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# Towards a Material and Spatial History of Knowledge Production. An Introduction

Pascal Schillings & Alexander van Wickeren\*

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**Abstract:** »Für eine materielle und räumliche Geschichte der Wissensproduktion. Eine Einleitung«. In the history of science and knowledge, materiality and space have until now frequently been studied separately. This introduction to the HSR Focus 'Spaces – Objects – Knowledge' argues that approaches that combine these aspects offer new perspectives on processes of knowledge production. Knowledge is produced, this introduction argues, in the interaction of humans, objects, and the spaces they are situated in. The tie that brings these elements together is the notion of practice. Three exemplary constellations in which humans, objects, and spaces are brought into interplay are discussed: Objects producing spaces, objects circulating through different spaces, and musealized objects.

**Keywords:** History of science, material turn, spatial turn, exploration, circulation, museum, practices of knowledge production.

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## 1. Towards an Integrative Perspective on Knowledge, Space and Objects

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In 1988, the English translation of Bruno Latour's book on Louis Pasteur, *The Pasteurization of France*, was published (Latour 1988). "The most novel aspect of the account of Pasteur," one reviewer argued, was "the way Latour makes room for the microbes" (Vernon 1990, 345). Without microbes, sheep, and laboratories, the review summarized the book's hypothesis: "[T]here could have been no Pasteurian revolution" (Ibid., 346). Of this trinity, the microbes were the actors that received the greatest attention, and reviewers generally noted that Latour's most notable achievement lay in "introducing a new agent, the microbe" (Wilson 1990, 862) in the debates about Pasteur, and the history of science in general.

A rereading of the book shows that apart from this widely recognized interest in the part that things, such as microbes, played in the production of

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knowledge, Latour's concern was also with the specific sites of knowledge production (Schaffer 1991). Indeed, this aspect seems vital to his argument: Laboratories and experimental farms constituted specially constructed spatial arrangements that were necessary not only as a stage for the microbes to appear as actors, but also as rooms in which new knowledge could be presented to a wider audience. They represented settings in which certain objects were brought together to perform specific scientific practices – and which were connected to specific epistemic strategies. How to define microbes, Latour argues, could only be learned in the laboratory, a space “constructed only out of the movement and displacement of other places and skills” (Latour 1988, 81; Canguilhem 1977, 73). Further, to convince the scientific and wider public, findings needed to be transferred from the laboratory to the “theatre of proof” (Latour 1988, 85) that experimental farms provided.

The relative neglect of the spaces of knowledge production that went hand in hand with the emphasis on objects that the reviews show, we suggest, became symptomatic for research in the so-called *science studies*, as well as in the history of science. This impression has somewhat changed over the last years, when the interest of studies returned to the categories of space and materiality. Yet, as this HSR Focus will argue, studies in these two fields have until now remained disconnected. It therefore seems time to systematically investigate the possibilities that an integrated perspective on materiality and space in the history of science and knowledge production might offer. Not only humans, the instruments and apparatuses they used were essential for the production of new knowledge, but also the spatial dimensions of their endeavors.

In arguing for an integrated perspective on materiality and space, we suggest that objects of historical research that have so far either been neglected or studied separately can be fruitfully combined. This introduction is intended as an exploration of the ways in which the different aspects of the processes of knowledge production might be brought into interplay. It surveys some of the key problems in the debates in the history of science and knowledge that have been strongly influenced by sociological and anthropological writings on materiality and space. In the following section, we try to sketch some of the current trends in historical research on materiality and space (2). After this, we suggest three constellations in which objects, places, and human actors in processes of knowledge production can be brought into interplay, offering new perspectives on materiality and space (3): Objects producing spaces (3.1), circulating objects of scientific research (3.2), and musealized objects (3.3).

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## 2. Separate Turns: Materiality and Space in Historical Research

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Debates about materiality and space have been influenced by parallel developments in sociology (especially the sociology of science) and anthropology. It is not our aim to provide a summary of each of these disciplinary discourses. Instead, we try to give a brief overview of the discussions and at some points hint at the intersections of discussions in other fields. An important insight that these historical discussions have produced, to first turn to studies focusing on the category of space, is the rejection of the idea of a universality of science, scientific method, and knowledge. Research in this direction has pointed out that knowledge production was “always a matter of local circumstances” (Ophir and Shapin 1991, 7). The influence of place on the knowledge produced has been argued to be crucial: “[T]he nature of science is conditioned by place, is produced through place as practice rather than simply in space” (Withers 2009, 653).

In the history of science, attempts at creating a new complex understanding of the spatial aspects of processes of knowledge production occur most prominently in studies focusing on laboratories as spatial units. Although most reviewers did not comment on Latour’s analysis of the specific spatial configurations of the laboratory (Schaffer 1991), this site of knowledge production became the primary unit of analysis in *science studies*, as well as in the history of science (Latour 1979, 1987; Shapin 1988). A significant portion of work on buildings, some architectural historians even assert, comes from historians focusing on laboratories (Findlen 2006). However, some commentators lately detect a fading historical interest in laboratories (Kohler 2008), and with the growing interest in the popularization of science (Bowler 2009; Daum 2002; Schwarz 1999), scholars have discovered other places where knowledge has been produced – some even as seemingly exotic as the nineteenth-century British pub (Secord 1994).

This might indicate a shift in the history of science – away from the traditional focus on laboratories and towards a multiplicity of other sites of knowledge production, which might well lead to a new geography of scientific knowledge, investigating new connections between knowledge and the places of its production (Livingstone 2000, 2003). To give just one example for this: Charles Withers has recently pointed out that the Enlightenment was “a geographical thing” (Withers 2007, 5). To understand what the Enlightenment was, he argues, a multiplicity of geographical locations, such as scientific/savant or agricultural societies, have to be taken seriously as spaces for the distribution and production of knowledge in the 18th century. Highlighting the spatial dimensions of the Enlightenment thus produces the image of a network of different institutions and places generating and circulating knowledge. We would

like to take up this point, but add and systematically explore the material aspects of these spatial practices that have so far frequently been ignored: Science and knowledge production, we suggest, were not only conditioned by place, but also by the specific objects that were used in these places, or that travel between different places.

While works focusing on the places of knowledge production have often overlooked its material aspects, the same seems true the other way around: Research on the objects involved in the generation of knowledge frequently leaves out the reference to its specific sites. Examples for this mutual neglect are the areas of the so-called *field sciences* and instrument studies. While in the former neither the materiality of place nor of the instruments used receive primary attention, works of the latter kind are often less interested in the places in which apparatuses were used or the interactions between scientists, instruments, and environment (Kuklick and Kohler 1996; Warner 1990; Taub 2011).

Turning to the *material turn* in history, it generally seems that research focusing on objects stresses either the material dimension of things or the discursive, while attempts to combine these approaches are rare. One reason for this might be that things form a rather new object of research. As Frank Trentmann has argued, one of the reasons for the *material turn* is the realization “that things have always been with us [...], but that we have been neglectful owners” (Trentmann 2009, 292). Anthropologists have come to this insight earlier (Appadurai 1986); it therefore seems understandable that some historians think that it is about time “to look at the actual materiality of things” (Clark 2009, 279) from a historical perspective.

A comparable postulate was brought forward in *science studies* in the 1980s in the form of an argument for a so-called principle of symmetry. It demanded that humans and objects that have an influence on processes of knowledge production should be treated within the same interpretative framework and with the same analytical vocabulary (Callon 1986). The advocates of this principle have sometimes been criticized for not fulfilling their requirements in their own work (Bloor 1991, 1999). The lesson for historians to learn from the earlier debates on symmetry, however, seems to be that a certain degree of asymmetry cannot be overcome: It is generally through the words of human protagonists that we learn about objects and their materiality. The objects we come into touch with are therefore usually discursively filtered, so to speak. This is no disadvantage though, and should not preclude historical studies interested in the materiality and objects. Instead, it is necessary to not separate the material aspect of things from their discursive construction. After the *material turn*, we would argue, the primary task for historians does not seem to be to find creative solutions for histories of objects detached from the discourses they were embedded in. Rather, new ways need to be found to combine material and discursive elements of objects.

One way to incorporate the materiality of research objects into historical analysis can be found in Andrea Westermann's and Christian Rohr's forthcoming 2015 HSR Special Issue "Climate and Beyond: Knowledge Production about the Earth as the Signpost of Social Change" (HSR 40 (2)) that shows how an object as the environment can become a rich theme for investigations. We want to take up this strand, but enlarge the perspective on objects with a broader focus on the so called *Stoffgeschichte* – studies interested in scientific, economic, and other aspects of certain substances. This emerging field of research has been inspired by Hans-Jörg Rheinberger's notion of the *epistemic thing*, towards which scientists direct their attention (Rheinberger 1997). Ursula Klein and Emma Spary have, for instance, recently proposed to work with the broad category of epistemic things that also includes phenomena outside modern laboratories (Klein and Spary 2010, 8-11). Any object, one can conclude from their study, that had an influence on the production of knowledge, be it scientific instruments, such as air pumps (Shapin and Schaffer 1985), plants, or musealized objects, could be a possible object of historical inquiry. The studies that fall under the label of *Stoffgeschichte* focus on substances, which are in many cases global or at least transregional trading goods, as for instance coffee, salt, or sugar (Mintz 1985).

These studies, but also works from other branches of research, may be regarded as attempts at combining the materiality of objects with the discourses that are attached to them. Historians of consumption, for instance, have highlighted the ways in which material objects were means of highlighting certain aspects of personal and social identities, their examples ranging from wallpaper to glasses (Smart Martin 2008; Styles and Vickery 2006). Furthermore, historians have investigated the construction of product "qualities" (Minard 2011) as well as scientists' attempts to define and order the nature of materials (Epple 2010; Vogel 2008).

Two observations follow from this brief survey: Firstly, it shows that studies usually follow either the *spatial* or the *material turn* – there does not seem to be a strong attempt to combine the potentials of both approaches. Secondly, objects and spaces are fluid categories, and therefore open to very different approaches – this point has been indicated with reference studies focusing on certain objects, investigating into their material and/or discursive aspects. We would like to follow up on these observations with two conclusions: As has been indicated above, we suggest that integrating material and spatial aspects might produce new insights into processes of knowledge production.

Further, the categorical openness of materiality and space requires some further consideration. Combining approaches focusing on objects and places creates a complex image of the processes of knowledge production – not the least because a wide range of associations and conceptions lie behind the terms of materiality and space. The solution that we would suggest is, however, not to introduce any sharp definitions that limit the objects and spaces that might be

taken into account. Complexity, we would argue, in this case is not a disadvantage, but allows for the analysis of a multiplicity of aspects of the processes of knowledge in the making. Because of the various notions associated with materiality and space, the combination of both approaches with a focus on processes of knowledge production, results in a conceptual tableau.

The terms object and space, we therefore argue, should be understood as mobile entities, moving on scales between the ends of materiality and discourse. Yet these conceptions should not be regarded as exclusive. Instead we think it beneficial to treat objects as at the same time material and discursive. Space, analogically, can at the same time be considered a physical surrounding that has, through its materiality, an influence on processes of knowledge production, as well as a discursive feature in the sense of a spatial imagination. What ties these elements – space and materiality – together is the notion of practice: It is through the practices of human actors that different objects and spatial contexts are brought into interplay in processes of knowledge production.

In the following, we will suggest three object/space-constellations: Objects that produce spaces, objects that circulate through different spatial arrangements, and seemingly immobile musealized objects. Our aim is to show that acts of knowledge production need to be understood as complex processes, in which both space and materiality are crucial factors. These constellations should not be regarded as exclusive, but as exemplary. Further, they are to some extent idealizations in that they should not be thought of as strictly separable: As will become clear from the articles of this HSR Focus, some processes of knowledge production can be brought together under the label of one constellation, yet there are frequently phenomena which escape clear allocation.

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### 3. Combining Turns: Three Constellations

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#### 3.1 Objects Producing Spaces

The long nineteenth century is frequently labelled the century of the exploration of the world. Beginning with Cook's voyages and ending when Roald Amundsen reached the South Pole, so the argument goes, it was the century in which humans got to know the planet on which they lived (Osterhammel 2009). After the – according to the contemporary geographical discourse – most significant blank spots on the map of the earth had been erased, outer space became the next sphere to turn explorative attention to. With the *spatial turn*, geographical exploration, especially in the context of European colonialism and imperialism, has – under the sublabel *new cultural geography* – received a lot of scholarly attention.

Two observations seem to characterize research in this direction: Firstly, studies in this direction have demonstrated that geographical knowledge pro-

duction was invariably linked to power structures, and that producing geographical knowledge was most frequently, in one way or the other, entangled with the exercise of power or control over other world regions. Some historians speak of the “symbiotic relationship between geography and imperialism” (Bell, Butlin and Heffernan 1996, 6), and it has been argued that geography was as much about knowledge as it was “deeply concerned with the legitimation, reproduction, and perpetuation of a given social order” (Edney 1999, 166). Research of this kind ultimately refers back to Edward Said’s *Orientalism*, in which he asserted that the Orient was a hegemonic Western construction (Said 2003). It remains to be shown how these power constellations transformed from imperial times to the twentieth-century Cold War.

Secondly, and following from the first point, visual representations of the world and its parts were already in the 1980s identified as important tools of domination. Rather than constituting an objective document, John Brian Harley has, for instance, shown that power structures were inherently inscribed into maps (Harley 1988, 1989). As research went on, other devices of producing images of faraway places for a European audience were taken into consideration: Ethnographic museums, zoos, tableau vivant, and diorama all served to make the world available for a European public (Mackenzie 2010; Laukötter 2007). The *spatial turn* in history thus produced a wide range of literature on so-called *mental maps*, investigations into the images that mostly European publics formed of other world regions (Schenk 2002).

Concerning the interplay of human actors, objects, and places, two further observations follow from this: A focus on Europe, the images produced there, and its geographical institutions has led to a relative neglect of the objects of geographical knowledge production. Among the few exceptions seem to be attempts to incorporate the materiality of maps into historical analysis. Matthew Edney, for example, analyzes maps as mobile objects into which knowledge was inscribed (Edney 2003). The concrete places of geographical knowledge production and the interactions between humans and environment seem even more absent from research, although branches of environmental history currently seem to be discovering this field (Butlin 2009).

It therefore seems necessary to turn attention to the complex processes through which geographical knowledge and images were produced – in the field, as well as in European drawing rooms. This ultimately refers back to Henri Lefebvre’s argument about the practical aspects of space, and the reproduction of social relations in spatial arrangements. Space is thus produced, it has been argued following Lefebvre, through processes of “experiencing, conceptualizing/representing, and practicing” (Dorsch 2013, 10). We would like to take up this notion of space as the result of a variety of practices, and take into closer consideration the different constellations of humans, objects, and environment interacting in the production of spaces – or: knowledge about places.



In his article in this HSR Focus, Pascal Schillings draws attention to the different strategies and practices by which Roald Amundsen's Antarctic expedition convinced the geographical and wider public of its attainment of the South Pole. Different strategies were applied through the use of different objects, so that not only geographical instruments, but also more mundane things, such as tents or skis played a vital part in the establishment of this geographical "matter of fact" (Schillings 2015, in this HSR Focus). In his article on artificial satellites, Daniel Brandau focuses more on the discursive aspects that were inscribed in these objects by taking into consideration what happened to these objects apart from their usage in outer space. Brandau shows that satellites as well as space rockets were embedded in the political discourses of the beginning Cold War that linked them to progress, as well as a Nazi past that should be overcome (Brandau 2015, in this HSR Focus).

### 3.2 Circulating Scientific Objects

The second object/space-constellation we would like to highlight is that of objects that as part of processes of knowledge transfer circulate between different spatial frames of reference. Two aspects seem especially interesting concerning these circulating objects with regard to the interplay between human actors, things, and places here: Firstly, this constellation draws attention to the complex of objects being inscribed with knowledge – these objects might thus be thought of as at the same time material and discursively constructed. Secondly, investigating into the travel routes of circulating objects sheds light on the different spatial frameworks in which these processes take place – and which they more or less frequently transcend. This can, we would argue, be read as an argument against the universality of science.

Following the circulation of objects involved in scientific knowledge production calls into question, as Regina Dauser and Lothar Schilling have done, models of knowledge transfer that argue, in the tradition of idealism, for an unproblematic diffusion of scientific knowledge or method – diffusion meaning either the spread of knowledge from scientists into society (Dauser and Schilling 2012). Nowadays, historians normally avoid a simplistic 'from the West into the rest of the world' perspective. Although models like the idea of "The Spread of Western Science" (Basalla 1967) appear outdated, they still seem to linger, and form the background, which many histories of knowledge production in colonial and imperial situations feel it is necessary to argue against.

Focusing on processes of circulation reveals that the notion of a transfer of stable entities of knowledge is over-simplistic, as studies on colonial contact situations in which knowledge was produced illustrates. Prominent among the historians who drew attention to the importance of processes of circulation in the history of knowledge production is Kapil Raj. In a number of micro studies, Raj has demonstrated the roles that various actors had in encounters from

which new knowledge arose. Rather than sites of an unproblematic exchange of knowledge, these contact situations, it has been shown, were characterized by processes “of encounter, power resistance, negotiation, and reconfiguration” (Raj 2013, 343). Knowledge production in cross-cultural interaction thus appears as a multidirectional exchange, and a vehicle that transforms knowledge on both sides of the encounter. This undermines the notion of a universality of science, as it points to the fact that knowledge and sciences are always located and must be analyzed in spatial relations.

In this vein, yet on a more abstract level, Raj also criticized the center/periphery bias inherent in many studies. The shortcomings of models, such as Latour’s centers of calculation (Latour 1987), might thus be overcome by not presupposing a successful spread of scientific ideas, and paying close attention to the channels (media, actors, etc.) through which knowledge was transported. The concept of circulation also raises doubts as to the notion of a single center in general: Prematurely taking one European center for granted might exclude the larger contexts of local knowledge, and conceal that it might be more useful to think of a multiplicity of centers. It therefore seems more adequate to work with a symmetrical focus on variable places and their traditions of knowledge, with a perspective that integrates the various groups and actors involved in the transfer and exchange in science.

Besides the criticism of the center/periphery bias, the term circulation points at questions of the spatiality of mobile knowledge. This aspect has, for instance, been highlighted by scholars that approach the history of science from the methodological background of *human geography*. David N. Livingstone, for example, has called for a “geography of science” as a tool to analyze the connections between global circulations and their respective “regional adaptation” by highlighting the different social, political and cultural contexts that reshaped knowledge (Livingstone 2003). In a similar vein, but focussing on the dynamic character of the process, Raj describes the spatial dimensions of knowledge circulations as follows:

The geography of these spaces of circulation changes historically, depending on the nature, morphology, geography, and relative power of the networks that interact in any given situation. Likewise, the morphology of spaces of circulation is seen to change overtime: from one closely linked to trade and commercial networks in early modern modernity in the case of South East Asia, it gradually becomes more intimately related to state-run institutions with the rise and development of colonial and imperial states (Raj 2013, 344).

The rather flexible terminology of a spatial “morphology” of circulations that Raj suggests relates to social formations, such as “patronage, friendship, obligation, or just economic exchange” (Raj 2013, 345). One might easily think of other examples, as for instance religious or family networks, or the *republic of letters* (Daston 1991). It provides, similar to the ideas of Livingstone, a tool to analyze spatial dimensions of circulating scientific objects in connection to

other social, cultural, or political contexts. Concerning the latter, one strength of studies focusing on circulations, we would argue, is that they call into question traditional units of historical analysis, but do not render them unnecessary: Transcending national boundaries, circulation studies can reveal flows of objects and knowledge in the spaces of nation states or in a groups that imagine their selves to be “nations” (Jessen and Vogel 2002), as well as their further reaching distances that might most adequately be described as transnational or (trans)imperial. Esther Helena Arens’ article in this HSR Focus takes up a broader perspective on European empires in the 18th century and outlines the spatial movement of plants, seeds, botanists, as well as botanical knowledge. Among other insights, her contribution shows the gradual stability of Carolus Linnaeus’ botanical taxonomy that was applied in different botanic gardens – an observation that highlights the complexity of circulating scientific objects which were not always transforming on the move, but could remain rather stable.

Complicated as these flows sometimes were, it seems hardly surprising that historical research has provided a number of examples in which objects and knowledge became disintegrated in the process of circulation. In these histories of disentanglement, gaps between material objects and the knowledge formerly inscribed in them occurred. The results and the handling of these gaps differed from time to time. There were objects that became detached from the knowledge of how they might be put into practical usage, and turned into decorative objects. Londa Schiebinger, for instance, has shown how the knowledge about the abortive potentials of the peacock flower was ignored by European explorers, though they transferred the actual plant from the Caribbean to Europe and turned it into an object mostly valued for its aesthetic qualities (Schiebinger 2012). In other instances, circulated objects stimulated new knowledge and techniques. Maxine Berg has shown in this respect how British manufacturers in the 18th century did not simply transfer knowledge of porcelain production from China to Europe, but took the objects they had as starting points to develop their own artisanal skills to reproduce the quality of Chinese porcelain (Berg 2004).

### 3.3 Musealized Objects

The objects of knowledge production, as might be the impression gained from focusing on circulation, were constantly moving between different places. Yet it seems necessary to point out that there were also objects that left this flow of things, and were – at least temporarily – locked in one institutional arrangement. A closer look at museum pieces shows, however, that this halt was never complete – especially when the differentiation between the material and discursive side of objects is taken into account: While being more or less fixed to one particular place, the knowledge that was inscribed in musealized objects remained mobile, changing with the arrangements of other objects they were brought in relation to. Historians of museums therefore suggest to “approach

the history of museums through the objects in their collections” (Alberti 2005, 560) the way they were presented and the effects that were created by positioning them in relation to other objects or within certain regimes of knowledge.

The changes in knowledge arrangements are especially interesting because the museum as an institution has a specific history. The examples of mineral cabinets, botanic gardens, and anatomical exhibitions that Jakob Vogel, Esther Helena Arens, and Anna Maerker discuss in their articles in this HSR Focus are situated in the context of newly evolving attempts of ordering knowledge from the beginning of the 18th century onward. With the Enlightenment period, new systems were applied to reorder objects, introducing new dynamics into the production of knowledge in museums. Research has pointed out that with Enlightenment came a shift from the paradigm of early modern *Wunderkammern* organized by the idea of curiosity to attempts at scientific ordering. This had an influence on the objects displayed as well as the principles of arrangement: “For the curieux, the singular and exceptional objects assembled in the cabinet are valued because they stand in a special relationship to the totality, and, hence offer a means of acquiring a knowledge of, and privileged relation to, that totality” (Bennett 1995, 40f). *Wunderkammern* also reflected their social contexts, as access to them was exclusive, and the objects shown could only be comprehended in their arrangement by few.

In the middle of the 18th century, and under the influence of natural history, the early modern interest in singularity, uniqueness, curiosity, or rarity of objects faded. New systems of classification were introduced that were based on models and theories developed beforehand in scientific discourse – rather than the singular, it was the exemplary object that now aroused attention now (Bennett 1995, 42). It therefore seems necessary, we would argue, to pay closer attention to the actual practices of classification, and possible gaps between theory and practice. Furthermore and apart from this broader shift from *Wunderkammern* to Enlightenment museums, more detailed analyses may shed light on the frequent processes of reordering, rearrangement, and reclassification that objects underwent over time (Alberti 2005, 567-8). In this respect, Jakob Vogel analyzes the scientific debate on mineralogical systems of classification, departing from the general frame work of Linnaeus’ system, as well as their impact on the material collections of minerals that developed in the German-speaking world around 1800. The article shows furthermore that mineralogical systems were often accompanied by modes of representation based on the regional or state-territorial origin of the minerals. However, Vogel stresses a frequent “discrepancy” between the various innovations in scientific discussion on mineral ordering and the lack of collections that were actually reordered. Although the new cameralistic discourses and practices on minerals represent the general shift away from the earlier emphasis on singularity towards abstraction, the article finally claims a long-lasting legacy of the *Wun-*

*derkammer* by pointing to the out-singled presentation of individual stones and the attachment of curators to their precious pieces.

These considerations indicate a further point: Museums did not represent closed-off spheres, but were embedded in broader contexts that influenced them (Thiemeyer 2011, 6-7). This concerned the broader intellectual discourse, but also contemporary institutions. It has, for instance, been shown that museums incorporated means of representation from other places, such as amusement parks, world exhibitions, and other places with an exhibiting character (Bennett 1995, 48). It also refers back to our claim that knowledge is produced in the interplay between human actors, objects, and places. While it seems interesting to focus on the specific spatial arrangements of objects in museums, it is equally necessary to not lose sight of the different groups of human actors involved in these processes. As Samuel Alberti explains: “We are looking from the standpoint of the object, but we are looking *at* people (especially their practices and institutions)” (Alberti 2005, 561).

It seems necessary, however, to avoid the trap of simply reading the ordering of objects in a museum as “a map of its curators’ claims to knowledge” (Livingstone 2003, 33). Instead, a broader range of actors needs to be taken into consideration. Museums then appear as the “sites of struggle between curators, academics, sponsors, and the general public, all of whom had different aspirations for the institution” (Livingstone 2003, 37). As one major group of actors, visitors have not received a lot of attention in research so far, although Susanne Köstering showed the influence that visitors and their receptions had on curators of natural history museums in Imperial Germany (Köstering 2003). Taking into account the *Eigensinn* (Lüdtke 1993) of visitors and their motives for visiting museums might even reintroduce the category of curiosity to studies of modern museums. In her contribution for this HSR Focus Anna Maerker highlights the physical interaction between musealized objects and visitors in the 18th century by drawing attention to a hitherto often neglected aspect of museum visits, namely the direct touch of objects. Her article shows how a longer European tradition of intellectual preference of vision as an epistemic mode for the production of knowledge was gradually challenged by a new appreciation of touching musealized objects in the late Enlightenment. Such changes corresponded to the practices of visitors in museums to touch objects and to generate knowledge in a rather multi-sensual mode that included different senses.

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