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HISTORICAL EPISTEMOLOGY MEETS THE HUMAN SCIENCES

Abstract: *The paper addresses recent developments in historical epistemology, traces the main inspirational sources that feed this approach, and suggests a possible agenda for closer approximation between historical epistemology and the human sciences in studying thought styles and thought collectives, conceptual and theoretical levels of knowledge and the material culture of science.*

Keywords: *historical epistemology; philosophy and history of science; material culture of science; thought styles*

Setkání historické epistemologie a věd o člověku

Abstrakt: *Studie se věnuje současnému vývoji historické epistemologie, sleduje její hlavní inspirační zdroje a navrhuje možné oblasti jejího protnutí s vědami o člověku: zkoumání myšlenkových stylů a myšlenkových kolektivů, konceptuálních a teoretických rovin vědění a materiální kultury vědy.*

Klíčová slova: *historická epistemologie; filosofie a dějiny vědy; materiální kultura vědy; myšlenkové styly*

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For the past two decades, historical epistemology has considerably stirred up the fields of philosophy and history of science. Around the mid 1990s several programmatic essays defining the urge and effort to historicize epistemology appeared;[1] three major international conferences followed (at the Max Planck Institute for the History of Science and at Columbia University in 2008 and at the K. U. Leuven in 2009); a survey introduction to the history and dominant problems of the approach was published in 2007;[2] and, most importantly, an impressive and inspiring body of research developed in most cases within or in connection with the Max Planck Institute for the History of Science, which seems to be the leading proponent of the concept. On the other hand, one could also witness hesitant, cautious or outright critical reactions to these developments based especially on the conviction that there is no need for such a new agenda since both its subject and method are already contained within the tradition of philosophy and history of science.[3] It is true that the program of historical epistemology was often formulated somewhat vaguely and perhaps too extensively – it is the nature of manifestos (even in academia) to be bold and ambitious. One positive effect of such declarations is that they lead to the reconsideration of fundamental assumptions and principles, provided the micro-political battles for demarcation and labeling are avoided.

Although the title "Philosophy and History of Science" is usually used to designate one field of academic research or training, the connection of philosophical and historical approaches to science is often mainly nominal.

This article was supported by grant No. P401/11/2338 "Contemporary Approaches in Historical Epistemology" from the Czech Science Foundation.

[1] Namely, Lorraine DASTON, "Historical Epistemology." In: CHANDLER, J. – DAVIDSON, A. I. –HAROOTUNIAN, H. D. (eds.), *Questions of Evidence: Proof, Practice, and Persuasion Across Disciplines*. Chicago: University of Chicago Press 1994, p. 282–289; Jürgen RENN, "Historical Epistemology and Interdisciplinarity." Max Planck Institute for the History of Science Preprint 2, 1994; Jürgen RENN, "Historical Epistemology and the Advancement of Science." Max Planck Institute for the History of Science Preprint 36, 1996.

[2] Hans-Jörg RHEINBERGER, *Historische Epistemologie zur Einführung*. Hamburg: Junius Verlag 2007 (translated into English as *On Historicizing Epistemology: An Essay*. Stanford: Stanford University Press 2010).

[3] Among the most relevant ones are Thomas STURM, "Historical Epistemology or History of Epistemology? The Case of the Relation between Perception and Judgment," forthcoming in *Erkenntnis*, and Yves GINGRAS, "Naming without Necessity: On the Genealogy and Uses of the Label 'Historical Epistemology'." *Revue de Synthèse*, vol. 131, 2010, no. 3, p. 439–454.

In academic practice, we often encounter a distinct divergence, sometimes even antagonism between philosophical analysis and historical description, between theoretical formalism and ahistorical methodology of philosophy on the one hand and descriptive empiricism and narrow specialization of the history of (natural and technical) sciences on the other.

"Historical Epistemology" represents a critical alternative to the traditional philosophy and history of science especially in its effort to overcome this segregation. It is an approach, which situates itself within this traditional field and draws on its accomplishments and contributions, yet tries to re-emphasize its central problems and issues in productive interfacing of history and theory. It attempts to disclose the basic knowledge forming mechanisms in different historical epochs, interpret scientific thought within its cultural and social contexts, and pay attention to the interdisciplinary relationships among different disciplines as well as to the relationships between the scientific and non-scientific ways of thinking.

> If it should be possible at all to formulate a theory of scientific thinking in its interdependence with other areas of human culture, than it must be a developmental theory which does not separate scientific from non-scientific thinking in any absolute way, but which deals with the emergence of scientific thinking within its cultural and social contexts. It is only in this perspective that the tensions between the philosophy and history of science, between internalism and contextualism, between the essence and the appearance of science, between its rational and its irrational moments can be conceivably addressed within a single theoretical framework.[4]

In its attempt to deal with the emergence and development of scientific thinking within its cultural and social contexts, historical epistemology proceeds through a conceptual integration of a variety of heterogeneous subdisciplines. This approach is motivated not only by the lost faith in the centrality of language and logic for understanding science as it was proclaimed by analytical philosophy, but also and most importantly by the present state of science, which can be dealt with by the traditional methods only with great difficulties and limitations. Vis-à-vis the transformations of contemporary sciences, it is necessary that the methods of studying them adapt and transform as well:

[4] RENN, "Historical Epistemology and Interdisciplinarity," p. 3–4.

> The fast-paced rise, decline, and recombination of scientific disciplines and departments indicates that Kuhn's concept of paradigm is no longer descriptive of most current scientific practices (which, in fact, are increasingly modeled through notions such as networks, assemblages, experimental systems, trading zones, and so on). […] The sciences are moving toward organizing their practitioners around *problems*, not disciplines, in clusters that may be too short-lived to be institutionalized into departments or programs or to be given lasting disciplinary labels.[5]

In this sense, we don't understand historical epistemology as a successor to the traditional fields of philosophy and history of science but rather as an opportunity to address afresh some pressing problems of these fields within this newly reconfigured regime of knowledge.

Historical inspirational sources of historical epistemology

The main body of work constituting historically an approach that might be (and sometimes is) called historical epistemology is the French tradition of philosophy and history of science (Bachelard, Cavaillès, Koyre, Canguilhem), culminating in the works of Michel Foucault.[6] Their reorientation of focus on science and knowledge rises from a critique of transcendentalist philosophies of science (established by Kant and propagated by such diverse approaches as phenomenology or logical positivism), which seek to justify logical and methodological norms by deriving them from foundational acts of consciousness. Systems of knowledge are rather constituted within social contexts, maintained by power relations, and guided by matrices governing the space of possible statements that occur in the writings of a given historical age. It is the shifting away from assigning a central epistemological role to the conscious acts of subjects what defines the core of historical epistemology, although the stress on language, which replaces it in the works of Foucault and others is equally open to questions.

[5] Mario BIAGIOLI, "Postdisciplinary Liaisons: Science Studies and the Humanities." *Critical Inquiry*, vol. 35, 2009, no. 2, p. 819.

[6] On the relationship of these figures to the contemporary perspectives in historical epistemology, see for example David HYDER, "Foucault, Cavaillès, and Husserl on the Historical Epistemology of the Sciences." *Perspectives on Science*, vol. 11, 2003, no. 1, p. 107–129 and Hans-Jörg RHEINBERGER, "Gaston Bachelard and the Notion of 'Phenomenotechnique'." *Perspectives on Science*, vol. 13, 2005, no. 3, p. 313–328.

Other two important discourses feeding the approach of historical epistemology are social epistemology (or the sociology of knowledge, or the sociology of scientific knowledge) and comparative epistemology. Although they both have brought important correctives to the traditional philosophical epistemology (especially the emphasis upon the relationship between cognition and social structure), they avoid the historicity of knowledge, tend to treat cognitive styles as static structures and to underestimate the role of particular individuals in the evolution of thought and science.

Primitive Classification by Durkheim and Mauss from 1903[7] contains the first attempt at analyzing the societal origins of the categories of the mind. Their attack on traditional epistemology (namely Hume and Kant) stems from the conviction that human categories and processes of classification are always social in origin and therefore closely reflect the social organization of particular societies. Their work, however, as well as the works of others who more or less critically proceed from them (mainly in the fields of anthropology and ethnography), focuses primarily on pre-modern or generally non-scientific modes of thought and so proceeds only half-way: the categories and classifications of modern science need to be relativized in terms of cultural matrixes as well.

Ludwik Fleck's pioneering study on the genesis and development of scientific facts[8] provided in 1935 such an elaboration and extension of Durkheim's approach, substituting the concept of the thought collective for his social group and the thought style for his collective representations. Although Fleck's work had not been much influential at the time of its first publication, it found its echo later in the historical turn in the philosophy of science, as well as at the emphasis upon institutional analysis.[9]

The general resources of historical epistemology have been also substantially influenced by the historical turn in the philosophy of science, particularly by the work of historians of science such as Kuhn, Lakatos, Laudan, Feyerabend. Especially Kuhn's *The Structure of Scientific Revolutions*[10] and

[7] Émile DURKHEIM – Marcel MAUSS, *Primitive Classification*. Chicago: University of Chicago Press 1967.

[8] Ludwik FLECK, *The Genesis and Development of the Scientific Fact*. Chicago: University of Chicago Press 1981.

[9] Mary DOUGLAS, *How Institutions Think*. Syracuse University Press 1986; Jonathan TURNER – Stephen TURNER, *The Impossible Science: An Institutional Analysis of American Sociology*. Newbury Park: Sage 1990.

[10] Thomas KUHN, *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press 1962 as well as Thomas KUHN, *The Essential Tension*. Chicago: University of Chicago Press 1977 and Thomas KUHN, "The Natural and the Human Sciences." In: HILEY, D. H. –

The Criticicism and the Growth of Knowledge edited by Lakatos[11] have been central to the reformulation of ideas such as knowledge accumulation, progress, advancement, and structural organization of (natural) science – subsequently adopted and developed by the social and human scientists.[12] Epistemological concerns of the philosophers of science before the historical turn had been consolidated in the search for foundational, ahistorical and universal grounds for knowledge, with implying denial of history in the construction of theoretical, methodological, and epistemological accounts. Social and human scientists principally celebrated "the turn to history," since it appeared much more suited to general problems of their disciplines, regardless of Kuhn's own claim that no implications should be drawn from his historiography of the natural sciences for the realm of other sciences.

In terms of historical epistemology, one of the crucial discrepancies arises from the fact that unlike the human sciences where histories of particular sciences, or disciplines, are written mostly by practitioners in the field, histories of natural sciences on the whole have been produced by historians of science using completely different methods, research tools and evidence than those exercised in the field they studied. This methodological self–awareness is reflected in the work of historical epistemologists and in this context it has to be said that historical epistemology avoids constructing "content-independent" methodology typical of traditional history of science.[13] It uses comparative-historical analysis not for the purpose of securing research tools (in its case mostly referring to questions of evaluation of archival evidence) exploitable across particular disciplines independently of the object under study, but in order to refer to some common issues of the human sciences (e. g. concept formation, formation of conceptual schemes,

BOHMAN, J. E. – SHUSTERMAN, R. (eds.), *The Interpretive Turn*. Ithaca: Cornell University Press 1991. See also Mary HESSE, *Revolutions and Reconstructions in the Philosophy of Science*. Harvester Press 1980.

[11] Imre LAKATOS – Alan MUSGRAVE (eds.), *Criticism and the Growth of Knowledge*. Cambridge: Cambridge University Press 1970.

[12] Charles TAYLOR, "Interpretation and the Sciences of Man." *Review of Metaphysics*, vol. 25, 1971, no. 1, p. 3–51; Barry BARNES, *T. S. Kuhn and Social Science*. New York: Columbia University Press 1982; Steve FULLER, *Thomas Kuhn: A Philosophical History of Our Times*. Chicago: University of Chicago Press 2000.

[13] Marx WARTOFSKY, "Epistemology Historicized." In: SHIMONY, A. – NAILS, D. (eds.), *Naturalistic Epistemology*. Dordrecht: D. Reidel 1987, p. 357–374; Margaret M. SOMERS, "Where Is Sociology after the Historic Turn? Knowledge Cultures, Narrativity and Historical Epistemologies." In: McDONALD, T. (ed.), *The Historic Turn in the Human Sciences*. Ann Arbor: University of Michigan Press 1996.

representation, rationality, relativism, reflexivity, intellectual and theoretical coherence, narration and knowledge, etc.).

In the area of the social and human sciences, these common issues are now usually approached by means of studying historical – intellectual and institutional – contexts, in which particular dominant ideas, knowledge cultures, thought styles, frames of reference have been formed. In contrast with earlier forms of historical analysis, which primarily focused on interpreting, rationalizing, disproving, or advocating various specific ideas, values, or attitudes, the "new" practices tend to approach this research material in such a manner that they situate the ideas, values or attitudes within their own historical, cultural, and material context. Studying how ideas are appearing, transforming, dismantling, or re-emerging, delivers new additives into historical narratives about the social and human sciences, such as the impact of local institutional factors, personal bonds, the position of the social and human sciences in the global structure of universities, the interdisciplinary interaction among particular disciplines, etc.[14]

Within the realms of both traditional philosophy and history of science and contemporary historical epistemology, the main focus is overwhelmingly slanted towards the natural and technical sciences:

> That is the source of both problems and examples, and, insofar as even the social sciences figure in such analyses, they appear as pale imitations of the natural sciences. Except for some older work on hermeneutics [...] and one study of the history of footnotes (by Anthony Grafton), there is almost nothing on the epistemology and practices of the humanists. Historians of science have written about how biologists learned to see under the microscope, how botanists learned to characterize plants in succinct Latin, how physicists learned to abstract from messy phenomena to mathematical models. [...] But what about an epistemology based upon the practices of humanists, on what they do?[15]

[14] This approach is developed and utilized, for example, in the following texts: Charles CAMIC, "Three Departments in Search of a Discipline: Localism and Interdisciplinary Interaction in American Sociology, 1890–1940." *Social Research*, vol. 62, 1995, no. 4, p. 1003–1032; Charles CAMIC – Yu XIE, "The Statistical Turn in American Social Science: Columbia University, 1890 to 1915." *American Sociological Review*, vol. 59, 1994, no. 5, p. 773–805; Christian FLECK, *A Transatlantic* History *of the Social Sciences: Robber Barons, the Third Reich and the Invention of Empirical Social Research*. London: Bloomsbury Academic 2011; Roger L. GEIGER, *To Advance Knowledge: The Growth of American Research Universities, 1900–1940*. New York: Oxford University Press 1986; Mark C. SMITH, *Social Science in the Crucible: The American Debate over Objectivity and Purpose*. Durham, NC: Duke University Press 1994.

[15] Lorraine DASTON, "Whither *Critical Inquiry*?" *Critical Inquiry*, vol. 30, 2004, no. 4, p. 363.

As regards the epistemology and the practices of the human sciences, three main research areas can be identified.

Thought styles and thought collectives

According to Fleck, the "thought style" (an elaboration on Durkheim's concept of "collective representation") sets the preconditions of any cognition and determines what can be counted as a reasonable question and a true or a false answer. It provides the context and sets the limits for any judgment about objective reality. Its essential feature is to be hidden from the members of the though collective – the thought style exerts compulsive force upon their thinking, which they are hardly ever aware of. The notion of thought style[16] is related to the traditional idea of a "conceptual scheme" and to Renn's concept of "cultural systems of knowledge;"[17] these concepts help to comprise both external and internal aspects of the development of science and to analyze the cognitive structures of knowledge and their forms of social transmission in conjunction. The notions of thought style and thought collective – which themselves are locally specific, although their identities transformed dramatically under the conditions of globalization – have to be applied distinctively to the different sciences.

From another position, the problem of the local specificity of knowledge has also been addressed by anthropology and post-colonial theory,[18] in which the spatial and temporal perspectives merge in delimiting areas and historical conditions of non-Western modes of knowledge that have been subjugated by the universalizing claims of Western science. In response to these claims, some authors attempt to show that "Western science, like all knowledge in all societies, is inherently local,"[19] while others choose to treat indigenous knowledge as "local science."[20] The notion of local science should not, however, imply spatially bounded and static form of knowledge. As Ed-

[16] Mary DOUGLAS, *Thought Styles: Critical Essays on Good Taste*. London: Sage 1996.
[17] RENN, "Historical Epistemology and the Advancement of Knowledge."
[18] See Clifford GEERTZ, *Local Knowledge: Further Essays in Interpretive Anthropology.* New York: Basic Books 1983.
[19] David TURNBULL, *Masons, Tricksters and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge*. Amsterdam: Harwood Academic Publisher 2000, p. 38. See also Laura NADER, *Naked Science: Anthropological Inquiry into Boundaries, Power, and Knowledge*. London: Routledge 1996.
[20] Paul SILLITOE, "Local Science vs Global Science: an Overview." in: Paul SILLITOE (ed.), *Local Science Vs Global Science: Approaches to Indigenous Knowledge in International Development*. New York: Berghahn Books 2007, p. 1–39.

ward Said suggested, "like people and schools of criticism, ideas and theories travel."[21] The concept of traveling theories thus allows for consideration of not only the history, but also of the trajectory or dislocation of knowledge. Itself a productive strand of inquiry, the post-colonial concept of local science may thus become yet another item in the intellectual exchange between post-colonial and post-socialist paradigms that has been advocated in recent academic debates.

Conceptual and theoretical levels of knowledge

The shift from the foundational discourse of scientific knowledge to the cultural system of knowledge – could be brought together with the problems of interdisciplinarity,[22] demarcation, unification, and identification of problems not in their "context- independent" and repeatedly programmatic form, but in their practical implications for the human sciences. Historical contextualization of these problems suggests that particular disciplines of the human sciences are very often separated not by their methods, research tools or knowledge claims and interests, but by the culture of thinking, writing, discovering, etc., which are – taken historically – relatively deeply structured.[23]

Emphasis is in this context also placed on the practice of concept formation in the human sciences, both in its general – the very idea of the concept of concept enabling the process of inquiry itself –, and in its practical implication engrained in the idea of conceptual standardization (and also in the idea of fundamental concepts). The perspective of historical epistemology points to the necessity for an analysis of conceptual schemes imposing boundaries on the culture of writing and the practice of argumentation in the human sciences.

In earlier forms of epistemological inquiries, the theoretical structures of knowledge have been conceived of as the antithesis of history. In historical

[21] Edward SAID, *The World, the Text, and the Critic*. Cambridge, MA: Harvard University Press 1983, p. 226.
[22] See, for example, Stephen P. TURNER, "What Are Disciplines? And How Is Interdisciplinarity Different?" In: WEINGART, P. – STEHR, N. (eds.), *Practicing Interdisciplinarity*. Toronto: University of Toronto Press 2000, p. 46–65.
[23] See, for example, Laurel RICHARDSON, *Writing Strategies: Reaching Diverse Audiences*. Newburry Park: Sage 1990; and George STEINMETZ (ed.), *The Politics of Method in the Human Sciences: Positivism and Its Epistemological Others*. Durham – London: Duke University Press 2005.

epistemology, the idea of theoretical coherence is systematically confronted with the relativist claims resulting from the unavailing past search for a synthesis at the level of theoretical, methodological, conceptual, and substantive concerns of science. An analysis of the theoretical structures of knowledge is at the very centre of interest of historical epistemology where it is contrasted with narrative descriptivism of the new social and cultural studies of science displacing any idea of theoretical coherence from their knowledge interests.

The material culture of science

Concepts, problems, and ideas have been traditionally accepted as the main "material" of science. Consequently, studying science and its history meant first of all reading and interpreting books or articles. In the past few decades, more and more scholars have striven to surpass such textualism by embracing much wider spectrum of materials, focusing on instruments, artifact collections, experiments, representations and visualizations, methods of observation and intervention, etc.[24] Within the histories of the natural sciences this shift helped to overcome the two separate and sometimes antagonistic approaches – one focusing on ideas and being practiced in academic circles, the other focusing on instruments and technologies and being the domain of scientific and technological museums. Within the realm of the human sciences, the situation is more complicated since it is – again – the various forms of texts we have to deal with. Yet it is possible to conceive of texts (be they codex bound tractates or collaborative hypertexts) as material embodiments of knowledge as well: they are objects that contain and transfer ideas as well as shape and condition them.

Studying the materiality of scientific texts means studying the techniques and practices of production, use and distribution of texts, their structures and visual organization at the intersections of science studies, literature studies, and the histories of print culture and media.[25] Apart from

[24] Peter GALISON, *Image and Logic. A Material Culture of Microphysics*. Chicago: University of Chicago Press 1997; Hans-Jörg RHEINBERGER, *Towards a History of Epistemic Things: Synthesizing Proteins in the Test Tube*. Stanford: Stanford University Press 1997; Thomas HANKINS – Robert SILVERMAN, *Instruments and the Imagination*. Princeton: Princeton University Press 1999; Lorraine DASTON, *Biographies of Scientific Objects*. Chicago: University of Chicago Press 2000; Davis BAIRD, *Thing Knowledge. A Philosophy of Scientific Instruments*. University of California Press 2004; Lorraine DASTON – Peter GALISON, *Objectivity*. New York: Zone Books 2007.

[25] Timothy LENOIR (ed.), *Inscribing Science. Scientific Texts and the Materiality of Communiation*. Stanford: Stanford University Press 1998.

focusing on the different forms of writing, which are embedded within an entire economy of signs and thus constitutive of meaning rather than a passive medium for restoring the presence of language to thought,[26] or on the literariness of scientific texts,[27] the attention is also paid to the conventions and institutions associated with the scientific enterprise, such as are the notions of authorship, originality, plagiarism, argumentation, co-production, etc. It is not only the technologies of inscriptions themselves that constitute meaning but also the wider social context of scientific practice,[28] such as the historically and locally particular scientific policy or method of evaluation.

More specifically, also the systematic interest in the historical development of material practices of reading and writing scientific texts and their interrelations with the conceptual architectures of these texts and at the transformations of the scientific "work" in its embodied forms with special emphasis on the ways the traditional genres (monograph, article, lecture, presentation) mutate in the electronic environment may potentially become an integrative part of the historical epistemology's research agenda.[29]

In the above stated account of the recent developments within a relatively newly emerging field of historical epistemology, we tried to draw attention to the possibilities stemming from research practices being set up with a promise to overcome traditional forms of historical analysis established in particular disciplines. The typical histories of the social and human sciences have usually been expressed in the form of textbooks, thematic anthologies, or readers, and were designed to produce, or reconstruct, disciplinary canons enabling to summarize the work of eminent figures, encapsulate previous knowledge, identify dominant ideas, theories, methods, and concepts, which would profile and integrate both the disciplinary

[26] Jacques DERRIDA, *Of Grammatology*. Baltimore: The Johns Hopkins University Press 1998; Friedrich KITTLER, *Discourse Networks 1800/1900*. Stanford: Stanford University Press 1990.
[27] Hayden WHITE, *Metahistory: The Historical Imagination in the Nineteenth-Century Europe*. Baltimore: The Johns Hopkins University Press 1975; Hayden WHITE, *Tropics of Discourse: Essays in Cultural Criticism*. Baltimore: The Johns Hopkins University Press 1986.
[28] Bruno LATOUR – Steve WOOLGAR, *Laboratory Life: The Construction of Scientific Facts*. Princeton: Princeton University Press 1986.
[29] Henry JENKINS, "The Work of Theory in the Age of Digital Transformation." In: MILLER, T. – STAM, R. (eds.), *A Companion to Film Theory*. Malden: Blackwell 2004; George LANDOW, *Hypertext: The Convergence of Contemporary Critical Theory and Technology*. Baltimore: The Johns Hopkins University Press 1991; Geoffrey NUNBERG, *The Future of the Book*. Berkeley: University of California Press 1996; Willard McCARTY, "Being Reborn: The Humanities, Computing and Styles of Scientific Reasoning." *New Technology in Medieval and Renaissance Studies*, 2007, no. 1, p. 1–23.

agenda and coordinate the future activities of the practitioners in the field. The approach endorsed in the programmatic texts written by proponents of historical epistemology does not promise to resolve the traditional presentist/historicist dilemma. Rather, it seeks to identify the intersections of particular disciplinary practices, academic cultures, knowledge cultures, or thought styles. Probably most importantly, it commits itself to the questions of the transformations of the scientific "work" in relation to the historically very deeply rooted notions, prerequisites, and requirements of the scientific "activity" as such. In the area of the human sciences, these concerns seem particularly acute, given the questionable and fragile epistemological foundation they have always had.