

Editorial

*Kristin Flugel, Alexander Lang, Christina Lechtermann, Norbert Ricken,
Tatjana Scheffler, Joachim Scholz, Estrid Sørensen*

It has been widely acknowledged that scientific knowledge in all its facets is shaped by social and material infrastructures as well as by the practices that unfold within these arrangements. Several decades ago, laboratory studies by Karin Knorr Cetina, Bruno Latour and Steve Woolgar, Hans-Jörg Rheinberger and others demonstrated in a compelling manner that the production of knowledge cannot be separated from the practices, sites and technologies of scientific work.¹ In contrast to a positivist aspiration to universal knowledge and to purely mentalist conceptions of knowledge, insights into the social and material constitution and the contextual character of (scientific) knowledge have brought new questions to the forefront in the theory, sociology, anthropology and history of knowledge, and indeed founded the field of Science and Technology Studies (STS).² These new questions address not only the reception, but also the production, circulation and distribution of knowledge, including practices of conservation and storage. The concept of »epistemic cultures« (Knorr Cetina) has served as a central heuristic to investigate the entanglement of knowledge, media, institutions, practices and material arrangements, and to differentiate them in relation to their specific historical situations.

In view of the ongoing infrastructural transformation and digitization of epistemic cultures, these questions are being posed anew and in revised form. For quite some time, the digital infrastructures of knowledge practices were interpreted in a rather reductive way, namely as the straightforward transfer of existing analogue practices into the electronic domain of computers.³ At least since the rapid estab-

-
- 1 Knorr Cetina, Karin (1999): *Epistemic Cultures. How the Sciences Make Knowledge*, Cambridge, MA: Harvard University Press; Latour, Bruno/Woolgar, Steve (1979): *Laboratory life. The social construction of scientific facts*, Beverly Hills: Sage; Rheinberger, Hans-Jörg (1997): *Toward a History of Epistemic Things. Synthesizing Proteins in the Test Tube*, Stanford: Stanford University Press.
 - 2 Cf. Beck, Stefan/Niewöhner, Jörg/Sørensen, Estrid (2012): *Science and Technology Studies. Eine sozialanthropologische Einführung*, Bielefeld: transcript.
 - 3 Rehbein, Malte (2017): »Digitalisierung«, in: Fotis Jannidis/Hubertus Kohle/Malte Rehbein (eds.): *Digital Humanities. Eine Einführung*, Stuttgart: Metzler, pp. 179–198; Holischka, Tobi-

lishment of AI infrastructures, including chatbots based on large language models (LLMs) from 2022 onwards, it has become evident that new modes of interaction are transforming multiple dimensions of knowledge—from production to circulation and distribution, conservation and reception. Referring to practices and forms of (non-)knowledge not as merely ›digitized‹ but as ›virtualized‹ emphasizes not only their technical articulation but also their specific features and affordances: their existence beyond physical locations; their relation to the imaginary, the real, the hypostasized, the material and the immaterial; their interoperability; their ability to generate doubles and immersive effects; their efficacy; their capacity to bring about new realities; and, above all, their power to constitute new objects of knowledge. Thus, focusing on virtuality rather than digitality not only allows for a more fine-grained description of contemporary forms and practices of knowledge, but it also opens up a renewed perspective on historical knowledge practices which, although not digitally mediated, nonetheless share features associated with the ›virtual‹.⁴

The contributions assembled in this volume share this perspective on the production, circulation and reception of knowledge. Drawing on examples from different periods in the history of knowledge and the sciences, they explore how knowledge depends on material arrangements, practices, communities, resources and locations which themselves change together with the status, logic, validity and function of knowledge. The contributions analyze how (non-)knowledge, infrastructures and technologies are intertwined. By focusing on the relation between knowledge and non-knowledge, they propose an approach that does not simply juxtapose knowledge and ignorance—almost in the sense of two complementary sets—but understands them as structurally linked and intertwined. Knowing is not only structurally and practically permeated by not-knowing, because it is perspectival, provisional, partial and fallible; knowing is also constituted through not-knowing. This also clarifies the specific significance of virtuality for forms and practices of knowledge, insofar as conceptions of reality always imply horizons of possibility and anticipatory structures (›as ifs‹) and can only be adequately understood in these structural terms. In this volume, the aim is not only to address questions concerning the structural constitution of knowledge, but also to examine its various constitutive conditions through infrastructures and associated technologies, as well as the relevance of digital platforms and archives. Some of the texts collected here are transcriptions or elaborations of lectures presented at the Second Annual Conference of the Collaborative Research Center 1567 *Virtual Lifeworlds* at Ruhr University Bochum, Germany, in October 2024.

as/Viertbauer, Klaus/Preidel, Christian (eds.) (2022): *Digitalisierung als Transformation? Perspektiven aus Ethik, Philosophie und Theologie*, Berlin: Metzler.

4 Lévy, Pierre (1998): *Becoming Virtual. Reality in the Digital Age*, New York/London: Plenum Trade.

Following this editorial, an extended introduction outlines the thematic focus of the book in two articles. The first one sketches two complementary moves. Firstly, it addresses the question of how knowledge (and the ontology of knowledge) can be, or has historically been, understood within different epistemological regimes. The paper therefore takes as its point of departure the (representational) understanding of knowledge, repeatedly marked as classical, in Plato's conception of knowledge as ›true justified belief‹, and traces the subsequent transformations of this conception toward a praxeological understanding of knowledge.⁵ In doing so, it shows that the relation between knowledge and non-knowledge is constitutive for knowledge and destabilizes the classical problem configuration of progressive truth. Secondly, the paper proceeds from infrastructures of knowledge and asks, in a complementary movement, how knowledge practices—and understandings of knowledge themselves—are changing in virtual worlds. The second introductory article shows that knowledge is inseparably linked to infrastructural prerequisites that are often overlooked or only noticed when they fail. Following considerations of the history of knowledge and discourse theory, the chosen examples, such as wax tablets, codices, hypertext and LLMs, illustrate how closely knowledge systems are linked to their respective forms of storage, transmission and representation, and how they simultaneously produce forms of non-knowledge. This leads to a plea for a reflexive observation of knowledge practices that systematically considers their own infrastructural conditionality.

Against this broad backdrop, the following chapters of this volume are divided into two main sections. In the first section, questions concerning the practices of (non-)knowledge are addressed and discussed with regard to their forms and structures, their logics, their histories and their functions. The focus is not only on what changes when knowledge is conceptualized and analyzed in praxeological terms. It also concerns how knowledge practices can be observed, methodologically investigated and described, on the one hand, and how they can be reconstructed in their historical genesis, on the other. The contributions illuminate various fields, such as sports, university contexts and small talk, and demonstrate that knowledge practices are an essential dimension of any social activity. They show that analyses of society and culture gain depth when attention is directed toward these practices. By examining (non-)knowledge, praxeological approaches yield valuable insights into the workings of social order and the multiple contexts on which it rests, particularly when implicit and embodied forms of (non-)knowledge and material infrastructures acting as co-actors are taken into account. Practices embedded in

5 Cf. Pulte, Helmut (2023): »Klassisch – Modern – Digital? Eine kleine Geschichte und Systematik des Wissensbegriffs, mit einer Note zur digitalen Bildung«, in: Sandra Aßmann/Norbert Ricken (eds.): *Bildung und Digitalität. Analysen – Diskurse – Perspektiven*, Wiesbaden: Springer VS, pp. 275–312.

contexts of (non-)knowledge generate and stabilize order while at the same time transforming it, sometimes even remaking entire epistemic cultures. Assuming that objects of knowledge are not simply given, but are constituted in the first place through heterogeneous practices and infrastructures, we can ask about both the deliberate, intentional or accepted and the unintended effects of such constitution processes—e.g.: To what extent and in what ways are multiple practices involved in creating objects of knowledge and engaging with them? What role is played by the concepts, assumptions, and ethical frameworks embedded within these practices, as well as by the latent possibilities inherent in their materials, instruments, apparatuses, and sites?

The second section turns to the significance of technical and non-technical infrastructures for the constitution of (non-)knowledge. Knowledge is produced and reproduced within, and through, certain infrastructural conditions. The fact that infrastructures themselves typically remain implicit, contained, or even invisible can be observed in numerous cases—for instance, in the spatial and logistical organization of universities, libraries or data centers, as well as in the logics of discrimination that accompany them. Yet the invisibility of infrastructures is historically and materially conditioned. Through catalogues, signatures, shelving systems and the physical involvement of researchers, the infrastructure of a library is often more readily perceptible than the algorithms of a database. At the same time, digital infrastructures are also perceptible—for example, when users help shape digital platforms through rating and evaluation tools. If the visibility of infrastructures is mutable, how can knowledge of the infrastructures of knowledge reflect its own contingency? How can virtualization be conceptualized as a tension between dematerialization, materialization and informatization? How does the relationship between visibility and invisibility, knowledge and non-knowledge change historically, materially, technically, economically and ecologically? And how is the increasing consumption of resources to be taken into account?

If we follow the trajectory outlined so far, it becomes necessary to ask how collections, repositories, platforms and digital or non-digital archives model, characterize and classify the objects of their knowledge. This concerns the methods of cataloguing, the data structures and document formats, the forms of metadata and indexing, the modes of linking, listing and description, as well as the specific spatial locations of the objects of knowledge. Not least, the issue of infrastructure helps to draw attention to the cooperative practices involved in the production of knowledge. Hence, in addition to technical and non-technical infrastructures and platforms, cognitive intrapersonal infrastructures are also taken into account—that is, the constitution and analysis of (non-)knowledge of human and artificial actors in virtual spaces of interaction.

The volume concludes with an outlook on the Virtual University. The university has always been an institution of virtuality in the sense of potentials, of the ›as if‹, of

experimentation. Since its inception, the university has been designed to scrutinize, imagine and shape existing, other, emergent, fantastic and utopian worlds, societies, forms of knowledge, natures and technologies. This infrastructure of speculation is fundamental to the university's mission. The humanities and social sciences, in particular, are trained in dealing with ambiguity, imagining the impossible, and engaging with speculation, multiplicity, tension, complexity, and ambivalence. But what might the virtual university of the future be? What will its infrastructures and architectures look like? How will we study, research and administer in and through virtual universities? The discussions at the conference resulted in a jointly authored contribution in which all discussants articulate their respective visions for the future of the Virtual University.

Taken together, the contributions collected in this volume provide a broad and nuanced insight into the interrelations between knowledge practices and their infrastructures. An overall picture emerges of complex practices and infrastructures of (non-)knowledge that, so we hope, will enable readers to sharpen their own view of these entanglements.

The editors would like to thank all authors for their contributions to the conference and to the preparation of this volume, without whose efforts its realization would not have been possible. We would also like to thank the German Research Foundation for funding the Collaborative Research Center 1567 *Virtual Lifeworlds*, in the context of which this volume was produced, and last but not least the editors of the series *Virtual Lifeworlds* for including this book in the series. In recognition of the considerable amount of work involved, we express our gratitude to Mirko Wittwar for language editing and to Benjamin Braamt and Laura Mazzoli for proofreading and formal editing. Finally, our appreciation goes to the publisher for the consistently reliable and smooth printing process.

Bibliography

- Beck, Stefan/Niewöhner, Jörg/Sørensen, Estrid (2012): *Science and Technology Studies. Eine sozialanthropologische Einführung*, Bielefeld: transcript.
- Holischka, Tobias/Viertbauer, Klaus/Preidel, Christian (eds.) (2022): *Digitalisierung als Transformation? Perspektiven aus Ethik, Philosophie und Theologie*, Berlin: Metzler.
- Knorr Cetina, Karin (1999): *Epistemic Cultures. How the Sciences Make Knowledge*, Cambridge, MA: Harvard University Press.
- Latour, Bruno/Woolgar, Steve (1979): *Laboratory life. The social construction of scientific facts*, Beverly Hills: Sage.
- Lévy, Pierre (1998): *Becoming Virtual. Reality in the Digital Age*, New York/London: Plenum Trade.

- Pulte, Helmut (2023): »Klassisch – Modern – Digital? Eine kleine Geschichte und Systematik des Wissensbegriffs, mit einer Note zur digitalen Bildung«, in: Sandra Aßmann/Norbert Ricken (eds.): *Bildung und Digitalität. Analysen – Diskurse – Perspektiven*, Wiesbaden: Springer VS, pp. 275–312.
- Rehbein, Malte (2017): »Digitalisierung«, in: Fotis Jannidis/Hubertus Kohle/Malte Rehbein (eds.): *Digital Humanities. Eine Einführung*, Stuttgart: Metzler, pp. 179–198.
- Rheinberger, Hans-Jörg (1997): *Toward a History of Epistemic Things. Synthesizing Proteins in the Test Tube*, Stanford: Stanford University Press.