a snapshot of permanently evolving processes; it changes, it can be revised, it can become dominant, it can become outdated or it can be forgotten.<sup>11</sup>

Apparently, the constructional focus manages to solve many of the problems of the traditional, reconstructional notion of knowledge. As a dynamic concept, the revised notion of knowledge is able to depict evolution and change. By considering cognitive processes in general, other symbol processes come into focus. Knowledge is no longer limited to sentences and language systems but embraces all symbol systems. These appear in many areas and they occur in many media. Therefore, it is a misunderstanding to limit the notion of knowledge to a fixed branch of science. It rather relates to certain structures and systematizations. Finally, the concept of rightness releases the debate on knowledge from exaggerated demands of an idealized certainty and absoluteness. The focus on the actual usage and processes of production leads to a more pragmatic point of view.

<sup>10</sup>Goodman and Elgin propose another usage of terminology, which does not prove suitable for the purposes here. They apply the notion of understanding in three different ways: as a skill, as a process, and as “what the cognitive process achieves” (Goodman and Elgin, 1988, pp. 161 f.).

<sup>11</sup>A certain type of dynamics could also be attributed to the traditional theory of knowledge, but it differs significantly from the dynamic concept introduced by Goodman and Elgin. The former is the dynamic of growth as an accumulation of knowledge within a static system. The latter sets the system itself in motion, the system itself is under permanent reconception. Within this model, it becomes possible to explain changes in ordering, weighing or focus, modification of criteria of rightness and so on.

What is of major interest here are the consequences for the dogmatic distinction into context of justification and context of discovery. The lesson we learn from Goodman's critique and his model of justification is far-reaching: in short, it says that discovery matters for justification. The process of gaining insights turns out to be the justification of those insights at the same time. Searching, probing, scrutinizing, testing, and assessing go hand in hand. Hence, we have the astonishing result that in order to solve problems related to the context of justification we need to consider the context of discovery. If we take the findings of Goodman and Elgin seriously, the separation of the context distinction turns out to be a severe misunderstanding of the epistemic analysis of knowing; as genesis shows up as a part of justification.

Nevertheless, Goodman's approach not only helps to identify how the context distinction leads us on the wrong track but also gives us a far better understanding of the method of reconstruction. In contrast to ways of constructing, reconstruction focuses on the results of the epistemic genesis, which are brought in an idealized, abstracted and formalized system. Reconstruction works with the results of the construction process. It simplifies and emphasizes, it draws sharp boundaries and distinctions in order to attain a better understanding. Many manifestations of knowledge can serve as an example: encyclopedias, textbooks, symbolic or pictorial representations. As shown above, there are important interrelations between methods of reconstruction and processes of construction. If one considers the results in isolation, severe misunderstandings can result. Only if we investigate them within their context of construction do they lead to a consistent theory of knowledge.

## **5 An outlook: The reconciliation of philosophy and sociology of science within a revised theory of knowledge**

Given the complex relation between ways of constructing and the method of reconstruction that leads to a reconciliation of the context of discovery and the context of justification, what are the consequences for philosophy and sociology of science? In Goodman's writings, we learn much about how to gain a better understanding and how to justify these findings, but his analysis remains limited to aspects of symbolic functioning and characteristics of symbol systems. However, in order to discuss the consequences for the relation of philosophy and sociology of science, we need to know more about the impact of historical and cultural influences on dynamic epistemic processes. Therefore, the challenge for further investigations is to analyse in detail the epistemic genesis, to question which circumstances become influential and which aspects intervene epistemically. Already a first glimpse

tells us that creative inventions and novelties play a crucial role in epistemic genesis. Adjustment, modification, improvement, testing, performing, and so on seem to be individually set off. Is epistemic genesis in the end driven by individual novelties?

For the theory of knowledge, these consequences turn out to be a major challenge heralding substantial change. At the core of the theory of knowledge, individual processes become visible. Nevertheless, it is crucial to notice that the focus on individual, dynamic and active processes is not equivalent to an epistemic solipsism. Individually triggered mutations and dynamics do not happen in isolation. Those processes are inseparable from a transindividual public sphere. There is a permanent interrelation between the individual and its life-world, which has an effect in both directions. By this, we gain on the one hand latitude for negotiation, for exchange and influence on a personal level. On the other hand, we can explain rules, practices, and usage beyond an individualized validity. We therefore have to shift the perspective. Starting points are singular processes of construction within a dynamic relationship with other individuals, in context, practice and usage. Those settings become part of the epistemic genesis and become influential for the results of the process. By this, cultural, historical and sociological aspects enter into theory of knowledge. In turn, knowledge can be investigated in its cultural, historical and social embedding.

Therefore, these readjustments not only help to overcome persistent obstacles in epistemology but they also open novel perspectives in research. To give an example: on this ground, it becomes possible to develop the epistemological framework for investigating questions concerning the *dynamics of epistemic diversity*. To this day, we have difficulties to explain how different forms of knowledge relate to each other.<sup>12</sup> In the succession of pluralistic approaches we have some means at hand to characterize specific kinds of knowledge. However, based on a revised theory of knowledge, it will be possible to describe the intersections and interactions between different kinds of knowledge, which remains a desideratum so far. When local knowledge is confronted with scientific knowledge, when expert knowledge meets the knowledge of a layman, when technical knowledge gets involved with everyday knowledge, they can trigger processes of mutual change, marginalisation, emancipation, alteration or reinforcement. In order to describe these kinds of processes from an epistemic point of view, a theory of knowledge is needed that is grounded both in a pluralistic and dynamic concept of

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<sup>12</sup>E.g., Weingart (2003, p. 141) points to the necessity of exploring the “inferences” between scientific and other forms of knowledge; Bösch and Schulz-Schaeffer (2003, pp. 210 f.) and Bösch and Wehling (2004, p. 20) focus on the “areas of interaction, overlapping, and conflict” of different forms of knowledge as a novel research agenda; Maasen (2009, p. 81) mentions the “interaction of different forms of knowledge” as a challenge for theory.

knowledge, and which is able to capture historicity and contingency as well as societal influences on knowledge (cf. Ammon, 2007; 2009, especially pp. 178 ff.).

These insights have an important impact on the relation of philosophy and sociology of science. When philosophy of science starts to acknowledge that the context of discovery matters epistemically, we have built the foundations for tackling the gap. Within the setting of traditional theory of knowledge, it was standard practice to investigate philosophical theory of knowledge in a decontextualized manner on an abstract level of formalized systems. With the processes of genesis as the new perspective in epistemology, related topics such as creativity, actions and interests, social, political and historical conditions come into focus as well. However, this is not equivalent to the thesis that knowledge is a purely social construction. It only leads to a reassessment of individual and social factors in theory of knowledge. By this, looking at reconstruction and construction reassesses the relationship of philosophy and sociology of science. Within the new setting, they have found common ground. If this leads to an exchange of concepts and theories, it can be the basis for bridging the gap in the near future.

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