Gathering Memory: Thoughts on the History of Libraries

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Maps and libraries are ways of externalising memory and knowledge, making them not only concrete, visible and accessible, but also durable, reproducible, communicable and socially active. Both are linked to processes of totalisation. Maps add together and incorporate individual, particular and partial experiences of a space: they provide a summary and synthesis of points of view concerning a given territory, obscuring their empirical content in order to construct a coherent degree of visibility and intelligibility. Libraries represent the sum of the reading and knowledge of the individual readers who frequent them. A library is one of the places that embody the intellectual, literary and spiritual heritage of a community; it is here that written memory, with its importance as a foundation for identity, can be seen in complete and tangible form.

As a book collection, in other words a place where these material supports for memory accumulate and interact, a library produces symbolic and intellectual effects of a different nature from those of the objects they contain. Just as a small-scale map has a different meaning from those of the many large-scale maps whose synthesis it is, so the power of libraries does not lie solely in the accumulation of the meaning and power of each of the books they contain. For a library as for a map, this accumulation produces effects of meaning which allow us gradually to distance ourselves from experience and specificity and to move towards intellectual understanding, or at least a kind of synoptic view which takes account of global configurations and enables us to make our way at the local or specific level without losing sight of the overall structure. It could be said that both maps and libraries also take us from thinking in terms of places to thinking in terms of relationships, or indeed of correlations, in other words, ultimately, of space. To control a library is to impose a material or mental topography on a collection of objects (books) and to identify relationships of inclusion, of complementarity or opposition, of presupposition and intellectual derivation or genesis between these objects and between the language and knowledge they carry. Maps and libraries are places through which we travel on routes that may be short, long, straight or circular, along the surface or stratigraphic, planned in advance or determined en route by a series of choices. Along the way we load up with knowledge, wisdom and experiences.

I should like to outline some thoughts on the library as place, intellectual mechanism and metaphor. Libraries are places where a number of threads come together in a single knot. These threads relate to the externalisation, organisation, control and use of the collective, cultural memory, including the memory of scientific and spiritual traditions, the different disciplines and literary genres. Through this all-inclusive social memory, which may sometimes be restrictive and imposed, individual memories plot their own

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paths. Thinking about libraries raises issues about accumulation and selection, order and consistency, use and access, and the nature of the underlying intellectual, institutional and political agendas.

My viewpoint in relation to these issues is that of a historian whose field of investigation is the lost library of Alexandria, with periodic migrations into the comparative history of libraries and literary practice.[1] Using this historical territory as a basis for my discussion, I shall outline my ideas concerning the concept of the library itself, the intellectual horizons libraries open up and the strategies for control and organisation necessary for their use by communities of readers. I shall move from a notion of the material library to one of the mental or living library, and then to that of the library of libraries. This path will lead me from inventories to catalogues, to bibliographies and to the universal bibliography.

Along the way I should like to play on the multiple meanings of the Greek word *bibliothéké*. The proper meaning of this term is 'book storehouse',[2] an architectural or movable structure in which books, the material content of the collection, are housed. But it can also be a book containing other books, a book which may be at once both book and library (the Bible for example), library and catalogue. This etymological reminder suggests that a library is at once material mechanism, content and structure (linking the first element to the second).

Some aspects of the concept of the library

Can any material accumulation of writings be described as a library? What is it that defines a library? These questions raise a further question of origins: what was the first library? A library is more than simply a spontaneous creation; it is almost certainly the result of an objective evolution, brought about by a series of shifts in the definition of its contents, aims and uses.

In fact the emergence of libraries does not manifest itself solely through material and architectural features, or indeed through quantitative or qualitative criteria. The crucial element lies in the individual or group view of the collection of material objects otherwise known as books. This view has consequences both for practices of acquisition, conservation and use, and for the intrinsic value conferred on a collection of objects understood as making sense as a whole and as being invested with a symbolic power greater than that of the individual components of the collection taken on their own.

The first presupposition associated with the appearance of libraries is a faith in the power and use value of books, as repositories of practical, technical and theoretical knowledge, of wisdom and truth, of a particular state of the language and a social memory. As a correlation of this belief it must be acknowledged that it is through reading – in other words through a process which has today become a matter of action and sight, but which was for a long time a matter of listening and speaking, sometimes as a group – that this knowledge, wisdom and truth are passed on and that this memory is reactivated.

The power of books[3] can take a great many forms, depending on cultural and social context. A book may be a substitute for a master's teaching of disciples; it may be useful in learning that is not associated with any particular time or place and whose progress and pace may be modified and reversed. The physical presence of the master, or perhaps

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his successors, may or may not be regarded as necessary for the written text to be properly received, for example when norms of permitted interpretation must be defined, or when exoteric teaching (conveyed through writing) must be supplemented with esoteric teaching (passed on through the oral tradition). Books can also be the place where an experience or event that has been fixed in writing is archived and made available for reading, re-reading, reproduction and forecasting, for example in the case of divinatory literature and all the different areas of knowledge based on the observation and interpretation of signs or recurrent phenomena. The archiving of individual cases makes it possible to deduce general laws (for the understanding of healing or exorcism, for example). Books and reading also invite us to share experiences of language, to lend our voices to new utterances – in the case of revealed or inspired texts, to the word of God – and to let different ideas and fantasies into our own minds. In so doing readers resonate (vocally, linguistically, emotionally, intellectually) with the text they are reading. They start out on the path towards another person's thoughts, whether by understanding the meaning, by memorising the actual words or by criticising or refuting what they read, accepting the challenge of going beyond the text. Reading is a visual, vocal and auditory process which also requires the reader's thoughts to follow the thread of an argument or meditation, to share a vision. A book is a tool of learning and stimulator of thought, a kind of cognitive prosthesis which, when consulted, provides information, ideas, coherent logic, knowledge or wisdom. Some types of reading imply a particular combination of writing and thought, and themselves take concrete form in scholarly writing such as annotation, commentary, re-writing, translation or compilation.

The second presupposition underlying the emergence of a concept of the library is that an accumulation of books produces specific effects which cannot be reduced to the cumulative effects of each book taken in isolation. A library is an active, evolving configuration, whose distinct components produce a global meaning through complex relationships of logical presupposition, genealogy, complementarity and mutual explanation. This configuration reveals a new understanding of the interdependence of books and their derivation one from another. Using a library cannot be reduced to reading the books it contains; it also implies reading them in relation to each other, whether in terms of comparison, supplementation, criticism, explanation or investigation, of exploring an area of knowledge in detail or on the contrary taking an overview of it. Such interdependence and derivation may take a great many forms, since not all a library's books are on the same level. Thus it would be possible to construct a typology identifying, for example, libraries centred around an original source text. This might be a revealed text such as the Bible, the Koran or the Buddhist Sutras, or it might be the work of the head of a philosophical school such as Plato, Aristotle or Epicurus, giving rise to spirals of commentary and exegesis. Other categories might be libraries with encyclopaedic ambitions, which collect books from different disciplines for methodical consultation, or libraries whose ambitions are more universalist, for example which seek to include all the literature relating to one or several aspects of culture. Another configuration would be that of the library for scholarly research, where books take on a role as tools for the reading of other books (commentaries, dictionaries, critical editions), or for the exploration of an intellectual problem or a particular field of knowledge (books as a source of information and ideas to be criticised or challenged). Thus, in some situations a library can be a global instrument of knowledge, making it possible to explore the worlds of nature, humanity, time and

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history, through the manipulation, mobilisation and recombination of what they have to say. The act of bringing together books relating to the same discipline or theme may reflect an intellectual or educational project, based on a cumulative model of knowledge or the dialectics of a critical comparison of discourses.[4]

Libraries came into being at a time when the accumulation and preservation books were becoming linked in a meaningful way. Such an association of practices may occur at different moments: for example a particular heritage maybe judged worth preserving for itself alone, for its economic, sentimental or intellectual worth, or for its role in defining the identity of a community sharing the same faith or philosophy, or that of a school. It may also have a pragmatic place in the juridical framework or political constitution of a regime, or as an element helping to legitimise a ruling group whose power is based on genealogy.

One characteristic of the library as an intellectual tool is that it foresees its own uses. Depending on its own degree of specialisation, its institutional and legal status and the community having access to it, a library may plan for its own use in a more or less restrictive and prescriptive way. However use is always planned, and this may result in particular choices, exclusions and principles of material and intellectual organisation adapted to its various categories of reader. The ergonomics on which a library bases its planning may be minimal or sophisticated; it may mediate between user and books by more or less developed means, including use of space, the principles by which books are arranged, inventories and/or catalogues governed by a range of possible criteria, and interfaces enabling a particular library to communicate with others, or indeed with an entire literary or scientific tradition (bibliographies). Here again a cartographic metaphor seems applicable to the shifts of scale from local to global, which provide different levels of visibility and intelligibility for a particular space.

Fundamentally speaking, a library gives actual material presence to potential knowledge. This potentiality may be fully realised when the library is centred on a particular teaching or corpus of texts that are fundamental to a community; it may remain potential when the size of the collection means that it exceeds the capacities of any individual reader. In such cases the collection opens up a space through which one can take many paths, whether freely or dictated by traditions of training or initiation. Herein lies another fundamental characteristic of a library: it is a space through which a great number of travellers may pass along their own specific routes, some keeping to the well-marked roads while others strike out cross-country. It is at once a well-signposted social space reflecting and developing a group identity and a territory for individual adventures driven by curiosity, intellectual vocation, the constraints of formal learning or the routine of scholarly work.

What is the nature of this potential knowledge? A library is a mechanism for preserving material objects, the inscriptions they contain and the knowledge, wisdom and messages contained in those inscriptions. Some of the people involved in their use are responsible for the material objects, their inscriptions or content, in other words it is the materiality of the object and signs that are important to them; others are concerned with the immateriality of their meanings. This division of labour between librarians and scholars long remained theoretical. However the realisation of the knowledge potentially present in a library presupposes a collaboration between the guardian of the texts and the scholar, who opens up meanings and knowledge with a range of tools – commentary, annotation, the selection of quotations, criticism, comparison or summary.

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Once it has been acknowledged to contain norms of knowledge and language, ideological, linguistic, cultural or religious norms, the words of a master or other sources of textual authority, the library becomes a space for reference, verification and validation. A library is a place where a great many cultural practices become possible: the model of consulting books and studious reading is only one among many. Yet even when a library is a silent island in an ocean of orality, it remains a place where memory is embodied, where tradition and the past have material existence in the present, where transmission occurs in a context of preservation and intellectual use and also of exhibition rich in symbolic effects.

For a library has a particular relationship to time; it could even be said that time is one of its fundamental dimensions. First comes the period during which the library is established, when books are gradually accumulated. At what stage and for what project can a library be regarded as complete? Why should the enrichment of a library be halted? When the creation of a library is consciously planned, it anticipates its future use and its readers' expectations. Those in charge may try to expand or limit the collection, they may remove certain elements or supplement them, sometimes they may reorganise them.

Next comes the period of preservation. The library settles and anchors objects generally subject to the ups and downs, the ebb and flow of all material things; on all it confers the same future. The preservation of books cannot be dissociated from the act of turning them into a collection. They are recognised as having a lasting use value: reading does not exhaust a book's power, nor render it outdated; either the reader will come back to it, or it will pass from reader to reader. The collection's stability and the permanence of its books are moreover the basic conditions that make it possible for the library's didactic, spiritual and identity-preserving effects for the community who share it to continue. The material safe-keeping of the books is a vital element in this process of preservation, preserving the library from the effects of time. It might involve re-binding and repairing books, re-copying texts when their material support is too damaged, transcribing them from one support to another (from scroll to codex) or from one form of writing to another (from majuscule to uncial script) or translating them from one language to another. Each of these processes is a stage enabling the preservation of the desired effects of textual transmission; each is a way of combating physical, intellectual and literal wear and tear on books.

Last comes the period of transmission. The act of establishing a library often involves taking over and centralising existing libraries. It is not possible to establish a library unless written works are already in circulation and without a belief that the accumulation of these works gives them a new efficacy and status at the symbolic, intellectual and political levels. Establishing a library, or re-establishing it if it has been destroyed, means instigating a deliberate, politicised process of transmission: the library comes to symbolise the continuity of the traditions of a family, discipline, corporation, dynasty or community. Its stratification and, sometimes, re-establishment reflect the history of these traditions and, in the case of scholarly traditions, their paradigmatic shifts and crises.

As well as a materialisation of time, a library is also a space through which one can move in accordance with the methodical order of a course of study, whether within a single discipline or across more than one, according to an initatory or spiritual quest or following the unconstrained path of curiosity or research whose direction emerges step by step. Every library must have a topography, a place where books and other texts are

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arranged in terms of the fields of knowledge or traditions to which they belong. A library's users must understand the principles of this topography, which leads from the material to the immaterial. If we accept that scholarly or scientific activity consists in carving out one's own path through this space, readers each identify their own landmarks, project their own maps on this common space.

This leads us to another crucial dimension of libraries, or at least of a certain type of library: its status as an intellectual and material space which can be adopted and shared by a community. In this light the library is an extension of the memory of a group, its space for thought, meditation, prayer or work. In the Ancient Greek world, the few documents relating to the 5th century BC give us a glimpse of the emergence of private libraries belonging to scholars or to young aristocrats, who saw the accumulation of books as an asset in their quest for social and political success. In the 4th century we see the emergence of community libraries, the best example being Aristotle's library, which he made available to his philosophical school. The emergence of libraries is part of a process of education, a contemplative way of life, in which both collective work and individual study involve consulting books. Libraries had a central place in intellectual comradeship based on a communitarian lifestyle. We find this model in the mediaeval monasteries, in the scholarly circles that formed around the libraries of the princes in the Renaissance, in schools, colleges and universities and among professional and vocational groups such as doctors or lawyers.

Aristotle's library contained at least three collections of books. First was the philosopher's personal library, consisting of the philosophical and literary writings of earlier authors. Second came Aristotle's own written works: his treatises, his own working documents and the notes taken by his students as he delivered his teachings. Last are the works of his disciples, their contributions to the school's investigations and their scientific or philosophical treatises.

In this type of model the library is defined by a dialectic of preservation and growth. In it we see the development of forms of intellectual work based on a particular collection of books in order to produce more books. The library is also a place of writing, a *scriptorium*, not just to ensure that the collection survives by recopying texts, but also to ensure its intellectual enrichment through new editions, commentaries and the production of new texts making use of bibliographic resources. Books acquire an instrumental value, in two broad senses. They make it possible to generate knowledge through the investigation, amplification, precision or explanation of the knowledge already inscribed in books. Critical editions, exegesis, paraphrases, summaries and translation are all types of rewriting. We can describe them as elements in a vertical space, in which successive interpretations branch out from their roots in an original text or corpus. These forms of writing contribute to the generation of knowledge by means of redistribution, comparison and centripetal or centrifugal movement. For example they may lead from a multiplicity of written sources to an all-inclusive text that brings all of these together in a synthesis. Conversely they may lead from an all-inclusive text to a multitude of specialised texts concentrating on a more profound understanding of a detail of its overall field. These two movements reveal specific conceptions of the accumulation and progress of knowledge, in which the library plays a central role as a store of experience, knowledge and information and as a source of texts in which reading and writing are inextricably linked.

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Libraries and universality

After these general remarks, I should like to turn now to the library's cognitive effects, and more precisely to one in particular. This involves the user's strategies of appropriation, the dialectics of accumulation and readability and indeed reading itself.

If we accept that, for its owner and the community that uses it, a library opens up an intellectual horizon at once enclosed and panoramic, the extension of this perspective and its ambitions represents an important cultural variable. What matters is not so much the physical and empirical characteristics of the collection as the guiding principles of its founder and the representation its users have of it. Some libraries reflect their use by a professional, technical or priestly group: they contain a corpus of texts for utilitarian purposes or intended for ritual or spiritual use. Others are built up in relation to an educational principle, which defines the corpus of classic texts, and reflect a particular state of the language and of ethical and aesthetic values, as a body of knowledge to be understood. Other libraries form their collections according to an existing classification of literary genres and knowledge, thus privileging a social model of culture, and indeed an encyclopaedic, and in some cases universal, ambition.

We have identified these different forms of library simply to make things easier. In historical reality collections of books were built up according to the hazards of acquisitions, bequests and individual interests. It might be said that the function of a library is as much, if not more, dependent on the practices of its users as on any prior design on which it was based. In the diversity of cultural forms, from Ancient Mesopotamia to the present day and including the Arab world and classical China, the needs expressed through the establishment and use of libraries are historical variables defined by a wide range of criteria, which give writing and the collection of written works their value and specific effects. The encyclopaedic and the universal are categories constructed by each culture in its own language.

One possible thread running through the history of libraries could be that of their relationship to totality and the metonymic link which means that most libraries are partial, local centres of memory, defined by their incompleteness, their gaps and limits. Private and community libraries offer particular intellectual perspectives to their users: when books were copied out by hand, before the establishment of distribution networks in the golden age of printing, libraries provided selections of different texts, which were likely to vary in both letter and overall form. This practical situation created challenges for both authors, who sought to control the distribution of their writings, and scholars, who faced terrible difficulties when it came to the acquisition, identification and verification of the texts they wanted to work on.

These partial perspectives and localised consistencies could however also serve the needs, interests and expectations of their users. Those who were not satisfied could go from one library to the next, could copy texts or have them copied. An empirical comparison of neighbouring libraries, or of inventories of collections and bibliographies, would reveal a series of different gaps.

The early phases of the history of libraries in Mesopotamia, Egypt or Greece reveal the same mechanism of localised, decentralised and autarchic concentrations of memory, which were open to comparison when they served the same communities. This multipolarity also governed the phases of late Antiquity and the Middle Ages, with the coenobitic

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communities and monasteries, the churches and the first universities. Even with the emergence of great poles of attraction with ambitions for a kind of completeness and universality, the centrifugal tendency in the history of libraries continued – and, it could be said, this was just as well for the transmission of texts. The survival of scholarly corpora, at least in the western tradition, was ensured through a decentralised network with a number of centres, which ensured that the circulation of texts operated at both the vertical and horizontal, the spatial and temporal levels. The great centralising concentrations, such as Alexandria or the Chinese imperial libraries,[5] suffered massive destruction, sometimes on repeated occasions. The scholarly heritage could then be reconstituted thanks to the periphery rather than the centre.[6] The internet, as a connection between a great many centres, can be seen as a useful metaphor for thinking about the circulation and transmission of technical, cultural and intellectual knowledge.

Because they were numerous, decentralised, heterogeneous, independent and uncontrollable, these places of memory represented a challenge, a threat and an incitement to authorities seeking to assert the universality of their empire at the symbolic level. Ashurbanipal in Niniveh, the Ptolemies in Alexandria and the Chinese emperors from the Han dynasty onwards are all representative of a process of appropriation and expansion of memory. They have a number of common characteristics. All instigated a centripetal movement in which the periphery was condensed in a central place, in their cases one or several palace libraries. They manifest a conception of power exerted through control of the written tradition in its totality. Some Chinese emperors strongly expressed their concern that private libraries might contain texts unknown to the imperial library. The logical corollary of this approach is to monopolise ownership of such texts by destroying private libraries, along with the political and symbolic threat they represent.

Ashurbanipal, Ptolemy I, the Chinese emperors and the Abassid caliph al-Mansur, who founded Bagdad in 762, all demonstrate the same desire to associate their exercise of power with control of the written heritage. The creation of hyperbolic libraries – although this adjective cannot be applied to al-Mansur – was motivated by political considerations. These libraries can be described as hyperbolic because all other libraries could be never be more than their partial, incomplete or imperfect copies. They embodied the desire, the fantasy of accumulating all written texts in one place and enjoying the symbolic benefits of such appropriation. However totality is a cultural variable. For example the Ptolemies of Alexandria wanted to collect together all the books in the world, and thus to surround the Greek texts with 'barbarian wisdom' that could be domesticated and indeed dominated through translation into Greek, the Jewish Pentateuch and Zoroaster's verses being the most famous examples. However for the Chinese emperors all the books in the world meant the Chinese books, which were enough to saturate the space with absolute memory. On the other hand, the books with which the caliph of Bagdad wanted to fill the library of his House of Wisdom were to be found in Byzantium and the Greek library.

I shall concentrate on Alexandria, with which I am the most familiar.[7] The time, place and purpose of the undertaking are exemplary. The establishment of the library and Museum by Ptolemy I in the early years of the 3rd century BC is a hyperbolic version at state level of the Aristotelian school. The fertility and influence of this intellectual model had been tested in reality, by a community of scholars and philosophers who had gathered around a library to work. Yet the library's purpose and influence change radically

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between Athens and Alexandria. The private library becomes a royal library; it moves from Athens, beacon of classical Hellenism, to Alexandria, a new city which had only just sprung up out of the sand on the fringes of Egypt, land of memory par excellence; it moves from the world of cities, political microcosms fighting over the leadership of continental Greece and the Aegean sea, to that of the Hellenistic kingdoms, whose borders or spheres of influence include not only Greece and its islands but also Asia Minor, Central Asia and Egypt, and which are fighting over the heritage of Alexander the Great. The ensuing division of land and the armed peace that came with it set limits on any dreams of universal empire. Yet universality could be conquered at another, symbolic, level by taking control of the memory of Hellenism as a linguistic, literary, scientific and philosophical space and, more broadly, by capturing and containing the great foreign scholarly traditions.

Alexandria's importance lies in its management of distance. The universal library of Hellenism came into being in another time and another place. It involved the delocalisation, transplantation and artificialisation of memory. The temporal, spatial and cultural break is crucial here. The Hellenism of living traditions, of texts encountered through poetic or theatrical performance and of values and beliefs internalised through rites and celebrations, became a library, an accumulation of papyrus scrolls of many different origins, a mass of material objects which was gradually organised into sections and categories so that the systematicity of the collection could be grasped. Out of this accumulation there arose an entirely new intellectual object: a culture, a literature, knowledge, the Greek language.

The Alexandrian period is striking for a number of reasons. First of all for the very idea that memory might be caught and monopolised by one kingdom among many, through the purchase, the confiscation by customs officials and sometimes the theft of all the books that came within the reach of the king's scouts. Secondly, for the fact that this seizure of material objects conferred a kind of symbolic legitimacy on the capital city and its ruling dynasty. Hellenism, as embodied in books, was no longer geographically tied to Greece, but could move around and become metaphorical. Lastly, for the fact that this absolute, hyperbolic memory generated a whole raft of strategies and intellectual practices intended to render it operational and to make it work.

Alexandria is the moment when Hellenism moves from being a culture of civic performance, ritual and the word as deed, rooted in locality and dialect, to being a library culture of distance and classification, of the expert and practical management of memory. The exponential accumulation sought by the first Ptolemies created a hitherto-unknown intellectual and linguistic space, where everything written in Greek was collected in the same place. Local and regional particularities could be ordered into a system; they gave structure to an encyclopaedia and filled boxes.

Library spaces: topographies of memory

A library is a space both structured and structuring. As both place and collection of objects, a library also implies a form of order, a discipline imposed on memory, the domestication of accumulation. Order and structure are at once the conditions for and effects of this vocation of libraries to produce meanings of a different nature and level

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from those of the individual objects they contain. Through libraries the memory of a culture, its traditions, fields of knowledge and literary genres have a physical existence. Where the palace of the Ptolemies in Alexandria is concerned, Gregory Nagy has discussed the metonymic and metaphorical processes involved in the interplay between the tomb of Alexander ('the body') and the body of literary work in the library, between the Egyptian myth of Osiris, whose body was dismembered and then put back together, and the practices of Homeric philology in the library.[8]

The royal project of gathering together all the books on earth, in all the domains and all the literary genres, soon resulted in the creation of a collection of almost 490,000 scrolls, according to a Byzantine source who apparently based this number on Hellenistic documentation. The figure of 490,000 scrolls does not mean that there were 490,000 different works. One work could cover several scrolls, sometimes a hundred or more. These were the successive 'volumes' of a single text. A library is primarily an arrangement of books in a physical space, which can be represented in terms of walls of shelves. As such the arrangement of the Alexandrian library may have prefigured the compartmentalisation of the *armaria* of imperial Roman libraries, where papyrus scrolls were stocked in racks, perhaps with an external label to assist identification.

Initially the material organisation of the library and its intellectual classifications probably evolved at the same time. There seems to have been a first stage of cataloguing for books coming into the library for the first time; this would involve identifying the work, its author, its former owner in the case of books that had been confiscated or bought, and its geographical provenance. Works were then classified under headings corresponding to the great literary genres and scholarly disciplines. We cannot say with any certainty whether or not these headings corresponded to the material arrangement of the books. The structuring principles of Aristotle's library were probably applied (Aristotle is traditionally regarded as the master of the Alexandrians where library organisation was concerned). A good structure has the quality of remaining stable and operational however many objects it contains. In Alexandria, the change of scale and exponential accumulation of books certainly brought with it a proliferation of structural divisions. The documentation suggests that, faced with the enormity of their task, the first scholars invited by Ptolemy I to run the library divided up the great literary genres of epic, tragedy and comedy between themselves. Their work probably included aspects of true librarianship, such as the identification of works, the reconstitution of scroll sequences in the case of epics and the constitution of corpora of the complete works of the great dramatists, through verification of earlier lists. This process of ordering also gave rise to specific intellectual projects such as philological editions of texts, works of lexicography and monographs of literary history. All these intellectual effects were engendered by the accumulation and laying out of different versions of the same texts – an invitation to philological investigation – or else by the very constitution of the corpora, which made it possible to work on different manifestations of the Greek language, its specialised lexicons and dialects.

As an arrangement of shelves which may or may not have been set in cupboards hollowed out in the thick walls, the library provided an excellent working model for the arts of memory, as Mary Carruthers has demonstrated.[9] She posits the existence of a compartmentalised structure in which scrolls could be stored in an ordered arrangement, like the compartments of bee-hives or pigeon lofts. Like human memory, a library requires

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order and structure in order to function. As Jerome advises, to train one's memory is to construct a library in the mind (*Letters*, LX 10, *PL* XXII, col. 595). This may also mean imagining the library not as an architectural structure but as a chest in which books are arranged, in other words a library one can take anywhere, as suggested by Cassiodorus and Hugh of St Victor.[10]

Unlike a pigeon loft or beehive, a library has the peculiarity of being both a material structure for the ordered storage of books and a mental structure, the latter depending on the former. The books arranged in the compartmentalised memory spaces of the physical or mental library are themselves mnemonic structures – the succession of columns of text on the papyrus scroll or the pages in the codex potentially generate as many distinct memory spaces (but according to different spatial principles) for the storage of quotations, information, words etc. It might be suggested, again on the basis of Mary Carruthers' work, that, while the medieval codices, with their inventive layout, calligraphy and illuminations, are suited to visual memory, the ancient scrolls might have been more suited to a memory of touch and gesture, since they had to be unrolled with one hand and rolled up with the other and required the reader to be able to scroll through a ribbon mechanically.

If we accept that libraries, as physical structures for organising and storing books, provided one of the models of ancient mnemonics, we can assume that the structure of its compartmentalised space enabled people both to find their way around the collection and also to memorise its contents, in other words the books they had read. As a mnemonic device the library is thus both externalised and internalised, material and mental; the isomorphism of the two aspects enables readers to get their bearings in both the collection of material books and that of books read and memorised. There was a continuity of practices between the two and the material library retained a role as a space for the verification, validation and enrichment of the mental library.

A famous anecdote related by Vitruvius[11] tells of an Alexandrian scholar who takes part in a poetry competition before the king in Alexandria and accuses the winner of plagiarism. To back up his claims, the scholar goes into the library and finds the scroll on which the original of the plagiarised poem is written. The king is astonished and appoints him Head Librarian. So it was, apparently, that Aristophanes of Byzantium, one of the most famous grammarians of Alexandria, got his job. Whatever the historical veracity of this story, its interest lies in its vision of the library of Alexandria, where a reader can go to a given section, shelf and scroll on that shelf, to find a text on the scroll. The reader who did this clearly understood maps, in this case a dynamic map involving successive changes of scale, from the library to the position of the text. Ultimately, the material library, with its fixed place in the palace of the Ptolemies, is simply the model, the matrix of a mental library which is portable, mobile and personal. It is also the common reference point allowing scholars to communicate and share the same culture, values and memory, despite the personal nature of their mental libraries. This common reference point could also be used to determine the paternity of texts and to make judgements about spoken poetic performances. For the scholar recognised a text he had read in a text recited aloud and was able to connect this identification with a memory of the location of a single scroll among 490,000.

This correspondence between material and mental libraries recurs in a too-brief allusion by Pliny the Elder,[12] who mentions the great mnemonists of Antiquity: 'As for Charmadas

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of Greece, one could point to any volume in a library and he could recite it by heart, as though he were reading'. This philosopher and member of the Academy, the Platonic philosophical school in Athens, in the 2nd century BC, apparently based his art of memory on the material arrangement of books in the library. The identification of the place where the book was stored enabled him to unroll the scroll in his memory and start reciting its contents, as though reading aloud a text written in his mind. Let us note: he would start reciting its contents; for the beginning of a text has a crucial part to play in both its bibliographical designation and in the practice of those false scholars who unrolled their scrolls only a little way and settled for memorising only the first words, enough to prevent them from losing face when conversing in polite society. It is striking that Charmadas had the same degree of access to both memorised and material books: linear recitation, starting from the beginning of the roll. The material library could thus give rise to a mental library in which books were arranged and where, if necessary, one could take a volume from a virtual shelf, unroll it and start mentally reading it.

The Alexandrian scholars developed a set of strategies to manage the exponential accumulation of books in the library. One of these was the critical edition, which made it possible to create categories of text, as an intellectual construct, among the accumulation of books, and to reabsorb the plurality of copies of the same work into an artificially constructed text.[13] Another strategy consisted of writing books using elements found while reading other books, such as words, facts, thematically redistributed quotations or information re-used in an general historical narrative or geographical description. Alexandria thus enabled the large-scale development of hypertextual mechanisms before hypertext was invented. It enabled long trajectories that passed through the library along one or several thematic or lexical threads to be fixed in writing. This resulted in the production of texts in the form of lists, catalogues, lexicons or compilations on a wide range of subjects including the winds, the names of fish, stones and their properties, the foundation of cities and Greek dialects. In themselves collections of this kind duplicated the dynamics of the library; they were mechanisms for the accumulation, distribution and storage of information, arranged in alphabetical, geographical, chronological or thematic order. They were portable libraries, replacing reading in the library proper by bringing together objects of knowledge or textual fragments in terms of thematic coherence.

In the absence of an index, such compilations enabled readers to take little-used paths across the library space, by decontextualising the crude data extracted from the books read and giving them new meaning and import through their recontextualisation in a new text. These texts, made from bits of other texts, were in fact interfaces between reading and writing. Material of this kind lends itself to infinite recombination. In a dynamic of fluidity and redistribution it represents a moment of stability, fixed and immutable because it is written. Lists, catalogues and enumerations can be seen as the mechanisms of a place of memory: each place has its own information, a word, a bibliographical reference, a fact or quotation. The library is atomised into minimal units of meaning and discourse, which can be recombined and accumulated throughout the process of reading and writing.

These places of lists, catalogues and lexicons in the literature of compilation that grew up within the library have their equivalent in the scholar's memory. While some, such as Charmadas, could recite a text in all its linearity, others, such as the great readers who participated in the scholarly banquets described in Athenaeus's *Deipnosophistes* (late-2nd

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century AD) liked to play with their memories.[14] In their erudite conversations they would delve freely into their mental libraries to find an apposite word, quotation or anecdote, with full bibliographical references: author's name, title and, if possible, scroll number. They were masters of mental techniques giving them random access to their mental libraries, where the borders between books disappeared in favour of a structured topography of textual places that could be called on at will.

This pattern of memory was called up by an interactive game in which members of the scholarly circle put questions to each other, inviting those present to search their mental libraries by author, keyword or generic category. Which ancient author discussed lemons? Which comic poet gives a recipe for this or that dish? Which authors have written on drunkenness or the art of playing the flute? Greed, bulimia and occasional indigestion were the occupational hazards of these compulsive readers, who spent their time drinking, feasting and talking about books.

Their searches, effected in the form of scholarly challenges and society games, turned conversation and the texts in which it was fixed into a hypertext circulating freely through the Greek library along intersecting threads. They provided the scholars with a means of continually testing their memories and the cohesion and coherence of their mental libraries. The text by Athenaeus which recounts these conversations and documents the scholarly practices cites more than 800 authors and more than 2500 texts, most of which have not come down to us. While Renaissance scholars knew how to play the game and recompile this encyclopaedic database with ease, the text has become opaque for the contemporary reader who no longer understands the rules.

A rich vein of Hellenistic and imperial literature was fed by such scholarly practices and by the atomisation of the library and the great literary texts, whether paradoxically split into fragments to glitter like strange objects in the eyes of the most blasé scholars, or compiled into encyclopaedias on the most apparently futile of subjects. These texts were themselves portable libraries, in which the original coherence of many books had been deconstructed so that words, quotations or information could be extracted. These portable libraries were the written, inert version of the 'living libraries' controlled by scholars who were expert at isolating and redistributing words, phrases and a text's objects of knowledge by deconstructing their linearity. In their memories as readers, they were able to configure dynamic databases at will. The scholarly art of memory was made to serve the ceaseless invention of learned topics of discussion. The literature of compilation is merely the temporary fixing of this textual flow, an extreme memory providing ready-cut materials ordered by theme, to be freely appropriated by new readers.

Within this vein Alexandria developed like a large-scale map of the library. It encouraged the scholars of the Hellenistic and imperial period to develop a microscopic approach, crossing the divides between genres and works and subverting the integrity of texts to get down to their word-atoms and aggregates of atoms in the form of quotations, anecdotes and information. These minimal units of knowledge, objectivised and rendered autonomous, were ready and waiting to be compiled into lists opening up strange perspectives on Greek culture. In the work of Athenaeus the readers are anthropologists of their own culture, researching a myriad threads, points of view, connections and discoveries in their material and mental libraries.

The library of Alexandria developed another form of cartography, but with a much smaller scale. This involved stepping back to identify only book titles, authors, how many

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scrolls they covered, sometimes the number of lines or even the first line, and what literary genre or field of knowledge they fitted into. It was an abstract cartography of the piles of scrolls and list of works, in association with their authors and arranged in disciplinary categories.

The *Tables (Pinakes)* of distinguished authors from every sector of culture *(paideia)*, drawn up by Callimachus in 120 scrolls, did not quite achieve the synoptic concision of a world map. Yet the very title of his bibliographic undertaking reveals that Callimachus was the first to demonstrate the Ptolemies that their library was not only a place of accumulation, but also a pole of universality, drawing in the entire culture in all its variety. It was the first work in the genre of the universal bibliography. As far as we can tell, these *Tables* differed from certain earlier directories, such as those of the Aristotelian school, in which the Athenian dramatic texts, for example, were enumerated in terms of a chronology of theatrical competitions. In Callimachus' work, all the theatrical texts are now collected together in the same place, within reach. The order he imposes is no longer that of enumeration in time but of juxtaposition in space. The catalogue imitates the configuration of the library, and it may have been possible to move from Callimachus's subdivisions to the physical spaces where the works were stored.

So Callimachus was creating an inventory space in which it was possible to stabilise the outlines of classical literature, of a Hellenism now past, through precise enumeration, bibliographic identification and the constitution of corpora of complete works. Like the learned compilations which atomised the library in terms of a hypertextual logic, Callimachus's *Tables* provide a map of the library of Alexandria, which could be separated from the territory to become mobile, capable of reproduction and invested with a value and functions that were independent of their place of origin. The catalogue became a bibliographic encyclopaedia and the map of the universal library became the map of the entire written culture. It worked equally well in Pergamo, Rome and all the other centres of culture in the Hellenised Mediterranean and also, of course, in Athenaeus's *Deipnosophistes*.

I should like to end by considering the cognitive effects of this map of books, works and knowledge, which functions as a book that is in itself a library. As Conrad Gesner notes in relation to the Renaissance, the word 'library' also means 'catalogue'. The map identifies with the territory, which it absorbs, dislocates and reproduces.

In the libraries of the Mesopotamian scholars analysed by J.J. Glassner[15], we see the emergence, within the texts themselves, of tablets containing lists of texts. These are inventories of the collection, sometimes with no real order from one tablet to the next, but ordered in terms of fields of knowledge, constituting a systematic bibliography for, for example, the art of exorcism. Such bibliographies invite us to consider what remains of a library if we adopt the point of view of a small-scale map, on which the materiality of books, the thickness of texts is no longer visible and only metadata remains, in the form of descriptive details, unequivocal identifiers and inclusion in classifications and lists.[16]

The link between library and bibliography is constant and reversible. It is the library's inventory, and sometimes the juxtaposition or combination of the inventories of several libraries, that leads to the bibliography, through the work of abstraction which leads from physical books to the work. Some books in the bibliography have been empirically seen, touched and handled. Others are simply mentioned in earlier bibliographies and catalogues. The bibliographic tradition does not like to remove or correct. It adds and accumulates.

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Although maps are abstractions of the territory, they make it possible to recreate the territory once it has been destroyed. Such is the function of catalogues. The history of the Chinese imperial libraries is thus one of a series of re-establishments in which, with almost every change of dynasty, the palace libraries burned[17] and where the preceding bibliography made it possible to reconstitute the store of books. While a map is drawn up on the basis of the concrete layout of the territory, it enables possible retrospective action to modify the principles of physical distribution within that territory and to change disciplinary groupings. Catalogues and bibliographies make it possible to reconfigure the book collection by manipulating the metadata, without actually touching the books. It becomes possible to enumerate, regroup, select, set up hierarchies, classify and adopt several principles of classification simultaneously.

Maps make it possible to develop knowledge about books as objects that can be arranged in series. Here the books themselves are reduced to their identificatory details. The strictly bibliographic identification of the work defines a space into which bibliographical, critical or historical information can be entered. What then appears is knowledge about literary genres, scientific fields and intellectual disciplines; the bibliographic entry in the catalogue becomes an encyclopaedic entry providing a vast spectrum of contextual information.

Alexandria was almost certainly the only moment at which the map could claim to coincide perfectly with the territory, in which the catalogue of the universal library could claim to map the totality of the written culture and to identify all its authors. The destruction of Alexandria marked the end of this utopia. The totality became forever inaccessible, and even Callimachus's catalogue disappeared as well. Before reconstituting the territory, it was necessary to reconstruct the map and to achieve universality and completeness at the level of the catalogue alone, a catalogue which could register the dimensions of the loss and so become a Noah's Art escaping the flood of history with its list of lost books.

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How does a historian's research into the ancient libraries and their associated intellectual practices connect with the thinking of engineers, computer scientists and philosophers in relation to today's technological developments? What are the heuristic effects, the models of intelligibility in circulation between these two worlds?

This dialogue is not simply a matter of juxtaposing opposite poles of history and projecting functioning metaphors, such as that of the hypertext, from one to the other. Nor is it a question of laying the foundations of a linear history in which a social mechanism, such as the preservation of written memory, is historicised by its successive mutations, leading from the clay tablet to computer hard disks, from the niche dug into a wall to the internet library 'without walls'.

Facile correspondences, surface analogies and immediate oppositions must be avoided; however a comparison of this kind can have an exploratory value for scholars dealing with very ancient realities or with the present and future of contemporary ones. The first effect would be to lay the foundations for a new kind of historiographic approach. Can we conceive of a form of cultural history that pays proper attention to the social and technological mechanisms for the production, archiving and transmission of discourses and knowledge and also to the articulation of the artefacts, actions, mental operations and institutional structures that legitimate these uses and define their goals and efficiency?

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History of this kind would be less concerned with observing the diachronic evolution of major functions, such as memorisation, archiving, transmission or visualisation, than with identifying the new divisions established between the technological, mental and social aspects of a given group. It would look at movements, principles of redistribution, forms of access to the written memory, procedures for archiving texts and objects of knowledge and the conditions necessary for their reactivation. How far are social and technological mechanisms constrained and programmed in relation to these uses, who prescribes them and to what symbolic or political ends?

The second benefit researchers might gain from such a dialogue is a certain model for defining their object of study and the questions it raises. For ultimately, the observer of contemporary realities and the archaeologist of the past are both trying to understand the relationship between individual and social practices for the production of meaning and knowledge and the perpetuation of the collective memory by means of external, material supports that enable thought and language to be archived. What kind of mediations make it possible to exploit these strata? What is the relationship between storage technologies and the circulation of knowledge in a particular society at a particular time, and what are the intellectual practices of those who use them? What are the determining factors linking the support, its inscription and the methods for its preservation, circulation and use? The physical limitations of the support and the specificities of writing systems and techniques for reproducing texts determine the ergonomics of reading, in social, vocal, and gestural terms, and also in terms of the mental procedures used by the scientists, scholars and intellectuals, who produce knowledge or new texts on the bases of their reading. Scholarly activities such as memorising and correlating data or decontextualised fragments of text, classifying, archiving and retrieving the information archived, combining empirical data in order to extrapolate a general law and resuming or synthesising a text to produce an edition, critical text or commentary for use in an argument, a meditation or the construction of a new text, are all practices involving mental operations, the manipulation of supports, inscriptions and writing tools, socially defined positions associated with a certain status and sometimes with an institution (in the case of exegetes, grammarians, teachers or librarians for example) and the collective dynamics in which a society's fields and traditions of knowledge unfold. These operations, manipulations and positions define an ergonomics of intellectual, scholarly or scientific work, affecting the influence, objects of study and even the nature of such work for a particular society.

The historian of the distant past and the observer of the present can weave the fabric of a comparatist dialogue: through different societies, technologies, inscriptions and intellectual projects, each will seek to understand how individuals, communities and authorities set about perpetuating and enriching knowledge, transmitting and updating it and imposing interpretations upon it. For example they might investigate the means by which memory is appropriated and controlled, condensed or expanded, accumulated and synthesised, centralised or dispersed. Such categories gain shape and meaning at the point of intersection between intellectual projects, tools and places of work, techniques of writing and the circulation of writing, and indeed forms of political power, institutions and the economy.

Libraries are indisputably an appropriate object for such investigations. Their archaeology poses questions to the modern world about the status of memory and its risks of saturation, about the status of centralising poles of attraction and the concentric or

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reticular spaces they organise and about the adaptation of mental operations for the production of meaning and knowledge to the materiality and ergonomics of supports. Further useful areas for exploration relate to the control of accumulation and the means of classification and synoptic visualisation, the development of discursive and graphic forms enabling reading to be transformed into writing, and research into interfaces which would allow words, ideas, information and quotations to be decontextualised and redistributed according to different intellectual logics. All of these issues raise questions for the new Alexandrias of this 3rd millennium.

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Translated from the French by Trista Selous

Notes

1. Earlier stages in my thinking in this area include: 'Navigations alexandrines: lire pour écrire', in *Le Pouvoir des Bibliothèques. La mémoire des livres en Occident*, M. Baratin and C. Jacob (eds), Paris, Albin Michel 1996, pp. 47–83; 'La Bibliothèque, la Carte et le Traité: Les formes de l'accumulation du savoir à Alexandrie', in: *Sciences exactes et sciences appliquées à Alexandrie (IIe siècle av. J.-C. – Ier siècle ap. J.-C.)*, Actes du Colloque international de Saint Étienne (6–8 June 1996), G. Argoud and J.-Y. Guillaumin (eds), Publications de l'Université de Saint-Étienne 1998, pp. 19-37; 'La bibliothèque et le livre. Formes de l'encyclopédisme alexandrin', *Diogenes* 178, *'Aux origines du rêve encyclopédique '*, 1997, pp. 64–85; 'Vers une histoire comparée des bibliothèques. Questions préliminaires, entre Grèce et Chine anciennes', *Quaderni di Storia* 48, 1998, pp. 87–122.
2. See Isidore de Séville, *Etymologies* VI, 3.1.
3. *Il était une fois le livre*, E. Portella (ed.), Paris, Éditions unesco, La Bibliothèque du philosophe, 2001.
4. For an initial comparative and typological approach to the ancient libraries, see section 'Bibliothèques et lettrés' in *Des Alexandries I. Du livre au texte*, L. Giard and C. Jacob (eds), Paris, Bibliothèque nationale de France 2001.
5. On the Chinese libraries see the crucial work by J.-P. Drège, *Les Bibliothèques en Chine au temps des manuscrits (jusqu'au xe siècle)*, Paris, Publication de l'École Française d'Extrême-Orient, CLXI 1991.
6. See Luciano Canfora, *La Bibliothèque d'Alexandrie et l'histoire des textes*, Université de Liège, Centre de documentation de papyrologie littéraire (CEDOPAL) 1992.
7. Two bibliographical landmarks: P.M. Fraser, *Ptolemaic Alexandria*, Oxford, Clarendon Press 1972, I, pp. 305-335; L. Canfora, *La véritable histoire de la bibliothèque d'Alexandrie*, Paris, Desjonquères 1986.
8. G. Nagy, 'Homère comme modèle classique pour la Bibliothèque antique: les métaphores du corpus et du cosmos', in *Des Alexandries I. Du livre au texte*, cit.
9. M. J. Carruthers, *The Book of Memory. A Study in memory in Medieval Culture*, Cambridge, Cambridge University Press 1990, p. 33 *ff.* See also her contribution to the present issue of *Diogenes.*
10. M. J. Carruthers, *op. cit.*, pp. 43–45.
11. Vitruvius, *On Architecture* VII, Preface, 4.
12. *Natural History* VII.24.
13. See C. Jacob, 'From book to text. For a comparative history of philologies', *Diogenes* 186, April–June 1999, pp. 3–27.
14. For an overview of both the work and this question, see C. Jacob, 'Ateneo, o il Dedalo delle parole, general introduction to *Ateneo, I Deipnosofisti*, Roma, Salerno Editrice 2001.
15. 'Scribes, érudits et bibliothèques en Mésopotamie', in *Du livre au texte. Des Alexandries I*, cit. See also J.-J. Glassner's contribution to this issue of *Diogenes.*
16. This thought was suggested to me by my reading of A. Serrai, *Storia della Bibliografia II. Le Enciclopedie rinascimentali (II). Bibliografi Universali*, Maria Cochetti (ed.), Rome, Bulzoni Editore 1991.
17. See *Diogenes* 141, *'Les bibliothèques'*, the article by Gilles Lapouge: 'Livres en flammes', Paris, Gallimard 1988. *(N.d.l.R.)*

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