The Career of a Catalogue: Organizational Memory, Materiality and the Dual Nature of the Past at the British Museum (1970–Today)

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Abstract

The emergent 'uses of the past' literature challenges traditional perspectives on history as an objective constraint for organizational action. It does so by putting forward an interpretivist view that highlights the moulding and shaping of history as a resource that enables action. We build upon and extend this approach by demonstrating how a more explicit attention to materiality reveals 'the dual nature of the past' as not simply constraining and/or enabling but also actively orienting organizational action in the present. We draw upon research on organizational remembering and the concept of affordance to theorize the entanglement of organizational remembering and the material technologies of memory. We examine the dynamics of organizational remembering and materiality in the context of the British Museum's digitization efforts. We show how narratives about the past enable organizational actors to make sense of and repurpose a novel material technology of memory (computers) through the construction of affordances. However, we also demonstrate how the materiality of objects inherited from the past also actively constrained and oriented *how* actors worked upon various obstacles on the path to digitization. We make two contributions. First, we develop how the dual nature of the past constitutes a novel way to reconcile deterministic and voluntarist interpretations of the past in organizations by assigning a more active role to material objects in organizational remembering. Second, we introduce a novel way to theorize organizational memory as an ongoing process of mutual constitution between technologies of memory (*Speicher*) and social practices of remembering (*Gedächtnis*).

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Introduction

Recent organizational research shows increased interest in how actors make active use of the past, e.g. when articulating new future-oriented strategies or identities (e.g. Anteby & Molnár, 2012; Hansen, 2007; Hatch & Schultz, 2017; Khaire & Wadhwani, 2010; Mordhorst, 2013; Schultz & Hernes, 2013). Because using and 'evoking the organizational past requires organizations to have maintained accessible cues from the past in some way' (Schultz & Hernes, 2013, p. 176), this line of research draws attention to the dynamics of collective memory and remembering in organizations. In particular, scholars have examined how actors continuously make and remake memory by actively bringing the past into the present through narratives, rhetoric and symbols (Adorisio, 2014; Lippmann & Aldrich, 2016; Ocasio, Mauskapf, & Steele, 2016; Rowlinson, Booth, Clark, Delahaye, & Procter, 2010; Rowlinson, Casey, Hansen, & Mills, 2014a). Such accounts foreground narratives and interpretation to paint a picture of the past as 'a malleable *substance* that actors mold and shape' (Godfrey, Hassard, O'Connor, Rowlinson, & Ruef, 2016, p. 599, emphasis added) almost as they wish.

However, if the past is thought of as a substance, the materiality of this substance and its implications for the moulding and shaping deserve a closer look. Materiality refers to 'the arrangement of an artifact's physical and/or digital materials into particular forms that endure across difference in place and time' (Leonardi, 2012, p. 31). As pointed out by Abbott, 'the contingent "stickiness" of past material reality' (2001, p. 222) can intimately shape actors' interpretations of the past. Indeed, the very notion of malleability (from *malleus*, Latin for hammer) implies working within the constraints of the material. Materiality, however, has so far received only insufficient attention within research at the intersection of 'uses of the past' and organizational remembering (Decker, 2014; Hatch & Schultz, 2017; Humphries & Smith, 2014; Schultz & Hernes, 2013). More specifically, material objects feature mostly as passive carriers of experience which actors can draw upon as a distinct 'memory form' (Schultz & Hernes, 2013). Prior research thus frames objects as resources that enable actors to reconstruct and interpret the past and pays only insufficient attention to the materiality of 'past things' and its potential to shape organizational action (Humphries & Smith, 2014). We maintain that objects possess a 'materiality that makes certain actions possible and others impossible, or at least more difficult to achieve' (Leonardi, 2012, p. 31). By asking *how material objects shape evolving processes of organizational remembering*, we bring in a new and more nuanced way of viewing the past and its materiality as not only enabling but also constraining and orienting organizational action in the present (Cardinale, 2018).

To address this question, we draw on the concept of affordance from research on sociomateriality (Gibson, 1986; Hutchby, 2001; Leonardi, 2013; Leonardi & Vaast, 2017). Affordances, which we understand as 'potentials for action that depend on both the material properties of objects and the ability of actors to perceive and use them' (Robey, Raymond, & Anderson, 2012, p. 224), provide a useful lens for unpacking the mutual entanglement of remembering and materiality. We draw on the German distinction between *Gedächtnis* (remembering the past as activity) and *Speicher* (material technologies of memory) to theorize this mutual constitution (A. Assmann, 2006; J. Assmann, 2011; see also Blaschke, 2010). To better understand how objects from the past can shape evolving processes of remembering, we examine the dynamics of affordances between *Gedächtnis* and *Speicher*.

To unpack these dynamics empirically, we draw on a historical study of the British Museum. We examine the history of digitization of the museum's collection as a critical material shift in the

organizational *Speicher*. We find a dynamic process of mutual constitution between *Gedächtnis* and *Speicher* that significantly shapes the enactment of digitization. This process proves crucial for understanding how the past not only enables and constrains but also orients how organizational actors go about dealing with an unfolding present and envisioning their future (Cardinale, 2018).

Our contribution is twofold. First, we contribute to the 'uses of the past' literature by elucidating 'the dual nature of the past' (Abbott, 2001, p. 224). This notion extends previous research by stressing how an attention to materiality enables us to see how the past – through its 'stickiness' (Abbott, 2001) – not only 'constrains (makes some actions impossible) and enables (makes some actions possible), … [but also] actively orients in the sense of making actors more inclined to settle on some actions out of the many that are made possible' (Cardinale, 2018, p. 133). Second, we contribute to a more nuanced understanding of the constitutive role of materiality for organizational remembering and using the past (Decker, 2014; Hatch & Schultz, 2017; Humphries & Smith, 2014; Schultz & Hernes, 2013). More specifically, we introduce the distinction between *Speicher* and *Gedächtnis* as a new way to theorize the mutual constitution of remembering and materiality and develop how the dynamics of affordance drive this process.

Theoretical Background

The past, history and memory in organizations and organizing

For some time, organizational research has paid increased attention to history and how it matters in organizations (e.g. Bucheli & Wadhwani, 2014; Godfrey et al., 2016; Kieser, 1994; Kipping & Üsdiken, 2014; Mills, Suddaby, Foster, & Durepos, 2016). Whereas some scholars view history as an objective constraint on actors and their choices (e.g. Brunninge & Melander, 2015; Marquis & Tilcsik, 2013; Sydow, Schreyögg, & Koch, 2009), others conceptualize it as a resource that enables action in the present (e.g. Anteby & Molnár, 2012; Foster, Suddaby, Minkus, & Wiebe, 2011; Hatch & Schultz, 2017; Khaire & Wadhwani, 2010; Schultz & Hernes, 2013; Suddaby & Foster, 2017; Suddaby, Foster, & Quinn Trank, 2010; Zundel, Holt, & Popp, 2015). Scholars who take the latter approach highlight the need to draw a clearer distinction between *the past* – as a sequence of empirical events – and *history* – as the collective interpretation of those events (Suddaby, Foster, & Mills, 2014). Thus, history matters primarily as a representation of the past in the present (see also Koselleck, 2004). Consequently, 'it would be more accurate to say that the past matters, but history is always rhetorical' (Godfrey et al., 2016, p. 598). This shift manifests in the rising interest in 'uses of the past' in organizations and organizing. This line of research shows how history, in various forms, can be brought to the present and used, for instance, in forging, maintaining and resurrecting organizational identities (Anteby & Molnár, 2012; Howard-Grenville, Metzger, & Meyer, 2013; Mordhorst, 2013; Schultz & Hernes, 2013; Zundel et al., 2015), in branding (Foster et al., 2011) or in competitive strategy (Kaplan & Orlikowski, 2013; Suddaby et al., 2010).

This surge of interest in interpretations and uses of the past led scholars to engage with the dynamics of memory and remembering (Anteby & Molnár, 2012; Lippmann & Aldrich, 2016; Ocasio et al., 2016; Schultz & Hernes, 2013). Indeed, 'Recognizing the importance of representations of the past leads to an engagement with memory' (Godfrey et al., 2016, p. 598). The concept of memory appears crucial for moving research attention from *what* the past is used for towards the micro-processes of *how* it is used (Hatch & Schultz, 2017). An engagement with memory allows scholars to take into account that 'the form in which it is evoked shapes the meaning of an experience' (Schultz & Hernes, 2013, p. 4). This insight opens an intersection of 'uses of the past' research with the related field of organizational memory studies.

Organizational memory was originally conceptualized as a static storehouse in which information about past events can be stored and retrieved (e.g. Levitt & March, 1988; Spender, 1996; Walsh & Ungson, 1991). However, attention is increasingly shifting toward the social processes of remembering that constitute collective memory (Feldman & Feldman, 2006; Nissley & Casey, 2002; Rowlinson et al., 2010, 2014a). Mirroring the 'uses of the past' approach, organizational memory studies now underlines how past 'experiences are recreated or reconstructed rather than retrieved through memory' (Rowlinson et al., 2014a, p. 442). Such a view highlights 'the associative quality of human remembering, i.e. [the ways in which] remembering forms complex connections between, say, an event, associates in the past and even reaches into the future' (Feldman & Feldman, 2006, p. 867). Rather than constituting a static repository of knowledge, memory now appears as a collective interpretation of the past devised through practices of remembering (Feldman & Feldman, 2006).

For example, Schultz and Hernes (2013) demonstrate how organizations use their past in the context of identity reconstruction by drawing on three distinct forms of memory. First, *oral memory* enables actors to evoke the meaning of past experiences in everyday conversations and interactions through narratives and storytelling. Second, remembering through *textual memory* (corporate communication, written rules, records, corporate autobiographies, etc.) allows for the construction of abstract, factual and standardized representations of past experiences. Finally, *material memory* enables actors to evoke the past through 'material objects and arrangements … [that] exemplify past practices and provide cues about the contexts in which they were carried out' (Schultz & Hernes, 2013, p. 5).

Whereas this interpretivist stance has been extremely valuable to critique an objectivist view of history, it does not adequately acknowledge what Abbott (2001, p. 224) refers to as 'the dual nature of the past' as simultaneously open for interpretation *and* constrained by the 'stickiness' of the material. According to Abbott, the past comes to matter in the present not only through interpretation of past events but also as material objects inherited from former times. The metaphor of 'stickiness' implies that the materiality of objects can 'intimately affect our mental constructions of the past' (Abbott, 2001, p. 223). As a result, 'retrospection can remake the past in many ways, but it is always constrained by a certain curious permanence of past *things*' (Abbott, 2001, p. 222, emphasis added). Research on 'uses of the past' and organizational memory has begun to recognize the importance of the material for remembering and using the past (Hatch & Schultz, 2017; Humphries & Smith, 2014; Nissley & Casey, 2002; Schultz & Hernes, 2013). However, the extent to which material objects can not only enable but also actively shape processes of remembering has remained underexplored.

More specifically, in most accounts material objects figure as 'triggers or containers for stories' (Humphries & Smith, 2014, p. 478). For instance, Nissley and Casey argue that, in corporate museums, 'memory is *prompted* by the exhibited artefacts and seeks to create meaning about what is important from the past' (Nissley & Casey, 2002 p. S40, emphasis added). More recent studies illuminate how the past becomes 'represented' (Ocasio et al., 2016), 'recorded' (Lippmann & Aldrich, 2016) or 'embodied' (Hatch & Schultz, 2017) within material objects, 'where it remains captive unless someone should happen upon it and set it free' (Hatch & Schultz, 2017, p. 5). Extant research thus tends to view objects as passive carriers of cues of the past or as a memory form 'from which people access the past' (Schultz & Hernes, 2013, p. 4). However, treating the material as a *distinct* memory form does not go far enough in recognizing that both textual and oral memory have materiality too. Indeed, textual documents constitute material artefacts with their own physical and sensory experience (e.g. reading a text, touching paper, smelling books in a library). Similarly, oral memory is also entangled with the materiality of the human body and, in particular, with dispositions such as thinking, hearing, speaking and seeing (Olick, Vinitzky-Seroussi, & Levy, 2011, p. 6).

In sum, extant literature recognizes that actors can reclaim and use material objects in organizational remembering and historicizing in the present (Hatch & Schultz, 2017). However, it also backgrounds how human agency is inextricably intertwined with and, thus, also conditioned by the materiality of objects that are inherited from the past (Humphries & Smith, 2014; Orlikowski & Scott, 2008). As stressed above, those properties of objects which endure across time and space – their materiality – can intimately shape the field of possible uses that an object can be put to (Hutchby, 2001; Leonardi, 2013). To better understand the 'dual nature of the past', we move beyond a view of objects as containers for stories and representations of the past and scrutinize the mutual constitution of materiality and organizational remembering. To do so, we propose a new way of theorizing organizational memory. We stress the entanglement of practices of remembering (i.e. how people reconstruct the past to use it) with 'the material substratum which underpins the very possibility of different courses of action in relation to an artefact' (Hutchby, 2001, p. 453).

Technologies of memory and their affordances for organizational remembering

Historians and sociologists of memory have repeatedly demonstrated the mutually constitutive relationship of social remembering and materiality. The invention of new technologies such as writing, the printed book, the filing cabinet and the computer has repeatedly been shown to fundamentally impact how social memory functions (J. Assmann, 2011; Esposito, 2008; Hutton, 1993; Leroi-Gourhan, 1993). Importantly, such material technologies of memory (Olick, 1999) are not merely containers for stories or external storage separate from the social practices of remembering. Instead, materiality and practice, in their entanglement, constitute memory.

Within organizational research, this inherent entanglement of 'the social' and 'the material' in human practice has become known as sociomateriality (Leonardi & Barley, 2010; Orlikowski, 2007; Orlikowski & Scott, 2008). The notion of sociomateriality 'reminds organizational scholars that materiality is present in each and every phenomenon they consider "social"' (Leonardi, 2012, p. 34). A key lens for theorizing sociomateriality relates to the concept of 'affordance' (Hutchby, 2001; Leonardi, 2011; Leonardi & Vaast, 2017). Originally coined by ecological psychologist James Gibson (1986), the term does not describe a feature of the object nor of its user alone, but rather a *relationship* between the two: 'An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behaviour' (Gibson, 1986, p. 129). Within organizational memory studies, Humphries and Smith (2014) demonstrate how an affordance lens renders objects as active participants in the process of remembering and narrating the past. Importantly, the concept of affordance rebuts the simplistic idea that material objects, such as documents, archives and databases, *are* the memory, as implicitly assumed by the early storage bin model (Walsh & Ungson, 1991). Instead, it underscores how memory can be understood as a process of remembering and (re)constructing the past *with* the material rather than its mechanical retrieval *from* the material.

We believe that the concept of affordance can be taken even further to reveal how the dual nature of the past manifests in organizations. An affordance approach elucidates how the materiality of objects conditions both actors' interpretations and their use of those objects (Hutchby, 2001). As put by Leonardi and Vaast in relation to technology in general:

> All technologies are constructed out of material features that have properties that transcend their context of use. Although … individuals can exercise their human agency to make choices about how to use the features of new technologies in their work …, those features are constructed out of materials that permit certain actions and limit others. (Leonardi & Vaast, 2017, p. 152, emphasis added)

Therefore, an affordance lens stresses the entanglement of human and material agencies as constitutive for social reality and, thus, also for processes of organizational remembering. For our analysis, we find it useful to follow Blaschke (2008) and his use of the nuanced German terms *Gedächtnis* and *Speicher* to capture this entanglement of materiality and remembering:

> It is obvious that books, movies, lectures, papers, computer programs, memos, et cetera do not have a *Gedächtnis*; they are media which cannot think or communicate. Contrastingly, the German term *Speicher* is technical in its nature, like the memory of a computer or, indeed, books, movies … *Gedächtnis* is a matter of communication and consciousness and thus recognition and recall, whereas *Speicher* emphasizes the storage and retrieval of data. (Blaschke, 2008, p. 95)

This nuance allows us to keep both the social practices of remembering (*Gedächtnis*) and the material technologies of memory (*Speicher*) in sight, and to draw attention to their mutual constitution through the construction of affordances.

By implication, the distinction between *Gedächtnis* and *Speicher* also opens up a historical perspective as a fruitful way for studying their mutual constitution. If there is indeed a dynamic relationship between *Gedächtnis* and *Speicher*, then this relationship is bound to evolve and change over time. This point has already been made by historians and sociologists, who examine more extended periods in one retrospective glance, and demonstrate how actors' past decisions to use a particular material technology of memory shape their capacity to remember (Cevolini, 2016; Yates, 1993). For example, medieval merchants used an available technology of memory (writing in bound volumes) and developed a novel practice of remembering financial transactions, i.e. double-entry bookkeeping (Arlinghaus, 2006). Thus, this practice was both enabled and historically conditioned (although not determined) by the material technology it relied upon. The invention of double-entry bookkeeping can be considered a prime example of the mutual constitution of *Gedächtnis* and *Speicher* and 'the dual nature of the past'. It illustrates how actors tend to work upon an unfolding present within the constraints of the materials available at a particular point in time. By entangling available materials with new social practices, actors can also devise novel ways of remembering and using the past which, in turn, leave material traces for the future. Consequently, history becomes a fruitful research strategy for empirically unpacking the mutual constitution of remembering and materiality.

To sum up our argument so far, we believe that the study of uses of the past in organizations can benefit from a more nuanced understanding of the dual nature of the past. One way to arrive at such an understanding involves examining how material objects that are inherited from the past shape actors' choices in the present. The role of material objects is particularly salient in organizational memory, which is critical for how actors can access past events to make them work to their goals. We argue that the distinction between *Gedächtnis* and *Speicher* provides a useful way to conceptualize this inherent entanglement of organizational remembering and materiality. This distinction shifts attention towards the process of mutual constitution between *Gedächtnis* and *Speicher*, which we believe is a crucial aspect of how the dual nature of the past manifests itself in organizations. To further illustrate and explore these dynamics empirically, we draw on a historical case study which traces the emergence of a new technology of memory (computers) and its consequences for practices of remembering (collection management) at the British Museum.

Methods

Our analysis draws on an in-depth, historical case study of the British Museum's efforts to digitize its collection records, a process which dates back to the 1970s. The materiality of memory is particularly salient in the context of museums (Nissley & Casey, 2002; Tan, 2013). As a specific kind

of organization, museums can be regarded as mediators between the past and the future as they conserve and make accessible artefacts of human activities for future generations (Hooper-Greenhill, 1992). Thus, understanding museums not as static repositories of history told by records and artefacts calls for increased attention to the organizational processes of remembering that constitute their memory. Indeed, museums are dynamic spaces, where ongoing practices of appraisal, acquisition, preservation, curation (and occasionally disposal) shape the narratives that objects contain, and the organization that houses them (Macdonald, 2011). In the course of digitization, objects undergo a secondary process of meaning-making. Museum digitization is, therefore, an active process of knowledge organization, neither neutral nor unconditional or merely mechanical (Dahlström, Hansson, & Kjellman, 2012). Instead, it is one that actively makes use of an organization's conception of its past, present and imagined future.

We chose the British Museum as a research site for several reasons. First, the museum was one of the first in the United Kingdom to begin digitizing its collection (Parry, 2013, p. 119) which implies that actors were working without precedent. Second, the sheer volume of the Museum's holdings (over eight million objects) and the complexity of the range of object types, from stone artefacts to printed playbills, meant that digitization was a particularly complex and lengthy undertaking. Finally, the digitization of the collection records resulted in significant changes to the working practices of museum staff. This makes the British Museum's digitization efforts an ideal context in which to study the interplay between materiality and organizational remembering.

Empirical material

We followed the strategy of 'analytically structured history' that involves the use of 'analytic constructs … to search archival sources, enabling the construction of a narrative of structures and events that may not even have been perceived as such by actors at the time' (Rowlinson, Hassard, & Decker, 2014b, p. 264). In particular, we make use of a variety of sources originating within the British Museum to trace the evolution of the museum's digitization strategy (see Table 1).

The British Museum's status as a public institution reporting to the UK Parliament and governed by publicly appointed Trustees means that is it obliged to make its records publicly available. As a result, we were able to draw on a rich body of both internal and public-facing documentation, including the British Museum's digital strategy papers, minutes of Trustees meetings and annual reports. Several of the Museum's directors have written histories of their time as head of the organization, and since the digitization of records began in the 1970s, we used these histories as sources for information relating to the development and implementation of these strategies. In addition, we made use of archival material held by the British Parliament which provided us with a historical context for examining the British Museum's self-identified purpose and role in the establishment and preservation of collective memory in Britain. Moreover, research and papers presented by the British Museum's documentation department (the unit tasked with managing the databases which contain the records for the eight-million-strong collection) are a significant source of data.

We supplemented these archival and documentary sources with interviews with the British Museum's documentation staff to contextualize the evolution of the digitization strategy. We conducted formal, in-depth oral history interviews with two of the four principal actors involved in the museum's digitization efforts; one of the other two had died, and the second declined to participate in our study. We also formally interviewed another person currently involved in managing the museum's digital collections and informally interviewed a person immediately responsible for entering data into the museum's digital database. Whereas some have criticized oral history interviewing as an unreliable historical source due to the 'retrospective bias' informants

Table 1. Empirical material.

Desk research:	**Museum archives**
	• Museum's vision statements for organizational and digital strategy from 2008–2012 and 2012–2020
	• Minutes of Trustees' Meetings from 2007 to 2012
	• Founding Statutes and Rules drafted by the Trustees (1759)
	• Museum Annual Report and Accounts for the year 1988
	• Internal report from collections documentation committee, 1991
	External archives
	• Report from 1836 Parliamentary Select Committee Enquiry on the condition, management and affairs of the British Museum
	• British Museum Act of Parliament 1753 creating the British Museum
	• Parliamentary Public Audit Committee Report 1988
	Media material
	• Online interview with current digital publishing staff
	• Museum press releases relating to the museum's partnership with Google Cultural Institute
Observations:	**Internal observation**
	• One two-hour observation of catalogue data input in the Department of Prints and Drawings
Interviews:	**Staff interviews**
	• Three interviews with staff involved in the digitization activity at the museum, two currently employed at the museum and one retired.

are often prone to (Langley, 1999; Rowlinson et al., 2014b), others agree that 'archival sources *should* be supplemented, when possible, with newspaper accounts, interviews, memoirs, and other materials' (Rojas, 2010, p. 1268, emphasis added) in order to deal with the issue of selective recording in archives. In particular, our interview data was useful regarding generating richer narrative data on the British Museum's digitization efforts and identifying the critical turning points in the evolution of its digital collections.

Data analysis

We analyszed our data in three steps. First, we used the empirical material collected to construct a case history of the evolution of the British Museum's digitization efforts since the early 1970s, the time the museum first started using computers. Simultaneously, we focused on how the museum made sense of the new technology by referencing its past and the ways in which utilizing the technology changed the memory of the organization. Second, we employed a 'temporal-bracketing' strategy (Langley, 1999) to break the historical data into four distinct episodes by identifying key 'turning points' (Abbott, 2001). These points marked a radical break in how digital technology was used within the museum, highlighting the evolution of computers from a tool for scientific research to a technology of memory and, most recently, to a tool for making the museum's collection available to a wider audience through the world wide web. This temporal bracketing allowed us to analyse how actors collectively 'used the past' to make sense of what digital technology can be used for and how their actions in each episode shaped the possible uses of technology in the following phases. Third, we subjected this data to a more fine-grained analysis to examine how the emergent use of computers as a technology of memory (*Speicher*) changed how actors' enacted practices of remembering (*Gedächtnis*). We present the findings of our study below.

Findings

Effective memory as a vital, yet unattainable goal for museum organizations

The primary task that museums traditionally give themselves is to manage and make accessible their collection to an external audience. The most critical precondition for accomplishing this task is to be able to remember what objects are in possession of the museum, how they were obtained, where they are located and how they can be used for study and display. Were this not the case, then objects could not be used. If objects cannot be used, museums cannot fulfil their primary task and their existence might be jeopardized.

This close connection between the ability to retrieve information about objects, self-chosen purpose and organizational survival is underlined by Antony Griffiths, who between 1991 and 2011 was the Keeper of the British Museum's Prints and Drawings department:

> Anyone directing a museum or gallery must be able to justify the existence of the institution and provide a clear statement of its purpose and function. … Traditionally such a justification has been presented in terms of preserving objects for the future and for display and education. … This seems adequate to me so far as it goes, but it runs into difficulties with the reserve collections in larger museums of works that will hardly ever or never be put on show. … But how can anyone know that a work is there that they want to see? If they cannot know, then they will not ask to see it, and reserve collections will languish unseen and unused. Lack of use means that the study room facilities are soon removed, the curator is next to go, and soon the collection may as well not exist. (Griffiths, 2010, p. 1)

For museums, perhaps even more than for other kinds of organization, it is thus crucial to find a viable way to organize their *Gedächtnis*.

Until recently, this seemed an unattainable task as actors considered it too labour-intensive to make paper-based *Speicher* technologies work in such a way that objects and data about them could be recorded comprehensively and retrieved quickly:

> My Department, like most of the large European print rooms, *never created any card index for each item in the collection – the task was just too great*. So there was no way of looking up anywhere to see what we should own. The way to find something was to look in the appropriate boxes and portfolios; if you could not find it either we did not own it, or it had been put in the wrong place. *Unless you had a superb memory you had to repeat this process regularly, as there was no way to record the result of any search*. (Griffiths, 2010, p. 2, emphasis added)

Organizational remembering thus relied primarily on the memory of individual actors. This situation began to change in the 1970s when computers turned the task of creating comprehensive collection records into something that was potentially achievable. In the following sections, we will narrate four crucial episodes in the museum's digitization history as shifts in the workings of its memory.

Episode I: The museum's first encounter with computers as a technology of memory

In the 1970s, both curators and collection managers at the museum faced the material reality of museum collections which had grown unmanageable and were poorly and haphazardly documented. In some departments, objects were mislabelled or missing labels. In others, there were no comprehensive records of what was in the collection:

> Throughout its history, the Museum has recognized the importance of comprehensive documentation of its collections. Various documentation systems have come and gone, but a perennial lack of resources had inevitably placed the emphasis on the registration of acquisitions and similar fundamental tasks, to the detriment of the development of systems for the organization, classification and retrieval of information. (McCutcheon, 1986, p. 131)

Actors explained such problems as constraints inherited from the organization's past – in particular, its unusual longevity and size and the implied heterogeneity of material records:

> The main barriers to obtaining information easily are the size of the collections, the two hundred year old practice of registering objects only in accession order, incomplete and indecipherable register entries, and the relative lack of dependable indexes and crossreferences. (McCutcheon, 1986, p. 133)

In the 1970s, computers were first introduced in the museum as research tools without any intention to use them as a technology of memory (*Speicher*):

> The first computers were introduced into the Museum in the early 1970s as a necessary tool for such processes as thermoluminescence.[1] It was soon realized that the computer had wider applications and had great potential for the Museum inventory, which was now so vast as to be almost unmanageable, and certainly incapable of being audited. (Wilson, 2002, p. 305)

Initially, the museum established a collections management committee and entrusted it with testing the possible benefits and drawbacks of computers in a circumscribed pilot project. This project would evaluate the feasibility of digitization in just one department. A separate working group, the collections data management section, was set up for this task (CDC Report, 1991, p. 4). The Department of Ethnography, with its large and diverse collection and history of inadequate record-keeping, was considered to be the most appropriate site for a test case (McCutcheon, 1986, p. 131). Crucially, over the 200 years of documentation, curators of ethnographic objects had used so many different styles and formats to record the object data that it was nearly impossible to translate them into a uniform structure:

> Typically, each curator spends at most one to two days a week on the registration process which includes the handwritten documentation of each acquisition in a bound ledger. The details recorded are loosely structured and include registration number, description, materials, measurements, colour, decoration, acquisition details, provenance, observations, often a sketch and, if relevant, the file number of any associated ethnographical documents. (McCutcheon, 1986, p. 132)

Put differently, in this department, a specific, highly heterogeneous material form of records had been inherited from the past work practices of previous curators. This materiality constituted an obstacle because digitization required a uniform, homogeneous form of records. Therefore, the data had first to be partially transcribed into a paper form with a standardized list of categories, and from there entered in batches into the database via a computer terminal.

This first episode describes how computers originally were brought into the museum for scientific research but, once they were available, their potential as a novel technology of memory was recognized by actors sensitive to the inadequacy of the paper-based collection records. This repurposing of the unfamiliar technology was mediated through a particular narrative about the organization's own past: that the museum had always needed good records, but this had constituted an unattainable goal because of scarce resources. This narrative about the past enabled actors to redefine an existing technology in such a way that it could serve as a new solution to an old problem,

thereby constructing a new affordance. The computer harboured the technical potential to be used in collection management, or *Gedächtnis*, but before it was connected to the museum's past via the narrative in question, it was not perceived as a technology of memory, or *Speicher*.

However, once museum staff began to transfer data from one *Speicher* to another (from hand-written registers to computer memory), the materiality of the paper-based records also presented actors with the organization's past as an obstacle: the messiness of hand-written registers. Dealing with this obstacle required actors to devise new procedures for translating data from one format into the other. Thus, in this episode, the past appeared in a dual way: first as a resource that could be used to drive, and make sense of, technological change; and then as a perceived constraint that drew actors to specific practical problems in the present.

Episode II: Museum-wide digitization of the collection records driven by an external request for accountability

In the late 1970s, there was considerable dubiousness within the collections data management section as to how successful their efforts at digitization would be. By 1986, however, the usefulness of the digital records was becoming clear:

> It was never the intention to propose this scheme as a generalized system for the computerization of museum records; on the contrary, it was specifically designed to resolve some particular problems in the Ethnography Department. Nevertheless, the data entry method has proved to be so successful that a similar technique has since been used in the recently started computerized inventory scheme in the Department of Coins and Medals, and is likely to be used in future for other departmental schemes. (McCutcheon, 1986, p. 142)

In a recollection of the period, Antony Griffiths, then a curator in the Department of Prints and Drawings and who also chaired the collections documentation committee, further emphasized the haphazard nature of the new technology's diffusion across the museum:

> Then it moved from there [Ethnography and Coins and Medals] to Medieval and Later Antiquities, and then, the decision was taken that the whole museum collection ought to be on [in the computer]. Now, in the way of museum decisions, *no-one thought about what this entailed, or how you were going to do it.* (Griffiths interview)

At the same time, an external request by a key stakeholder (Parliament) added further impetus for digitizing the collection records. In the early 1980s, the National Audit Office and the parliamentary Public Accounts Committee became interested in auditing national collections at many of the major museums in the UK. A digital record seemed *the* only way to comply with this request:

> The then Director [David Wilson] *had little choice* but to reply that as soon as we had everything transferred to a database we would be able to answer the question [of what the Museum's collection was worth]. So this began a process of transferring all the information from the old hand-written registers to a database. (Griffiths, 2010, p. 3)

Computer technology thus presented itself as a self-evident solution for responding to the accountability request of Parliament. However, the creation of a single database was at odds with various sociomaterial practices inherited from the past:

> The departments keep, like amoebas, coalescing and splitting. But the assumption always was that each department was its own core, and the keepers knew best what was needed. … So the database was very

problematic as it cut right across all of this, and that was one of the big issues, and why the collections
documentation committee was important, as they were the only body to pull it all together. (Griffiths
interview)

Since its inception, the museum's departments had operated semi-autonomously, each developing
its workflows, curatorial practices and methods of record-keeping. This had resulted in a lack of
uniform information not only within, but even more so across, the departments. The heterogeneity
of the formats in which the data was recorded constituted an obstacle for those who were building
the uniform infrastructure for the digital database.

The collections documentation committee was appointed by the Director of the Museum in
1989 to address these issues. It comprised of nine staff from curatorial and documentation depart-
ments and was tasked with formulating a documentation strategy for the museum as a whole,
assisting departments in addressing any questions regarding the strategy, and suggesting proce-
dures to ensure that computerized databases were properly compiled and maintained (CDC Report,
1991, p. 3). The formation of the committee was an attempt to understand and shape the process of
digitization that was well under way when the group took up its work in 1990:

> The collections documentation committee was trying to work out what this new database really represented.
> Its final report was the theoretical underpinnings of what we were doing, which was rather ex-post facto
> as we'd already started by then, but it was us trying to work out where we were going and in particular
> what the relationship between the new database and the old registers was. (Griffiths interview)

When the committee started to compare recording practices in the museum, the diversity that the
different departments had inherited from the past was cast in even sharper relief:

> The reports of the sub-committees … reveal how the wide variety of the collections of the Museum has led
> each department to create somewhat different kinds of records. … we found that different departments had
> devised a number of quite different strategies: some use card-indices, others marked catalogues, while others
> had been able to do very little indeed because of the vast size of their holdings. (CDC Report, 1991, p. 3)

A critical obstacle that resulted from the materiality of paper-based technologies of memory was
the need to find and establish common standards, especially for naming objects and their makers:

> Since the principle behind the unified global structure is that all relevant information should be retrievable
> by a standard search across databases in all departments, it is obvious importance that those databases be
> built up according to standard principles and maintained in the same way. Particular matters of immediate
> concern (among others) are the maintenance of thesauri and the addition of new terms, and the use of the
> producer name field and the acquisition name field. (CDC Report, 1991, p. 13)

Importantly, the main argument made by the committee for introducing a centralized and harmo-
nized database – at odds with both the museum's organizational structure and existing data storage
and retrieval systems – was a historical one. The committee argued that the purpose of the muse-
um's record management was defined by five 'basic principles' (CDC Report, 1991): to identify
objects, enable audits, to make objects available to external audiences, to provide object-related
data and to facilitate scholarly research. These principles were framed as goals for the future that
were inherited from the past:

> Even if not articulated in this form, these principles have informed a vast amount of work that has been
> done by the staff of the British Museum *since its foundation.* Success in achieving these aims in the past

has been limited both by staffing factors and by the lack of adequate technology. For the first two hundred years of the Museum's existence there were no other tools than manuscript ledgers and card indices. The introduction of new methods of information technology based on the computer has transformed the situation. … It follows that a new record of each object held on the computer … should become the central location for information about the description of the object and its placing, and will take priority over, although it will not replace, earlier forms of record. (CDC Report, 1991, p. 4, emphasis added)

Eventually, the museum's management and Trustees endorsed the committee's recommendations. It was now the collections data management section's task to create a single database across all the departments, and to train curatorial staff.

This second episode describes how digitization spread across the museum, first in a haphazard, ad-hoc fashion, then as part of an organization-wide policy endorsed by the top management. The impulse for this policy came from Parliament, a key stakeholder for the museum, in the form of an information request for auditing purposes. This external request resonated strongly with the narrative that had also driven the initial experiments in digitization described in episode I: that proper documentation had always been an essential goal for the museum's activities; and that its implementation had long been hampered by inadequate technology and scarce resources. By linking computers with this narrative, actors added a new affordance to computer technology as a tool for accountability. This affordance drove additional change in the *Speicher*, as the committee successfully argued that a computerized record, stored in a central database, would allow the museum to implement proper documentation. This change was remarkable as the creation of such a database was at odds with the heterogeneity of records and work practices characterized as they were by the departments' considerable autonomy throughout history. The past thus was used as a resource that enabled organizational actors to translate an external request for accountability into an impetus for accelerating change in the museum's technologies of memory.

When data inputters began to create computer records from existing paper technologies, the immense diversity across the different departments appeared as a key problem. Now, the past was evoked again – this time not as a resource but (just as in episode I) as a constraint in the present. Over time, each department had developed its own technologies of memory whose particular materialities created problems when proponents of digitization began to carry out their plans. Again, materiality drew actors into courses of action necessary to tackle these problems.

Episode III: Involving the curators to change how technologies of memory are used

As digitization progressed, the relative lack of curatorial interest in the database surfaced as an additional obstacle. After all, it was the curators who brought the museum's *Speicher* facilities to life by consulting object data for external requests, for planning exhibitions, or for their own research. However, this specific group of staff was hardly involved in the ongoing shift from traditional paper-based tools to the new digital database:

> There was no curatorial involvement. I was really the only senior curator in the museum who really believed in the whole thing. Most curators thought 'That's someone else's doing.' (Griffiths interview)

For the collections documentation committee, this obstacle emerged from the decision, made early in the process, to divorce curatorial activity from data entry. This distance, coupled with the slow progress of adding information to the database, cultivated a perception that the database was less than useful for curatorial work:

> The use of specialist CDMS [Collections Data Management Section] teams has so far meant that curators have little reason to practice data entry themselves. This, and the incompleteness of the databases at their present stages of development, has then caused them to find data retrieval more difficult than expected. The end results are the views that we have heard expressed that the databases are of little use. (CDC Report, 1991, p. 13)

Tanya Szrajber, who at the time of interviewing was Head of Documentation at the museum, stressed how the material properties of the early computer system constrained its usability and thus also contributed to a lack of curatorial involvement:

> The first problem was that it was a form that curators filled in, and sent to be processed. You had about five forms for different parts of the records, so you had to split your record. … Originally, it wasn't that they weren't interested. They physically didn't have access. (Szrajber interview)

The authors of the CDC report expressed their hope that the situation would improve in the future when more curators would be given access and would make themselves familiar with the system. However, when the report was written, this outcome was not certain. Instead, the authors highlighted the risk that digitization would lose its drive unless action was taken to ensure that curators were involved on more than just a technical level:

> Curators' familiarity with the system must however be extended to a feeling of responsibility towards the accuracy and completeness of the database, not just in new records, but also in the old ones. *This is absolutely crucial*. If the database is not maintained and updated, it will become increasingly inaccurate and obsolete. Once this is so, it will no longer be trusted and therefore not used. (CDC Report, 1991, p. 13)

Already in the early 1990s, this greater involvement was foreseen to also require changes in curators' working practices:

> This means that documentation will have to be given much higher priority than it has traditionally been accorded. A constant effort will have to be made to improve the accuracy of description of the objects in the database, to record newly published information in them, to check key-words used for indexing, and to update the locations. (CDC Report 1991, p. 14)

Importantly, this projected change of practices (i.e. a stronger curatorial involvement in the ongoing digitization) was interpreted as a constraint inherited from the past, as the materiality of computers was considered to merely highlight previously inadequate documentation practices:

> These are not matters which have traditionally caused much concern. It is only the existence of the computer, and the possibility it *affords* of generating vastly increased amounts of improved information about the collections, that makes them important. (CDC Report, 1991, p. 14)

Thus the ongoing efforts to more strongly enmesh the new digital technology of memory with curatorial practices highlighted certain aspects of these practices as an obstacle on the path to digitization.

Two shifts occurred in the late 1980s and early 1990s which made curatorial involvement in the ongoing digitization more likely to happen: one was technological and the other organizational. The first change occurred in 1988 when the old batch-processing system for updating the database was revised and improved. The new version (called Magus) allowed direct access for reading and creating collection records from distributed terminals. This decision (i.e. to build onto the existing

system rather than looking for an off-the-shelf solution that would cater more clearly to curatorial needs) was perceived to be forced by the trajectory that digitization had taken in the years before. The already available technology presented itself as an almost self-evident solution:

> There was no one in the departments who knew about computers, so no one would have known how to find a system and customize it. Remember this was the world when we had all been in the museum for fifteen years, without using computers or knowing anything about them. There wasn't any sort of basic-level knowhow at the curatorial side, so *we had no choice* in the matter. It was the Information Service section or no one. And *there already was a system*, so the decision was very easy. (Griffiths interview)

The new system addressed some of the curatorial concerns outlined by the CDC report above because, for the first time since digitization began, it provided curators with direct access to the central database without the need to rely on specialized staff. However, the mere technological possibility for access was not enough to change the curators' working practices:

> The existence of an on-line (rather than batch-processing) system offers the possibility of using the database as the primary means of recording all information about the collection – including, for example, photographic, conservation and bibliographical records. As yet, few of these options have been taken up by any department, and only one department has on-line access to enter information onto its database. (CDC Report, 1991, p. 4)

In 1993, record-keeping was formally handed over to the departments themselves to address this issue. This meant that departmental practices now had to become more strongly enmeshed with the new central database:

> And then, in 1993, there was a point where all new acquisitions had to be added on-line [in the internal computer network]. It was entirely their responsibility. So that was the switch from paper to digital. I don't think anyone actually resented it, but initially it was much quicker to write a line in the register than to fill something out. (Szrajber interview)

> As from 1993, all registration of acquisitions had to be online. And of course, someone had to do it, because that had always been a departmental responsibility, although never a central one. Departments always had to do their own registration, and that registration was, in effect, a mini-cataloguing. That was the route in, to get departments to have to do something, and that was quite an effort. You had to go around to each department and say 'You realize this means you are going to have to put it in the computer.' (Griffiths interview)

A further opening-up of access to the database took place in 2000 when the museum again updated its database management system. The new version, called Merlin, possessed certain material features which made it even easier for the non-technical, curatorial staff to use:

> Merlin was a huge relief because Magus was a very difficult system to use. It worked, it's a good system, but it was a 1990s system and so for example, if you were typing anything in a free-text field, and made a mistake and you did a backspace, you wiped out the whole field. (Griffiths interview)

> It did not support images, non-Latin character sets, nor standard word-processing features such as 'cut-and-paste'. … So in 1998, tendering for its replacement began, and Merlin, created by System Simulation Ltd (SSL), was selected and in operation in 2000. Merlin is a bespoke system using Index+ (a product based on non-relational database technology) and operates on Windows PC. (Szrajber, 2007, p. 3)

The real shift, however, only occurred when curators recognized that, unlike the old paper tools, the digital database *afforded* making connections between objects across different departments because it provided access to a critical mass of common references:

> There's also a natural growth of the database. The bigger it is, the more useful, and the easier it is to use. For example, Prints & Drawings, Coins & Medals, and the Prehistory collections are huge, they have millions of records. When they started to create each artist and engraver's name, they used existing files that they knew were in their record because they had set them up in advance. So when names came up on prints that hadn't yet been recorded, you knew there was an existing reference. And eventually, everyone can see the benefits this has for planning an exhibition or book. (Szrajber interview)

In a museum as large as the British Museum, where much of the material in the collections is stored off-site, this affordance made curators recognize the database as the quickest and easiest way to interact with the museum's holdings:

> Many curators, particularly young ones, see Merlin as their way of mastering the collections. It's their way of knowing what we've got, and that's always been a big museum problem. So in the future it will go on being a good thing. (Griffiths interview)

This third episode described how the switch from one class of technologies of memory (*Speicher*) to another also entailed a change in the practices of remembering (*Gedächtnis*) of curators as the critical group of users. However, this was not a straightforward transition. Even when the creation of the new database was well advanced, few curators considered it superior to the paper technologies that had been in use for a long time. In this episode, the past not only enabled and constrained but also actively oriented how actors enacted digitization. This time, it was the material properties of computer technology inherited from the previous decade that constrained actors and motivated specific technological and organizational change. Importantly, the mere availability of the existing database made actors feel that they had little choice in how they would make their next step towards digitized collection records ('It was the Information Service section or no one. And *there already was a system*', Griffiths interview). Material reality inherited from the past thus appeared sticky to the extent that it actively oriented actors' choices in this episode.

Episode IV: Decision to use internal database for reaching web audiences motivated by the museum's earliest history and shaped by its more recent history

By the early 2000s, the arrival of the Internet put the museum under pressure to engage with emerging online audiences. In 2005, the museum's Trustees first mentioned in their meeting minutes 'the importance of the use of the internet and new media technologies to engage with a wider audience' (Trustee minutes, 2005, p. 2). A year later, they 'agreed that the Museum's website was the clear place to build engagement and that its development would be a priority' (Trustee minutes, 2006, p. 2). A strategy paper from 2008 put the challenge this way:

> By 2012, the Museum's physical presence in London will be complemented by a globally accessible media resource, including multimedia products, digitised archives and broadcast programmes which will make the Museum's world-class collections available to a global audience. (British Museum, 2008, p. 12)

Importantly, the arrival of the Internet made actors remember an additional founding principle of the museum: universal access. The engagement with online audiences was explicitly framed as a natural extension of the museum's long history of providing universal access to its collections:

> The Museum's Director (Neil MacGregor) asked the question, what's the museum for? It's a place where the whole world could get access to the whole world. Well, that's a brilliant 18th-century enlightenment dream but it has never been possible because you need something that gives you access to the whole world to make that dream happen. *Now, you combine that enlightenment dream with what the internet can do and actually, sometime in the next 20 years, the reason that the British Museum was founded becomes possible for the first time.* So, that's what we should do – we should fulfil that 250-year-old dream and take the history of mankind to all of mankind. (Chris Michaels, interview with Blooloop, December 2015, emphasis added)

The basic principle of universal access, which this quote refers to, is often understood by actors in light of the museum's early history. This principle is encapsulated in two foundational texts, the will of the founder Hans Sloane who in 1753 offered his private collections to the British King and Parliament so that they might form the basis of a museum, and an Act of Parliament of the following year, which is preserved in the museum's own archive and library, and which been repeatedly cited in the museum's written histories:

> That a free access to the said general repository, and to the collections therein contained, shall be given to *all studious and curious persons*, at such times and in such manner, and under such regulations for inspecting and consulting the said collections, as by the said trustees, or the major part of them in any general meeting assembled, shall be limited to that purpose. (Pickering, 1766, pp. 76–77, emphasis added)

Actors were thus constructing an affordance between the emerging technology of the Internet and the principle of providing universal access to their collection. Once this affordance was established, it informed the further steps of actors. The promise of reaching audiences beyond those who would make the trip to London made key actors to look for an internal technology that would be compatible with the Internet.

As shown in the previous section, the museum already had a central collections database that was used by an increasing number of non-technical staff. The idea to make this internal database available to external audiences via a web interface became intuitively plausible:

> Of course, when we started [with digitization] the web didn't exist. We never dreamt of putting this on the web or any public access. It was a separate *internal* system. And it was only after we moved to Merlin in '01 that we suddenly found we had something which could be put on the web … And I still remember Andrew Burnett, who was then the deputy Director, who said, 'Well, we'd better get this on the web.' And I said 'Yes, I guess we'd better had.' So that was how that decision was taken. (Griffiths interview)

It is intriguing to note that a different tool named Compass was available at this point, which had numerous features that rendered it equally if not more suitable for reaching online audiences. It comprised a database designed *specifically for public use* with information on the museum's 5000 best-known objects which could be accessed by visitors to the museum building via computer terminals. Griffiths, and Julia Stribblehill, who at the time of interviewing was Web Liaison Documentation Officer at the museum, describe the tool in the following way:

> Compass was created as something to use the reading room [in the central court of the museum building] for. … 'Compass, your orientation to the Museum' that was what it was meant to be. (Griffiths interview)

> [The system was] designed for more contextual, educational, external-facing records. Actually, not even records, more like information, rather than internal records. So there was a lot more about the context [of the objects]. (Stribblehill interview)

Designed as a tool for display, the system's non-specialist language and attractive images made it very accessible for visitors on site. When Compass was linked to the Internet in 2000, it also became available to visitors of the website (Szrajber, 2007).

However, the key actors of digitization did not seriously consider Compass to be a viable way of providing online access to the collection. The reason for this lies in the particular way in which narratives about the museum's past had been entangled with technologies used by staff. The regular recourse to the principle of universal access suggested that the museum needed a tool that was able to unlock their *entire* collection, and not just a selection of highlights, to the emerging audiences on the web. Similarly, actors perceived the size and complexity of the collection as too large a constraint for expanding the approach taken in Compass further. They considered it almost impossible to decide what parts of the collection records to put online, or to recreate the working documents into a more publicly palatable form. In the eyes of key actors, providing *universal* access to the collection online required an all-or-nothing approach:

> Another [reason] is the sheer size of the database which would make any re-writing totally impracticable. (Szrajber, 2008, p. 2)

> When you have that many records it's very difficult to start to unpick things and to say 'actually, I'll hold that one back'. You would have to go back and look at all of them, which is not an appealing prospect. (Stribblehill interview)

When the decision was finally made to open up the internal database to the wider public on the Internet, there was initial resistance by some of the curatorial staff:

> Most curators did not want it to go out. And it took a lot of persuading because there was a risk of poor records becoming public. The starting point was people saying 'It can only go out if the curator has signed off the record.' If that had been the case, there would only be about 20 records out there by now; it had to be the other way around. So I said to curators 'Look, there's no hurry, it's going to take a long time to get this out, your record won't be out for three years. You have got three years to improve.' (Griffiths interview)

As in the 1980s, recourse to the museum's founding principles proved useful for driving change:

> The only way the issue could be resolved was by going back to first principles. The collections were there for the public, and so we had a duty to let the public know what we had. If the records were no good, that was not a reason to hold them back; rather it was a reason to get on and do something to improve them. The Director backed this principle, and the Trustees were concerned that we develop as strong a website as possible. So the decision was taken. (Griffiths, 2010, p. 7)

Stribblehill remembers how, during the 2000s, the appeal to the founding principles enshrined in the British Museum Act was used to reaffirm the decision to put the Merlin online:

> A lot of it was around that concept of being a museum of the world for the world, it being a public collection, not owned by us. It's owned by the nation, as you see in the British Museum Act. So it was not ours to hold back. The decision was made to publish and to publish pretty much everything. (Stribblehill interview)

After a phased launch, the internal database has been accessible through the museum's website as the Collections Online since 2007. While some information is hidden from the public, such as where objects are kept, or how much the museum originally paid for them, the records that the public sees online are the same records that the curators work with every day.

Thus using the past enabled the museum to open its internal *Speicher* to a much broader range of users. The openness of the database, in turn, affected the practices of museum staff engaging with the collection database: they now had to take into account that external users will be able to see most changes made in the system. A very mundane example relates to the additional care that cataloguers need to give to the creation of records:

> Cataloguer: I don't know what the database looked like in 2002 but this record [of the Prints & Drawings department] is very rudimentary, so I'd start straight away by saying how it's been used. So this is an associated name, the person is a sitter, but this hasn't been filled in, so we start adding a first name. … Whenever someone sees this on the user's interface, and they hover over the name it will now come up with more information. So there is a benefit to the user. (field notes)

Moreover, this openness allowed the museum to respond to public critique surrounding the repatriation of objects in a new way. Traditionally, the museum had always actively resisted calls for the repatriation of objects (most famously, the Parthenon, or Elgin Marbles) by repeating their universalist position: that they have a moral responsibility to keep and preserve the objects in their collection for the betterment of all people. By making the entire internal database available online the museum could now argue that repatriation is no longer a significant issue: 'Repatriation is yesterday's question. Questions of ownership depend on the thought that an object can only be in one place. That's no longer true' (Higgins, 2006). This quote by director MacGregor carries an implicit inference: that to speak of repatriation is to be stuck in the past, to be curatorially backward and undeveloped. In his reframing, MacGregor positions the museum's digital engagement with the digital tools and methods at its disposal as another means by which it may fulfil its declared aspirations of making the museum's collections available to a broader, geographically dispersed audience, while neatly sidestepping any debate about repatriation.

This final episode describes how the existing database, which had become the primary *Speicher* for many of the museum's everyday remembering, was given an altogether new function of displaying objects to external audiences. This shift began when actors used the past to construct an affordance between the emerging technology of the Internet and a particular narrative about the museum's own history. More clearly than in the previous episodes, the microprocesses of activating the past come into focus. The founding principle of providing universal access outlined in Sloane's will – which existed as a manuscript in the archive, in an 18th-century print in the library, and as citations in the museum's own written histories – was rediscovered and renewed. Once constructed, the affordance prompted key actors to look for an internal technology that was compatible both with the Internet and the goal of providing universal access. The past mattered again in a dual way. It appeared as a constraint which made actors consider a digital tool available at the time (Compass) as inappropriate for the task. Instead, actors were drawn towards constructing an affordance about the potential of the internal record management system Merlin as a tool for external display. Thus, the past appeared also as a resource, as it was evoked to push through organizational change in spite of initial curatorial concerns. When Merlin was finally linked to the Internet, the museum's internal *Speicher* was effectively opened up to external visitors of the website. This shift not only had implications for the way in which staff interact with the technology (*Gedächtnis*) but also enabled the museum to respond in new ways to public critique regarding the repatriation of objects.

Discussion

We set out to unpack the how material objects shape processes of organizational remembering by following the history of a new technology of memory (computers) and its impact on organizational

memory at the British Museum. Our empirical analysis demonstrated how the past mattered in a dual way in the mutual constitution of *Gedächtnis* and *Speicher*. The past was used as a resource as actors drew on it to make sense of the potential uses of a new material technology of memory (computers). They did so by relating material properties of the technology with narratives about the founding principles of the museum. These principles had been enshrined in various documents that were kept in the archive and the library but reclaimed and renewed in the process of sense-making. Evoking these principles allowed actors to motivate an experiment for testing the new technology which, later on, evolved into an organization-wide initiative for transforming the departments' idiosyncratic collection records into a central database (episodes I and II). Further on, actors repeatedly drew on this narrative about the museum's past as a resource to construct additional affordances that added momentum by motivating shifts in curatorial practices (episode III) and expanding the range of applications for the internal database (episode IV). In other words, adding new affordances to computers as a technology of memory (*Speicher*) by using the museum's past rhetorically enabled actors to digitize the organizational practices of remembering (*Gedächtnis*).

However, we also found that the past mattered in a second way, namely as a material reality inherited from previous times that constrained and oriented *how* actors enacted digitization. Actors experienced the past as constraining as they had to act upon various obstacles on the way to digitization which they interpreted as a consequence of sociomaterial entanglements inherited from the past. Initially, these obstacles had to do with (i) the historically grown diversity of record-keeping practices among different museum departments and (ii) the historical neglect of documentation as a priority within curators' practices. Later on, actors' choices were also conditioned by how they enmeshed computer technology and social practices early on in the process of digitization. In episode III, actors chose to adjust the existing database (which was originally adopted for an entirely different reason) to address the problem of curatorial disengagement rather than try to develop a new system, better fitted to curatorial practices. Even more strikingly, in episode IV, actors chose to use the internal database – adjusted to the needs of a specialized, internal audience – to provide Internet access to the collections. This happened even though they had access to an alternative technology, Compass, that had been explicitly designed to present objects in a digital form to broader external audiences. As actors drew on the principle of universal access to construct the affordances, they foregrounded certain features of the technology as more important (scalability to entire collection), and backgrounded others as less relevant (user-friendliness). In both cases, actors preferred working within the constraints of what was 'already there' instead of starting from scratch and enjoying more degrees of freedom. In this sense, the repeatedly evoked narrative about the museum's founding principles allowed actors to construct new affordances of computer technology, which, in turn, *oriented* how they addressed various emerging obstacles further on in the process.

Theoretical implications

We now discuss how these findings contribute to (i) expanding the 'uses of the past' approach to include 'the dual nature of the past' as both a resource and a constraint for organizational action, and (ii) the development of a novel conceptualization of organizational memory's entanglement with materiality.

Sociomateriality and the dual nature of the past. Our study contributes to the emerging literature on 'uses of the past' in organizations (e.g. Bucheli & Wadhwani, 2014; Foster et al., 2011; Kipping & Üsdiken, 2014; Rowlinson et al., 2014b) by drawing attention to the dual nature of the past (Abbott, 2001) as both a resource and a constraint for organizational action. We do so by explicitly paying heed to the inextricable intertwining of social processes of remembering and material objects

inherited from the past. Whereas extant literature has focused primarily on how actors can use objects in the collective *interpretation* of the past (Adorisio, 2014; Rowlinson et al., 2014a; Suddaby et al., 2010), we demonstrate how the materiality of objects can also constrain and actively orient action in the present.

More specifically, our findings lead us to suggest that material objects are the primary way in which actors can not only access but also reconstruct and evoke the past in organizations. In line with Koselleck (2004), one could say that the past thus only exists in the present as a 'present past' embodied within objects and actors. Whereas 'uses of the past' scholars have approached objects primarily as a distinct memory form that carries cues about the past (Hatch & Schultz, 2017; Ocasio et al., 2016; Schultz & Hernes, 2013), we suggest that objects have a more active role in making the past matter in the present. We observed how certain material properties of objects could make actors remember and draw upon narratives about the past that allow them to make sense of the objects and their usability. However, our affordance lens also revealed that, when actors act upon such interpretations of material properties of objects, they also leave material traces that have permanence—or 'stickiness' (Abbott, 2001)—across time and space and thus possess the potential to shape future social action.

In our case, objects that persisted from one present to another conditioned the course of action of future actors in a non-deterministic way. For example, a decision about how to enmesh computer technology and organizational practice early on in the digitization process (in a centralized manner) left material traces that presented themselves as obstacles later on (when curators had to be more strongly involved in the process). Tackling these obstacles drew actors into concrete courses of actions which, in turn, shaped how digitization was enacted. This is the case because, when actors act in a particular present, they can only imperfectly anticipate as a premise of their action all possible futures. Consequently, the sociomaterial entanglements they leave behind as traces will fit better into some and worse into other future courses of action. As a result, future actors who work with these sociomaterial entanglements will have to move within the constraints of their materiality as it appears in the present. In short, we suggest that past decisions embodied into the material will not only enable but also actively condition – yet never determine – how actors construct affordances, narrate the past and act upon 'unfolding circumstances' in the future.

To summarize our main contribution, we find it useful to borrow language from Cardinale's (2018) recently proposed 'new micro-foundations' for institutional theory. Cardinale's approach allows us to go beyond the idea that the past can only be 'enabling' or 'constraining', a view originally inspired by Giddens' structuration theory (1984). More specifically, Cardinale's approach suggests that what is inherited from the past not only 'opens up possibilities for action' and 'restricts the set of possibilities for action' (Cardinale, 2018, p. 136) but also actively *orients* action in the present. That is, 'it makes a given actor more likely to settle on some possibilities out of those it enables' (Cardinale, 2018, p. 136). Our study suggests that material objects inherited from the past will usually exhibit specific enduring propensities toward particular interpretations and particular courses of actions. They can thus enable actors to engage in collective processes of remembering and interpreting the past, but these propensities will also draw actors to certain possibilities while excluding others.

In our case, this was apparent in episode IV when actors chose to open up the already existing sociomaterial entanglement between *Gedächtnis* and *Speicher* which was constructed under reference to the museum's founding principle of universal access. Rather than engaging in a reflection and evaluation of all possible alternatives, the internal database presented itself as an almost self-evident solution. Because so many of the records were already digitized within this database, it possessed the propensity to provide *universal* – rather than selective – access to the collection. This, in turn, was envisioned as the key goal of digitization by reference to the museum's founding

principle. Thus, the already existing *Speicher* technology actively oriented actors toward itself as the most adequate possibility about *how* to enact digitization.

To sum up, whereas previous research on organizations' uses of the past has highlighted how history is fundamentally open for interpretation, our focus on the inherent entanglement of organizational remembering (*Gedächtnis*) with materiality (*Speicher*) implies that such openness does not mean pure arbitrariness in how actors can act upon their interpretations. The past—through the stickiness of the material—can intimately and actively shape both how actors remember and use it and how they act in the present. Rather than juxtaposing the enabling and constraining aspects of how the past matters in organizations, our conceptualization of the 'dual nature of the past' brings into view how the past draws actors into some directions rather than others. This more nuanced approach opens up possibilities for future research to examine in more detail the micro-processes which entangle the agencies of both actors and objects in processes of remembering and using the past. Such investigations promise to enrich the debate on 'uses of the past' by drawing attention not only to the sociomaterial constraints on the malleability of history, but also to the more active and agentic ways in which past material reality shapes the present.

Organizational memory as a history of affordances between Gedächtnis *and* Speicher. By adopting a historical perspective sensitive to sociomateriality, our study also contributes to the ongoing efforts to apply an organizational memory lens for studying how the past is evoked in organizations.

First, by introducing the distinction between *Gedächtnis* and *Speicher*, our study outlines a new way of theorizing the relationship between organizational remembering and materiality as a process of mutual constitution. In contrast to earlier research that either equates organizational memory with materiality (e.g. Walsh & Ungson, 1991) or treats materiality as a special memory form (e.g. Schultz & Hernes, 2013), we draw attention to the dynamics of affordance between technologies of memory (Olick, 1999) and organizational remembering (e.g. Adorisio, 2014; Feldman & Feldman, 2006; Humphries & Smith, 2014). Our conceptualization allows us to maintain a concept of collective memory as an active 'storying of the past that emphasizes the selection and interpretation of past events in the light of the experience of the individuals involved' (Adorisio, 2014, p. 475). However, it also adds to it by stressing that this process involves entangling social practice with material objects (*Speicher*, or technologies of memory), whereby affordances need to be constructed. In so doing, our study contributes to a more nuanced understanding of the relationship of materiality, remembering and using the past in organizations. The distinction between *Gedächtnis* and *Speicher* lays the foundation of a theory of organizational memory which acknowledges both its sociomateriality and its constitution through collective interpretation. Within this theorization, the concept of affordance is crucial for explaining how the mutual constitution of the social and the material plays out in practice. Moreover, we demonstrate that narratives about the past can be a useful resource for constructing affordances surrounding novel and unfamiliar technologies of memory (*Speicher*). Actors established the usefulness of computer technology by connecting computer technology with the museum's founding principles. Moreover, repeatedly evoking these principles allowed them to overcome various obstacles on the path to digitization. However, the way in which affordances are constructed, in turn, also defines actors' scope of action in the future and shapes the processes of remembering in organizational life (*Gedächtnis*). Thus, our study also draws attention to the historicity of memory and remembering in organizations.

Second, this insight also suggests rethinking the idea of the material as a distinct memory form (Schultz & Hernes, 2013). In our case, the analytical distinction between oral, textual and material memory was difficult to maintain. For instance, we found that actors, to preserve the data contained in *text*, changed its *material* form in dramatic ways. When the hand-written registers, index cards, and printed catalogues were gradually transcribed into the new database, this preserved most of the

text but eventually changed almost everything about the way in which this text could be evoked and used in everyday remembering. While the form remained the same (textual), its materiality changed completely. Against this background, we believe it is more useful to differentiate between *Gedächtnis* and *Speicher* and focus on the affordances constructed between these two aspects as mutually constitutive for organizational memory. The three 'forms' of memory identified by Schultz and Hernes (2013) would describe different kinds of material *Speicher*, such as oral devices, artefacts, texts, paper filing systems, computers and so on. However, the concept of *Speicher* draws more explicit attention to the different materialities (i.e. combinations of materials and form) of such media. *Gedächtnis* on the other hand refers to the active use and entanglement of such technologies of memory within everyday organizational practice. In our view, limiting memory to only three forms cuts the world along the wrong lines. It appears somewhat arbitrary as there could always be another material form, which would then complicate the model. Our conceptualization thus does not abandon the concept of 'the content of memory as shaped by its form' (Schultz & Hernes, 2013, p. 4). However, it also points to the fruitfulness of unpacking this fundamental dynamic as a process of mutual constitution between *Speicher* and *Gedächtnis*.

Conclusion

Our study illustrates the benefits of further advancing the 'uses of the past' approach by combining insights from research on organizational remembering with a sensitivity towards sociomateriality. The main strength of the 'uses of the past' approach lies in its ability to analyse how the past, rather than simply constraining actions in the present, can also be evoked and actively used by actors to their ends. However, and this is our main message, how this happens is not completely arbitrary, but conditioned by the affordances constructed in relation to material objects entangled in processes of remembering the past. By introducing the distinction between *Gedächtnis* and *Speicher* and developing the concept of 'the dual nature of the past', our paper brings a perspective into the debate about 'uses of the past' that takes sociomateriality more seriously. Although we examined a museum organization where the entanglement of materiality and memory was particularly salient, this conceptualization can be extended and used to study other kinds of organization too.

For example, one way to theoretically elaborate on our findings would involve drawing on insight from media studies (e.g. Garde-Hansen, 2011) to explore how different new digital media technologies beyond the ones we studied (e.g. video, podcast, social media) connect with and shape processes of remembering and using the past in organizations. Indeed, as more and more organizations are enforcing the use of such media internally, one might ask how this impacts organizational remembering. For example, how might the introduction of a searchable digitized video database of previous strategy workshops shape remembering and using the past within strategizing processes? Whereas in much of the popular discourse such media seem to be embraced uncritically as a way to improve 'memory', one should not forget that *forgetting* is at least as – or perhaps even more – important for how history is constituted (Anteby & Molnár, 2012; Casey & Olivera, 2011; Esposito, 2008). Indeed, we believe that *Gedächtnis* is as much about remembering as it is about forgetting the past. What is remembered is always highly selective in relation to everything that is simultaneously left out and, thus, forgotten. Future research should, therefore, more explicitly look at how the materiality of technologies of memory shapes forgetting as the other side of organizational remembering.

Finally, we believe the answers that organizational researchers provide to the question of how organizations remember and use the past have significant implications for numerous subfields of organization studies. Memory and remembering are constitutive to how organizations function and act (Langenmayr, 2016). So far, much of the academic discourse on memory has been limited to

topics such as learning, knowledge management and, more recently, organizational identity. Consequently, establishing links to other related fields such as routine dynamics, strategy as practice, or institutional theory, to name but a few, can prove a fruitful strategy for future research. All these fields have increasingly moved towards a more process-based understanding of their underlying phenomena of interest. Thus, they bring with themselves an inherent sensitivity towards temporality. Looking at how organizational remembering mediates between the past, present, and future can provide a fruitful new lens for advancing such research programmes.

Note

1. A method of dating pottery.

References

Abbott, A. (2001). *Time matters*. Chicago: University of Chicago Press.

Adorisio, A. L. M. (2014). Organizational remembering as narrative: 'Storying' the past in banking. *Organization*, *21*, 463–476.

Anteby, M., & Molnár, V. (2012). Collective memory meets organizational identity: Remembering to forget in a firm's rhetorical history. *Academy of Management Journal*, *55*, 515–540.

Arlinghaus, F.-J. J. (2006). Account books. In M. Ostermann, O. Plessow, & G. Tscherpel, *Transforming the medieval world: Uses of pragmatic literacy in the middle ages* (pp. 43–69). Turnhout: Brepols.

Assmann, A. (2006). Memory, individual and collective. In *The Oxford handbook of contextual political analysis* (pp. 210–224). Oxford: Oxford University Press.

Assmann, J. (2011). *Cultural memory and early civilization*. Cambridge: Cambridge University Press.

Blaschke, S. (2008). *Structures and dynamics of autopoietic organizations*. Wiesbaden: Springer-Verlag.

Blaschke, S. (2010). *The autopoiesis of organizational knowledge, learning, and memory*. Advanced Series in Management (Vol. 6, pp. 215–231). Elsevier.

Blooloop (2015). The digital transformation of the British Museum: An Interview with Chris Michaels. Accessed from: https://blooloop.com/features/the-digital-transformation-of-the-british-museum-2/

British Museum (2008). *Strategy to 2012*. Retrieved from: https://www.britishmuseum.org/pdf/Towards_2020-The_British_Museum_Strategy.pdf

British Museum Collections Documentation Committee (1991). Report to the Director. Privately shared.

Brunninge, O., & Melander, A. (2015). The dynamics of path dependence on the individual, organizational and the field levels: MoDo, the Kempe family and the Swedish pulp and paper industry 1873–1990. *Management & Organizational History*, *11*, 189–210.

Bucheli, M., & Wadhwani, R. D. (2014). *Organizations in time*. Oxford: Oxford University Press.

Cardinale, I. (2018). Beyond constraining and enabling: Toward new microfoundations for institutional theory. *Academy of Management Review*, *43*, 132–155.

Casey, A. J., & Olivera, F. (2011). Reflections on organizational memory and forgetting. *Journal of Management Inquiry*, *20*, 305–310.

Cevolini, A. (2016). *Forgetting machines: Knowledge management evolution in early modern Europe*. Leiden and Boston: Brill.

Dahlström, M., Hansson, J., & Kjellman, U. (2012). "As we may digitize"—Institutions and documents reconfigured. *Liber Quarterly*, *21*, 455–474.

Decker, S. (2014). Solid intentions: An archival ethnography of corporate architecture and organizational remembering. *Organization*, *21*, 514–542.

Esposito, E. (2008). Social forgetting: A systems-theory approach. In A. Erll (Ed.), *Cultural memory studies: An international and interdisciplinary handbook* (pp. 181–189). Berlin and Boston: De Gruyter.

Feldman, R. M., & Feldman, S. P. (2006). What links the chain: An essay on organizational remembering as practice. *Organization*, *13*, 861–887.

Foster, W. M., Suddaby, R., Minkus, A., & Wiebe, E. (2011). History as social memory assets: The example of Tim Hortons. *Management & Organizational History*, *6*, 101–120.

Garde-Hansen, J. (2011). *Media and memory*. Edinburgh: Edinburgh University Press.

Gibson, J. J. (1986). *The ecological approach to visual perception*. Hillsdale, NJ: Erlbaum.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Berkeley: University of California Press.

Godfrey, P. C., Hassard, J., O'Connor, E. S., Rowlinson, M., & Ruef, M. (2016). What is organizational history? Toward a creative synthesis of history and organization studies. *Academy of Management Review*, *41*, 590–608.

Griffiths, A. (2010). Collections online: The experience of the British Museum. Address at CODART Dertien Congress, Rotterdam, 30 May–1 June 2010. Available at https://www.codart.nl/images/Events/CODARTDERTIENcongress_Antony%20Griffiths.pdf

Hansen, P. H. (2007). Organizational culture and organizational change: The transformation of savings banks in Denmark, 1965–1990. *Enterprise and Society*, *8*, 920–953.

Hatch, M. J., & Schultz, M. (2017). Toward a theory of using history authentically. *Administrative Science Quarterly*, *62*, 657-697.

Higgins, C. (2006). Into Africa: British Museum's reply to ownership debate. *The Guardian*. Retrieved from: https://web.archive.org/web/20160926170548/ https://www.theguardian.com/world/2006/apr/13/arts.artsnews.

Hooper-Greenhill, E. (1992). *Museums and the shaping of knowledge*. London and New York: Routledge.

Howard-Grenville, J., Metzger, M. L., & Meyer, A. D. (2013). Rekindling the flame: Processes of identity resurrection. *Academy of Management Journal*, *56*, 113–136.

Humphries, C., & Smith, A. C. T. (2014). Talking objects: Towards a post-social research framework for exploring object narratives. *Organization*, *21*, 477–494.

Hutchby, I. (2001). Technologies, texts and affordances. *Sociology*, *35*, 441–456.

Hutton, P. H. (1993). *History as an art of memory*. Hanover: University Press of New England.

Kaplan, S., & Orlikowski, W. J. (2013). Temporal work in strategy making. *Organization Science*, *24*, 965–995.

Khaire, M., & Wadhwani, R. D. (2010). Changing landscapes: The construction of meaning and value in a new market category: Modern Indian art. *Academy of Management Journal*, *53*, 1281–1304.

Kieser, A. (1994). Why organization theory needs historical analyses – and how this should be performed. *Organization Science*, *5*, 608–620.

Kipping, M., & Üsdiken, B. (2014). History in organization and management theory: More than meets the eye. *Academy of Management Annals*, *8*, 535–588.

Koselleck, R. (2004). *Futures past*. New York: Columbia University Press.

Langenmayr, F. (2016). *Organisational memory as a function*. Wiesbaden: Springer.

Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, *24*, 691–710.

Leonardi, P. M. (2011). When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS Quarterly*, *35*, 147–167.

Leonardi, P. M. (2012). Materiality, sociomateriality, and socio-technical systems: What do these terms mean? How are they different? Do we need them? In P. M. Leonardi, B. A. Nardi, & J. Kallinikos(Eds.), *Materiality and organizing* (pp. 25–48). Oxford: Oxford University Press.

Leonardi, P. M. (2013). Theoretical foundations for the study of sociomateriality. *Information and Organization*, *23*, 59–76.

Leonardi, P. M., & Barley, S. R. (2010). What's under construction here? Social action, materiality, and power in constructivist studies of technology and organizing. *Academy of Management Annals*, *4*, 1–51.

Leonardi, P. M., & Vaast, E. (2017). Social media and their affordances for organizing: A review and agenda for research. *Academy of Management Annals*, *11*, 150–188.

Leroi-Gourhan, A. (1993). *Gesture and speech*. Boston: MIT Press.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology*, *14*, 319–340.

Lippmann, S., & Aldrich, H. E. (2016). A rolling stone gathers momentum: Generational units, collective memory, and entrepreneurship. *Academy of Management Review*, *41*, 658–675.

Macdonald, S. (2011) Collecting practices. In S. Macdonald (Ed.), *A companion to museum studies*, Vol. 39. (pp. 81–97). Oxford: Blackwell.

Marquis, C., & Tilcsik, A. (2013). Imprinting: Toward a multilevel theory. *Academy of Management Annals*, *7*, 195–245.

McCutcheon, D. (1986) The British Museum. In R. B. Light, D. Roberts, & J. D. Stewart (Eds.), *Museum documentation systems: Developments and applications* (pp. 131–142). London: Butterworths.

Mills, A. J., Suddaby, R., Foster, W. M., & Durepos, G. (2016). Re-visiting the historic turn 10 years later: Current debates in management and organizational history – an introduction. *Management & Organizational History*, *11*, 67–76.

Mordhorst, M. (2013). Arla and Danish national identity – business history as cultural history. *Business History*, *56*, 116–133.

Nissley, N., & Casey, A. (2002). The Politics of the exhibition: Viewing corporate museums through the paradigmatic lens of organizational memory. *British Journal of Management*, *13*, S35–S45.

Ocasio, W., Mauskapf, M., & Steele, C. W. J. (2016). History, society, and institutions: The role of collective memory in the emergence and evolution of societal logics. *Academy of Management Review*, *41*, 676–699.

Olick, J. K. (1999). Collective memory: The two cultures. *Sociological Theory*, *17*, 333–348.

Olick, J. K., Vinitzky-Seroussi, V., & Levy, D. (2011). Introduction. In *The collective memory reader*. Oxford: Oxford University Press on Demand.

Orlikowski, W. J. (2007). Sociomaterial practices: Exploring technology at work. *Organization Studies*, *28*, 1435–1448.

Orlikowski, W. J., & Scott, S. V. (2008). Sociomateriality: Challenging the separation of technology, work and organization. *Academy of Management Annals*, *2*, 433–474.

Parry, R. (2013). The end of the beginning: Normativity in the postdigital museum. *Museum Worlds*, *1*, 24–39.

Pickering, D. (1766). *The statutes at large from the 26th to the 30th year of King George II*. Cambridge: Joseph Bentham.

Robey, D., Raymond, B., & Anderson, C. (2012). Theorizing information technology as a material artifact in information systems research. In P. M. Leonardi, B. A. Nardi, & J. Kallinikos (Eds.), *Materiality and organizing*. Oxford: Oxford University Press.

Rojas, F. (2010). Power through institutional work: Acquiring academic authority in the 1968 third world strike. *Academy of Management Journal*, *53*, 1263–1280.

Rowlinson, M., Booth, C., Clark, P., Delahaye, A., & Procter, S. (2010). Social remembering and organizational memory. *Organization Studies*, *31*, 69–87.

Rowlinson, M., Casey, A., Hansen, P. H., & Mills, A. J. (2014a). Narratives and memory in organizations. *Organization*, *21*, 441–446.

Rowlinson, M., Hassard, J., & Decker, S. (2014b). Research strategies for organizational history: A dialogue between historical theory and organization theory. *Academy of Management Review*, *39*, 250–274.

Schultz, M., & Hernes, T. (2013). A temporal perspective on organizational identity. *Organization Science*, *24*, 1–21.

Szrajber, T. (2007). *Collection Online. The British Museum Collection Database Goes Public*. Paper presented at Digital Archive Fever Conference, Birkbeck, London, 8–9 November.

Szrajber, T. (2008). *Public Access To Collection Databases: The British Museum Collection Online (Col): A Case Study*. Paper presented at Annual Conference of CIDOC Athens, September 15–18, 2008. Retrieved from http://network.icom.museum/fileadmin/user_upload/minisites/cidoc/ConferencePapers/2008/82_papers.pdf.

Spender, J. C. (1996). Organizational knowledge, learning and memory: Three concepts in search of a theory. *Journal of Organizational Change Management*, *9*, 63–78.

Suddaby, R., & Foster, W. M. (2017). History and organizational change. *Journal of Management*, *43*, 19–38.

Suddaby, R., Foster, W. M., & Mills, A. J. (2014). Historical institutionalism. In M. Bucheli & R. D. Wadhwani (Eds.), *Organizations in time* (pp. 100–123). Oxford: Oxford University Press.

Suddaby, R., Foster, W. M., & Quinn Trank, C. (2010). Rhetorical history as a source of competitive advantage. *History and Strategy*, *27*, 147–173.

Sydow, J., Schreyögg, G., & Koch, J. (2009). Organizational path dependence: Opening the black box. *Academy of Management Review*, *34*, 689–709.

Tan, L. (2013). Museums and cultural memory in an age of networks. *International Journal of Cultural Studies*, *16*, 383–399.

Wilson, D. M. (2002) *The British Museum: A history*. London: British Museum Press.

Walsh, J. P., & Ungson, G. R. (1991). Organizational memory. *Academy of Management Review*, *16*, 57–91.

Yates, J. A. (1993). Co-evolution of information-processing technology and use: Interaction between the life insurance and tabulating industries. *Business History Review*, *67*, 1–51.

Zundel, M., Holt, R., & Popp, A. (2015). Using history in the creation of organizational identity. *Management & Organizational History*, *11*, 211–235.

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