Book Reviews

Memory practices in the sciences
## Geoffrey C. Bowker

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In the book *Memory Practices in the Sciences*, Geoffrey C. Bowker discusses the relationship between infrastructures and supporting information used to record knowledge and construct a memory of science (such as manuscripts, printed matter, archives and data bases, among others); and the development of knowledge and information itself. The author not only considers the technical aspects of this debate, but also their socio-political dimensions.

Executive director of the Centre for Science, Technology and Society of the University of Santa Clara, in Silicon Valley, California, Bowker was the first Regis and Dianne McKenna Professor in Science, Technology and Society. Previously, Bowker worked in the Centre de Sociologie de l'Innovation, Paris and the Graduate School of Library and Information Science in Urbana-Champaign, Illinois. Furthermore, he was a Professor at the Department of Communication at the University of California, San Diego.

With *Memory Practices in the Sciences*, he gives continuity to his academic project initiated in previous works, especially *Sorting Things Out*: *Classification and Its Consequences* (co-authored with Susan Leigh Star, MIT Press, 2000) and *Science on the Run: Information Management and Industrial Science at Schlumberger, 1920-1940* (MIT Press, 1994).

His focus of interest again falls on the field of classification and standardisation and its role within the infrastructure of information, particularly in the development of that which is called scientific "cyberinfrastructure" and its social and organisational features. Bowker is especially concerned about the relationships between these subjects and collaborative scientific work, data sharing and the use of computer science in biodiversity studies. The author defines the central question in this field as being
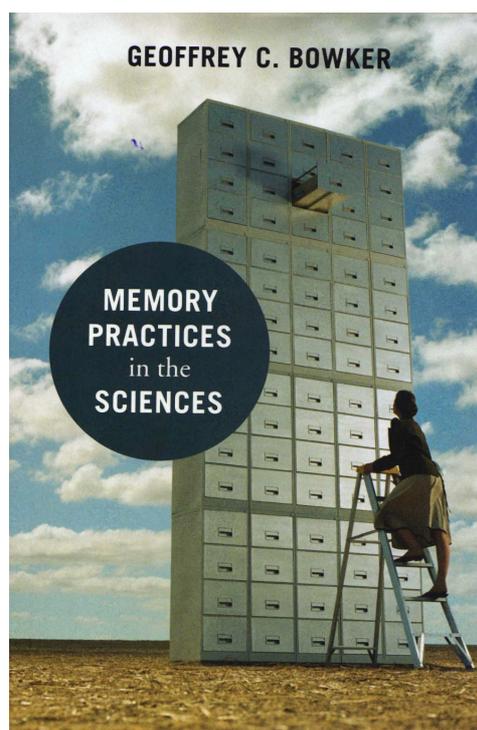
*Cambridge, MA:
MIT Press, 2006.
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how scientists analyse some sciences that contribute to the subject of biodiversity; how they communicate with each other and among themselves in matters such policy formulation - and in particular how data structures and current practices affect this communication.

Through the use of vast multidisciplinary literature, Bowker considers, in *Memory Practices in the Sciences*, the examination of two great issues: (1) How do scientists configure their own past, either as individuals, "land creatures", or as pertaining to a disciplinary line? (2) How do scientists configure the past of their objects - the land, climate and the process of extinction?

The author points out the concerns and intentions of science, as a social institution, to create a *perfect* memory of the past; developing technologies that permit the recording of the pasts' traces, which, conversely, would be forgotten. He highlights that, by means of these traces, they can be understood better as part of a temporal process and larger space.

On the other hand, he argues that the traces we leave - or the records that we execute - do not necessarily correspond to that which we were or to the facts that happened. In truth he deals with a tacit negotiation between us and our future readers, listeners or those who want to come to judge or evaluate us. In the case of texts and other scientific records, many times they tell the history of an ideal past, essentially being concerned that the protocols have been adequately followed.

The act of recording (as for example writing a scientific article) occurs in the scope of a set of collective practices - technical, educational, social - articulated furthermore in a tenuous way that the author defines as memory practices. These range from being totally unaware to being super-aware. They confer utility to our past in the present, in a way to better drive the future. For the author, the interesting thing is to characterise and understand how a set of memory practices are articulated in memory regimes, around relatively constant technologies and practices.

The archive is the unit of space in which memory practices are extended, while memory epochs are their units of time. They are units that make communication and information sharing possible. There is also the concern with interoperability, on the one hand, and with the loss of data that is frequently caused with the changes in information technologies, on the other.

It is emphasised that information infrastructure evolution - especially in information technologies - affects the ways in which we deal with our past, our ability to recover, reconstruct, and forget it. In reality, we think of the past with instruments of our own time and from our social matrices, as well as technologies that we employ in the present, therefore projecting - including onto nature - our ways of thinking and organising them.

The emergence of each memory epoch occurs in association to the development of new recording media, seeing that the limits between these epochs - oral, manuscripts, mechanical, electronic, digital... - are not very clear or evident. The matter of characterising and analysing the circulation of memories occurs through multiple media which are developed by us.

The transition to new memory practice regimes, as well as the increasing valuation of the record on the side of organisations – was not frequent or trivial throughout history, it involved profound transformations in regard to ways of thinking, on both an individual and social plain.

The memory would then be operated by means of a variety of "technical devices", amongst which the author highlights classification and standardisation. Classification is a resource that allows us to forget something that we will need to remember afterwards. Standards and protocols are formal procedures and/or techniques that result from negotiations and commitments, being essential for communication and sharing between those who are involved in a network.

Without professing a linear chronological narrative, the author conveys this discussion from a historical perspective, analysing the ways of networking support material and technological information and the nature of producing knowledge, throughout the last 200 years. Its starting point is the Industrial Revolution in England, arguing that it is was here that new archiving methods were developed - and the new underlying scientific memory practices.

Industrialisation at the beginning of the nineteenth century, in Europe, is considered an important moment in the increase of historical awareness. In a similar way, the period of 1870-1914 is seen as being particularly significant in the recent history of memory practices, with the intensification of concern about standardisation and classification of information, creating space in the twentieth century for the planning of databases as a central, cultural form.

From there, the author constructs his argument on the basis of scientific analysis of the specific methods of reconfiguring of scientific knowledge at three historical points and in three scientific fields, which he calls "memory epochs": the geology of the nineteenth century, mid-twentieth-century cybernetics and today's sciences of biodiversity. The current epoch is baptised by the author as "the epoch of potential memory".

He begins by drawing a parallel between the transformations in nineteenth century geological science and the change in perspectives of time and memory since the Industrial Revolution, taking the form of a "second nature" completely "archivable" - monetised time, mechanised time and standardised time, essential to the globalisation process that would deepen in the following century.

Next he comments on the cybernetics of the post World War II era, whose emphasis falls into the functional similarities between mind and machine, human and non-human systems. Cybernetics thus began as a metascience to which several disciplines would be subordinated, requiring the development of a common language, however also bringing indignity by scientific memory.

He then covers memory practices in the emergent science of biodiversity. This requires the interaction and cooperation of scientific fields and many diverse geographic regions, generating an enormous mass of data and information, simultaneously making the development of unified databases and the compatibility between many classification systems difficult.

Digital archiving reveals the emergence of a new regimen of technologies that intend to conserve - but also to mold - the experience. This new regimen now permits a new flexibility, a new *texture*, a new mobility of global to local and vice versa. It furthermore makes possible the aggregation of data involving much more complex and diversified operations - such newness is not a quantitative capacity; already having been developed in the nineteenth century, but principally in its *curves and folds*, its distinct crossings and intersections.

This empirical-analytical statement serves as a conducting wire for the discussion about how memory - and our own conscience - are configured very differently in different infrastructures and information technologies. This material is expressed in a metaphoric way. New mediations, new recording media, new memory prostheses form a new identity already imbricated in these new media. This same information infrastructure is also used in order to speak of ourselves.

The author seeks to demonstrate the overlapping, the traffic and synchrony between the world (and time) social and the natural (and time) world. He argues that information technology, as much as metaphor and materiality, permits the creation of a second middling nature of indexation and archiving, thus eternalising the present and allowing a better understanding of the past. He thus considers that the database and archive - as material substratums and symbolic artefacts - are central elements in the development of *longue durée* knowledge in the West in recent centuries.

For Bowker, then, the act of remembering doesn't lessen recovery of the past. However it is inserted in developing reading concerning current methods. Memory - or the act of remembering - is an instrument of socialisation and relation with the world, a way to mold and to act regarding the present. There are traces of the past in every part and the possibility of accessing them is, by itself, heartwarming.

The exercise of memory is, according to the author, transcendent and inherent, political and personal, allowing a better understanding of our respect and regarding our insertion in the living and inanimate world, in all its complexity. In a similar way, the archive is not simply a stock of useful facts; it is inserted in our sets of actions that contribute in molding the present.

It is a work of great contemporaneity, proving that the fields of information studies and social science studies have much to contribute to each other's mutual enrichment, opening a scenario for new transdisciplinary practices.

With *Memory Practices in the Sciences*, G. C. Bowker received the 2006 Best Information Book award conferred by the American Society for Information Science and Technology (ASIS&T). His next book, in progress, is titled *How to Read Databases*.