Forgetting Machines: Knowledge Management Evolution
in Early Modern Europe

Library of the Written Word

The Handpress World

Forgetting Machines: Knowledge Management Evolution in Early Modern Europe

Edited by

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Knowledge Management Evolution in Early Modern Europe: An Introduction

Alberto Cevolini

We are so accustomed to use computers and digital memories as data storage devices that we are oblivious to the improbability of such a practice. Habit hides what we habitually use. To understand the mere possibility of producing and managing knowledge without digital archives or card indexes, we should resist the obviousness of this common practice with tremendous effort. Practices that were usual centuries ago would be considered improbable today. If we could not store information on external devices – allowing us to forget it – the only option would be to record it in our minds and develop the ability to recall it as needed.

This problem dates back to the origins of Western philosophy. In the mid-fourth century BC, Plato was confronting the ambiguity of writing. Although writing hinders forgetting, it relieves our consciousnesses of the effort of remembering. Writing is not a *pharmakon* of memory; instead, it is a hypomnematic device that encourages scholars to use their mental energies for more abstract – that is, context-detached – operations. In a primarily oral culture, this attitude would have been seen as a type of decadence. Learned men would have gone soft had they trusted external media such as annotations or records. Spontaneously asked a question, without their handy notebooks they would give the impression of ignorance. According to Plato, the true learned man should rather be autonomous. He should not ask for help coming from the outside; instead, he should be able to help himself, especially in face-to-face interactions.[1]

However, Plato himself did not relinquish all of the advantages of writing as a memory aid. If we read the incipit of *Theaetetus* as nearly autobiographical evidence, we see that between the fifth and fourth centuries BC, the use of annotations was widespread among all scholars who aimed to publish their texts.[2] Yet, the absence of treatises on methods of study and scholarly work in Greco-Roman culture makes any conclusion somewhat speculative. In the

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1 Cf. Plato, *Phaedrus*, 274B–278E.

2 Cf. Plato, *Theaetetus*, 143A-C. Euclid tells Terpsion that to recollect arguments developed by Socrates in conversation with Theaetetus, as soon as he was at home he had written down notes (*hypomnémata*) which he had then unfolded, emended, and enlarged until a text in the form of a dialog was ready.

first chapter of this volume, Tiziano Dorandi explores whether it is possible to determine how ancient authors read, chose passages, and gathered excerpts to use in writing their scholarly works. These three stages – *legere*, *adnotare*, and *excerpere* – have been the subject of various interpretations by philologists based on the few extant sources. Nonetheless, they represent an essential outline of what occurred in classical writers' workshops. Dorandi scrutinizes several authors (Plutarch and Cicero, Pliny the Younger and Aulus Gellius, Philodemus and Thucydides) and investigates the meaning of two keywords: *hypomnémata* (Latin, *commentarii*) and *adnotare*. The latter term likely referred to the introduction of marginal signs (*notae*) in the text by the reader himself or by his scrivener (*notarius*). The purpose of those signs was to mark the most relevant passages worthy of being remembered. *Adnotare* also referred to the practice of copying the same passages on external media (waxed tablet or parchment). *Hypomnémata* were a store of raw materials (excerpts, quotations) that had been used to write a text. Following the same *notae*, these excerpts could be organised into headings, thus creating a type of card index. Dorandi's investigations indicate that such a card index was understood as a transitory medium in both the cognitive and the physical senses of the term; it was a transitional stage between knowledge management and the final scholarly work and was not intended to be preserved and continually extended, as the interplay of learned men and modern card indexes rather implies.

During the Middle Ages, scholars continued to read, annotate and record excerpts in this manner. They were following the example of Pliny the Elder who, according to his nephew, took at least one excerpt from every book he read because he was sure that no book is so bad that it offers not a single memorable passage.[3] However, only a century after the invention of the printing press, methods of note-taking became a topic of discussion for scholars and educators who thus produced a literary genre of vast scientific relevance. In this respect, a few years ago, Ann Blair noted that "the history of note-taking has only begun to be written".[4] Ten years earlier, Helmut Zedelmaier argued that excerpting remained a marginal topic in historical studies.[5] This volume aims at emancipating the theory and practice of note-taking from this marginality. In addition, its goal is to use historical evidence – as I will explain below – to test an evolutionary theory of social memory.

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3 Pliny the Younger, *Epist.*, III, 5, 10–11.

4 Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), p. 316.

5 Helmut Zedelmaier, "De ratione excerpendi. Daniel Georg Morhof und das Exzerpieren", in F. Waquet (ed.), *Mapping the world of learning: the* Polyhistor *of Daniel Georg Morhof* (Wiesbaden: Harrassowitz, 2000), p. 75.

To understand radical changes in the intellectual habits of early modern scholars, we must recall the widespread success of the florilegium during the Middle Ages. This type of text was usually compiled privately and for personal use; for the medieval learned man, it was a priceless learning instrument. Florilegia were true copybooks, that is, repositories of redundancy to be stored and managed according to the occasion. This compilation habit had its origins in rhetorical culture and fulfilled the orators' need for a great abundance (*copia*) of topics and arguments, so that when orators were in front of an audience, they could avoid appearing as though they had nothing to say. Eloquence was achieved by avoiding both *inopia* (i.e., lack of redundancy) and *loquacitas* (i.e., redundancy without variety).[6]

The fundamental problem was that the speaker needed a prodigious memory to speak without interruption and in an engaging style. He could achieve this prodigious memory either by nature or by art. In the latter case, he might resort to medicaments or technical devices such as places and images.[7] Artificial memory was therefore a form of 'mental training'. Scholars were aware that such training was necessary to successfully participate in conversations in front of an audience that had great expectations.[8] Nevertheless, this did not prevent the use of writing as a memory aid. A scholar could gather the best passages from his readings and store them in a notebook that could easily grow to the size of an encyclopaedia. Despite its dimensions, this notebook

6 Cf. Terence Cave, *Cornucopia. Figures de l'abondance au xvie siècle: Érasme, Rabelais, Ronsard, Montaigne* (Paris: Macula, 1997), p. 33. Redundancy and variety are terms of art drawn from the mathematical theory of communication developed by Claude E. Shannon and Warren Weaver, *The mathematical theory of communication* (Urbana: The University of Illinois Press, 1949). Redundancy is what repeats and is thus already known and predictable; variety is a surprising event or deviation that has an information value for observers. Every time these terms occur, they must be understood according to this theory.

7 Cf. Francesco Sansovino, *La rhetorica, al magnanimo Signor Pietro Aretino* (In Bologna: Per Bartholomeo Bonardi & Marco Antonio Grossi, 1543), p. 22; reprint in B. Weinberg (ed.), *Trattati di poetica e retorica del Cinquecento* (4 vols., Bari: Laterza, 1970), I, p. 465.

8 Michel Beaujour, *Miroirs d'encre. Rhétorique de l'autoportrait* (Paris: Seuil, 1980), p. 84. In the mid-eighteenth century, David Hume found it outrageous that these expectations had nearly disappeared. No one, he stated, would argue that a short memory is "a reason for a man's failure in any undertaking. But in ancient times, when no man could make a figure without the talent of speaking, and when the audience were too delicate to bear such crude, undigested harangues as our extemporary orators offer to public assemblies; the faculty of memory was then of the utmost consequence, and was accordingly much more valued than at present". David Hume, *Enquiries concerning human understanding and concerning the principles of morals* (London: T. Cadell, 1777; reprint Oxford: Clarendon Press, 1975), p. 241. On this quotation, see also Paolo Rossi, *Clavis universalis. Arti della memoria e logica combinatoria da Lullo a Leibniz* (Bologna: Il Mulino, 2000³), esp. pp. 25–26.

was not understood as a substitute for memory but as a memory aid. It was, in a sense, a duplicate of personal memory; a scholar could resort to it and ask for help any time his memory failed. Thus, it is indisputable that – as Ann Moss noted – "the technology of the commonplace-book as information-retrieval system [was] essentially medieval".[9]

However, and curiously, the commonplace-book reached the peak of its success only between the fifteenth and sixteenth centuries. Indeed, as Ann Blair argued, "strictly defined the commonplace-book [was] a humanist innovation", although when it was re-discovered, it had "a glorious ancient pedigree" in its wake.[10] The reason is that the early typographic industry exploited this tradition for commercial purposes. Indeed, in early modern Europe the success of printing was based on its economic purposes. Printing was a true enterprise and once they could be mechanically reproduced, books were no longer perceived as proprietary goods but as consumer goods whose value (and price) depended on their circulation. Thus, it is unsurprising that one of the most successful literary genres in the first two centuries of the typographic industry were *sylvae* and *polyantheae*, i.e., those gardens or treasures of knowledge that complied with scholars' desires to store all learning in a single book.[11]

This market triggered a circular process. Learned men used printed florilegia as templates to compile their private commonplace-books, which from the very beginning were designed and arranged in order to be printed. This working method was somewhat contradictory: learned men used a standard format to produce a personal treasure of knowledge. Educators also discouraged this habit. The guiding rule was that the best way for students to retain knowledge was to write it themselves because they were supposed to deeply investigate (through the process of writing) the meaning of what they were learning. In addition, it was clear that what attracts attention and is deemed memorable in a book may not be the same for all readers. By definition, information-retrieval is a selective performance; in turn, selection is a highly personalized activity.

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9   Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996), p. 44. See also Mary Carruthers, *The book of memory. A study of memory in medieval culture* (Cambridge: Cambridge University Press, 1990), p. 176: the florilegium was "the essential book of memory", and annotations preserved in this book were "memorative both in origins and purposes".

10   Ann Blair, "Humanist methods in natural philosophy: the commonplace book", *Journal of the History of Ideas*, 53: 4 (1992), pp. 541–551, at p. 541.

11   See Paolo Cherchi, *Polimatia di riuso. Mezzo secolo di plagio (1539–1589)* (Rome: Bulzoni, 1998).

Finally, the scholarly motto was "notae propriae, notae optimae" (your own notes are the best notes).[12]

By the sixteenth and seventeenth centuries, the practice of note-taking was so widespread that historians speak of a true 'commonplace mentality'. Printing technology enhanced this practice. As a consequence, the "desire for copiousness of material became almost an obsession", as Joan Marie Lechner noted.[13] Scholars knew that there were a potentially unlimited number of places where knowledge might be stored. They also realized that the quantity of material they could fit in notebooks could become unwieldy. Social scientists may therefore wonder how the florilegium – an essentially medieval information-retrieval technology – could function as a requisite for the eventual invention of archives.[14] My hypothesis is that we may find the answer if we combine historical evidence with the principles of a neo-Darwinian theory of evolution.

One of the most difficult questions of evolutionary theory has always been that of transitional stages. Darwin himself recognized this difficulty and only after meticulous investigations did he note that, indeed, the same structure can perform different functions, although only one of them is primary.[15] In turn, the same function may be performed by different structures. Thus, evolution takes advantage not only of the redundancy of a determinate structure with respect to the variety of functions that must be performed to preserve adaptation but also of the redundancy of a determinate function with respect to the variety of available structures.

One telling case in knowledge management is the alphabetical index. In medieval scholarship, the index was used not only to quickly recover topics in a manuscript but also as a memory aid. Between these two functions – *facilitas*

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12   See also Ann Blair's essay in this volume, esp. § 11.4.

13   Joan Marie Lechner, *Renaissance concepts of the commonplaces* (New York: Pageant Press, 1962), p. 77 and p. 168.

14   Here, the term 'archive' must be understood as a memory model. As reference works, see Elena Esposito, *Soziales Vergessen. Formen und Medien des Gedächtnisses der Gesellschaft* (Frankfurt am Main: Suhrkamp, 2002), esp. Ch. 4; Elena Esposito, "Social forgetting: a systems-theory approach", in A. Erll and A. Nünning (eds.), *A companion to cultural memory studies* (Berlin and New York: Walter de Gruyter, 2010), pp. 181–190.

15   Charles Darwin, *The origin of species by means of natural selection* (London: Murray, 1872[6]; reprint Chicago et al.: The University of Chicago and William Benton, 1952), Ch. 6, p. 87. See also the valuable article of Ernst Mayr, "The emergence of evolutionary novelties", in S. Tax (ed.), *Evolution after Darwin. 1. The evolution of life* (3 vols., Chicago: The University of Chicago Press, 1960), I, esp. p. 360ff.

inveniendi and *ordo rerum* – the latter was primary. This is proven by the fact that although scholars followed an alphabetical order, in the index Adam came before Abel because Adam was the first man created by the Lord.[16] However, just a century after the invention of the printing press, in discussing the functions of an alphabetical index in encyclopaedic works made to be consulted instead of perused, Conrad Gessner argued that these functions are essentially two: the reader can resort to the index either to recollect what he has already read ("ut *reminiscatur* quae legerit") or to retrieve information ("ut *nova* primum *inveniat*").[17] Gessner convincingly defended the index against those who argued that cunning students could misuse it, thus indulging their laziness, and he made clear that something in the relationship between reader and book had changed over time.

Usually, an evolutionary transition occurs when a primary function becomes secondary, then disappears, whereas a previously secondary function becomes primary and consequently affects the structure that performs it. After the transition, one could say that a new structure is an old structure that was co-opted to perform a new function.[18] In a sense, the same structure had previously solved a problem that no longer exists, whereas later it solves a problem that previously did not yet exist. However, evolution is not the outcome of a design, and it goes unnoticed when it occurs. This is why early modern scholars did not immediately realize that the education that they encouraged in the art of note-keeping (in the firm belief that it was a type of memory training) was instead a way of forgetting learning. The same book of commonplaces, as Joan Marie Lechner aptly noted, was "in some ways very similar, yet in others quite different from the ancient one".[19]

The reason for ambivalence is that what had been conceived as an aid was unintentionally used as a substitute for individual memory. Consequently, the

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16 Cf. Anna-Dorothee von den Brincken, "Tabula alphabetica. Von den Anfängen alphabetischer Registerarbeiten zu Geschichtswerken", in *Festschrift für Hermann Heimpel zum 70. Geburtstag* (2 vols., Göttingen: Vandenhoeck & Ruprecht, 1972), II, pp. 900–923.

17 Conrad Gessner, *Pandectarum sive partitionum universalium ... libri XXI* (Tiguri: Apud Christophorum Froschoverum, 1548), Book I, Title XIII, § 2, p. 20a-b (italics added).

18 In this respect, Anton Dohrn formulated the 'principle of functional change'. Current evolutionary theory speaks of 'preadaptive advance' or 'exaptation'. Cf. Anton Dohrn, *Der Ursprung der Wirbelthiere und das Princip des Functionswechsels. Genealogische Skizzen* (Leipzig: Verlag von Wilhelm Engelmann, 1875), esp. p. 60; Mayr, "The emergence of evolutionary novelties", p. 377; Stephen Jay Gould, "Darwinism and the expansion of evolutionary theory", *Science*, 216 (1982), pp. 380–387; Stephen Jay Gould and Elisabeth Vrba, "Exaptation: a missing term in the science of form", *Paleobiology*, 8 (1982), pp. 4–15.

19 Lechner, *Renaissance concepts*, p. 170.

idea of artificial memory assumed a different meaning than it had in rhetorical culture, which however in the Renaissance remained very lively. Meanwhile, the functional change in the use of artificial memory transformed the structure of knowledge repositories in increasingly radical, yet subtle ways.[20] These repositories were so fully stocked with material taken from books that it was clear no one had ever been able to memorize their content. Indeed, it was also clear that no one had any intention of doing so. Scholars could nonetheless cherish the hope that by frequently re-reading what had already been digested, they would be able to retain the most valuable information. However, the relief of forgetting was incomparable. By a certain point, if one had asked these scholars whether their commonplace-books were substitutes for memory instead of tools for enhancing memory and improving recollection, their answer would have been both.

The transition to a new cognitive habit does not occur suddenly. If it is true that the invention of printing technology profoundly changed the nature of intellectual work, it is also true that this change did not happen without some contradictions. In this respect, Koji Kuwakino's essay sheds light on how media affect the evolution of knowledge management. In analysing the printed works of three valuable representatives of the Renaissance revival of ancient mnemotechnique (i.e., Filippo Gesualdo, Cosma Rosselli and Lambert Schenkel), Kuwakino investigates the transitional stage (between the second half of the sixteenth century and the first half of the seventeenth century) that led to the decline of the art of recollection and the emergence of a new form of artificial memory based on the use of secondary memories. One of the most striking manifestations of this transition is early modern scholars' use of space for storing knowledge.

In the rhetorical art of memory, as is well known, space was an essential device for storing memorable content. Through a complicated assimilation of Aristotle, Cicero, and Quintilian's instructions, ancient mnemotechnique was successfully taught during the Middles Ages and then stormed into the Renaissance. The main rule of artificial memory was to create a virtual space, i.e., a storehouse (*thesaurus*), which should be organized into places (*loci*), e.g., rooms and gardens, in which the orator could arrange the active images (*imagines agentes*) that he would employ in due time in order to recall memorable

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20   Richard Yeo speaks of 'subtle shift in function' of notebooks. Cf. Richard Yeo, "John Locke's 'New Method' of commonplacing: managing memory and information", *Eighteenth-Century Thought*, 2 (2004), p. 9; Richard Yeo, "Notebooks as memory aids: precepts and practices in early modern England", *Memory Studies*, 1: 1 (2008), p. 130.

facts and words. Consequently, knowledge management and production were similar to 'local motion'.[21]

One might wonder why memory was managed spatially, even though it is a temporal performance. In short, there are two reasons. First, space is a type of order that ensures consistency because what is here cannot simultaneously be there. For this simple reason, space fulfils one of the essential functions of social memory.[22] Second, if the recollection of things and words is based on semantic associations triggered by images, then these images must be placed somewhere. This arrangement cannot be chaotic; it must follow an order that in turn may be easily memorized.

Kuwakino's investigations clearly demonstrate that during the Renaissance, scholars relinquished virtual spaces which reproduced natural spaces (such as palaces, cities, or the cosmos) and adopted more and more artificial virtual spaces, built up as Chinese boxes or mathematically arranged containers for storing millions of mnemonic active images that no one had been able to recollect (§ 2.3 and § 2.4). The artificiality of these artificial spaces – this second-order artificiality – is compelling evidence of the difficulties that scholars were experiencing. Although they were reluctant to relinquish the old-fashioned mnemotechnique, they attempted to keep pace with the enormous and, above all, unlimited growth of knowledge produced by the printing industry. Space was no longer suited to this task, not because it was inconsistent but because to keep up with the times, space should become *infinite*. This expansion contradicted a core rule of the ancient art of recollection, according to which the rhetorical storehouse should be built up with well-defined boundaries and should be neither too big – otherwise it enhanced forgetting – nor too small – otherwise it could not store all indispensable knowledge.[23] Eventually (and paradoxically), the rhetorical storehouse collapsed because of its unlimited expansion.

Another clear example of confusion during the transitional stage is Schenkel's attempt to combine both space and indices, that is, the ancient and the modern rules for checking consistency (§ 2.7). His intention was first to compile a commonplace-book of excerpts taken from readings and arranged into headings according to the studied disciplines. The second step was to move these topics to the virtual space (to the storehouse) to fix them in the mind.

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21   Cf. Lechner, *Renaissance concepts*, p. 151; Mary Carruthers, *The craft of thought. Meditation, rhetoric, and the making of images 400–1200* (Cambridge: Cambridge University Press, 1998), Ch. 1.

22   Cf. Esposito, *Soziales Vergessen*, esp. p. 158ff.

23   "Et magnitudine modica et mediocris locos habere oportet" (*Ad Her.*, III, § 31).

To use the commonplace-book, Schenkel's advice was to maintain an index so that the reader would not waste time looking for a certain topic. Nevertheless, the struggle between index and space was clear: the former device implied a relief of mind, the latter device led to the saturation of cognitive energies. Or to put it in more effective terms: the former device encouraged forgetting, the latter device compelled one to remember. In short, Shenkel's hesitation concerned the possibility that the commonplace-book, which had been designed as a memory aid, could be converted into a substitute for personal memory. In external form seemingly nothing had changed, thus scholars had a job understanding where the difference actually lay.

However, this evolutionary advance took a century to establish. Helmut Zedelmaier's investigation of the German educational practice of note-taking and the respective pedagogical reflection on the art of excerption around 1700 clearly demonstrates that only in the second half of the seventeenth century, scholars acquainted themselves with the idea that a card index could be used as a type of secondary data storage, independent of the individual memory. Zedelmaier scrupulously studies the rise and fall of the art of excerpting in the German milieu from the first manual on excerption in the German language, published by Christoph Just Udenius in 1681, to the article "Ueber die vorzüglichsten Methoden Collectaneen und Exzerpte zu sammeln", published by Johann Friedrich Blumenbach in 1786. During this century, several widespread opinions were strengthened, several theories were corroborated but also severely criticized. However, the outcome was an exciting debate that generated resonance even in universities and private academies and regarded excerption as a subject for academic teaching and dissertations. At the end of the eighteenth century, according to Zedelmaier, excerption was still a common practice among scholars but it was unfortunately largely disappeared from the public discourse on scholarly knowledge and scientific studies. Some relevant issues of this debate are worth being briefly mentioned.

First, while dealing with rules and methodological principles, learned men focused on the construction of titles or headings (*tituli*, *capita*) as metadata (to put it in modern terms) which should be chosen wisely because they guarantee the functionality of the index card, particularly the quick retrieval of materials recorded in notebooks. Second, more and more learned men praised movable slips as substitute for bound books. The reason was that loose file cards are best suited to the construction of an unlimitedly expandable knowledge container – the problem that Schenkel could not disentangle, as we have seen. Third, despite criticisms, it was the firm belief of teachers that excerpts do not simply imply the production of sterile and pedantic *collectanea*, but they represent an essential requirement for enhancing 'independent thought'.

According to Zedelmaier, the manual on excerption as a literary (or educational) genre became extinct with Bertram's *Discours von der Klugheit zu Excerpiren*, published in 1727. In the second half of the eighteenth century, the art of note-taking was of marginal importance in German academic culture. Apparently, only in natural sciences this topic still had some relevance. In the already mentioned article on the best methods for gathering excerpts, for instance, Blumenbach held the opinion that a good filing system should save time and be efficient. Slip boxes have the advantage of flexibility because they ensure the possibility of re-arranging paper slips in whatever order according to the purpose of research; thus, they are to be preferred to bound books. However, little more can be found on this subject at the end of the eighteenth century. Nonetheless, despite the lack of handbooks, it seems that scholars never gave up the personal use of card-indexing systems, as Élisabeth Décultot's survey demonstrates.

Décultot's essay focuses on the role that the art of excerption and its outcome (i.e., knowledge repositories) played in scholarly work, especially during the eighteenth century. The core hypothesis of Décultot's investigation is that during this period, particularly in German-language milieus, excerption played an ambivalent role: learned men vacillated between the revival of an ancient and glorious practice and the questioning of a humanistic tradition they increasingly felt to be a burden from which they wanted relief (§ 4.1). Through a detailed analysis of the scholarly experiences of many contemporary learned men – among others, Jean Paul, Johann Joachim Winckelmann, and Friedrich Andreas Hallbauer –, Décultot highlights some of the most relevant features of this ambivalence.

First, between the seventeenth and eighteenth centuries, early modern scholars replaced pre-arranged systems of *loci* with looser and less-confined excerpting systems, for instance, *adversaria* or *miscellanea*.[24] The opinion shared by many German readers was that it was substantially more efficient to use more flexible classification methods, which allowed readers to customize the organisation of their studies and the selection of materials with a view to future works. This opinion was widespread. As Décultot notes, the "emancipation from fixed humanistic classification models was a phenomenon encountered on a European scale" (§ 4.2). Second, what was excerpted was increasingly subjected to the reader's critical assessment. Although this habit was also a part of the ancient art of excerption, from the seventeenth century onwards, scholars were less interested in emulating the past than in exploiting the past as a virtual repository of knowledge for the exploration of

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24   On this crucial development, see also Michael Stolberg's essay in this volume.

the unknown (§ 4.3).[25] Third, this new relationship with the past changed the meaning of the distinction between copy and originality. On the one hand, the use of excerpts was subjected to sharp criticism because it led to sterile copy-work, if not to plagiarism. On the other hand, scholars recognized that without an extensive knowledge of the past, no one would be able to produce interesting work. In short, only by working with what was already known could one hope to be original.

These three changes clearly demonstrate that, as Décultot writes, notebooks were assuming new functions. This conclusion validates the hypothesis of the evolutionary theory, according to which the triggering point of any advance is a functional change in a structure that was previously used to perform a different function. In appraising this historical and cultural situation, it is easy to see that the turning point for the invention of a true 'forgetting machine' is the early modern use of notebooks as secondary memories.

The ambivalent use of commonplace-books both as memory aids and as substitutes for psychic memory was matter under discussion also by contemporary scholars. One of the most striking examples is found in a short dissertation presented by Andreas M. Stübel in June 1684 at the University of Leipzig, and which otherwise is relatively derivative. Returning to Drexel, Stübel deemed the notebook to be a *secondary and subsidiary memory* ("*memoria secundaria & subsidiaria*"). Obviously, Stübel was aware that the two terms were the horns of a dilemma, so he disentangled this ambivalence in a highly scholastic manner by stating that excerpts *per se* are a mnemonic aid ("memoriae subsidium"), but *per accidens* they are a substitute for personal memory ("desidiae adminiculum").[26] However, evolution always occurs through the selection of accidental differences without a design. Thus, it is unsurprising that also in this case evolution selected the option that Stübel deemed accidental, whereas it eventually eliminated the option that Stübel called essential.

However, Stübel's ambivalence never completely disappeared. In a relatively new form, it has been revived by some recent developments in cognitive psychology and philosophy of mind. Richard Yeo's essay is concerned with this topic. His starting point is a relatively theoretical question: the correct meaning of the term 'external memory'. Yeo studies several contemporary sources, paying particular attention to the learning experiences of three major figures (Robert Boyle, John Locke and Robert Hooke) involved in the Royal Society of London's scientific activities during the second half of the seventeenth century

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25   On this reassessment of the past, see also Elena Esposito's remarks in this volume.

26   Andreas M. Stübel, *Exercitatio academica de excerptis adornandis* (Lipsiae: Literis Johannis Coleri, 1684), p. 33.

and arguing that annotations that are stored in the external memory can function only in tandem with internal memory, so excerpts and notes prompt recollection of more than what they actually contain (§ 5.7).

Indeed, the academic discussion of external memories is influenced by the idea that such memories are a type of 'extended mind'.[27] Unfortunately, this definition contains a source of confusion: consciousness and communication are not clearly distinguished and consequently, memory is seen as an essentially psychic phenomenon. Moreover, philosophers very often fail to explain whether what is extended is the mind or cognition. It is not even clear what 'extended' actually means.

The same problems arise when one is dealing with the idea of 'external memory'. This idea implies a distinction between internal and external in which 'internal' is represented by the mind. However, the theory of society tells us that this approach is disputable. Indeed, one of the most striking aspects of social memory is that whereas individual memories fade and eventually disappear, knowledge remains. This observation is also valid with respect to primary orality: knowledge is socially managed through communication, although at least one consciousness is required to perpetuate communication. Writing and (later) printing do not perform a distinction between psychic and social events; instead, they simply clarify this difference and, compared with social interactions, which require the presence of communication partners, they provide communication with substantially more possibilities for reproducing meaning relationships.

The profound change in the mnemonic habits of learned men in early modern Europe is thus much more complicated than it appears; it asks for a conceptually more sophisticated description. If the systemic reference is communication, memory is always *inside*. In other words, both information processing and knowledge management occur during communication by means of communicative requirements. From the standpoint of a single individual who contributes to the social system through a conversation or a written text, memory is *outside of* but not *independent from* psychic performances.[28] This observation leads back to Richard Yeo's argument.

A theory that was very successful in the second half of the twentieth century states that evolution implies an increasing 'exteriorization' of individual

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27 Richard Yeo refers to the much-discussed article written by Andy Clark and David J. Chalmers, "The extended mind", *Analysis*, 58: 1 (1998), pp. 7–19; reprint in Richard Menary (ed.), *The extended mind* (Cambridge, MA: The MIT Press, 2010), pp. 27–42.

28 Niklas Luhmann, *Die Gesellschaft der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1997), p. 217.

memories.[29] However, the main hypothesis that inspired this volume is that evolution must be re-described as *a shift in the structural coupling of communication from consciousness to machines*. Obviously, this does not imply the exclusion of consciousnesses from the constitution of social memory. As we have seen, consciousness is a basic requirement for reproducing communication. In addition, the only operations that can reproduce and manage meaning are communication and consciousness. However, consciousness cannot communicate and consequently, communication is required to share redundancy.[30] From the standpoint of social memory, communication exploits psychic systems as 'transitory depots'[31] for topics that are understandable without too much explanation and have the capacity to promote (in principle) unlimited communication.

Historical research has shown that in the space of a century, the typographic industry demonstrated that both the variety of topics and their infinite possible combinations were beyond the capacity of any single consciousness. At the same time, no one would relinquish the many advantages of printed books, including easy access to knowledge and the relief from the burden of copying. The result was the invention of forgetting machines: commonplace-books, card indexes, and libraries. In short, archives. The coupling of learned men and machines not only assured the adaptation of social systems to an environment that had become substantially more complicated than ever before but also amplified information overload using the same instruments that had been designed to tame it. In other words, learned men who acquainted themselves with the mechanical reproduction of texts realized that training their card indices was much more effective than training their minds. This is the basis of the fundamental shift in which the structural coupling of communication moved from consciousness to machines.

As two different operations, consciousness and communication have two different forms of memory. Not everything contained in the memory of an individual becomes socially accessible, and not everything that society remembers is equally relevant to all individuals. When early modern scholars discuss the utility of secondary memories such as the commonplace-book,

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29   André Leroi-Gourhan, *Le geste et la parole. La mémoire et les rythmes* (Paris: Albin Michel, 1965); Italian transl. *Il gesto e la parola. La memoria e i ritmi* (Turin: Einaudi, 1977), Ch. 9, pp. 302–312, at p. 307.

30   Social system theory as a whole is based on this assumption. Cf. Niklas Luhmann, *Soziale Systeme. Grundriß einer allgemeinen Theorie* (Frankfurt am Main: Suhrkamp, 1984), Ch. 4.

31   The concept of 'transitory depot' (*Zwischenspeicher*) is drawn from Luhmann, *Die Gesellschaft der Gesellschaft*, p. 217.

they know that communications that contain scientific claims are more effective if scholars employ a personal archive instead of simply trusting their mental capability. The meaning of the relationship between natural and artificial memory also changes. 'Artificial' is no longer the rhetorical art of memory based on imagination; instead, it is the use of a "machine [designed] to make and gather excerpts", as Daniel Georg Morhof defined the wooden filing cabinet (the so-called *Ark of Studies*) invented by Thomas Harrison in the 1640s.[32]

If the meaning of the relationship between natural and artificial memory changes, then so do methods of remembering and forgetting. The exploration of a storehouse is quite different from the exploration of a scholarly machine. Whereas in the former, scholars entered the storehouse virtually – through imagination – if not physically, an archive is a *black box* by definition, and users interact with it from the outside through search engines – for instance, an alphabetical subject index.[33] Yeo's inquiry clearly demonstrates both that contemporaries experienced this change not without some confusion and that they employed a trial-and-error system – to put it in modern terms. For example, although Robert Boyle trusted his prodigious personal memory, he continued to entrust his theoretical speculations and the results of his empirical experiments to several loose notes. When it was too late, he understood that these two mnemotechniques conflicted, and the reason is clear: the former is based on the mind's ability to remember, whereas the latter encourages scholars to forget.

On the other hand, notes alone cannot speak. Moreover, they must not be stored in the filing cabinet haphazardly if they are to be retrievable when the user requires them. In early modern Europe, the solution was revealed by the keyword 'order'. In this respect, the indexing system cleverly thought up by John Locke (§ 5.6) may be understood as one among several methods employed to create order in an archive. This way of ordering is significantly more abstract than the order of places in a storehouse. Today, anyone using

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32   Cf. Daniel Georg Morhof, *Polyhistor, literarius, philosophicus et practicus* (Lubecae: Sumptibus Petri Boeckmanni, 1747⁴), Book III, Ch. XIII, § 53, p. 713: "ad excerpendum et colligendum machina".

33   Esposito, *Soziales Vergessen*, p. 240ff. See also Alberto Cevolini, "Indexing as preadaptive advance: a socio-evolutionary perspective", *The Indexer*, 32: 2 (2014), pp. 50–57. The term *black box* is drawn from cybernetics and refers to any system (psychic system, machine, communication system) that cannot be internally explored. The user can trigger the box (input) and search for consistency in its reactions (output). Although the relationship input/output can result in a type of transparency, the box remains black (i.e., unpredictable). Cf. William Ross Ashby, *An introduction to cybernetics* (London: Chapman & Hall, 1956), Ch. 6.

an alpha-numerical indexing system such as Locke's to explore a common-place-book would quickly understand both that such an archive (as Richard Yeo notes) was conceived to "reduce dependence on memory" and that this method "allowed one to forget, thus relieving the memory and yet also providing a means of finding required material at a later time".[34]

Under these circumstances, how is recollection possible? Obviously, the matter is no longer to find one's bearings in a storehouse, searching for vivid images that can help the orator recall what he has forgotten. Scholars now train themselves to interact with a machine that must be prompted by inquiries (usually keywords), and they wait for the machine's reactions. Users – as Yeo reasonably assumes – must make a contribution, but what actually occurs is not so much the prompting of the users' psychic memory; instead, a true communication process is triggered that exploits the machine's ability to surprise, i.e., to produce information. And what eventually becomes socially visible is the elaboration of meaning that communication has reproduced by means of communication. This is indeed the advantage of books: they may be used as operative links (they can be quoted, interpreted, and discussed) precisely because readers do not need to know what was in the minds of their authors.

A further question is raised in Chapter 6: what does it mean that the card index, like any archive, is 'futurecentric'? The main hypothesis is that the open-ended structure of the card index is the co-evolutionary outcome of the operational closure of the social system of science in a period during which the printing press established itself as a mechanical reproducer of texts. To verify this hypothesis, I analysed many features of Renaissance commonplace-books and of card-indexing systems based on loose file cards.

One of the most striking features – compared to the rhetorical mentality – is that from the very beginning, the card index was conceived of as endlessly extendable (§ 6.1). In the Middle Ages, scholars were warned against the temptation of reading too many books because in a culture of memory, an excess of information cannot be preserved in the mind and therefore knowledge is forgotten. If we compare Hugh of St. Victor's warning against the desire to read an infinite number of books and Jeremias Drexel's excitement about the possibility – supported by his annotation method – of reading six hundred authors in a day and selecting from them the best passages to be stored in a commonplace-book, we understand that the evolution of cognitive habits was triggered by a deviation that early modern scholars welcomed as an incomparable innovation (§ 6.3).

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34   Yeo, "John Locke's 'New Method' of commonplacing", p. 24.

The card index is open-ended not only in a physical sense – new file cards and new entries can be added to existing ones without limits – but also in a structural sense. Once knowledge has been dismembered into loose entries, in principle there is no limit to the production of links and cross-references between excerpts. This structure enlarges the combinatory power of the machine, making it unpredictable. The striking effect is that whereas in the rhetorical storehouse attention was exploited to search for active images with the goal of recollection, when the user interacts with a filing cabinet he pays attention in order to discover latent truths, as Robert Boyle argued (§ 6.1). In other words, users who trigger the combinatory potential of a card index hunt for what is still unknown and shift their cognitive energies (newly relieved of the burden of memorization) to processing information. How was such a revolution of knowledge management and production possible?

While the commonplace mentality was establishing itself during the Renaissance, the declared intention was to select and gather the best from circulating books and to produce, with the help of these printed works, a sort of private 'universal library' without walls. At the same time, the typographic industry also enabled the circulation of substantially more redundancy than in the culture of manuscripts, which prompted in readers the desire to read something new whenever they bought a new book. In fact, the relationship (and reciprocal expectations) between authors and the reading public is very different than the relationship between orators and the listening public. Anyone who wishes to be successful as an author is expected to adapt to these expectations. In the second half of the seventeenth century, learned men were encouraged to look not for what was there but – paradoxically – for what was lacking in the books of others and to attempt to write something new because, as Muratori put it, most of beauty consists of novelty (§ 6.4). The process is recursive because an open future continually changes the past one has to deal with in order to say something interesting. As Daniello Bartoli argued, one who looks for solutions (i.e., what others did not find) finds problems (i.e., what others never searched for), thus begetting an advancement of learning that has no goal and therefore, no end. Finally, the operational closure of scientific communication creates the unlimited possibility of further knowledge production, a possibility that society can manage through secondary memories. The open-ended structure of these memories is assured by a self-referential closure; in short, secondary memories themselves have an inner order that allows for exploration and information processing.

Iveta Nakládalová's essay demonstrates that many scholars saw this reform of knowledge management as an opportunity to restore the alliance between rhetorical culture and metaphysics. By thoroughly interpreting Johann Amos

Comenius' works, Nakládalová shows that the Moravian theologian and polymath understood the method of *excerpere* as a valuable instrument for starting an encyclopaedic enterprise whose goal was to produce a book that could be used as "Store-house of Universall Learning". Thus, the practice of *excerpere* and the pansophical project were tightly coupled: the former was suited to realizing the latter, whereas the latter gave an orientation to the former. Nakládalová stresses that behind Comenius' encyclopaedic design there was an essentially gnoseological apprehension of the world. Pansophy was understood as a 'System', an 'ordinary Clocke' that should consistently reproduce the order of the universe. Pansophy was regarded as a 'new Anatomy of the Universe'.

However, this gnoseological design was somewhat contradictory. First, Comenius was persuaded that no book should be printed unless it contained *new* things. As we have seen above, the printing press had created a huge redundancy; in response, scholars began to appreciate knowledge variety. This did not mean simply adding new quotations to the same headings but instead, hunting for information that could start new disciplines or even reform the order of knowledge – a problem that the founders of early modern libraries also experienced. By definition, openness to the future and the wish for a universal system of knowledge were in conflict. Comenius was persuaded that once it had been realized, Pansophy would relieve men of the "never-ending trouble with libraries"; however, as Nakládalová observes, this opinion made a strong case against the practice of excerpting and we may reasonably doubt that Comenius, who had a high opinion of Drexel's treatise on the art of excerpting, was not aware of it. Moreover, the intention of grasping the true order of the universe in a systemic manner was an effect of that early modern transitional stage during which the printing press was seen as an opportunity for fulfilling the medieval dreams of having all learning contained in a single book. However, it also tempted scholars to use their relieved cognitive energies to explore the unexplored.

Indeed, in the sixteenth century, rhetoric still played a crucial role in the organisation of knowledge.[35] This primacy also affected the idea of commonplace and the use of notebooks. In turn, printing spread this practice through the use of vernacular languages instead of Latin. In this respect, José Aragüés Aldaz's contribution is valuable for two reasons. First, it investigates the first

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35   This persisting type of knowledge management is the reason why in this volume contributors refer to the Middles Ages and early modern period as to 'rhetorical culture' or 'rhetorical memory model'. Only in the mid-sixteenth century, memory begins to be removed from rhetoric and to be regarded as a part of logic. Cf. Rossi, *Clavis universalis*.

treatise on rhetoric published in the Castilian language, and its guidelines on the best method of compiling a commonplace-book. Second, it covers a region that has seldom been considered by studies of Renaissance educational reform and the use of filing systems. Aragüés Aldaz addresses Miguel de Salinas' 1541 work *Rhetórica* with special focus on the third appendix, which discusses the best way of reading books and selecting all memorable quotations worth preserving for future use (§ 8.4). Salinas returns to the famous treatise *De copia* by Erasmus of Rotterdam and teaches students to restrain their "disordered appetite for knowledge" by using a commonplace-book arranged into headings. Unsurprisingly, the keywords for this practice are 'abundance' (*copia*), 'brevity' (*brevitas*), and 'order' (*dispositio*). To recover stored materials, Salinas recommends maintaining two indexes (*tabulae*): a subject index that contains all notebook entries in the same order in which they were originally arranged; and an alphabetical index. In this way, both requirements of a Renaissance scholarly reader could be met: the ability to quickly retrieve topics from one's own private archive and the capability – which learned men were not yet willing to relinquish – to memorize subjects to use in oratory. However, only evolution – as mentioned above – eventually determined which of these two functions would be the primary one.

When an old structure used for organizing information retrieval – in this case, the index of commonplaces stored in a copybook – is transformed by a new function, the cognitive habits of scholars who manage knowledge are compelled to adapt this structural change. This process develops as a positive feedback loop. A minor change in structure begets changes in cognitive habits; in turn, these habits enhance those structural features that improve the cognitive function (for instance, a strictly alphabetical order); finally, the selected structure reinforces changing cognitive habits. This process is based on the difference between *use* and *disuse*. Darwin noted that use leads to the functional *specialization* of a structure, whereas disuse leads to the opposite effect: *atrophy*.[36] Thus, scholars' concern for the decline of memory during the transitional stage is understandable but in a sense, groundless. What atrophies when new media (such as writing or printing, today also digital media) enhance social memory is simply psychic memory.

Many contemporaries deemed this change in habits somewhat advantageous. For instance, Samuel Hartlib annotated in his diary that according to the jurist Jacques Cujas "hee is a Learned Man non qui multa legit sed qui can fitly turne to Authors et use them according to his occasions. Non qui multa

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36   Darwin, *The origin of species*, Ch. 14, esp. p. 225ff.

memoria teneat sed qui optima in libris optimis posset invenire".[37] Against the background of the rhetorical education that had transmitted the art of memory, this annotation reveals that the interaction with filing cabinets was perceived by scholars as an art of forgetting. In this respect, we can grasp the meaning of evolution in the use of forgetting devices. Indeed, it would be meaningless to compile an alphabetical index of the vivid images stored in a rhetorical storehouse and it would be equally meaningless to use vivid images to recollect all entries in a filing cabinet. Probably for the same reason Giulio Camillo's theatre was unsuccessful: memory also claims consistency in the choice of criteria that ensure consistency.

All that notwithstanding, the relationship between memory and evolution appears ambivalent. On the one hand, evolution hinders forgetting; on the other hand, evolution fosters forgetting. Both writing and printing enable users to remember substantially more than before because these media allow users to forget substantially more than before.[38] Therefore, evolution complies with – so to speak – the main function of memory, that is, forgetting, and frees up information processing possibilities which otherwise would be saturated by the need to recollect.

The great advantage of archives is that learned men can entrust memorable bits of knowledge to a machine and be certain that if the machine has been properly constructed, they will be able to recover them. This type of retrieval is quite different from the exploration of a rhetorical storehouse. Orators who wandered about gardens and palaces of memory searching for active images were well aware that the architecture of these spaces, along with the associations of meaning embedded in images, should not change. As we have seen above, space is an effective memory device because it ensures consistency: the orator can move through a space searching for images because the space itself is unmoving. And recollection occurs, in a sense, as a syllogism in which premises lead to conclusions.

In the card index, everything is different. To argue that the filing cabinet simply stores records would be to give a too short (and therefore misleading) description of the interplay of user and machine. The effectiveness of this machine does not lie in the sporadic access that it provides to single entries, or in what these entries, once selected, may teach the user. A card index is a true secondary memory when whatever inquiries become an opportunity to

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37   Hartlib Papers 29/2/49A, Ephemerides 1634, Part 5.

38   Cf. Niklas Luhmann, *Das Recht der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1993), pp. 245–246; Luhmann, *Die Gesellschaft der Gesellschaft*, pp. 578–579; Esposito, *Soziales Vergessen*, esp. p. 24ff. See also Elena Esposito's contribution to this volume.

trigger a network of associative references and links which give birth to 'collaborative' reasoning that had not been previously designed.[39] User selectivity is combined with machine selectivity and this combination is exploited in order to produce further irritations. Moreover, the filing cabinet – if one looks at it from a distance – is a repository of entries without a centre and without hierarchies. Compared to the storehouse, this arrangement is advantageous. The utmost freedom of recombination is produced by the utmost loosening of knowledge. In addition, the filing cabinet may preserve everything because it is not designed to preserve something specific. For this reason, materials can be arranged in alphabetical order, that is, without any concern for their content.[40] The outcome is that the machine does not preserve memories, i.e., combinations but does preserve memorability, i.e., combinatory potential. In this sense, the archive is a 'virtual memory':[41] instead of restoring memories, it allows users to construct memories in a highly selective way.

Evolution shows itself also in involutional resistance. Plato's criticism of the use of writing is revealing because of its outcome: to be efficient, this criticism should be written. This contradiction raises some doubts about the credibility of the criticism itself, despite the fact that Plato camouflaged the contradiction by using writing as if it were a recording of an oral conversation, that is, in a mimetic way compared with that type of face-to-face interaction that he attempted to rescue from decline. During the Renaissance, the enthusiastic revival of commonplacing led to increasingly standardized methods that even created the possibility of delegating annotations and the control of the card index to a specialized staff. Intellectual activity thus became a type of 'scholarly bookkeeping'.[42] Some scholars believed that this bookkeeping was a sign of the advancement of learning, whereas others felt that it was a sign of alarming decay. At the end of the seventeenth century, learned men warned against the 'excerpt-addiction' (*Excerpir-Sucht*) that had afflicted scholars seduced by

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39   On this topic, see also Markus Krajewski's essay in this volume.

40   In this respect, cybernetics speaks of 'undifferentiated encoding'.

41   Krzysztof Pomian, "Les archives. Du Trésor des chartes au Caran", in P. Nora (ed.), *Les lieux de mémoire* (Paris: Gallimard, 1997), p. 4008. See also Esposito, *Soziales Vergessen*, esp. pp. 302–303.

42   See the title of the handbook on excerpting systems published by Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689). On the metaphor of scholarly bookkeeping, see also Anke te Heesen, "Die doppelte Verzeichnung. Schriftliche und räumliche Aneignungsweisen von Natur im 18. Jahrhundert", in H. Tausch (ed.), *Gehäuse der Mnemosyne. Architektur als Schriftform der Erinnerung* (Göttingen: Vandenhoeck & Ruprecht, 2003), esp. p. 271ff., and Élisabeth Décultot's essay in this volume.

typographic culture.[43] Too often, the commonplace-book was a simple compilation which no one was able to curb. The danger was that instead of stocking their head with knowledge, scholars stocked their filing cabinet with headings, leaving their heads empty.

In this parody, early modern scholars rediscovered the well-known rhetorical rule according to which learning should be entrusted to personal memory instead of to books, and preserved in the mind instead of in a closet. However, they too revealed a certain annoyance for what they perceived as 'pedantry', that is, piling up scholarly notions and quotations without reasoning. As Charles Sorel put it, pedantic people behave like people who stock their rooms with weapons but never leave for the war.[44]

Despite these criticisms, the art of excerption was not forgotten. In the eighteenth century, it was still widely employed and it further contributed to the launch of empirical science. This point is investigated by Fabian Krämer, who focuses on another relevant effect of the invention of the printing press: the changed function of reading. As Elizabeth L. Eisenstein already proved in her well known historical survey, in the seventeenth century the assumption that the printing press had replaced the cult of the book with the observation of nature was a commonplace.[45] The mechanical reproduction of texts did trigger a more complicated change. Indeed, the printing press created a public space in which anybody who was able to read could freely access available knowledge. This space combined a high degree of anonymity (knowledge is like the language we speak, it does not belong to anyone)[46] and a high degree of

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43 Cf. Élisabeth Décultot, "Introduction. L'art de l'extrait: définition, évolution, enjeux", in É. Décultot (ed.), *Lire, copier, écrire. Les bibliothèques manuscrites et leurs usages au XVIIIe siècle* (Paris: Centre National de la Recherche Scientifique, 2003), pp. 7–28, at p. 11. In his contribution to this volume, Helmut Zedelmaier shows that around 1700, this criticism no longer referred to the danger traditionally associated with excerpting, that is, the loss of individual memory, but to the students' incapability to develop independent thinking. However, Zedelmaier also shows that many contemporary scholars already regarded this criticism as 'partial' and misleading because, if practiced 'prudently' according to systematic rules, excerption promotes rather than stifles independent thought.

44 Charles Sorel, *Supplement des Traitez de la connoissance des bons livres* (Paris: Chez André Pralard, 1673), p. 15. In a sense, this is the modern version of the rhetorical *loquacitas*.

45 Cf. Elizabeth L. Eisenstein, *The printing press as an agent of change. Communications and cultural transformations in early-modern Europe* (2 vols., Cambridge: Cambridge University Press, 1979), II, p. 453ff.

46 Cf. Ephraim Chambers, *Cyclopaedia, or an universal dictionary of arts and sciences* (2 vols., London: Printed for James and John Knapton, 1727), I, p. xxix: "To offer a thing to the Publick, and yet pretend a Right reserved therein to one's self, if it be not absurd, yet it is sordid. The Words we speak; nay, the Breath we emit, are not more vague and common than

personalization (knowledge must be authored). One who set foot in this place could observe how others managed and produced knowledge and in turn, he could present himself as an author with arguments. Although science encouraged the direct observation of phenomena, scientists could not overlook the results of others' observations, which the printing industry spread throughout society. Thus, the observation of nature was coupled with the observation of observers who made themselves visible through printed texts.

Albrecht von Haller's intellectual experience investigated by Fabian Krämer is a case study that aptly verifies this hypothesis. Scrutinizing Haller's extant reading notes, the thousands of book reviews the Swiss scholar authored, and his *Bibliotheca medica*, Krämer shows that Haller's reading practice was based on two basic requisites: the critical assessment of available knowledge by means of *iudicium*, and the selection of valuable information. The scholarly instruments of Haller, that is, book reviews and the Baconian literary genre of *Historia literaria*, demonstrate that Haller's intention was to gather all available knowledge about a scientific discipline, to check for what could be discarded and what should be stored instead, and eventually to establish a starting point for future discoveries, that is, for the advancement of learning. According to Krämer's investigations, the method best suited for this type of enlightened reading remained the art of excerpting. Indeed, in the eighteenth century many journals, handbooks, and encyclopaedic works were deemed to be compilations based on excerpts, and no scholar was willing to relinquish the cognitive advantage of bits of knowledge retrievable in a highly selective, i.e., methodical way, which saved him both time and energy.

The final contributions of the first part of this volume fill a gap in the literature on the early modern art of note-taking. They address the use of commonplace-books by physicians, on the one hand, and the habit of hand-writing annotations for personal or collaborative purposes, on the other hand. Michael Stolberg's essay investigates the note-keeping systems of academically trained physicians between the end of the sixteenth century and the seventeenth century. Stolberg's inquiry into personal, unpublished, and manuscript notes is valuable for at least two reasons. First, it enables a comparison between theory and practice, between abstract rules taught at school or in academic rooms, and the personal experience of physicians who had no intention of publishing

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our Thoughts, when divulged in print". See also Maurizio Mamiani, *La mappa del sapere. La classificazione delle scienze nella* Cyclopaedia *di E. Chambers* (Milan: Franco Angeli, 1983), esp. p. 11ff., p. 29ff., and pp. 49–50; Richard Yeo, "Ephraim Chambers's *Cyclopaedia* (1728) and the tradition of commonplaces", *Journal of the History of Ideas*, 57: 1 (1996), pp. 157–175, at p. 162: encyclopaedia actually was an "extended commonplace-book".

a book on the art of excerption or being successful as authors. Second, Stolberg's study on medical note-keeping systems sheds light on the emergence of early modern inductive medicine, whose aim was to reach general rules starting from the empirical observation of individual cases.[47]

Stolberg first sketches a typology of medical notebooks and distinguishes three types: plain notebooks, commonplace-books, and practice journals or casebooks. Although this overview of different kinds of medical note-taking intentionally aims at being explorative and descriptive, Stolberg explains the differences, advantages, and disadvantages of these filing methods, along with the reasons why some methods were more successful than others. The results of this inquiry are quite informative.

First, it is clear that, although students were encouraged during their academic education to compile their personal commonplace-books following a textbook approach best suited to the memorization of the discipline, by the time they began their medical practice physicians relinquished the previous approach and replaced the academic commonplace-book with loose notebooks that allowed them to record any information without worrying too much about a pre-arranged order. The advantages were clear: physicians not only saved time and paper but also freed up their minds by relying on a diligently updated index for retrieving information as the need occurred. In short, the commonplace-book was designed for coping with an unpredictable future, not preserving and repeating the past. Second, the use of such repositories for empirical knowledge challenges the assumption that note-keeping was an essential way to escape the excess of knowledge produced by the printing press – i.e., a solution to the problem of information overload. Stolberg's inquiries actually prove that on the contrary, physicians' notebooks were designed to arrive at valid generalizations from individual observations, thus improving diagnostic and prognostic practices, which was only possible by scrupulously keeping records about patients, diseases, medicines and their effects.

Ann Blair's contribution investigates a counter-intuitive fact: whereas until the end of the Middle Ages learned men dictated and delegated their scholarly annotations and the final handwriting of their works to 'invisible helpers' (also

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47   A desideratum for future research still remains a discussion of legal note-taking and excerpting. In the continental tradition, the practice of creating legal arguments in a series of points, and of generating finite anthologies of laws and rules from the Corpus Juris Civilis offers a history that is well worth recording alongside the one relating to natural philosophy, medicine, and literary creation. Unfortunately, there is no modern specialist who has discussed this at length (for this valuable remark, I am indebted to the anonymous reviewer of this volume).

in Greco-Roman culture a widespread habit, as Dorandi's survey has proved), after the invention of the printing press they wrote by themselves. During the Renaissance, in other words, scholars displayed an increasing interest in autonomy, both while reading and while selecting information to be hand-written in a notebook. The question is why, during a period without writing machines, scholars delegated writing to helpers, whereas during the period characterized by the typographic industry – the so-called *ars artificialiter scribendi* – scholars chose to handwrite.

Following Ann Blair's inquiry, it can be argued that the reason is tied to how available media shape knowledge management and production. In this respect, it is indisputable that until early modernity, orality had primacy over writing. This hierarchy had a twofold effect: knowledge was seen as a personal virtue, something that lies in the minds of individuals. Moreover, to be successful in conversation, scholars needed to have a well-trained memory. For the same reason, reading was mostly done aloud: this both fostered mnemonic retention and better fixed words and arguments in the mind.[48] In short, culture was an oral-aural performance which developed in the form of dialog,[49] whereas writing played the subordinate role of memory aid – notwithstanding all objections raised against composition by dictation and concerns about privacy, the control of texts, and the opportunity for more time for speculation.

As seen above, the printing press revolutionized information processing in service of what was by then usually called 'erudition'. Many handbooks on note-taking (especially those produced by Jesuits, as Blair aptly highlights) taught students to annotate by themselves because in this way, they were compelled to linger over the excerpted subject and to rewrite what they read – a type of repetition that helped the mind retain the selected passages. This educational rule produced a somewhat odd effect already observed above: note-taking and the respective construction of a card index were considered both a substitute for personal memory and a memory aid. As I tried to explain, contradictions and ambivalences of this kind are usual in transitional stages and may be understood as signs of evolutionary advance. After the introduction of a new

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48   On silent and aloud reading, see Paul Saenger, "Silent reading: its impact on late medieval script and society", *Viator*, 13 (1982), pp. 367–414; Paul Saenger, "The separation of words and the order of words: the genesis of medieval reading", *Scrittura e Civiltà*, 14 (1990), pp. 49–74; Paul Saenger, *Space between words. The origins of silent reading* (Stanford: Stanford University Press, 1998). Reading systems also affected the form and function of punctuation. On this point, see Alberto Cevolini, "Punteggiare la comunicazione e comunicare la punteggiatura", *La Bibliofilia*, 111: 3 (2009), pp. 301–307.

49   As reference work, see Walter Ong, *Ramus, method, and the decay of dialog. From the art of discourse to the art of reason* (New York: Octagon Books, 1979).

medium such as the printing press, the personalization of vivid images with which orators filled their storehouses is replaced with the personalization of annotations to which scholars entrusted not only the excerpts taken from others' books but also their own reflections and empirical observations. Because of this personalization, as Ann Blair reminds us, Francis Bacon was sceptical that a scholar had been able to use others' annotations.[50]

Nonetheless, there is a circle within the printing press that encouraged delegation: peer groups that engaged in collaborative note-taking (§ 11.4). This practice is still one of the less-studied aspects of the early modern culture of note-taking. Moreover, the very fact that it was coupled with the use of a wooden filing cabinet made of removable loose entries (similar to the scholarly chest invented by Thomas Harrison) is telling: it reveals a mentality that gradually accepted the idea that knowledge is not a personal virtue but a social production and that its management is not contingent on consciousness but on communication. In Harrison's slip box, as in modern libraries or archives, one finds communicative 'hooks' (in both the metaphorical and concrete senses of the term), not the mental states of a compiler. If the card-indexing system has been properly constructed, every entry is an opportunity to reproduce information and prompt the self-reproduction of communication.

According to many contemporary scholars, this instrument was best suited to the compilation of an encyclopaedia. However, encyclopaedia was by then conceived of as an open work – nearly an oxymoron for late-medieval learned men. Filing cabinets containing removable entries ensured extreme flexibility and collaboration for the members of a scholarly staff. Ephraim Chambers was one of the first learned man who intentionally and in an almost programmatic way promoted the cognitive advantages of filing systems. At the beginning of the eighteenth century, with the publication of his *Cyclopaedia*, he inaugurated the 'Commonwealth of Learning' that digital media would eventually transform into a world collaborative project.

The following question could be raised: what remains of this revolution in the methods of scholarly work after the eighteenth century? The contributions that form the appendix to this volume attempt to provide some answers and cues for further research. On the one hand, they display some of the most valuable results of the modern theory and practice of excerption; on the other hand, they attempt to explain the evolutionary change prompted by digital media. Before I come to some provisional conclusions, it is necessary to spend some few words on these developments.

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50   On this Bacon's observation, see also Richard Yeo's essay in this volume.

In recent years, several inquiries have demonstrated that scientists never ceased to use filing cabinets during the nineteenth and twentieth centuries.[51] The late modern cultural scene is more complicated than it seems and still deserves empirical research. For sure, the card-indexing system that stands out among many different filing methods developed by scholars during the twentieth century is the system designed and successfully employed by the German sociologist Niklas Luhmann. Indeed, Luhmann was the only scholar who not only passionately practised the art of excerption, but also reflected on the practical rules and theoretical principles of this art. Retrospectively, Luhmann's report on the construction of his filing cabinet can be regarded as the most advanced result of a long-lasting reflection performed by modern society – rather than simply by single scholars – on knowledge management and reproduction systems based on data storage devices – that is, on social memory.

In his contribution, Johannes F.K. Schmidt investigates the origins and development of Luhmann's filing technique in detail, also availing himself of firsthand information about the content of this exceptional filing cabinet.[52] The direct access to file cards and paratextual tools as, for instance, the subject index and the bibliography, enabled Schmidt to identify also principles and rules which lay behind the realization of one of the most famous and perhaps better researched card-indexing systems of the second half of the last century. The result is telling even if not particularly surprising when it is compared with the historical inquiries presented in the first part of this volume: for the sociologist of Bielefeld, the card index was simultaneously a thinking tool and a publication machine.

Schmidt's survey demonstrates that Luhmann did not regard his filing cabinet as a simple slip box, rather, he interacted with it as if it were a true communication partner that Luhmann himself could incessantly *consult* – to use Muratori's language (cf. § 6.2). Luhmann's card index is clearly constructed as a cybernetic machine, that is, as an autonomous system that reproduces itself recursively and can produce information. Between card index and scientific production, moreover, there is a circular relationship. The filing cabinet

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51   For an overview, see Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006); Markus Krajewski, *Paper machines. About cards & catalogs, 1548–1929* (Cambridge, MA: The MIT Press, 2011). See also Heike Gfrereis and Ellen Strittmatter (eds.), *Zettelkästen. Maschinen der Phantasie* (Marbach am Neckar: Deutsche Schillergesellschaft, 2013).

52   Bielefeld University is digitalizing it in the context of the long term research project *Niklas Luhmann – A passion for theory* (2015–2030) funded by the Nordrhein-Westfälische Akademie der Wissenschaften und der Künste.

can obviously store only what has been extracted from books. However, it is indisputable that in books Luhmann searched for information or ideas that could be linked to the content of his own card index (in this respect, Schmidt speaks of 'card integration method'). The outcome is the reproduction of complexity by means of selection, that is, the paradoxical reproduction of complexity through a reduction of complexity.

The basic conditions that make this outcome possible are the loosening of knowledge into homogeneous entries (i.e., topics, to put it in rhetorical terms), and the operative use of the combinatory potential that thus arises. In order to produce these conditions, as well known, Luhmann opted for the numbering of entries. I would like to linger over this point for a while because it represents, in my opinion, one of the most interesting results of evolution. In fact, there is no doubt that the maximum degree of deviation compared with the rhetorical tradition is reached with the numbering of entries. In this respect, one crucial step is the relinquishing of bound books of annotations and the use of paper slips. In the mid-sixteenth century, this method was already employed and recommended, particularly when scholars were expected to compile a reference work, e.g., a dictionary or a bibliographical catalogue.[53] A century later, Harrison had further improved the systematical arrangement of index cards by means of a strictly alphabetical order. Yet, in a cognitive sense, loosening only peaks when entries or headings are numbered. Here, it can be useful first to gather all empirical evidence of this technical advancement that most likely was designed but never put into practice by early modern scholars.

The first evidence dates back to the beginning of the eighteenth century, but it seems to have had no special resonance. In a booklet published in 1713 comparing several different filing systems, Fridericus Sidelius and Paulus Sigismundus Schubart recommended the use of file cards (*excerpta schedacea*). Against the objection that this system would not allow one to know where these paper slips should be stored or how they could be retrieved, they replied that it would be sufficient to preserve index cards in distinguished files and to number them consecutively, while leaving a margin for later gluing or stitching together all cards belonging to the same entry.[54]

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[53]   Cf. Hans Wellisch, "How to make an index – 16th Century style: Conrad Gessner on indexes and catalogs", *International Classification*, 8 (1981), pp. 10–15; Maria Cochetti, "Teoria e costruzione degli indici secondo Conrad Gessner", *Il Bibliotecario*, 1–2 (1984), pp. 25–32; pp. 73–77.

[54]   Fridericus Sidelius and Paulus Sigismundus Schubart, *Positiones XXXIV de studio excerpendi* (Ienae: Fickelscher, 1713), Positio 32, pp. 14–15.

More than half a century earlier, Thomas Harrison had invented his *Ark of Studies*, a filing cabinet – as we have already seen – containing loose entries that could easily be arranged in alphabetical order and could also easily be numbered, as Harrison himself advised.[55] At the beginning of the eighteenth century, while discussing both the advantages and disadvantages of such a filing cabinet, Johann Benedict Metzler did not hide his scepticism, but recommended numbering the entries (*acicula*) because compared with alphabetical order, numerical order is clearer and avoids the inconvenience of empty spaces.[56]

More than technical troubles (indeed, numbering is no more unusual than alphabetical order or the alpha-numerical indexing system thought up by John Locke), what actually frightened Metzler's contemporaries was that at this level of abstraction, they had gone beyond the tipping point – so to speak – of forgetting. Numbering clarifies that the inner order of the repository (i.e., of secondary memory) does not mirror the order of the universe, thus defusing one of the most efficient remembering devices of rhetorical culture. In addition, users are compelled to develop a completely different cognitive capacity, that is, a truly combinatory ability to manage knowledge. Searching for information is now a much more useful skill than repetition. Finally, numbering ensures the utmost autonomy, i.e., self-referential closure of the machine, which implies that users must now acquaint themselves with the idea that their interaction with secondary memories is a type of communication.

To trigger this type of interplay, one must go beyond a 'systemic boundary'. Users let their inquiries re-appear inside a horizon of associative references that they had not designed in advance.[57] When users entrust their thoughts to their own filing cabinet, these thoughts no longer belong to them, but to their filing cabinet. Consequently, when users trigger the card-indexing system again, they do not recover their own thoughts as if they were delivering a soliloquy; instead, the filing cabinet is speaking. Herein lies the difference between subsidiary memory and secondary memory. Whereas the florilegium was a type of 'double memory' to which scholars could resort any time their

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55   See BL Middleton Papers, vol. XLIV, Sir Kenelm Digby's Papers, Ms Add 41846, fol. 198r. See also the printed edition of this manuscript improved by Placcius, *De arte excerpendi*, at p. 134.

56   Johann Benedict Metzler, *Artificium excerpendi genuinum dictus die rechte Kunst zu excerpiren* (Lipsiae: Apud Theophilum Georgl, 1709), pp. 23–24, p. 30, and pp. 91–92.

57   Cf. Niklas Luhmann, "Kommunikation mit Zettelkästen: Ein Erfahrungsbericht", in N. Luhmann, *Universität als Milieu. Kleine Schriften*, ed. by A. Kieserling (Bielefeld: Haux, 1992), pp. 53–61, at p. 59.

personal memory failed, the filing cabinet behaves as a true communication partner with its own idiosyncrasies and its own opinions. During an interaction with the user, in short, the card index is not an other Ego, he rather behaves as an Alter Ego.

Following this same theoretical route, Markus Krajewski's paper extensively addresses Luhmann's card-indexing system and its meaning for contemporary personal digital archives. Krajewski's contribution is organized into three steps. In the first step, the cataloguing of a library is briefly analysed, with particular attention given to the emergence of the card catalogue. The second step turns the former perspective upside down and investigates personal access to libraries, i.e., to the world of knowledge in light of the scholarly construction of personal slip boxes to be used for further research. In the latter case, the card index is understood not only as a memory aid but also as a sorting aid, a search engine, and a computer in the etymological sense of an organizing, guiding, and reasoning machine (§ 13.1.2).

The most impressive outcome of this second step is that a universal (albeit personal) library is made out of a universal library. Such re-arising of the world (of learning) inside the world (of learning) is possible through selection, and in turn selection is the crucial operation for begetting complexity, that is, an excess of possible combinations, links, or references among meaningful data (§ 13.2). In the final step, Krajewski describes the software named *Synapsen: A Hypertextual Slip Box* that he created, clearly inspired by Luhmann's card-indexing system. The digitization of this filing system ensures high performance and is very successful at cross-referencing and connecting items that belong to different topics, thus providing the interplay of user and machine with surprising, i.e., informational value and capability. In fact, as Krajewski explains with respect to his return to Luhmann's indexing design, a single note or index card is valuable only when it is linked to a network of associative references, thus reproducing an (in principle) inexhaustible combinatory potential that represents, as seen above, the argumentative part of the filing cabinet (§ 13.3).

We can go now a step forward if we address the relationship between forgetting and oblivion. The basic assumption is that, if evolution shows itself in different manners of discriminating between remembering and forgetting, it can also be traced by examining different ways of deleting memories, i.e., looking at the art of oblivion. In broad terms, we may distinguish between intentional and unintentional oblivion. Augustine left a very amusing memory of his attitude towards forgetting. He wrote that when he entered the *lata pretoria* (vast fields) of his personal memory, where all images of memorable things and words had been stored, he often puzzled himself. He rummaged in rooms but

either he could not find the images that he was seeking or what he eventually found was wrong.[58] Clearly, the problem was that memory fields were *lata* and vivid images were *innumerabiles*.

However, the impossibility of intentionally constructing an art of oblivion is well known. One would be paralysed by the paradox of the presence of absence, that is, by the duty of remembering to forget – because memory functions properly when one forgets to forget.[59] Oblivion is nonetheless required to open up spaces for further memories. In rhetorical culture, scholars searched for devices to sidestep this paradox. One of them was to multiply, instead of to delete, the number of presences virtually embedded in a mnemonic hook. If the white colour of milk had been associated both with air and wetness – as in the Aristotelian example – and with snow, the orator would have been unable to decide whether the season he was looking for was autumn or winter. The capacity of recollection provided by the mnemonic hook had been thus defused. In other words, if memory is enhanced, forgetting is fostered. A drastic measure was to destroy the storehouse by means of imagination. However, in this way the same soul faculty that was used to build up should be used to pull down. This operation was hard and exhausting, above all because what had been fixed in the mind with huge effort could not be easily swept away.[60]

Filing cabinets change everything. In short, we could say that users make use of cassation or post-cassation.[61] In the former case (as early modern inventors of filing systems continually repeat), while reading, the reader must select what he will store in his commonplace-book, and relinquish, that is, strike off, all of the rest. In the latter case, what has been stored can then be deleted (Web pages too disappear). This practice also explains why early modern scholars considered the use of file cards advantageous. Paper slips could be provisionally preserved in files or canvas bags, so scholars could postpone the decision of whether to store them in a filing cabinet, destroy them, or replace them with emended and improved file cards.

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58   Augustine, *Conf.*, X, VIII.

59   Umberto Eco, "*Ars oblivionalis*. Sulle difficoltà di costruire un'*ars oblivionalis*", *Kos*, 30 (1987), pp. 40–53, at p. 49; English transl. "An *ars oblivionalis*? Forget it!", *Modern Language Association*, 103: 3 (1988), pp. 254–261, at p. 258. See also Esposito, *Soziales Vergessen*, p. 29f., and the handbook on forgetting published by Harald Weinrich, *Lethe. Kunst und Kritik des Vergessens* (München: C.H. Beck, 1997).

60   Cf. Eugenio Battisti and Giuseppa Saccaro Battisti, *Le macchine cifrate di Giovanni Fontana* (Milan: Arcadia Edizioni, 1984), esp. p. 155. On this point, see also Lina Bolzoni, *La stanza della memoria. Modelli letterari e iconografici nell'età della stampa* (Turin: Einaudi, 1995), p. 147.

61   This distinction is drawn from Hermann Lübbe, *Im Zug der Zeit. Verkürzter Aufenthalt in der Gegenwart* (Berlin: Springer, 1994²), esp. Ch. 4.

The interaction with card indexes begets oblivion in different ways. For example, an item is not linked to the network of self-referential references on which the structure of the filing system is built. Or although the item is linked, it has a peripheral location. This distinction shall not be understood in a geographical sense. An item's central of peripheral location depends on the thickness of links in the network where the item represents a node – to put it in current terms. A file card that can be retrieved only by means of a cross-reference in a negligible entry that is poorly linked to other entries is nearly lost. It is there, but it is almost invisible.

This trouble is associated with another question that intersects with the evolution of social memory and that I already mentioned: the question of selection. In the construction of a storehouse, as we have already seen, orators should design a geography of seats and places demarcated by clear boundaries. This geography – like the universe men lived in – was closed, even when the storehouse was designed to store an encyclopaedic amount of knowledge. The choice of active images was in turn highly selective, not only with respect to the form of images placed in the storehouse but also with respect to the succession of meaning associations that these images would have triggered in a nearly syllogistic way in order to perform recollection. Compared to this situation, the card index allows scholars much more freedom. Into the filing cabinet they may put everything, provided that everything is linked to everything and is thus retrievable. The excitement prompted by secondary memories is mostly contingent on the idea that relieving the burden of memorization enables scholars to store any kind of knowledge with a view to unpredictable re-combinations. In this sense, 'information overload' is not only a scary word but also a challenging purpose.

Nonetheless, filing systems are highly selective. In early modernity, learned men continually repeated that *excerpere* and *seligere* are the same operation. In fact, it would be meaningless to move the whole content of a book into the filing cabinet. Without forgetting, there would be nothing to remember. As Ann Blair put it, "discarding and forgetting are crucial to effective information management".[62] Troubles arise when one wonders about the criteria according to which one should select, store, or discard. Scholarly readers cope with a temporal circularity that would become a vicious circle without the insertion of differences that transform such circularity into a virtuous circle.[63]

Elena Esposito's contribution fits into this discussion and provides valuable cues for future research. Esposito starts from the assumption that the early modern use of forgetting machines cannot simply be a transition from a culture of remembering to a culture of forgetting. Instead, the early modern invention

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62   Cf. Blair, *Too much to know*, p. 65.

63   The modern name for this solution is 'aim'. See my essay in this volume, esp. § 6.5.

of card indexes and archives must be understood as cause and effect at a time of drastic change in social memory, which transforms both remembering habits and forgetting systems. Behind Esposito's reasoning lies the basic assumption that one of memory's primary functions is to discriminate between remembering and forgetting. Discrimination is a single operation: when it is performed, both sides are involved. In this respect, Esposito's argument does not allow compromises. One does not remember more if he forgets less, one remembers more if he can forget substantially more than before. Remembering and forgetting do not exclude each other; instead, they are the opposite sides of a single distinction, which is operatively performed in different ways according to available media. The use of machines truly offers this opportunity.

By relieving the consciousness of the exhausting use of imagination, scholarly machines (the filing cabinet, today the Web) enable scholars to entrust everything memorable to an external medium and to postpone retrieval, i.e., recollection. Esposito investigates the evolutionary meaning of this transformation. Compared with the rhetorical storehouse, the card index preserves a knowledge – we could also say, a past – that not only continually changes but also can be recalled in a highly selective manner according to users' needs. Esposito notes that in this way, *available* memory is distinguished from *accessible* memory. With a view to an unpredictable future, users prepare – so to speak – a past that is loosened enough (that dismemberment of learning into alphabetically or numerically arranged entries I spoke of above) to be recombined at will. In this sense, filing cabinets are designed to remember everything in principle and nothing in particular. Among the materials available, users will select what they wish to make accessible according to their interests, which change every day. In other words, memory lies not in the machine but in the structural coupling of users and machines, that is, in the indexing system. Remembering and indexing thus become one and the same operation that – and this is Esposito's hypothesis – is well suited to a society that structurally copes with an open future.

As the latter remarks demonstrate, evolution did not stop at wooden filing cabinets. The invention of computers and the tremendously rapid success of digital memories turned the relationship between remembering and forgetting upside down. Nowadays, to remember (nearly) everything is the rule, whereas to forget is the exception.[64] This does not mean that the problem of selection is solved. The problem is simply postponed and for the same reason, it becomes more difficult. From an evolutionary standpoint, the use of memory becomes *hypertrophic* – an effect complementary to the atrophy of psychic memory, as I

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64   About this much-discussed opinion, see Viktor Mayer-Schönberger, *Delete. The virtue of forgetting in the digital age* (Princeton, NJ: Princeton University Press, 2009).

explained above. If memory remembers almost everything (what we searched for, the keywords we used, how frequently we performed these queries), retrieving what we really need becomes problematic. Our experience with search engines is disappointing for at least two reasons: the number of results that we obtain is too large and consequently, users simply read, at most, the first ten entries (the first Web page) and forget the rest (that is, almost everything). In addition, the complete number of results is never a reliable panorama of what is actually stored in the secondary memory and it is not necessarily informative for users.

The final question that should be answered is why the evolution of memory is followed by the mechanization of memory. Today, we take for granted that the management of a huge quantity of records and data preserved in secondary memories is possible only by using algorithms, which in turn allow the storage and management of many more records and data than before. Thus, one may wonder what 'artificial memory' really means in an age characterized by the relegation of memories to machines. If we remember that communication is an artificial phenomenon (language itself is possible not in spite of, but because of the use of artificial signs), we may suspect that the concept of 'artificiality' actually refers to the probability of improbability – which is consistent with the hypothesis that evolution increases improbability that becomes probable.[65] However, that recollection can be mechanized and that this mechanization has cognitive advantages was realized by the eighteenth century. According to Hegel, for instance, it was indisputable that whereas the semantic management of data implies a huge effort and limits on storage, mechanical management is much less exhausting and in principle, has no limit on storage. Compared with *Mnemonik*, which compelled scholars to torment themselves with foolishnesses ("sich mit verrücktem Zeuge zu plagen"), a *mechanisches Gedächtnis* displays much higher performance.[66] By emptying topics of their meaning, such memory remembers much better and more quickly. Digital memories fully exploit this opportunity: they do not process meaning but instead, they process data with virtual information value and by doing that, they reproduce data that can become information if they in turn are processed. The mechanization of memory thus establishes a self-feeding process. If and how society will be able to manage its own knowledge through such memories is a subject for future research.

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65   Cf. Luhmann, *Die Gesellschaft der Gesellschaft*, esp. p. 413.

66   Georg Wilhelm Friedrich Hegel, *Enzyklopädie der philosophischen Wissenschaften im Grundrisse* (Heidelberg: Verwaltung des Oswaldschen Verlags, 1830³; reprint Hamburg: Felix Meiner, 1992), Dritter Teil, I. Abteilung, §§ 462–463, pp. 460–461. The mentioned 'foolishnesses' are active images.

*Scholarly Practices and the Transformation of
Cognitive Habits in the Early Modern Age*

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Notebooks and Collections of Excerpts: Moments of *ars excerpendi* in the Greco-Roman World

Tiziano Dorandi

1.1 Introduction

It is not easy to recall in every detail the writing techniques of literary works and the authors' compositional strategies in antiquity.[1] Usually, from ancient times, reading primary sources came before the drafting of a literary text. Ancient authors made notes out and wrote them down on wood or waxed tablets, papyrus sheets, or parchment slips and notebooks, or any other material; or else, they dictated their notes to their secretaries. These notes were sometimes further handed-copied on rolls or codices (depending on the historical age the authors lived); in this way, they made up real collections of different subjects (Greek: *hypomnémata*; Latin: *commentarii*) which turned out to be useful to authors during the composition of their literary works.[2]

1.2 From Collections of Excerpts to Books

An interesting description of this attitude can be read in the preface to the booklet *On Tranquility of Mind* (464F–465A) by Plutarch (c. 46–120 AD).

Plutarch says he was used to put together collections of excerpts about different subjects for personal use. When he started writing *On Tranquility of Mind*, he retrieved his annotations (*hypomnémata*) and chose the material concerning that subject. Luc van der Stockt gave an impressive explanation of this passage and he tried to set the standards of a Plutarchean *hypómnema*.[3]

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1 In the following pages I presume the first two chapters of Tiziano Dorandi, *Nell'officina dei classici. Come lavoravano gli autori antichi* (Rome: Carocci, 2007).

2 Annewies van den Hoek, "Techniques of quotation in Clement of Alexandria. A view of ancient literary working methods", *Vigiliae Christianae*, 50 (1996), pp. 223–243.

3 Luc van der Stockt, "Three Aristotle's equal but one Plato. On a cluster of quotations in Plutarch", in A. Pérez Jiménez et al. (eds.), *Plutarco, Platón y Aristóteles* (Madrid: Ediciones Clásicas, 1999), pp. 127–140; Luc van der Stockt, "A Plutarch hypomnema on self-love", *American Journal of Philology*, 120 (1999), pp. 575–599; Luc van der Stockt, "Plutarch in

Analysing the presence of very same clusters of corresponding passages in different Plutarch's works, he proved that the author had, among others, an *hypómnema* devoted to self-love (*philautía*). In this one, Plutarch gathered many different excerpts which he then used for the composition of *On Tranquility of Mind*, and further on for the two essays *How a Man May Become Aware of His Progress in Virtue* and *On Praising Oneself Inoffensive*. Plutarchean *hypomnémata* were like rough drafts in which notes were already been worked out and reorganized:

> I am inclined to imagine it [i.e., the *hypómnema*] as a more or less elaborate train of thought, involving material previously gathered and certainly written in full syntactical sentences: we are beyond the stage of heuristics. On the other hand, the *hypómnema* does not yet display literary finish.[4]

Cicero (106–143 BC) as well sometimes compiled this kind of collection. We have a likely evidence of this practice at the beginning of the second book of his *Treatise on Rhetorical Invention*. Cicero states that when he decided to write *a treatise on the art of speaking* he did not restrict himself to a unique model, but after collecting all the works on the subject, he excerpted (*excerpimus*) the precepts which seemed to be more useful.[5]

The most precious statement on the technique of excerpting and on production of *hypomnémata* is a letter by Pliny the Younger (51–103 AD) to his friend Baebius Macer shortly after 79 AD.[6] In this letter, Pliny gives an outline of his uncle Pliny the Elder (23–79 AD), listing his literary works and widely illustrating his way of working in detail:

> (10) After a short and light refreshment at noon some author was read to him, while he took notes and made excerpts (*liber legebatur, adnotabat, excerpebatque*). Every book he read, he made excerpts out of; indeed, it was a maxim of his, that no book was so bad but some good might be got out of it (11) ... During supper-time, a book was again read to him, which he would take down running notes upon (*super hanc liber legebatur,*

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    Plutarch: the problem of the *hypomnemata*", in I. Gallo (ed.), *La biblioteca di Plutarco* (Naples: D'Auria, 2004), pp. 331–340.

4   Stockt, "A Plutarch hypomnema on self-love", p. 595.

5   Cicero, *De inv.*, 2, 4.

6   Pliny the Younger, *Epist.*, III, 5, 10–17.

adnotabatur et quidem cursim) … (14) In the country, his whole time was devoted to study excepting only when he bathed. In this exception, I include no more than the time during which he was actually in the bath; for all the while he was being rubbed and wiped, he was employed either in hearing some book read to him or in dictating himself (*audiebat aliquid aut dictabat*). (15) In going about anywhere, as though he were disengaged from all other business, he applied his mind wholly to that single pursuit. A shorthand writer constantly attended him, with book or tablets (*ad latus notarius cum libro et pugillaribus*) … (17) Through this extraordinary application, he found time to compose the several treatises I have mentioned, besides one hundred and sixty volumes of extracts he left me in his will, consisting of a kind of commonplace, written on both sides, in very small hand (*electorumque commentarios centum sexaginta mihi reliquit, opisthographos quidem et minutissime scriptos*); so that one might fairly reckon the number considerably more.

The complexity in the explanation of this letter is particularly due to the identification of the real meaning of words such as *adnotare, excerpere, pugillares, electorumque commentarios …, opisthographos quidem et minutissime scriptos*.[7] Moreover, we need to state whether sequences as *legere, adnotare, excerpere*, on the one hand, and *notarius cum libro et pugillaribus*, on the other hand, refer to two different ways Pliny worked, or else if they both identify the same operation consisting in different stages.[8]

Klotz paid specific attention to the meaning of the verb *adnotare*. *Adnotationes* are both the notes Pliny added onto the books he read, and the ones he copied on tablets (*pugillares*); *adnotare* could mean both marking passages on sources, or copying them on a writing support.[9] Klotz does not specifically choose one of these meanings, but it seems that he took the verb *adnotare* in

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7 Alfred Klotz, "Die Arbeitsweise des älteren Plinius und die *indices auctorum*", *Hermes*, 42 (1907), pp. 323–329; Albrecht Locher and Rolf C.A. Rottländer, "Überlegungen zur Entstehungsgeschichte der *Naturalis Historia* des älteren Plinius und die Schrifttäfelchen von Vindolanda", in *Festgabe H. Vetters* (Wien: Holzhausens, 1985), pp. 140–147; Albrecht Locher, "The structure of Pliny the Elder's *Naturalis Historia*", in R. French and F. Greenaway (eds.), *Science in the early Roman Empire: Pliny the Elder, his sources and influence* (London and Sidney: Croom Helm, 1986), pp. 20–29; Valérie Naas, *Le projet encyclopédique de Pline l'Ancien* (Rome: École Française de Rome, 2002), pp. 108–136; Dorandi, *Nell'officina dei classici*, pp. 30–36 and pp. 43–44.

8 Naas, *Le projet encyclopédique*, pp. 112–113.

9 Klotz, "Die Arbeitsweise", p. 329.

the sense of marking passages on rolls of sources, in order to help shorthand writers to copy the mat a later stage.[10]

The conclusions of Locher and Rottländer's researches are more complex and exciting. They take and develop Schaaber's theory, according which Pliny should have used 'keywords' (*Schlüsselwörter* or *Deskriptoren*)[11] as structural values, needed to understand the inner set up of *Natural History*.[12]

Locher and Rottländer presume the arrangement of *Natural History* be done in five consecutive stages: (1) Pliny reads sources – or makes someone reading sources for him; (2) shorthand writer copies the passages indicated by Pliny onto *pugillares*, using 'keywords' (*Schlüsselwörter* or *Deskriptoren*); (3) excerpts are then copied on writing supports where they are classified, paying attention to 'keywords'; (4) Pliny prepares his *commentarii* basing on these notes; (5) *Natural History* is the definitive result of this material, put together on *commentarii*.

Locher and Rottländer did not specify if *adnotationes* of the second stage were written directly on sources' books, or else on the excerpts copied on *pugillares*.[13] Locher illustrated this point in a later release, coming to the conclusion that *adnotationes* are additions to something already written.[14] Pliny therefore used 'keywords' to take note on both *commentarii* and sources; 'keywords' noted on the rolls of sources indicated the point where the excerpts were to be set up on *commentarii*, which, in turn, included raw material already arranged and intended to be used on the writing of *Natural History*.

The most interesting passage of Locher and Rottländer's theory is no doubt the third. Between the moment which *excerpta* were copied on *pugillares* and the preparation of *commentarii*, they suppose an intermediate stage, during which all the raw material that was found, was classified on a new writing support. In order to implement this stage, Pliny would have used tablets similar to

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10   Locher and Rottländer, "Überlegungen", p. 142; Locher, "The structure", p. 25; Tiziano Dorandi, "*Commentarii opisthographi* (Plin., *Epist.* III 5, 17)", *Zeitschrift für Papyrologie und Epigraphik*, 65 (1986), pp. 71–75, at p. 72; Naas, *Le projet encyclopédique*, pp. 113–114.

11   These 'keywords' would have pointed out the subjects of each single section of *Natural History* in a systematic and extremely condensed manner. Thanks to 'keywords', Pliny would have arranged the huge quantity of raw material, put together in order to write his encyclopaedia. Cf. Locher and Rottländer, "Überlegungen", pp. 140–141.

12   Otto Schaaber, "Überlegungen zur Deutung der Plinius-Ausgabe über das Eisen aufgrund metallkundlicher Funduntersuchungen", *Jahreshefte des Österreichischen Archäologischen Instituts*, 51 (1976–1977), pp. 85–105. Schaaber was not the first to introduce the theory of 'Schlüsselwörter'. Cf. Locher and Rottländer, "Überlegungen", at p. 147 (fn. 2).

13   On the meaning given to *pugillares*, *pugillaria*, see below, § 1.3.

14   Locher, "The structure", pp. 26–27.

the ones found in Vindolanda, that is to say tablets made of a very thin wood which could be fold like an accordion and tied together with a string.[15] These tablets were much more manageable than the wax ones, and they were ink-written instead of being engraved. They easily allowed to make an archive or a card index up, which worked thanks to 'keywords'.[16] In this way, it would be possible to state a direct link between *adnotationes* and 'keywords': thanks to *adnotationes*, Pliny could therefore classify his data depending on 'keywords'.

An halfway step between the collection of excerpts and *commentarii* had already been assumed by André.[17] Pliny would have used handy tablets where all excerpts taken from sources were noted; these notes were later put together by a *notarius* (secretary), and they included all information Pliny needed for any subject.

In my researches about Pliny the Elder's working method, I took from the beginning, as a starting point, not only the study of the terms used by Pliny the Younger, but I also and mostly took advantage of the comparison between the description of his nephew about *commentarii* of *Natural History* and the book of the Epicurean philosopher Philodemus of Gadara dated first century BC and given by Herculaneum papyrus 1021.[18]

In order to define the meaning of the verb *adnotare*, we need to consider two passages of the letter, *liber legebatur adnotabat excerpebatque* and *liber legebatur adnotabatur*. From these passages we can deduce that actions such as *legere*, *adnotare*, *excerpere* and *legere*, *adnotare* were in closed connection, and that the action of *legere*, *adnotare* came before the action of *excerpere*; at the moment of reading and of *adnotationes* no one mentions *notarius* nor *pugillares*, yet. After Klotz, the verb *adnotare* takes the meaning of marking, from

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15   The tablets take their name from Vindolanda situs (nowadays called Chesterholm, in the north of England) where they were found. They are little tablets made from birch, alder and oak that grew locally. They mostly bequeath letters dated from 80 to 120 AD. Cf. Alan K. Bowman and David Thomas, *The Vindolanda writing-tablets* (*Tabulae Vindolandenses*) (3 vols., London: British Museum Press, 1984, 1994, 2003); Alan K. Bowman et al., "The Vindolanda writing-tablets (Tabulae Vindolandenses IV, Part 1)", *Britannia*, 41 (2010), pp. 187–224.

16   Locher and Rottländer, "Überlegungen", p. 143 and p. 146.

17   Jacques André, "Pline l'Ancien botaniste", *Revue des Études Latines*, 33 (1955), pp. 297–318, at pp. 312–313.

18   Dorandi, "*Commentarii opisthographi*", pp. 71–75; Tiziano Dorandi, "Den Autoren über die Schulter geschaut. Arbeitsweise und Autographie bei den antiken Schriftstellern", *Zeitschrift für Papyrologie und Epigraphik*, 87 (1991), pp. 14–17; Tiziano Dorandi, *Le stylet et la tablette. Dans le secret des auteurs antiques* (Paris: Les Belles Lettres, 2000), esp. pp. 29–39.

the beginning to the end, those passages which had to be further taken from sources' volumes. At a later stage, a secretary would have copied these excerpts on one or more rolls of papyrus, or Pliny would have dictated them. Pliny's working method can be therefore retraced as follows: Pliny read (or someone read for him) sources; he indicated with signs (*adnotare*) the passages he found interesting; when travelling, he dictated these excerpts to a *notarius* who wrote them on *pugillares*. They were then copied on rolls labelled as *commentarii, opisthographi quidem et minutissime scripti*, that is to say, volumes which contained all excerpts on different subjects, copied on both sides, in very small hand.

In my opinion, we can see a sample of how Pliny *commentarii* could look like in PHerc. 1021, a roll treasuring a collection of *excerpta* taken from different sources, brought together by Philodemus in prevision of his work on Academics philosophers included in *Collection of the Philosophers*.[19]

Valérie Naas suggested some modifications to this theory of mine.[20] First of all, she believes that the mere existence of a card index not consisting in a 'temporary intermediary' between the reading of sources and the making of *commentarii* would allow Pliny to the stage of reorganization of sources. The files Pliny used for this card index, which are the *pugillares*, "would be thin wood tablets; once they were classified thanks to keywords, they were ordered in a 'card index' consisting of organized documents".[21]

Moreover, Naas says that there is no need to distinguish the two stages I presumed, so that the verbs *legere*, *adnotare* and *excerpere* would refer to the usual Pliny's work, while *notarius* and *pugillares* would have come occasionally out (*in itinere*). Pliny was helped in his work from a *lector*, but also from a *notarius*, whose constant presence has been proved in the sequence *audiebat aliquid et dictabat*.[22]

In Naas' reconstruction, the composition stages of Pliny's *commentarii* would be the following:

> Reading or making someone read the sources, Pliny suggested the passages to be copied. His assistant wrote these excerpts on a writing support which had the function of card (papyrus, wooden tablets or parchment), taking into consideration the length of what Pliny had marked, and,

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19   I return to this topic below.

20   Naas, *Le projet encyclopédique*, pp. 108–136.

21   Naas, *Le projet encyclopédique*, pp. 124–126. In this way, Naas presumes to reconcile the solution suggested by Locher and Rottländer with the one of mine.

22   Naas, *Le projet encyclopédique*, p. 123.

occasionally, of all remarks (keywords, room where to put the excerpts, cross-references, interpretations…) … (Pliny) asked his assistant to copy the chosen extracts. In this way he did not need shorthand writing, so the excerpt could be used exactly the same as it was, as a 'card'. On the contrary, when dictating notes, Pliny had a shorthand writer; depending on their function and content, they were put to use or copied in order for Pliny to make good use of them. They were probably not excerpts from sources, but rather comments and annotations Pliny took on his sources or on the masterpiece he was working at.[23]

Some of Naas' suggestions and sparks are convincing; for instance, her interpretation of the sentences *liber legebatur, adnotabat, excerpebatque … liber legebatur, adnotabatur et quidem cursim*, and the suggestion that Pliny was always attended by a *notarius* (not only when travelling). On other points, I feel I have to remain faithful to my own views.

In contrast with Naas' assertion, I did not suppress "the mid-stage of reorganization of sources on a new writing support".[24] I simply replaced Naas' presumed card index with *commentarii* volumes. This seems evident to me, when reading what Pliny the Younger wrote:

> Through this extraordinary application, he found time to compose the several treatises I have mentioned, besides one hundred and sixty volumes of extracts he left me in his will, consisting of a kind of commonplace, written on both sides, in very small hand, so that one might fairly reckon the number considerably more.

These "one hundred and sixty volumes of extracts written on both sides, in very small hand" were the result of the reorganization of excerpts Pliny the Elder gathered together and dictated, or which he asked someone to copy on *pugillares*, during his reading.

In some respects, I actually rejoined the solution glimpsed from Skydsgaard: the volumes of commentaries would be useful to Pliny as an intermediate step between the collection of *excerpta* and the final text; notes and extracts would have been systematically classified on opistograph rolls.[25] As a matter of fact, Skydsgaard does not speak about a new writing support; he rather thinks of a simultaneous process of information classification, and of the transfer of

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23   Naas, *Le projet encyclopédique*, p. 132 and p. 136.

24   Naas, *Le projet encyclopédique*, p. 117.

25   Jens E. Skydsgaard, *Varro the scholar* (Copenhagen: E. Munksgaard, 1968), p. 105.

extracts from tablets to rolls. In my opinion, however, *commentarii* were a brand-new support where extracts of *pugillares* were copied, once classified and reorganized by Pliny. This operation was not necessarily simultaneous, but probably occurred at a later time, after the extracts had been reordered.[26]

The description of the working method of Pliny the Elder recalls, in some ways, the one Aulus Gellius (second century AD) makes about his compositional technique in the introduction to the *Attic Nights*.[27] It would be interesting to mention here all the places where Gellius describes the preliminary stages to the composition of the work, and specifically the stage about the collection of extracts. I will just limit myself to a single passage:

> In the arrangement of my material I have adopted the same randomly order (*ordine rerum fortuito*) that I gave to excerpts at the time to gather them together (*in excerpendo*). For as I get any Greek or Latin book in my hands, or heard something that seemed worthy to be remembered, I took note of what I liked, whatever it was about, without distinction and with no order (*indistincte atque promisce*), and I put it aside to aid my memory (*annotabam eaque mihi ad subsidium memoriae*), as if I was making a supply to my stock of literature, so that whenever I needed a fact or a word, which by chance I suddenly had forgotten, and whose books were no more available to me, I could easily retrieve and use them (*facile nobis inuentu atque depromptu*). I have therefore kept even in these essays (*his commentariis*) the same variety that was in my original notes, which we shortly gathered, in a disordered way and with no style, from different disciplines and readings.[28]

The composition of the *Attic Nights* had probably resulted in three phases: Gellius collected notes (*adnotationes*), organized them according to their content and, finally, put together the *commentarii* without any rational order. He firstly gathered together the notes randomly collected during lectures and meetings with scholars. Later, he put those notes together, in separate essays (*commentarii*). During the third stage, the author had finally met, deliberately

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26   The origins of the frequent mistakes which can be found in Pliny's *Natural History*, dates back to this stage. See André, "Pline l'Ancien botaniste", pp. 315–317; Schaaber, "Überlegungen", pp. 89–90; Locher and Rottländer, "Überlegungen", pp. 143–145.

27   Leofranc Holford-Strevens, *Aulus Gellius* (London: Duckworth, 1988), pp. 20–34.

28   Gellius, *Noc. Att.*, Praef., 2–3. See also Gellius, *Noc. Att.*, Praef., 11: "in excerpendis notandisque". Cf. Maria Laura Astarita, *La cultura nelle* Noctes Atticae (Catania: Università di Catania, 1993), pp. 26–31.

out of order, a large portion of his *commentarii*, and had this way composed the twenty books of *Attic Nights*.[29]

The main difference between Gellius and Pliny is the timing of the distribution and the selection of excerpts in view of the subjects they are about. In his decision to keep notes without an established order, Gellius was perhaps inspired by the *Historical Commentaries* of Pamphile of Epidaurus (first century AD). According to the testimony of Photius (ninth century AD), Pamphile admitted that

> she put together in miscellaneous notes all data that seemed worthy to her of being exposed and remembered, and stated that she did not separate them by distinguishing each one depending on subject, but randomly, and kept each of them as it originally was.[30]

In a passage from the preface to the *Saturnalia*, Macrobius (forth-fifth centuries AD) criticized Gellius' decision to present his *commentarii* without any rational order. Addressing to the son Eustace, Macrobius shows him, in a previously worked-out order, the results of the reading of Greek and Latin authors, in order for him to find an aid to his cultural background, and he goes on as follows:

> For it is not *out of order*, as in a pile, that we brought together what was worthy of memory; but *different subjects*, recovered from different sources and in indistinct times, were brought together to form a kind of body; so that what I wrote down *in this order* and *in a raw way, just as a support for memory*, was put together into a coherent system, as the limbs (of a body).[31]

The stage of collection of *excerpta* is the same, made an exception for the fact that Macrobius "does not allow the publication of lecture's notes without a predetermined idea, and he prefers a serious work, going clearly towards a definite and well-defined end, instead of a nonchalant reading, with no directives".[32]

Taking these elements into consideration, can we finally define how ancient authors read their sources (*legere*), marked (*adnotare*) the most interesting passages, and took notes or gathered excerpts together (*excerpere*)?

29 Cf. Gellius, *Noc. Att.*, 17, 21–22. See also Astarita, *La cultura nelle* Noctes Atticae, pp. 29–30.

30 Photius, *Bibliotheca*, ed. by I. Bekker (2 vols., Berolini: G. Reimer, 1824–1825), I, 175, p. 119b. Cf. Holford-Strevens, *Aulus Gellius*, p. 25.

31 Macrobius, *Sat.*, Praef., 3. Italics are 'quotations' Macrobius takes from Gellius.

32 Egbert Tuerk, "Macrobe et les *Nuits Attiques*", *Latomus*, 24 (1965), pp. 381–406, at p. 382.

The issue began to attract the attention of scholars, in the late nineteenth century, starting from Münzer's studies on the working method and on *Quellenkritik* in the *Natural History* of Pliny the Elder.[33] More recently, Skydsgaard expanded this horizon in an excellent study on Varro's erudition (116–127 BC).[34] Mejer, finally, came back to the same matter, talking about Diogenes Laertius, and described the four characteristics the whole ancient, Greco-Latin world, has in common when collecting *excerpta*:

(a)   *Excerpts are per definitionem out of context.* It is therefore not surprising to find that excerpts sometimes are used in a different context and for different purposes than in the original.

(b)   The use of an excerpt will often lead to the *introduction of another excerpt* from same source (whether or not it fits the context) or on the same subject matter from another source.

(c)   As the ancient scholar worked on his subject matter his *excerpts would follow a certain pattern* … One single excerpt from a source may be used several times … and the fact that one passage in a source is used but not others which seem equally relevant is no proof that the writer had only indirect knowledge of his source.

(d)   Finally, as a consequence of the above … the idea of a main source … should only be considered if and when any other way of explaining the nature of an ancient literary work has been proved useless.[35]

The best contribution is still the one of Annewies van den Hoek in an article on the techniques of quotation in *Stromata* (*Patchwork*) by Clement of Alexandria (c. 150–215 AD).[36] Van den Hoek takes into account, for the first time, alongside the literary evidences of the ancient authors, even a real collection of *excerpta* transmitted from a papyrus of Tura (now in the Egyptian Museum of Cairo). This papyrus codex is made of extracts taken from different works by Origen of Alexandria (third century AD), especially the first two books of *Against Celsus*.[37] The document is particularly interesting because there we have the

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33   Friedrich Münzer, *Beiträge zur Quellenkritik der Naturgeschichte des Plinius* (Berlin: Weidmann, 1897), pp. 1–133.

34   Skydsgaard, *Varro the scholar*, pp. 101–116.

35   Jørgen Mejer, *Diogenes Laertius and his hellenistic background* (Stuttgart: Steiner, 1978), pp. 16–19.

36   Hoek, "Techniques of quotation", p. 225 and p. 239 (fn. 21–24).

37   PCair. J 88747 (seventh century AD). Jean Scherer, *Extraits des livres I et II du* Contre Celse *d'Origène* (*papyrus n. 88747 du Musée du Caire*) (Le Caire: Institut Français d'Archéologie Orientale, 1956).

Against Celsus in its entirety, and it gives us the possibility to closely investigate the technique used by the anonymous editor in preparing his collection.

The papyrus of Tura transmits a series of first hand's excerpts, as shown from the corrections (letters and words deleted) and later additions of long passages. These excerpts did not create a methodical summary of the original works; their author only keeps what he likes and finds interesting. The copied passages are of various lengths: a word, a few lines or several pages; they usually become shorter and rushed towards the end of each individual book. It seems that the anonymous collector was strongly interested in biblical quotations. In other cases he recovers formulas that seem to him new, or forceful. His permanent procedure is to shorten; excerpts sometimes seem to be simple reading notes. Sometimes it summarizes and revises his own text, most of the time not in-depth. Despite all revisions and personal interventions, the transcript of the text is faithful to the original.[38]

Through her analysis of Clement's writing techniques, in the light of the information given by the papyrus of Tura, van den Hoek concludes that even Clement – the same way Pliny the Elder did – used to take notes and make *excerpta* collections in form of *hypómemata*, which would later be useful for the preparation of his literary works.[39]

The thesis of van den Hoek are generally convincing. Personally, I would have chosen the PHerc. 1021 as a sample of *hypómema*, rather than the papyrus of Tura. The reason is that, while the anonymous compiler of Tura had in fact gathered together excerpts recovered in the works of one, single author (Origen), and preparing a shortened version of one or more texts of that writer, only, Philodemus collected on the same roll (PHerc. 1021) a wide range of excerpts taken from many sources, all about the same subject (the history of the Academy), and made someone copy them on the front (*recto*) and on the back (*verso*), just like Pliny's *commentarii*.

It is time to further investigate what kind of information on the working method of Philodemus we can recover from PHerc. 1021 and to integrate this data with what we know about Pliny the Elder and other ancient writers. Studies made by Cavallo and Gaiser, which I developed, made it clear that the PHerc. 1021 hands a real collection of excerpts down, or at least the rough draft of the Philodemus' *Catalogue of the Academics*.[40] This papyrus is copied in a

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38 Scherer, *Extraits*, pp. 26–29.

39 Hoek, "Techniques of quotation", p. 235.

40 Guglielmo Cavallo, "Testo, libro, lettura", in G. Cavallo et al. (eds.), *Lo spazio letterario di Roma antica. 11. La circolazione del testo* (Rome: Salerno Editrice, 1989), pp. 307–341, at pp. 311–313; Konrad Gaiser, *Philodems Academica. Die Berichte über Platon und die Alte*

neglected writing and with an irregular *mise en colonne*; we can see erasures, deletions, in-between lines additions, additions in the margins and in the spaces between the columns. Duplications and *adnotationes* were also identified, indicating transpositions of pieces of text, additions, breakdowns of the text; moreover, papyrus is opistograph, i.e., written on the front (*recto*) and on the back (*verso*). So, this is one of the rare examples of 'author's manuscript' transmitted from antiquity.[41]

Apparently, Philodemus had dictated or made someone copy on this roll a number of excerpts retrieved in the work of several authors who wrote about Plato and his school – among others, Hermippus of Smyrne (third century BC), Antigonus of Carystus (third century BC) and Apollodorus of Athens (second century BC). Sources are often transcribed in their original wording (for example, excerpts of *Lives* of Antigonus and the iambic trimeters of the *Chronology* of Apollodorus), but sometimes partially reworked. PHerc. 1021 looks like the result of a first arrangement of *excerpta* Philodemus gathered together during his lectures in view of the composition of the book about the history of the Academy, from Plato to Antiochus of Ascalon and his brother and successor, Aristo of Ascalon.

The comparison with Pliny the Younger's description of the working method of Pliny the Elder allows us to reconstruct in a pretty clear way the stages that led to the compilation and organization of PHerc. 1021. Philodemus read, or made someone reading his sources to him; marked (*adnotare*) what was interesting to him; these notes were copied by one of his scribes or were dictated by Philodemus himself to a shorthand writer (*notarius*); at this time, we have to assume the use of *pugillares* in order to explain the presence of two passages out of place.[42] All these excerpts were transcribed on the front (*recto*) of the roll, known today as PHerc. 1021. During his further researches, Philodemus increased the material he already had collected and arranged. New excerpts were added onto the back (*verso*) of the same papyrus, corresponding to parallel passages on the front (*recto*).[43]

Akademie in zwei herkulanensischen Papyri (Stuttgart and Bad Cannstatt: Frommann and Holzboog, 1988), pp. 32–41; Tiziano Dorandi, "Di nuovo sulla trasmissione del testo dell'*Index Academicorum philosophorum Herculanensis* (*PHerc.* 1021 e 164)", in *Atti del XVII Congresso Internazionale di Papirologia* (2 vols., Naples: Centro Internazionale per lo Studio dei Papiri Ercolanesi, 1984), II, pp. 577–582.

41 See Dorandi, *Nell'officina dei classici*, pp. 47–64, and Oronzo Pecere, *Roma antica e il testo. Scritture d'autore e composizione letteraria* (Rome and Bari: Laterza, 2010).

42 I return to this point below, § 1.3.

43 The reference to additions on the *verso* is made by means of an *ópisọ* (i.e., 'see' *verso*). Regarding the meaning of *ópisọ*, I follow Manfredo Manfredi, "Opistografo", *La Parola del Passato*, 208 (1983), pp. 48–50. Evidences of this typology may be also found in other

Here is, schematically, the way I propose to reconstruct the history of Philodemean *hypómnema*:

(a) Philodemus read (or asked someone to read) sources, marked (*adnotare*) the passages he found interesting and which he wanted to make excerpts from (*excerpere*). We can assume that, as Pliny, Philodemus had a *lector* (someone who read the books of sources) and a *notarius* (a shorthand writer to whom he dictated extracts or personal notes about these extracts and their use) on hand.

(b) At least some excerpts were probably transcribed on *pugillares*.

(c) Philodemus dictated to a secretary (*librarius*) sentences that made a connection between *excerpta* and introduction, as well as other sentences expressed by himself.

(d) A secretary copied the first draft of the work, the rough draft which is kept into PHerc. 1021.

(e) Philodemus corrected his text, reads complementary sources and makes additions. These additions and corrections, varying in length, were written in the margins and in the empty spaces of the front (*recto*) or, for lack of space, on the back (*verso*), in addition to what was first collected.

(f) Later on, the manuscript, completely revised and reworked by Philodemus, was copied in fair copy by a *librarius* on a new roll of papyrus, both directly or under dictation. The work was now ready to be published.

In light of the above, and in particular of the palaeographic and bibliological characteristics of the PHerc. 1021, I find it difficult to embrace the recent thesis of Arrighetti about the unique structure of the papyrus. Arrighetti excludes the idea of the PHerc. 1021 as a simple collection of material and a rough draft, similar to Pliny's *commentarii*, and he rather suggests to find in it Philodemus' application of two different compositional strategies. The first part of the roll, characterized by a sequence of large extracts mostly literal, would perhaps be the proof of a first project of writing the book, then abandoned in favour of a more traditional one:[44]

> What we mean is a project inspired to different criteria such as those adopted by Berlin Didymus, which dedicated great part to *excerpta*, and was then left in favour of the one, less demanding and more streamlined,

documents. See now Demokritos Kaltsas, "Beiträge zum antiken Buchwesen", *Zeitschrift für Papyrologie und Epigraphik*, 193 (2015), pp. 80–86.

44 Cf. Graziano Arrighetti, *Poesia, poetiche e storia della riflessione dei Greci* (Pisa: Giardini, 2006), pp. 414–421.

represented by PHerc. 164, after passing through the phase, recorded in the coll. XXII–XXXVI of PHerc. 1021, characterized by flatness of exposition and much poorer data and learning.[45]

PHerc. 164 hands down bare remains of a later copy of the final edition of the same Philodemus' book. Compared to PHerc. 1021, the fragments of PHerc. 164 are too small to be able to tell something concrete about the structure of their text.

Each one of the one hundred and sixty *opisthograph commentarii* by Pliny the Elder was probably developed in a similar way to what I assumed with respect to PHerc. 1021. Each *commentarius* contained all of the excerpts Pliny gathered together on a specific subject (or more subjects connected someway to each other); the rolls were opistograph, i.e., written on the *recto* (front) and on the *verso* (back); the back was reserved for the additions that Pliny had done at a later time and which had not been placed on the front due to the lack of space. At the origins of these rolls were all the excerpts Pliny had gathered from its own sources and which were copied on *pugillares* or dictated to a shorthand writer. *Commentarii* were therefore presented as collections of excerpts not yet drawn up in a definitive literary form, but already organized and classified by Pliny. It is from these *commentarii* and with this method that Pliny wrote countless books in his enormous literary output. It is not impossible that the same kind of collection gave birth to other literary texts of antiquity. However, we must not forget that the examples presented so far are somewhat limited in space and time. We must also take into account the fact that Pliny the Elder is a very peculiar case and that its working method was probably influenced by the subject of his book and his encyclopaedic content.

1.3   The Use of Loose Sheets of Papyrus or Notebooks

The time has come to bring back the vexed question of the use of tablets or single sheets of papyrus or parchment in the drafting of literary works. In an article published in 1930 entitled: "How Thucydides wrote his history", William K. Prentice wondered:

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45   Arrighetti, *Poesia, poetiche*, p. 23. Arrighetti refers to *On Demosthenes* by Didymos Chalkenteros (c. 63 BC–10 AD) which is partially preserved in PBerol. 9780 and has been re-edited by Phillip Harding, *Didymos: On Demosthenes* (Oxford: Clarendon Press, 2006).

But how was it possible for Thucydides to be continually revising and enlarging his book [i.e., Book 8], how could he have acquired certain "documents gradually and stuck them in his manuscript to work up later", if his manuscript was on papyrus rolls? Such a procedure can be imagined only if the author wrote on flat sheets, which he kept together in a bundle or in a box. And there is no reason whatever for rejecting such a supposition; it would explain many of the puzzling phenomena which the long study of this unfinished book has brought to light. The original manuscript consisted of a pile of loose sheets with many corrections, alterations, and insertions. From these sheets the text was transferred to rolls after the author's death, when the book was to be published and copies were made for sale.[46]

Prentice assumed that, preparing at least the eighth Book of his *Histories*, Thucydides (c. 460–400 BC) used individual sheets of papyrus, gathered together in bundles or stored in a box; the manuscript would be presented as a pile of loose sheets which were later transcribed into fair copy on rolls of papyrus at the time of publication.

This actually was not a new hypothesis, but after it has been revived by Prentice it has known a great success. A similar procedure has been postulated, rather than proven, to explain the presence of irregularities in the manuscript tradition of some literary works, in particular erroneous transfers of textual pericopes which have been identified in the transmission of works of ancient authors.[47]

We can not rule out sporadic use of loose sheets in some stages of the composition of a literary text. Indeed, we find concrete evidence of this practice, once again, in Philodemus' PHerc. 1021. I am referring to the current col. 4 of the roll. The location of this text between cols. 3 and 5 is undoubtedly erroneous, as already appears in a first reading of the whole of the three columns.[48] In cols. 3 and 5, Philodemus recounts the last night of Plato following Philip of Opus' report (forth century BC) transmitted by Neanthes of Cyzicus (second half of the forth century BC). If we take into account the syntax and content of

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46   William K. Prentice, "How Thucydides wrote his history", *Classical Philology*, 25 (1930), pp. 117–127, at p. 125.

47   Luciano Canfora, "Traslocazioni testuali in testi greci e latini", in E. Flores (ed.), *La critica testuale greco-latina, oggi. Metodi e problemi* (Rome: Edizioni dell'Ateneo, 1981), pp. 299–315.

48   Cf. Gaiser, *Philodems Academica*, pp. 80–82; Cavallo, "Testo, libro, lettura", pp. 313–314.

the passage, there is no difficulty in noting that the end of the col. 3 is joined to the beginning of the col. 5:

> Plato, now old, had as a guest a Chaldean; then, for a few days (Plato) had fever. And he (the Chaldean), || accompanied by a (slave) Thrace, wanted to sing a song of his land giving a rhythm with his finger.[49]

The presence of col. 4 between the last line of col. 3 and the first of the col. 5 interrupts the narration and creates an incomprehensible text. From the content point of view, the col. 4 is composed, in turn, of two fragments, independent of one another. The first (4, 1–25) retains the end of the story of Xenocrates' victory in a sympotic race at the court of the tyrant Dionysius II of Syracuse, and it rejoins with the end of the col. 8, after the line 46:

> And when he won, Xenocrates took it [the gold crown] and || he put it on the head of the statue of Hermes as he usually did with those of flowers.[50]

The second text (4, 25–45) comes from the *Life of Polemon* that Philodemus copied from the *Lives* of Antigonus of Carystus (fr. 9A Dorandi). It joins with the beginning of the col. 13, 1:

> It is said that (Polemon) was initially a young man, wild in the most audacious way, || to the point that he once even went around drunk through Keramikos during daylight.

To explain the phenomenon, we can admit that Philodemus had written the two excerpts on different loose sheets, and that these were then copied by mistake one after another by the secretary of Philodemus and placed at the wrong place. This testimony invalidates the assumption of Mejer,[51] who denies the use of loose sheets and, taking up a notion of Daly,[52] says that, in Greek and Latin, there is no specific term to designate a loose sheet.

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49   Cols. 3, 39–5, 3. I translate the text edited by Enzo Puglia, "Platone e l'ospite caldeo nella *Storia dell'Accademia* di Filodemo (PHerc. 1021, coll. III 39–v 19)", *Studi di Egittologia e di Papirologia*, 2 (2005), pp. 123–127. The transitions from a column to the next one are marked by the sign ||.

50   Tiziano Dorandi, *Filodemo. Storia dei filosofi. Platone e l'Accademia (PHerc. 1021 e 164)* (Naples: Bibliopolis, 1991), p. 46 and p. 139.

51   Mejer, *Diogenes Laertius*, p. 14.

52   Lloyd W. Daly, *Contributions to a history of alphabetization in Antiquity and the Middle Ages* (Bruxelles: Latomus, 1967), pp. 86–87.

The last statement is false. In fact, in both Greek and Latin there are a series of words that designate individual loose sheets of papyrus (Greek: *chartíon, chartídion, chartárion, chartarídion*; Latin: *chartula*) and parchment (Greek: *diphthérai, membránai*; Latin: *membranae*), or wax or wooden tablets (Greek: *grammateîa, déltoi*; Latin: *cerae, tabellae, tabulae*). Even more frequent is the Latin generic noun *pugillares* (or *pugillaria*), that is something that can be hold in the palm of a hand.[53]

Pugillares could be in the form of two or more tablets of simple wood, wood coated with wax or ivory, but also in the form of sheets or notebooks of parchment and papyrus.[54] Some authors make the distinction between *pugillares*, in the sense of 'writing tablets', 'notebooks', and *liber, libellus*, in the sense of 'written text'.[55]

There are also many literary evidences proving the occasional and not systematic use of sheets or tablets in the composition of a scholarly work, such as support for notes taken by reading the sources and sometimes even for the preparation of waste books or initial drafts of texts of limited extension.[56] Here are a few examples, to begin with, of the use of *pugillares* to take notes.

Roberts and Skeat[57] showed that the noun *membránai* in the *Second Epistle to Timothy* by Paul (first century AD)[58] has the sense of 'parchment notebooks': "When you come, bring the cloak that I left at Troas in Carpos' home, as well as the books, especially the parchment notebooks".[59]

We are better informed about the Roman world. Seneca the Younger (c. 4 BC–65 AD) points out to his friend Lucilius: "Some come here (to the lessons of Attalos) carrying notebooks (*cum pugillaribus*): certainly not to transcribe ideas, but to transcribe words they will repeat to others with no profit, the same way they heard those words with no profit for themselves".[60] Pliny the Younger wrote in a letter to Tacitus, saying that even while hunting, he spends his

53 Mario Capasso, *Volumen. Aspetti della tipologia del rotolo librario antico* (Naples: Procaccini, 1995), pp. 31–40; Paola Degni, *Usi delle tavolette lignee e cerate nel mondo greco e romano* (Messina: Sicania 1998), pp. 169–172; Naas, *Le projet encyclopédique*, pp. 128–132.

54 Dorandi, *Nell'officina dei classici*, p. 26 (fn. 42–44). A leather *pugillaris* is preserved in the collection of Berlin papyri (PBerol., Inv. 7358/9). A photographic reproduction can be seen in Colin H. Roberts and Theodor C. Skeat, *The birth of the codex* (London: Clarendon Press, 1985²), Plate II.

55 Dorandi, *Nell'officina dei classici*, p. 26 (fn. 46–48).

56 Degni, *Usi delle tavolette*, pp. 25–27, pp. 29–31 (Greece); pp. 40–44, pp. 55–59 (Rome).

57 Roberts and Skeat, *The birth of the codex*, p. 22 and p. 60.

58 Paul, *Epist. to Tim.*, II, 4, 13.

59 Theodor C. Skeat, "'Especially the parchments': a note on 2 Timothy IV. 13", *Journal of Theological Studies*, n.s. 30 (1979), pp. 273–277.

60 Seneca, *Epist. ad Luc.*, 108, 6.

time working: "I had at hand … a stylus and some tablets (*stilus et pugillares*); I pondered some thought and I took notes".[61] In *Metamorphoses* of Apuleius (c. 124–170 AD), the young Lucius, transformed into a donkey, regrets "having neither tablets nor stylus (*pugillares et stilus*) to take note (*praenotare*)"[62] upon the tale of Cupid and Psyche.

The use of *pugillares* as support of early drafts or waste books is dated at least at the beginning of the Hellenistic era. Let me just recall the famous verses of the prologue of *Aitia* by Callimachus (third century BC), where the poet is sitting with a tablet (*délton*) on his knees, ready to write his verses inspired by Apollo Lyceus (fr. 1. 21–22 Pfeiffer). The witness of Dionysius of Halicarnassus (c. 60 BC– after 7 BC) is interesting as well, and it tells how, after the death of Plato, a tablet was found that retained some variants of the beginning of the *Republic*:

> All scholars know … the history of the tablet (*délton*) which, it is said, was found after the death of Plato, containing different variations of the beginning of the *Republic*, "I came down the Piraeus yesterday in the company of Glaucon, son of Ariston".[63]

In the Latin world, the well-known verses of Catullus (c. 84–54 BC):

> Yesterday, Licinius, having nothing to do, enjoyed my tablets (*tabellae*), because we had decided to be lascivious. Each one of us wrote a few lines without pretense, now in a meter, now in another.[64]

And those taken from *Ars poetica* by Horace (65–68 BC):

> If finally, one day, you will write something, put it into the critical ear of Maecius, of your father and mine, and keep it for nine years into the well-closed notebooks of parchment (*membranae*).[65]

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61   Pliny the Younger, *Epist.*, 1, 6, 1.

62   Apuleius, *Metam.*, 6, 25.

63   Dionysius of Halicarnassus, *De comp. verb.*, 6, 25, 33. In fact, the text cited by Dionysius is not different from the text transmitted by medieval manuscripts of Plato, *Resp.*, 1, 327a 1–2. The same episode is told by Quintilian, *Inst. orat.*, 8, 6, 64, who speaks of Plato's wax tablets but does not cite the text of *Republic*. Diogenes Laertius, *Life of Plato*, 3, 37 dates back this information to Hellenistic times and ascribes it to Euphorion (fr. 187 van Groningen) and to Panaetius (test. 149 Alesse).

64   Catullus, *Carm.*, 50, 1–5.

65   Horace, *Ars poet.*, 386–389. In *Serm.* 2, 3, 1–2, Horace uses *membrana* in the sense of 'parchment sheets' rather than in the sense of 'parchment notebook'. See Roberts and Skeat, *The birth of the codex*, p. 20.

The noun *membranae* takes here the sense of 'notebook', as suggested by Brink and by Roberts and Skeat,[66] thus it indicates the rough drafts of the poems of Horace. I personally deem the interpretation of Rudd less convincing:

> This seems to imply two stages: (i) lines or phrases (*scripta*) are jotted down (possibly on a wax tablet); (ii) a draft of the completed poem is prepared on *membrana* (parchment).[67]

I just finally discuss some controversial cases: the testimony of Diogenes Laertius on Philip of Opus, 'editor' of Plato's *Laws* and of a series of *Apophoreta* (presents gave 'to be carried away') of the Latin poet Martial (first century AD) in which books of Greek and Latin authors copied onto *membranis* or *pugillaribus membraneis* seem to be mentioned.

In the *Life of Plato* by Diogenes Laertius, we read: "Some say that Philip of Opus *metégrapsen* the *Laws* of Plato when they were *en kerôi*".[68] The interpretation of this sentence depends on the sense given to the verb *metégrapsen* and to the expression *en kerôi*. I propose to translate the verb *metégrapsen* as 'copied it down', and to mean the expression *en kerôi* in a metaphorical sense: Plato's *Laws* were still in a provisional draft (literally: were still written on wax tablets), that had not yet received the last hand. So we can translate: "Some say that Philip of Opus recopied the *Laws* of Plato when they were still in a provisional draft". Philip would have therefore put into circulation, 'published', the *Laws* that Plato had left unfinished (*en kerôi*) at the time of his death.

The use of *en kerôi* in a metaphorical sense seems to be inescapable. The hypothesis that the *Laws* were actually written, in their entirety, on thousands of wax tablets, is untenable, and the same can be said about the thesis of Theodor Bergk, who makes here an allusion to the practice of plastic art and the system of bronze-casting called *en cire perdue*. However, I cannot overlook the fact that I have not found other evidences of *en kerôi* in the metaphorical sense of "still in a provisional draft".[69]

In some *Apophoreta* (a collection of couplets that form the fourteenth Book of *Epigrams*), Martial describes copies of books of Greek and Latin authors which were offered as presents.[70] The title given to individual couplets

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66   Charles O. Brink, *Horace on poetry. The* Ars poetica (Cambridge: Cambridge University Press, 1971), pp. 383–384; Roberts and Skeat, *The birth of the codex*, p. 20.

67   Niels Rudd, *Horace. Epistles Book II and Epistle to the Pisones* (Ars poetica) (Cambridge: Cambridge University Press, 1989), at p. 213.

68   Diogenes Laertius, *Life of Plato*, 3, 37 (=Philip of Opus, test. VI Tarán=fr. 14b Lasserre).

69   Dorandi, *Nell'officina dei classici*, p. 22 and p. 27 (fn. 67–70).

70   Martial, *Epigrams*, 14, 183–195.

sometimes indicates only the author's name (for instance, Sallust and Tibullus),[71] sometimes also the title of the work (for instance, Vergil's *Culex* and Menander's *Thaïs*).[72] Within this group, we can distinguish five epigrams in which Martial describes editions of Homer, Vergil, Cicero, Livy and Ovid, copied on parchment (*in membranis*).[73] The most interesting case is the one of Homer:

> The *Iliad* and the history of Ulysses, the enemy of the kingdom of Priam, are stored together in a number of sheets of parchment (*multiplici pariter condita pelle latent*).

If we give credence to the title that accompanies the couplet, this edition would have been copied in *pugillaribus membraneis*. What does Martial mean saying *pugillares membranei*? It is hard to believe that Homer's *Iliad* and *Odyssey* were contained in one single parchment notebook (*pugillares*). The same can be said for the couplet describing the edition of Livy.[74] Here there is no mention of *pugillares*, but Martial makes good note about the contrast between the immense (*ingens*) work by Livy and the smallness of the manufacture of parchment (*pellis exiguis*):

> These small parchments condense (*pellis exiguis artatur*) the enormous Livy, that my library can not wholly contain.[75]

The most likely hypothesis is that Martial has used the terms *pugillares membranei* or *membranae* as interchangeable synonyms of the term *codices*, and thus alludes to miniatures of parchment codices.[76] Even Martial's *Epigrams* were published in the form of a codex that has the same size of *pugillares* (*me manus una capit*) and is described by the poet with a similar vocabulary (*quos artat breuibus membrane tabellis*) to the one used about the codex of Livy:

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71   Martial, *Epigrams*, 14, 191 and 193.

72   Martial, *Epigrams*, 14, 185 and 187. See Roberts and Skeats, *The birth of the codex*, p. 25.

73   Martial, *Epigrams*, 14, 186, 188, 190 and 192.

74   Martial, *Epigrams*, 14, 190.

75   The same argument, *mutatis mutandis*, goes for the work of Vergil (Martial, *Epigrams*, 14, 186) and Ovid's *Metamorphoses* (Martial, *Epigrams*, 14, 192) copied "on parchment" (*in membranis*).

76   Roberts and Skeat, *The birth of the codex*, pp. 24–29.

> You, who want to keep by your side my books wherever, and want their company on a long trip, should buy these ones here, that the parchment (*membrana*) condenses into small pages (*breves tabellae*). Take your shelves for big books: I can hold in one hand (*me manus una capit*).[77]

Be as it may, it is with full consciousness that I do not deal, here, neither with the hotly debated issue of relations between *pugillares* and *codex* – that is, if you can find in *pugillares* a rudimentary form of *codex* –, nor with the one of the role played by *pugillares* in the epochal moment of transition from rolls to codes.[78]

Let me conclude. I can only reiterate that we must abandon the hypothesis stating that the manuscript of an author consisted of a stack of loose sheets of papyrus copied to a complete roll only at the time of publication. The use of *pugillares* was therefore limited to the first phase of the composition of a writer, to the collection of notes and excerpts, to the preparation of waste books of a short text, or else, to make sporadic further additions.

English translation by Silvia Misley

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77   Martial, *Epigrams*, 1, 2 and 1, 4.
78   Dorandi, *Nell'officina dei classici*, p. 28 (fn. 83).

From *domus sapientiae* to *artes excerpendi*: Lambert Schenkel's *De memoria* (1593) and the Transformation of the Art of Memory

Koji Kuwakino

2.1   Introduction

The classical art of memory, based on Cicero's system of 'places' (*loci*) and 'images' (*imagines*) was revived in the Renaissance.[1] It was further developed thanks to the rapid diffusion of printing technology.[2] Many sixteenth-century authors of mnemonic treatises divided memory into two kinds: natural and artificial. Following the traditional Aristotelian view that 'nature' (*natura*) could be perfected by 'art' (*ars*), they also held that the innate mnemonic ability of human beings could be improved artificially.

According to some theorists, even the mnemonic art itself could be further refined in the course of time. In his *Plutosofia* of 1592, Filippo Gesualdo (1550–1619) illustrated the art of memory enriched with the new elements

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1   On the classical art of memory, see Paolo Rossi, *Clavis universalis. Arti della memoria e logica combinatoria da Lullo a Leibniz* (Bologna: Il Mulino, 2000³); Frances A. Yates, *The art of memory* (London: Routledge and Kegan Paul, 1966); Herwig Blum, *Die antike Mnemotechnik* (Hildesheim: Olms, 1969); Mary Carruthers, *The book of memory. A study of memory in medieval culture* (Cambridge: Cambridge University Press, 1990).

2   On the revival of the art of memory in early modern Europe, see Lina Bolzoni and Pietro Corsi (eds.), *La fabbrica del pensiero. Dall'arte della memoria alle neuroscienze* (Milan: Electa, 1989); Lina Bolzoni and Pietro Corsi (eds.), *La cultura della memoria* (Bologna: Il Mulino 1992); Jörg J. Berns and Wolfgang Neuber (eds.), *Ars memorativa. Zur kulturgeschichtlichen Bedeutung der Gedachtniskunst 1400–1750* (Tübingen: Max Niemeyer, 1993); Lina Bolzoni, *La stanza della memoria. Modelli letterari e iconografici nell'età della stampa* (Turin: Einaudi, 1995); Jörg J. Berns and Wolfgang Neuber (eds.), *Seelenmaschinen. Gattungstraditionen, Funktionen und Leistungsgrenzen der Mnemotechniken vom späten Mittelater bis zum Beginn der Moderne* (Weimar et al.: Böhlau, 2000); *Il senso della memoria. Atti dei convegni dei Lincei* (Rome: Accademia Nazionale dei Lincei, 2003); Donald Beecher and Grant Williams (eds.), *Ars reminiscendi. Mind and memory in Renaissance culture* (Toronto: Centre for Reformation and Renaissance Studies, 2009); Anna M. Busse Berger and Massimiliano Rossi (eds.), *Memory and invention. Medieval and Renaissance literature, art and music* (Florence: Leo S. Olschki, 2009); Koji Kuwakino, *L'architetto sapiente. Giardino, teatro, città come schemi mnemonici tra il XVI e il XVII secolo* (Florence: Leo S. Olschki, 2011).

introduced in his age.[3] Comparing the modern method with the old one, he argued that "with time arts are increased, improved, augmented and rendered always more perfect with new reasons, inventions and experiences".[4] Toward the end of the sixteenth century and the beginning of the seventeenth, however, the structure of the art became so complex that many intellectuals found it almost impracticable. Abandoning the traditional, strictly mental method, they increasingly made recourse to external devices as 'secondary memories' such as commonplace books, elaborated indexes, slips of paper or note cards and branching diagrams.

Renaissance mnemonics have been studied mainly in the field of philosophy, literature and visual arts. To understand its complex development, it is necessary to place them in a broader context of information management.[5] From this point of view, three figures of the late sixteenth century stand out: Filippo Gesualdo, Cosma Rosselli and Lambert Schenkel, who epitomized the summit and limit, or even collapse, of the tradition. By analyzing their teachings, especially Schenkel's, this article addresses the crucial moment at which the declining art of memory and rising humanist methods of learning were fused inextricably, paving a way to the ideal handling of encyclopaedic knowledge.

2.2 The Art of Memory as a Visualization of *loci communes*

In *Thesaurus artificiosae memoriae* of 1579, Florentine Dominican friar Cosma Rosselli tried to reform the traditional system of 'mnemonic places' in the shape of houses with a highly theological inspiration.[6] Most likely influenced

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3 Filippo Maria Gesualdo, *Plutosofia ... nella quale si spiega l'arte della memoria, con altre cose notabili pertinenti, tanto alla memoria naturale, quanto all'artificiale* (Padua: Paolo Meietti, 1592).

4 Gesualdo, *Plutosofia*, fol. 24r: "... l'Arti col tempo son cresciute, migliorate, augmentate, e fatte sempre più perfette, con le nuove raggioni, inventioni, ed esperienze".

5 The following studies are very interesting from this point of view: Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006); Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010).

6 Cosma Rosselli, *Thesaurus artificiosae memoriae, concionatoribus, philosophis, medicis, iuristis, oratoribus, procuratoribus, caeterisque; bonnarum litterarum amatoribus* (Venice: Antonio Padovano, 1579). Cf. Yates, *The art of memory*, pp. 121–129; Umberto Eco, "Mnemotecniche come semiotiche", in L. Bolzoni and P. Corsi (eds.), *La cultura della memoria* (Bologna: Il Mulino 1992), pp. 35–56; Barbara Keller-Dall'Asta, *Heilsplan und Gedächtnis. Zur Mnemologie*

by the cosmological vision of the great poet Dante, Rosselli proposed to use the entire world, starting from Hell and Purgatory, and move through the realm of the four elements to finally reach the Empyrean sky, the Christian paradise depicted as heavenly Jerusalem. Once constructed, these mnemonic places in the mind allow readers to freely choose the appropriate one to store the information. For example, the *locus* of Paradise should be used for remembering theological doctrines; the physical worlds of the four elements are selected for secular matters, while the celestial sphere fits astronomical knowledge.

Rosselli's method is characterized by a well-articulated system of places, divided into 'common' and 'particular'.[7] Images are directly placed in the particular places, which are in turn contained in the common ones. Rosselli further divides these common places into six categories according to their size: *amplissima, ampliora, ampla, maiora, mediocrira* and *minima*.[8] For example, a series of traditional Christian world divisions inspired by Thomas Aquinas such as Hell, Purgatory, elemental worlds, celestial spheres and Paradise are assigned to the group of the largest places, *amplissima*. Then the middle classes comprise various artificial and natural structures such as cities, castles, roads, mountains and rivers. Finally, individual human beings, animals, plants and minerals are contained in the group of the smallest places, *minima*. For Rosselli most of these categories serve as mnemonic 'commonplaces'. Thus they are labelled with 'common nouns' as a kind of empty container to be filled with more concrete information. In other words, they are equivalent to 'topical headings' in reference books to define larger *topoi* (cities, fortresses, roads, etc.), then more refined items (palaces, churches, streets, etc.), finally reaching specific data (the Archangel Michael, Apostle Peter, St. Thomas Aquinas, Lucifer as the king of Hell, etc.). These six categories are hierarchically organized so that larger commonplaces always contain smaller ones. Following this scheme, the entire universe is turned into a kind of Chinese box that can handle a huge amount of information.

To create the individual parts of those mnemonic places, especially for those of *minima*, Rosselli advises readers to consult various reference books such as Pliny the Elder's *Naturalis Historia*, encyclopaedic works by Vincent of Beauvais (c. 1190–1264?), a polyglot dictionary by Ambrogio Calepino

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des 16. Jahrhunderts in Italien (Heidelberg: Universitätsverlag Winter Heidelberg, 2001), pp. 149–184; Kuwakino, *L'architetto sapiente*, pp. 235–284.

7 Rosselli, *Thesaurus*, fol. 1v: "Quo ad divisionem Locorum quaedam communia vocamus: quaedam particularia".

8 Rosselli, *Thesaurus*, fol. 2r.

(c. 1435–1509/10) and the *Officina* by Johann Ravisius Textor (c. 1480–1524).[9] Among these books, Textor's work is the most useful to the present study. First published in Paris (1520) and reprinted many times during the century, his *Officina* was one of the most popular printed commonplace-book of the time.[10] It gathered a large quantity of 'commonplace phrases' (*exempla*) which were mainly extracted from classical literature and classified into 150 'topical headings' (*tituli*). Readers can easily find required information through the elaborate index at the end of the work.

Browsing Textor's pages that assemble many commonplaces on trees and gems allows us to acquire concrete notions which are necessary to depict mnemonic images of natural objects stored in Rosselli's mnemonic world. Consulting *Officina*'s topical headings such as *Elementa quatuor*, *Fluvii infernales*, *Lacus, paludes & stagna*, *Sylvae* and *Gymnasia*,[11] readers can easily imagine various natural settings and buildings that compose its larger 'commonplaces' (*loca communia*): *ampliora*, *ampla*, *maiora* and *mediocrira*.

Indeed, the 'commonplaces' in Rosselli's mnemonic art literally corresponded to the commonplaces in rhetoric and dialectic, which were typical phrases and sentences on various topics. He adopted the famous image of the heavenly Jerusalem as one of *loca communia amplissima*. Well known by the description found in the book of Revelation, this city was celebrated to have a great number of saints, blessed and angels as holy inhabitants (see Fig. 2.1). All of them are depicted with traditionally recognized outfits and attributes such as Saint Peter with a key and sword, the Archangel Gabriel with a lily and the Cherubim with books. Thus both the very structure of Paradise and its multiple residents functioned as 'visualized' commonplaces that presented the perennial image of each entity.

As seen in *Officina*, enormous quantities of such phrases and sentences were organized hierarchically through volumes, books, chapters with a series

9   Rosselli, *Thesaurus*, fol. 64v: "Historias autem praedictorum hominum in Alphabeto, et superioribus ordinibus positorum videre poteris apud Ioann. Textorem in sua Officina, et apud Plinio et in vocabulario Ambrosij Calepini: et apud Vincentium Belvacensem".

10   Johann Ravisius Textor, *Officina partim historicis partim poeticis refertis disciplina* (Paris: Reginaldus Chauldière, 1520). Cf. Walter Ong, "Commonplace rhapsody: Ravisius Textor, Zwinger and Shakespeare", in R.R. Bolgar (ed.), *Classical influences on European culture, A.D. 1500–1700* (Cambridge: Cambridge University Press, 1976), pp. 91–126; Alfredo Serrai, *Storia della bibliografia II. Le enciclopedie rinascimentali (II), bibliografie universali* (Rome: Bulzoni, 1991), pp. 153–160.

11   These headings are of the following edition: Johann Ravisius Textor, *Officinae* (Lyon: Haeredes Sebastiani Gryphii, 1560). On its index, see Kuwakino, *L'architetto sapiente*, pp. 228–234.
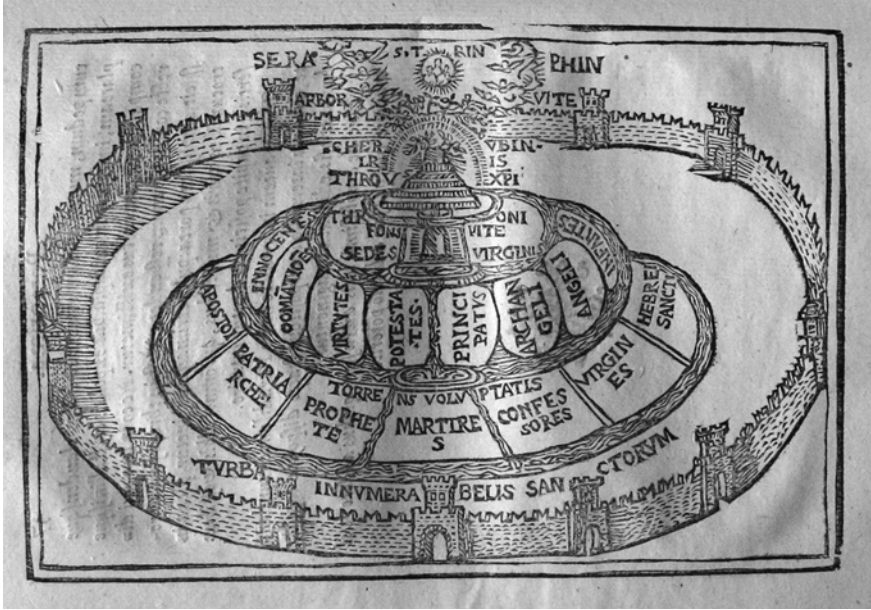
FIGURE 2.1 *Heavenly Jerusalem as* loca communia amplissima. *Cosma Rosselli,* Thesaurus
artificiosae memoriae, concionatoribus, philosophis, medicis, iuristis, oratoribus,
procuratoribus, caeterisque; bonnarum litterarum amatoribus (*Venetia: Antonio
Padovano, 1579*)*, p. 51r.*
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SITARIA OF PISA, ITALY, D.B.11.12.

of topical headings in many commonplace-books of the time.[12] Rosselli's
mnemonic places, called suggestively *loca communia*, are also hierarchically
organized from larger categories to smaller ones, serving as the containers of
notions. Indeed, this system was an application of information management
found in its contemporary commonplace-books. In his *mundus mnemonicus*,
Rosselli tried to visualize rhetorical commonplaces and offer a universal inter-
pretative grid through which all the phenomena of the physical world could be
analyzed and classified so that every creature could have its proper position in
the 'universal history' (*historia universalis*).

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12   On the notion of commonplace in the early modern Europe, see Wilhelm Schmidt-
        Biggemann, *Topica universalis. Eine Modellgeschichte humanistischer und barocker
        Wissenschaft* (Hamburg: Felix Meiner, 1983); Alfredo Serrai, *Dai "loci communes" alla bib-
        liometria* (Rome: Bulzoni, 1984); Ann Moss, *Printed commonplace-books and the structur-
        ing of Renaissance thought* (Oxford: Clarendon Press, 1996); Francis Goyet, *Le sublime du
        "lieu commun". L'invention rhétorique dans l'Antiquité et à la Renaissance* (Paris: Honoré
        Champion, 1996).

2.3   The Library of Memory

Unlike Rosselli's system, largely based on the actual structure of the universe or on the real world whose existence was then firmly believed, some intellectuals such as Giordano Bruno (1548–1600) adopted a purely imaginative model in their construction of mnemonic places. For them, these places had to be designed according to the content to be stored.[13] Italian Franciscan friar Filippo Gesualdo also belonged to this current. His *Plutosofia* was a sort of encyclopaedia that compiled almost all the previous mnemonic precepts advanced by major authors such as Pietro da Ravenna (1448–1508), Johannes Host von Romberch (1480–1533), and Rosselli.[14]

At the end of his treatise, Gesualdo suggested a very original idea which can be called 'library of memory'.[15] All the information extracted from daily reading could be stored through the system of places and images in this library, which was a huge virtual archive built in the human mind. Gesualdo insisted its extraordinary utilities: it is not expensive to build and maintain; it never wears out by the test of time and disasters such as earthquake and fire; and it could be always used without librarians.[16]

Instead of providing a concrete description of its spatial structure, Gesualdo focused on the internal decoration of his virtual library. Referring to the embellishments of the actual libraries of his time, he urged readers to garnish its walls with portraits of saints, angels and blessed residents of heaven. These items could serve as visual aids to grasp the disposition and the classification of books.[17] Furthermore, Gesualdo also proposed to orient his library following the precept of Vitruvius, according to which library and bedroom should face the east to get the ideal lightning from the morning sun.[18] However, he made a reservation as a clergyman by adding that he meant by the east spiritual rather than physical, that is, the direction of Jesus Christ as the 'spiritual orient'.[19]

In the virtual library of Gesualdo, the disposition of its stacks represented the general division of human knowledge, while the arrangement of its shelves

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13   Giordano Bruno, *Opere mnemotecniche* (2 vols., Milan: Adelphi, 2004), I, p. 141.

14   See Keller-Dall'Asta, *Heilsplan und Gedächtnis*, pp. 88–148.

15   Gesualdo, *Plutosofia*, fols. 55v–58v.

16   Gesualdo, *Plutosofia*, fol. 56r.

17   Gesualdo, *Plutosofia*, fol. 57r. On the ornaments of early modern libraries and studies, see Wolfgang Liebenwein, *Studiolo. Die Entstehung eines Raumtyps und seine Entwicklung bis um 1600* (Berlin: Mann, 1977).

18   Vitruvius, *De architectura*, 6, 4, 1: "Cubicula et bibliothecae ad orientem spectare debent, usus enim matutinum postulat lumen, item in bibliothecis libri non putrescent".

19   Gesualdo, *Plutosofia*, fol. 57r : "… l'Oriente spirituale che è Christo".

stood for further division of various disciplines. There, each book composed of hundreds of pages contained concrete notions in the form of *imagines agentes*. According to Gesualdo, those images stored in their proper places should never be deleted, remaining forever as eternal memories in order to build a *summa* of knowledge.

Contrary to expectation, Gesualdo actually suggested a different scheme for his mnemonic places. Instead of a single large library, he promoted the form of cities, each of which would have many buildings. One discipline of knowledge like philosophy, theology or logic was assigned to a certain district of each city. Each building of the district represented a branch of that discipline.[20]

Although Gesualdo offered only a general outline without any detail in the physical aspects of those mental buildings, the information extracted from reading had to be gathered, selected, summarized and classified before being placed as the mnemonic images. His project can be seen as an attempt to internalize the system of information management adopted in the commonplace-books of the time since there was a clear parallel between his well-organized mnemonic places and the information contained in texts as bibliographic *loci*.

To manage the influx of information, Gesualdo's mnemonic places could be modified with the addition of new buildings or the division of districts by new roads. It functioned as if new sheets of paper were added to a commonplace book or its pages were divided by the introduction of new topical headings for more detailed notions. These operations would be difficult to carry out in real physical places. That was why Gesualdo recommended this method for purely mental places. Thus his virtual library of memory was a true 'metropolis' of knowledge that constantly grew and changed in the memory-scape.

2.4   Lambert Schenkel's Mnemonic System

Considering the contemporary tendency to appeal to the 'secondary memory' in order to relieve the mind, Gesualdo's project based on the traditional mnemonic system seems rather old-fashioned. But such judgment is hasty in light

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20   Gesualdo, *Plutosofia*, fols. 57r–v: "… sicome nelle Librarie li libri son posti con ordine, siche in una parte son riposti quelli della Logica, in un'altra quelli della Filosofia, in quell'altro canto quelli della Geometria, &c. così bisogna ordinar li luoghi communi, che tra loro siano distinti. Per esempio, nelli luoghi d'una Città colloco la Logica, & in quelli d'un altra la Filosofia, in quelli della terza la Theologia, & in un luogo commune della seconda Città si colloco il primo della Fisica, nel secondo il secondo, e così procedendo nelli sequenti libri della Filosofia".

of the similar idea proposed by Thomas Lambertus Schenckelius or Lambert Schenkel (1547–c. 1630). In his *De memoria*, Schenkel tried to accommodate the most up-to-date art of memory with the 'method of learning' (*methodus studiendi*).[21] This was the outcome of the sixteenth-century reform of dialectic, which ultimately lead to the decline of the classical mnemonics. How could these two apparently opposite tendencies coexist in one treatise?

Schenkel was widely known as a great master of the art of memory in his time. Born in 's-Hertogenbosch in 1547 and having studied philosophy at Louvain, he taught this art in France, Burgundy, Germany and Bohemia. His teachings were so efficient that he was once accused of heresy by Catholic Church. Innocence proven, he received a license from French King to freely profess his art in the kingdom.[22] First published in 1593, Schenkel's major mnemonic treatise was more widely circulated after being included in the *Gazophylacium artis memoriae,* a collection of mnemonic texts of various authors published under his name in 1610.[23]

Schenkel's system was rather traditional, based on 'places' and 'images'. Far from a metaphysical orientation adopted by Giulio Camillo (1480–1544) or Giordano Bruno, it could be characterized by a rational and flexible way to build mental places. Unlike most theorists of his time, who recommended well-known existing spaces and buildings, Schenkel preferred artificially constructed ones from the point of utility.[24] Drastically different from Rosselli's complex cosmological places, Schenkel's system had simple rectangular houses composed of square rooms alone. The walls of each room had five mnemonic

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21   Lambert Schenkel, *De memoria libri duo* (Douai: Vidua Jacobi Boscardi, 1593). Its French translation is *Le magazin des sciences, ou vray art de mémoire descouvert par Schenkelius* (Paris: Jacques Quesnel, 1623).

22   On this accusation, see Lambert Schenkel, *Methodus sive declaratio … quo modo Latina lingua sex mensium spacio doceri* (Strasbourg: Eberhard Zetzner, 1619), pp. 83–84. On his royal license, see Jan Paepp, *Schenckelius detectus: seu, memoria artificialis hactenus occultata, ac a multis quam diu desiderata* (Lyon: Bartolomé Vincent, 1617), p. 50. Cf. Valerius Andreas, *Bibliotheca Belgica* (Louvain: Jacob Zegers, 1643), pp. 615–616.

23   Lambert Schenkel, *Gazophylacium artis memoriae, in quo duobus libris, omnia et singula ea quae ad absolutam hujus cognitionem inserviunt, recondita habentur* (Strasbourg: Antonius Bertramus, 1610). See also Rossi, *Clavis universalis*, pp. 148–149 and p. 165; Yates, *The art of memory*, pp. 291–293. This collection also includes Johannes Magirus, *De memoria artificiosa libellus* (1600); Girolamo Marafiori, *De arte reminiscentiae* (1602); and Johann Spangenberg, *Erotemata de arte memoriae* (1570).

24   For example, see Giovan Battista Della Porta, *Ars reminiscendi, aggiunta l'arte del ricordare tradotta da Dorandino Falcone da Gioia*, ed. by R. Sirri (Naples: Edizioni Scientifiche Italiane, 1996), p. 66; Gesualdo, *Plutosofia*, fol. 12v.
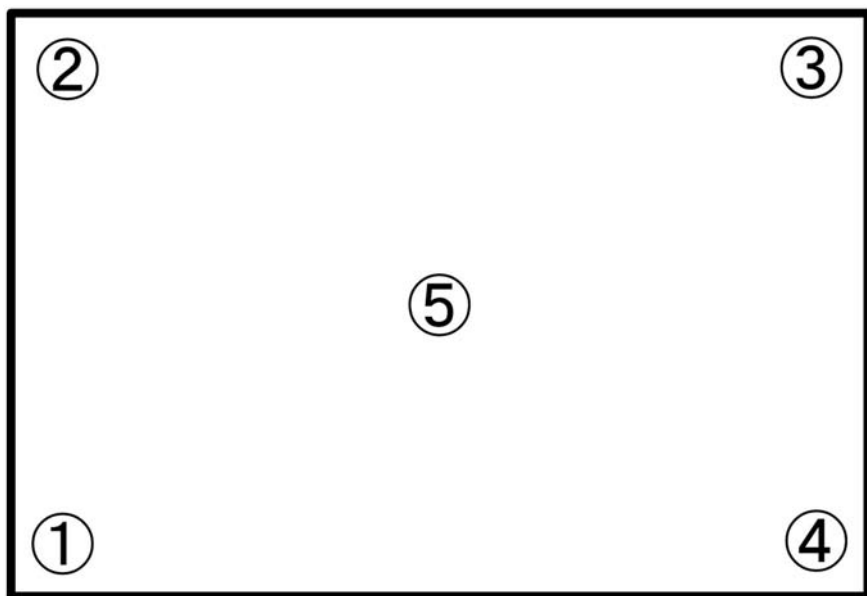
FIGURE 2.2 *Five mnemonic places in a wall.*

places: one for each corner and one in the centre (see Fig. 2.2). Each room with its four walls had 20 places in total. Schenkel added a supplementary rule to store large data. It was possible to replace each of the five places of the wall with smaller rectangular walls. In this way, each wall of a room could provide 20 mnemonic places (see Fig. 2.3).

Schenkel's system was so elastic and mathematically abstract that one could easily increase the number of places according to the quantity of data to be stored. By infinitely repeating the insertion of ever-smaller walls, it could theoretically produce up to a million mnemonic places in a single wall and up to four million in a room can be built.[25] According to another rule, rooms could be arranged linearly up to 600 on each side of a house.[26] It was also possible to increase the number of floors. Schenkel mentioned the example of a mnemonic skyscraper of 100 floors.[27] To distinguish these highly homogeneous *loci*, he also introduced a series of discrimination symbols such as *impresa*, mathematical symbols, Latin, Greek and Hebrew characters, colours, various instruments, animals, plants, etc.[28]

25　　Schenkel, *De memoria*, in L. Schenkel, *Gazophylacium artis memoriae*, p. 119.
26　　Schenkel, *De memoria*, p. 117.
27　　Schenkel, *De memoria*, p. 117.
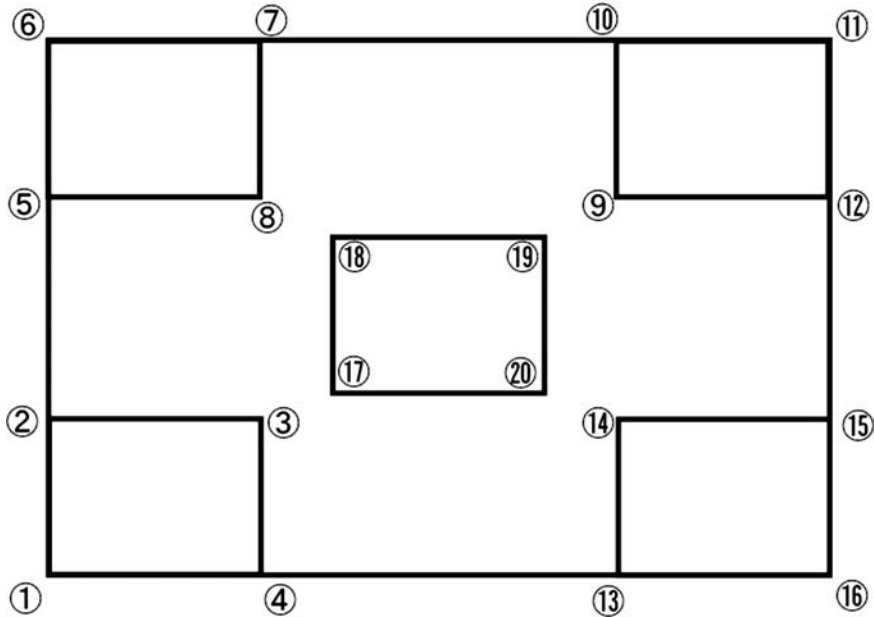28　　Schenkel, *De memoria*, pp. 115–116.

FIGURE 2.3 *Twenty mnemonic places in a wall.*

This extraordinary elasticity of mnemonic places could bring great advantages for the management of information in the age flooded with ever-increasing notions coming from all over the world. At the same time, it revealed the limit of the traditional art of memory. Indeed, no one, except a gifted figure like Schenkel, could handle such a large number of places that required incredible mental strength and imagination. After centuries of development, the art began to move towards its decline.

2.5 The *domus sapientiae*

To get the greatest advantage of his system, Schenkel proposed a unique method of learning, called *methodus studiendi*, in the second part of his treatise. This concept was illustrated in detail in a chapter entitled "How this art of memory is applied to grammar, rhetoric, dialectic and other liberal arts as well as to theology, jurisprudence and medicine …".[29] Properly mastered, readers could learn diverse sciences and languages in a quick, easy and secure way.

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29   Schenkel, *De memoria*, p. 137: "Quomodo gram: rhet: dial: et caeteris liberalibus artibus. Item theologiae, iurisprudentiae, medicinae, haec ars memoriae applicetur …".

It was the application of mnemonics to learning with the construction of a mental library similar to the one proposed by Gesualdo. The combination of mnemonics with an educational method formed the quintessential core of Schenkel's system.

Having explained how to build mnemonic places, Schenkel dedicated each house of memory to a single academic discipline such as grammar, rhetoric or dialectic.[30] Indeed, his austere mental buildings, capable of modifying the number of mnemonic places, served as the simple containers of sciences and arts. These *domus sapientiae* in turn formed a great city capable of storing the universal knowledge.[31] Surrounded by walls with 100 towers, this city was carefully divided by vertical and diagonal streets into many districts filled with houses.[32] It is not difficult to recognize here some reflections from the urban planning theories which were inspired by Roman architect Vitruvius. Unlike Gesualdo, Schenkel explained in detail how to build each house dedicated to disciplines of knowledge, starting from the seven liberal arts and then theology, law and medicine.

The essential part of Schenkel's method consisted of 'definitions' and 'divisions'. By this, he divided the whole of a discipline into a series of manageable segments of information. For example, Latin grammar was divided into three major parts: speech, syntax and prosody. Speech was further divided into eight elements. Among these, Schenkel insists, *nomen* and *verbum* were most important.[33] Then Schenkel assigned all the rules of Latin grammar to a square house of 100 rooms, each side of which had 25 rooms.[34] Speech occupied one of its four sides. Its first six rooms contained rules about nouns such as number, gender, case and declension. Its seventh room stored rules about pronouns. The rules about verbs occupied rooms 8 to 12, in which the four regular conjugations of verbs were distributed through *definitio* and *divisio*. Rooms 13 to 16 contained rules about participles, adverbs, conjunction, interjections and prepositions (see Fig. 2.4).

The second and third sides of this house of Latin grammar were assigned to syntax and prosody, whose rules were distributed in different rooms always

30   Schenkel, *De memoria*, p. 119.

31   Schenkel, *De memoria*, p. 115: "Et sic una tantum ciuitate opus esset pro omni scibili".

32   Schenkel, *De memoria*, p. 115: "Erunt fortassis qui unam ciuitatem malint, et in moenibus 100 turres plateis optime distinctis 3 aut 4 in longum, et totidem transuersim euntibus: iisque domibus repletis".

33   Schenkel, *De memoria*, p. 138: "In rudimentis traduntur octo partes orationis inter quas Nomen & Verbum primas obtinent".

34   Schenkel, *De memoria*, pp. 138–139.
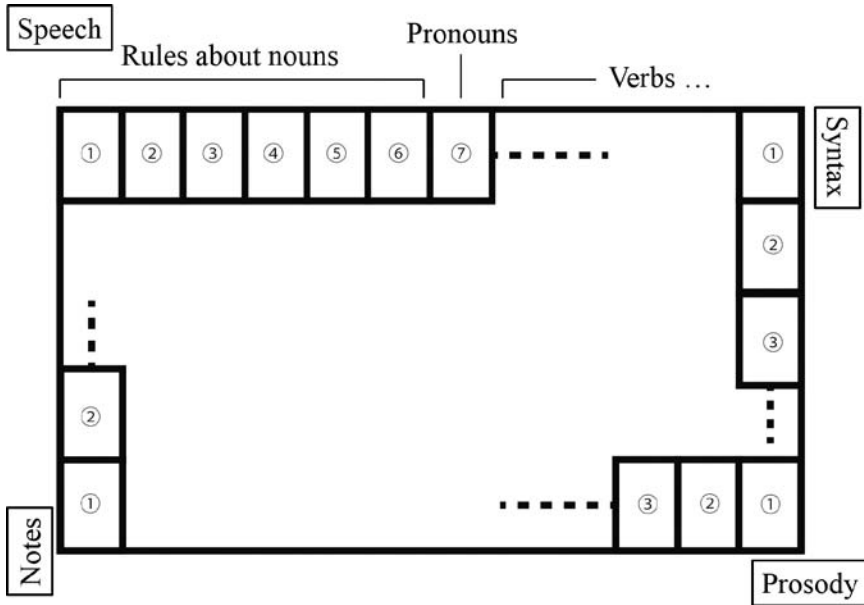
FIGURE 2.4 *Domus grammaticae.*

through definitions and divisions. The fourth side was reserved for notes on general grammar.

Likewise, Schenkel continued to apply his system to other fields of knowledge such as rhetoric, dialectic, theology, jurisprudence and medicine.[35] The basic rules were always the same: to divide a discipline by definitions in a series of key topics that were assigned to mnemonic places in each house. As seen before, by repeating the division of walls of each room, even extremely restricted and detailed topics could be stored. In this way, many *domus sapientiae* assigned to each discipline were gathered to form a splendid mnemonic city of sapience that contained all human knowledge.

2.6 The Art of Memory and the *methodus studiendi*

Schenkel's method based on definition and division evokes the humanistic educational *methodus*, especially that advanced by Petrus Ramus (1515–1572)

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35 Schenkel, *De memoria*, pp. 140–148.

in his reform of the art of speech.[36] In this regard, it is of considerable interest to look at the beginning of the chapter dedicated to *domus sapientiae*. There Schenkel advised readers to consult the *Rhetorica* by Cornelius Valerius (1512–1578) and the *Dialectica* by Augustinus Hunnaeus (1521–1577/78) in view of dividing the discipline of Latin grammar. Indeed he appraised their works as being composed of the *optima methodus*.[37] Among these authors, Schenkel himself published one of Valerius's editions in 1593.[38] Referring once again to this figure later in the same chapter, he argued: "Indeed, I judge Cornelius Valerius's *Rhetorica*, composed of questions and responses, most useful for this art precisely because of its brevity, clarity, order and stylistic elegance".[39] He highly appreciated Valerius's work for its well-articulated structure and adaptability.

The term *methodus* had a particular meaning for Schenkel as the final chapter of his mnemonic treatise was dedicated to *methodus studiendi*. According to him, the essential part of his mnemonics precisely lied in that 'method'.[40] He added in the same chapter that the method for learning the liberal arts constituted the 'philosophical speculation' (*theoria*) in connection with the art of memory.[41]

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36   On this point, see Cesare Vasoli, *La dialettica e la retorica dell'Umanesimo. "Invenzione" e "Metodo" nella cultura del XV e XVI secolo* (Milan: Feltrinelli, 1968); Cesare Vasoli, "I tentativi umanistici cinquecenteschi di un nuovo 'ordine del sapere'", in C. Vasoli, *Le filosofie del Rinascimento*, ed. by P.C. Pissavino (Milan: Mondadori, 2002), pp. 398–415.

37   Schenkel, *De memoria*, pp. 137–138: "Inprimis quod ad Grammaticam, accipiendus auctor, qui optima method scripserit, hoc est, qui nihil superflui habeat, & cui nihil desit, quique veritatem maxime secutus, & ordinem ... qualis est L. Schenkelii Rhet: Corn: Val: Dialectica, Aug: Hun: ...".

38   Cornelius Valerius, *Rhetorica Cornelii Valerii Ultraiectini, Lovanii in collegio trilingui professoria celeberrimi; universam benedicendi rationem perspicua brevitate optimoque ordine absolute complectens ... per Lambertum Schenckelium* (Antuerpiae: Ex Officina Plantiniana & Ioannem Moretum, 1593). The work of Hunnaeus cited here is *Augustinus Hunnaeus Dialectica seu, Generalis logices praecepta omnia, quaecunque praecipue ex toto Aristotelis organo, ad ediscendum proponi consuerunt. Primum quidem iuxta ueterem translationem impressa, deinde ad Ioachimi Perionij & Nicolai Grouchij uersionem accommodata; nunc uero plurimis in locis recognita, & ab erroribus non paucis repurgata* (Cologne: Maternum Cholinum, 1555).

39   Schenkel, *De memoria*, p. 140: "Iudico autem Rhetoricam Cor: Val: per interrogationes & responsiones digestam commodissimam esse huic arti propter brevitatem, perspicuitatem & ordinem stylique elegantiam".

40   Schenkel, *De memoria*, p. 149: "CAPVT IX. De Regulis artem adjuvantibus, Mehodo studiendi, in quibus artis medulla sita sit".

41   Schenkel, *De memoria*, pp. 158–159: "Methodus studiendi artes liberales ac graviores disciplinas, connexa theoria artis memorie ...".

To clarify the meaning that Schenkel attributes to the term, it is worth calling into consideration his other work, *Methodus sive declaratio ... quo modo Latina lingua sex mensium spacio doceri*, printed in 1619. This manual for learning Latin in a short timeframe was characterized by the importance accorded to the art of memory. There, after enumerating conditions such as diligence, eagerness and youth required for students, Schenkel divided Latin grammar into speech, syntax and prosody that are further divided into more detailed rules.[42] Among the eight parts dedicated to speech, he emphasized the importance of nouns and verbs just as in his mnemonic treatise because their rules constituted major difficulty for beginners.[43] These elements along with their explanations had to be stored in the mind of a student by the art of memory. The learning method promoted in this manual, consisting of the division of grammar rules and their memorization, is very similar to that of *De memoria*.

Importantly, in his learning manual Schenkel used the term *methodus* in a very limited and particular purpose: to indicate the brevity, easiness, clarity and convenience of study, obtained by following the rules that he prescribed. Needless to say, these features were the typical slogans repeated by the promoters of the new educational method during the sixteenth century.[44] Schenkel was so proud of his method as to call it 'royal way' (*regia via*) because it offered the easiest way to attain learning objectives.[45] Although he never mentioned the name of Petrus Ramus in his works, it is still possible to see the influence of Ramus and his followers. For the master of mnemonics, teaching in the Catholic realm despite having been accused by the Church, it was too dangerous to refer to the notorious Protestant, considered a heretic by the ecclesial authority.

In this respect, it is interesting to examine the synoptic tables which Schenkel referred to in his *Methodus sive declaratio*. Intended as a toolset for reinforcing memory, these tables summarized the essential rules of Latin grammar. They contained "true and necessary precepts with a brief, clear and easy method

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42 Schenkel, *Methodus sive declaratio*, pp. 6–9 and p. 13.

43 Schenkel, *Methodus sive declaratio*, p. 15: "Octo sunt orationis partes, inter quas Nomen & Verbum principatum obtinent: & si quae est in aedificio Grammaticae difficultas, ex iis duobus oritur".

44 See Walter Ong, *Ramus, method, and the decay of dialog. From the art of discourse to the art of reason* (Cambridge, MA: Harvard University Press, 1958); Neal W. Gilbert, *Renaissance concepts of method* (New York: Columbia University Press, 1960); Vasoli, *La dialettica*; Nelly Bruyere, *Méthode et dialectique dans l'oeuvre de la Ramée. Renaissance et age classique* (Paris: Vrin, 1984).

45 Schenkel, *Methodus sive declaratio*, p. 11: "Nonnulli recta semita suos auditores brevi, facili, perspicua & jucunda methodo, sine taedio, cum voluptate quo volunt perducunt; & hi tales omne ferunt punctum: digni quibus pueri liberalis indolis erudiendi committantur. Hanc ego Regiam appello viam".

with which everything is contemplated together in a single look".[46] Following this learning method, Schenkel adds, a young boy can perfectly master Latin and Greek in only two years without any annoyance or suffering.[47] For those who doubted the efficacy of his method, he mentioned as evidence the 'educational table' composed by himself for the public school of Mechelen (*Tabula publicae scholae Mechliniensis*). This table was printed by Christophe Plantin of Antwerp in 1576.[48] As its title shows, it was a literal work, rather than a graphic table. It summarized with words the school's curriculum by enumerating the teaching materials of each grade.

Schenkel also referred to a similar example composed by Cornelius Valerius for "Scholae trilinguis artium liberalium".[49] Yet, another item mentioned in the same page is more suggestive. That table is entitled *Tabula Declinationum, comparationum, & conjugationum, Latinarum: Item Graecarum*; it was written by Schenkel himself and published in Antwerp in 1580. It is a kind of visualized *summa* of all the rules of Latin and Greek grammar and is "composed with expertise and presents to the eyes everything together in a single look".[50]

Although Schenkel did not provide any image related to these tables, their appearance can be reconstructed: it represented "a brief, clear and easy method". This method allowed students to concisely visualize all the materials and grasp everything "in a single look". Indeed, the promoters of the humanistic learning method of the time frequently used synoptic tables with branching diagrams. On several occasions Schenkel quoted Cornelius Valerius, who was alleged to be a Ramist at Louvain. Valerius often made recourse to this kind of graphic tool to summarize the contents of his work. For example, his *Rhetorica* edited by Schenkel in 1593, contained many of such summary tables. Among these, the folded large diagram (see Fig. 2.5) at the end of the work

46   Schenkel, *Methodus sive declaratio*, p. 26: "… Continentes praeceptiones veras ac necessarias, brevi perspicua facilique method, uno quasi intuit simul omnia subjicientes".

47   Schenkel, *Methodus sive declaratio*, p. 27: "Pueri vero 10. 12. 14 annorum duobus annis in Latina & Graeca possunt esse pares, ut intelligant, loquantur, transferant, componant, rationem praeceptionum reddant: idque sine taedio vel labore magno".

48   Lambert Schenkel, *Tabula publicae scholae Mechliniensis, summam rei scholasticae complectens, omnibus docentibus perutilis* (Antuerpiae: Ex Officina Christophori Plantini, 1576).

49   Schenkel, *Methodus sive declaratio*, p. 29: "Item exemplum Scholae trilinguis, artiumque liberalium, a Cornelio Valerio Vltrajectino Lovanii in Collegio trilingui Professore celeberrimo: aliisque viris doctis examinatum & approbatum".

50   Schenkel, *Methodus sive declaratio*, p. 29: "Antuerpiae apud Antonium Tilenium 1580. sic digestum a Lamberto Thoma Schenckelio Dusilvio. Tabula Declinationum, comparationum, & conjugationum, Latinarum: Item Graecarum, artificiose concinnata unoque intuit Omnia simul oculis objiciens".
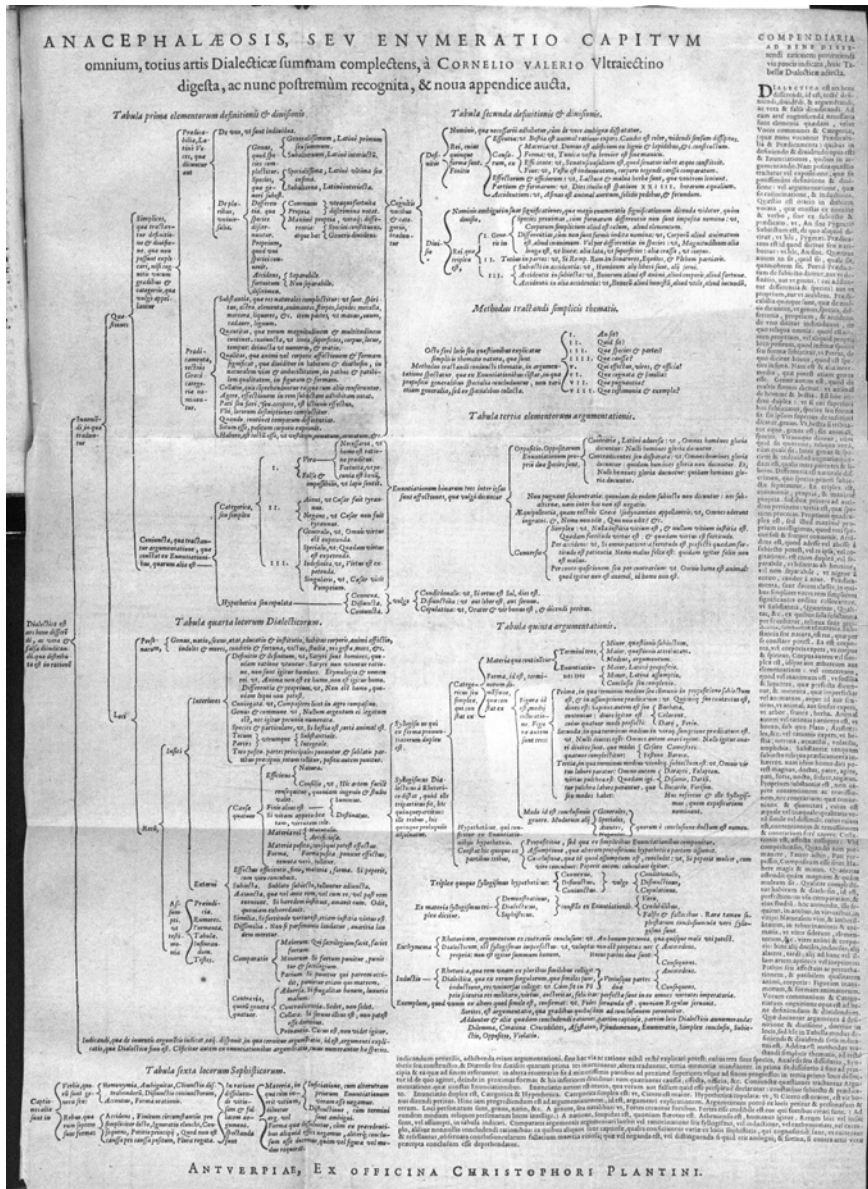
FIGURE 2.5 *Branching diagram in Cornelius Valerius,* Rhetorica Cornelii Valerii Ultraiectini, Lovanii in collegio trilingui professoria celeberrimi; universam benedicendi rationem perspicua brevitate optimoque ordine absolute complectens … per Lambertum Schenckelium (*Antuerpiae: Ex Officina Plantiniana & Ioannem Moretum, 1593*), s.n.

was nothing but a branching dichotomous table promoted by Ramus and his followers.[51] The entire discipline of dialectic was divided by dichotomous definitions in this diagram allowing readers to trace the organization of materials from general topics to particular points. It is thus very plausible that Schenkel had in mind this type of diagram as the graphic tool that supported his learning method.

Schenkel's *methodus studiendi*, presented both in his mnemonic treatise and learning manual, was based on the definition and the division of topics and characterized by the use of diagrams that visualized the organization of knowledge. By applying the traditional mnemonic art, it aimed to make the learning process short, easy and convenient. Thus, it is possible to suppose that there was a close and organic relation between the printed branching diagrams and the mnemonic buildings drawn in the human mind for Schenkel. Composed of homogeneous cubic rooms lined up straight, his *domus sapientiae* looked like a 'three-dimensional' diagrammatic tree due to its geometric and mathematical abstraction. Those mental rooms of memory can be seen as the equivalent to the larger branches of a diagram to which the principal topics are assigned. By contrast, their walls correspond to the diagram's smaller ramifications reserved for more specific topics.

It is not my purpose here to examine the eventual influence of Petrus Ramus on Schenkel's *methodus studiendi*. It is not necessary either to exclusively associate the former's idea to the latter's. Indeed, various options were combined and discussed under the title of *methodus* in the late sixteenth century, while branching diagrammatic trees themselves were already widely used for information management in the Middle Ages.[52]

Nevertheless, it is possible to obtain some remarks for further reflections on the later evolution of mnemonic art from my analysis. First of all, Schenkel's works would demand the revision of a simplistic schematization, advanced by Walter Ong and his followers, on the relationship between the humanistic *methodus* and the art of memory.[53] According to their scheme, the very *methodus*, proceeding from general topics to particular points, served as a mnemonic

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51   On Ramistic tables, see Annarita Angelini, *Metodo ed enciclopedia nel Cinquecento francese: 1. Il pensiero di Pietro Ramo all'origine dell'enciclopedismo moderno* (Florence: Leo S. Olschki, 2008).

52   See Lina Bolzoni, *La rete delle immagini. Predicazione in volgare dalle origini a Bernardino da Siena* (Turin: Einaudi, 2002); Alessandro Ghisalberti (ed.), *Pensare per figure: diagrammi e simboli in Gioacchino da Fiore: Atti del 7. Congresso internazionale di studi gioachimiti, San Giovanni in Fiore, 24–26 settembre 2009* (Rome: Viella, 2010); Blair, *Too much to know*, pp. 144–152.

53   Ong, *Ramus*; Yates, *The art of memory*; Rossi, *Clavis universalis*.

device for Ramus and his followers; it thus contributed to the decline of the traditional art of memory under the dominance of their educational program. To my sense, it is better to avoid oversimplifying the complex constellations of intellectual currents of the time. Schenkel's original work showed that the process of transformation was gradual and that the traditional art did not disappear even long after Ramus's work. Schenkel's treatise witnessed the creative and complementary coexistence of the old art and the new 'scientific' way. He translated the hierarchical structure of Ramus's schemes, based on definitions, divisions and concrete examples, into an architectural structure, passing from the big cities of the universal knowledge down to the particular *domus sapientiae* of each discipline.

2.7   From the Art of Memory to the *ars excerpendi*

Schenkel addressed the distribution of subjects into specific mnemonic places of the *domus sapientiae*. As an example he took several houses for storing the sentences extracted from the Bible, the works by major theologians (Augustine, Ambrose, Jerome, etc.), various rhetorical and dialectical treatises and other secular literature.[54] Thus, the mnemonic building, whose rooms and walls are assigned to specific topics and themes, can be seen as three-dimensional 'rhetorical places' (*loci*) or materialized *topoi*.[55]

To further examine that aspect, let us return to the final chapter of Schenkel's mnemonic work on *methodus studiendi*, which was closely connected to the 'art of excerpting' (*ars excerpendi*).[56] Although it existed from Antiquity, this art saw a considerable development after the decline of mnemonics in the seventeenth century. It enabled efficient collection of the essential data from a plethora of writings. It was also useful in summarizing, sorting and classifying data transcribed on paper cards. In other words, the art of excerpt was vital in constructing 'secondary memories', which saved a considerable amount of energy by eliminating the need for memorization. As a consequence, the moderns

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54   Schenkel, *De memoria*, pp. 119–120: "Cubiculis autem bene formatis, oportet unicuique materiae suam domum Rhetoricae, Dialecticae, & c. Domum unam Bibliis secundam 3. 4. 5. 6. 7. 8 C.D. Tho: S. Aug. Greg: Amb: Hieron: &c. domum vocabulis, domum sententiis sacris, domum profanis, domum concionibus, Domum festis, domum controversiis, & ut uno verbo dicam una quaeque materia certis suis castris & domibus erit traenda, eo modo quo in civitate bene constituta sit".

55   On this concept, see Ong, *Ramus*.

56   See Cevolini, *De arte excerpendi*; Blair, *Too much to know*.

could reduce their suffering in this activity.[57] Paradoxically enough, as the most energetic proponent of refined mnemonics, Schenkel found the possibility to improve his art in this newly developing method.

Schenkel advised the moderns to classify the authors of each discipline into three classes depending on their authority and importance.[58] According to him, the excellent authors who sufficiently treated the discipline's fundamental topics must be grouped in the first class. Those of the second and third classes should not be neglected since their writings could sometimes contain important themes overlooked by authors in the first class. Thus fundamental concepts and notions can be extracted from their works to compile a single book, which contains all the essential topics of each discipline.[59] Detailed indexes have to be added to this work, organized hierarchically in volumes, chapters and paragraphs, so as to facilitate its consultation.[60] A wall of the *domus sapientiae* will be assigned to each piece of classified and interrelated information along with the 'mnemonic images' (*imagines agentes*) that represent its contents.[61]

As for the information management by the art of excerpt, Schenkel pointed out the importance of elaborated indexes, which could speed up a search of the required data and shorten their study time. Referring to the mythical figure of Sisyphus, who uselessly continued endless labour, he compared the contemporary readers, flooded by multiple books, with those who lacked a 'good method' (*bona methodus*) in reading.[62] To avoid the same tragic fate, Schenkel thus promotes the combination of indexes with mnemonics. For him, this allows readers to absorb the contents of each book with a single careful reading. With the help of systematic indexes, they can memorize all important notions and topics excerpted from a vast ocean of writings to render those data ready for use. Otherwise, the moderns would waste their short life for reading and rereading the immense amount of books.[63] Indeed, for Schenkel all information

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57   Cevolini, *De arte excerpendi.*

58   Schenkel, *De memoria*, p. 159.

59   Schenkel, *De memoria*, p. 160: "Illorum deinde libri in compendium redigemus ac ex pluribus unum quasi corpus formabimus: trasportatis eo omnibus scitu necessariis".

60   Schenkel, *De memoria*, pp. 161–162.

61   Schenkel, *De memoria*, p. 160: "Vnaquaeque imago exprimenda & per domos, cubicula suis locis collocanda".

62   Schenkel, *De memoria*, p. 162: "itaque indefesso studio, bonae methodi defectu, quasi saxum Sisyphi perpetuo volutatur".

63   Schenkel, *De memoria*, p. 162: "... quaecunque notatu digna, indicis auxilio semper in promptu habebimus: alioquin legendis relegendisque libris, vita hominum brevis consumitur".

for each discipline, collected in 'the book of excerpts', had to be learned by way of mnemonics. In this respect, indexes served as the important tools for bridging the gap between the internal memory of the human mind and the external 'secondary memories' materialized in the form of physical books.

For Schenkel, bibliographic and rhetorical places and mnemonic places were completely interchangeable. The walls of the *domus sapientiae* as mnemonic places contained the notions extracted from various writings and corresponded to the commonplaces. The collocations of those data in the mental architecture were in a sense equivalent to bibliographic *loci*, which indicate the positions of data in writings. From this point of view, his book of excerpts resembles the printed commonplace-books of the time.[64] Composed of extracts from an enormous amount of texts, these books served as a secondary memory. The medieval *florilegium*, based on selected ethical and philosophical extracts from essential literature, presupposed the thorough memorization of the contents.[65] Unlike this kind of literature, external secondary memory helped readers to avoid the overload of information and to get quick access to the required information thanks to elaborate indexes.

Despite its insistence on easy, quick and secure learning, Schenkel's method can be taken as a transitional system precisely because it was still based on the full memorization of collected data. In other words, he could not fully trust the external secondary memories. As the myth of Sisyphus indicates, Schenkel was well aware of the contemporary crisis regarding information overload caused by the rapid development of publishing industry. However, his 'improved' art of memory, reinforced by both the *methodus studiendi* and *ars excerpendi*, constituted the 'ark' capable of sailing across the flood of notions.

2.8   Conclusion

According to Schenkel, the division of subjects based on definition and division along with the visual display by branching diagrams does not harm the traditional mnemonic art; rather, it even reinforces the art. For him, the 'old art' and the 'new scientific method' were not wholly incompatible as purported by historians. They could realize an organic coexistence. On this belief he developed a sophisticated system of mnemonic places. Abstract yet flexible,

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64   See Moss, *Printed commonplace-books*.

65   See Jacqueline Hamesse, "Parafrasi, florilegi e compendi", in G. Cavallo et al. (eds.), *Lo spazio letterario del Medioevo 1. Il Medioevo latino* (3 vols., Rome: Salerno Editrice, 1995), III, pp. 197–220.

it responded to the demand of memorizing ever increasing subjects by freely augmenting the number of rooms and floors and dividing their walls almost infinitely.

Schenkel's mnemonic places in the simple form of a square building with rectangular walls can be construed as virtual note cards. Released from the determined *loci* in the mind, they were almost ready to transform into paper cards, widely used in note taking based on the art of excerpt during the following centuries.

Christoph Just Udenius and the German *ars excerpendi* around 1700: On the Flourishing and Disappearance of a Pedagogical Genre

Helmut Zedelmaier

3.1 Introduction

A student should always carry "a writing board on which he may write remarkable things he hears, reads, or contemplates, transcribing them from there into his excerpt volumes".[1] This advice is taken from a little book titled *Excerpendi ratio nova*. This first manual on excerption in the German language was published in 1681 in Nordhausen, in Thuringia. It apparently attracted a certain interest, because it was printed three more times, in 1684, 1687, and 1691. The author was Christoph Just Udenius, who was a preacher in Osterode (close to the Harz Mountains) from 1663 to 1668, and then in Herzberg (also in the Harz region) from 1668 until his death in 1686. Born in 1631 in Hannoversch Münden (close to Göttingen), he began his university studies 1653 in Jena and worked as a teacher in Helmstedt, before taking office as a preacher.[2] Little else is known about Udenius. His life was confined by a narrow geographical space; aside from his manual on excerption, he left behind only minor occasional writings.

When the book, a slim volume of barely two hundred pages, was published, excerption was a frequently covered topic. As Udenius' example demonstrates, it was able to generate some resonance even in the provinces, and even though it only compiled advice from earlier manuals on excerption. Udenius did not hide his reliance on earlier texts, although the title announces a *ratio*

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1 Christoph Just Udenius, *Excerpendi ratio nova, das ist eine neue Art und sonderbare Anweisung, wie die studirende Jugend in jeden Wissenschaften, Disciplinen, und Fakultäten, vornemlich aber in Theologia Homiletica ihre Locos Communes füglich einrichten* (Northusae: Sumptibus Johannis Daeterstadii Bibliopolio, 1687), p. 158. I would like to thank Anna Larsson and Robert Folger for the translation of this article.

2 Regarding his life and work, see https://www.deutsche-digitale-bibliothek.de/entity/124410 936 (last accessed on 19 January 2016). Regarding his matriculation in Jena, see Günter Steiger (ed.), *Die Matrikel der Universität Jena 2, 1652–1723* (Weimar: Hermann Böhlaus Nachfolger, 1977), p. 1653. Regarding his matriculation as *Magister* in Helmstedt (2 December 1659), see http://uni-helmstedt.hab.de/index.php?section=matrikel, s.v. 'Udenius' (last accessed on 18 February 2016).

nova (probably due to its use of German, which was of great importance to the author).[3] After all, Udenius tells us in the introduction that his work provided, in German translation, what he "dictated, eighteen years ago, at a famous university, briefly, in Latin, to my students".[4] Udenius does not tell us at which university this took place. Based on what we know of his life, it must have been the University of Helmstedt, where he was registered in 1659 as a *Magister*, without appearing in the course catalogue. In Helmstedt and other German universities like Jena or Kiel, excerption was a subject of academic teaching.[5] For instance, in 1668, the then-famous Helmstedt professor of rhetoric Christoph Schrader (1601–1680) offered private teaching (*Privatkolleg*) on the "method of excerpting" (*methodus res & verba excerpendi*), responding to a "strong demand" (*multorum rogatu*), as stated in the course catalogue.[6] We will come back to Schrader's *Privatkolleg*.

In the following, I have no intention of praising the province in order to "wrest the little book from oblivion". Rather, I read the *Excerpendi ratio nova*, a standard product, as I have already noted, together with other manuals on excerption as documents that show how excerption was seen in Germany around 1700. In the seventeenth century, manuals on excerption were a popular pedagogical genre throughout Europe.[7] They were particularly abundant (in printed form as well as unpublished manuscripts) in the German Empire, with its many and multiform universities. This diversity spurred competition and thus an openness to reform, particularly in the philosophical faculties, and

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3   See Udenius, *Excerpendi ratio nova*, Vorrede, s.n. The manual does not contain any other indication on the nature of its novelty.

4   Udenius, *Excerpendi ratio nova*, Vorrede, s.n.

5   See Paul Nelles, "*Historia literaria* at Helmstedt. Books, professors, and students in the early Enlightenment university", in H. Zedelmaier and M. Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen: Max Niemeyer, 2001), pp. 147–175, at p. 151f., p. 156, p. 165. Regarding Kiel, see Paul Nelles, "*Historia literaria* and Morhof: private teaching and professorial libraries at the University of Kiel", in F. Waquet (ed.), *Mapping the world of learning: the* Polyhistor *of Daniel Georg Morhof* (Wiesbaden: Harrassowitz, 2000), pp. 31–56, at p. 47.

6   See the corresponding entry at http://uni-helmstedt.hab.de/index.php?section=lehrverans taltung (last accessed on 19 January 2016).

7   The best overview is provided by Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006). The book also contains (at pp. 141–425) the Italian translations of and commentaries on the most important works. If works and authors appear without references in the following footnotes, these can be found in this excellent study.

particularly in Protestant universities.[8] One example is the new course type, the *Privatkolleg*, which Schrader and others used to teach excerpting.[9] Manuals on excerption were predominantly products related to academic *Privatkollegien*, that is, they were originally written for teaching purposes.

In the eighteenth century, the rise of *Selbstdenken*, independent or autonomous thinking, devalued knowledge produced and processed by others, marginalizing an author's dependence on alien lore. This is another topic of this article: how excerption, which was discussed by early modern scholars like Udenius in all its most intricate technical details, largely disappeared in the course of the eighteenth century as a topic of scholarly reflection, and how it was recently rediscovered in relation to new techniques of data processing, related to digitalization.

3.2   The *ars excerpendi* in the Early Modern Period: General Considerations

In the early modern period, 'excerption' refers to various activities. "Excerption is the scholar's endeavour to make an extract of what one has read in order to make a record of it which, in due time, can be recovered and used. Therefore, it consists of other people's thoughts which we need for our own contemplation". These are the first words of the entry on *Excerpiren* in Johann Heinrich Zedler's *Universal Lexicon*. Zedler continues sketching a rudimentary epistemology of the excerpt, showing how an individual's thinking relies on the processing of others' thoughts.[10] In this general sense, excerption has a long history that

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8   See Arno Seifert, "Das höhere Schulwesen", in N. Hammerstein (ed.), *Handbuch der deutschen Bildungsgeschichte* (6 vols., München: C.H. Beck, 1993), I, pp. 197–374; William Clark, *Academic charisma and the origins of the research university* (Chicago and London: University of Chicago Press, 2006).

9   See Nelles, "*Historia literaria* at Helmstedt"; Nelles, "*Historia literaria* and Morhof".

10   Johann Heinrich Zedler (ed.), *Grosses vollständiges Universal Lexicon aller Wissenschafften und Künste* (64 vols., Halle and Leipzig: Johann Heinrich Zedler, 1732–1754), VIII, col. 2321: "Excerpiren ist diejenige Bemühung derer Gelehrten, da man aus dem, was man gelesen, einen Auszug macht, und solches dem Gedächtniß zum Besten aufzeichnet, damit solches zu rechter Zeit kann wieder gefunden, und gebraucht werden. Es bestehet also dasselbe in einer Sammlung von denen Gedanken andrer, die wir zu unserer eigenen Meditation nöthig haben". He continues: "Those who want to become wise through their own contemplations only make their way to erudition more arduous" ("Diejenigen machen sich den Weg in der Gelehrsamkeit selber schwer, welche nur durch ihre eigene Meditationen klug werden wollen"). The following argument indicates that Zedler

spans many eras and cultures. Recent studies have shed light on excerption in the early modern period in particular. These studies focus on collections of excerpts preserved in libraries and archives,[11] on storage media for notes, and on published advice about excerption, which was first dispersed in different genres, and then appeared in manuals devoted to the topic, starting in the seventeenth century.[12]

Part of the reason why Latinate Europe not only made excerpts but also reflected on the process, was the humanist interest in the world of ancient texts as a privileged source of knowledge. Humanist excerption is closely related to the acquisition of Latin language skills, based on classic authors.[13] Marking passages in exemplary classical texts, excerpting, memorizing, and processing them for different purposes is the basic model of the early modern acquisition of knowledge. The humanist practices became more differentiated in the course of the early modern period and were adapted and modified by different knowledge cultures. The emerging, 'new' (natural) sciences also used excerpts; this is why historians of science have also recently shown an interest in the history of excerption. While the traditional, ideologically charged distinction between old bookish knowledge and new empiricism presented excerption as the opposite of empirical knowledge in the seventeenth century, the more recent history of science recognizes in excerption one of the prototypes of the empirical method.[14] Thus, excerption must not be understood merely as a learned and homogenous technique based on 'old' bookish knowledge, which was superseded by new empirical and experimental methods, making it an outdated practice. Excerption was used in all scholarly and scientific

already propagates the maxim of autonomous thinking. Regarding Zedler's dependence on Morhof, see Helmut Zedelmaier, *Werkstätten des Wissens zwischen Renaissance und Aufklärung* (Tübingen: Mohr Siebeck, 2015), esp. p. 47 and p. 61.

11   Michael Stolberg, "Medizinische *Loci communes*. Formen und Funktionen einer ärztlichen Aufzeichnungspraxis im 16. und 17. Jahrhundert", *NTM – Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin*, 21 (2013), pp. 37–60. See also Michael Stolberg's contribution to this volume.

12   See Cevolini, *De arte excerpendi*; Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), pp. 62–116; Élisabeth Décultot, "Einleitung: Die Kunst des Exzerpierens. Geschichte, Probleme, Perspektiven", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 7–47.

13   See Anthony Grafton, "Die *loci communes* der Humanisten", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 49–66.

14   See Fabian Krämer, *Ein Zentaur in London. Lektüre und Beobachtung in der frühneuzeitlichen Naturforschung* (Affalterbach: Didymos, 2014).

disciplines, and it was subject to change. For instance, the storage media for excerpts made a transition from the (topically) pre-structured excerpt book to the flexible slip box. The changes in the practice of excerption itself are more difficult to grasp. Manuals on excerption provide some clues. Since the seventeenth century they recommend not only making excerpts from texts, but also making records of observations, experiments, and thoughts.[15] This and other rules, for example the recommendation to make excerpts as concise as possible, indicate that excerption was no longer limited to the acquisition of linguistic patterns, but comprised the gathering of varied information and data.

Regarding the question of how to store excerpts, the seventeenth-century manuals still recommend the bound book as the traditional storage medium, yet they no longer focus on the topical structures as an *aide-memoire*. Instead, they reflect the retrieval of recorded information with the help of index systems. This points to a process of general epistemological transformation. In a process of *longue durée*, not limited to the early modern period, the 'invention' of arguments related to artificial memory and complementary techniques of reasoning were transformed into techniques aiming at identifying fragments in fixed written texts. Consequently, knowledge production became an operation not so much depending on individual memory, but progressively determined by external storage media and related technologies and instruments of knowledge generation. Repositories of excerpts evolved into secondary data storages, independent of the individual memory.[16]

Excerpting means choosing. Early modern academic teaching prescribed in detail which textbooks (particularly from classical authors) should be lectured on and interpreted. However, how was one to choose from the plethora of books, published in ever larger quantities, that did not belong to the academic canon of textbooks? This question preoccupied early modern scholars and also the institutions of the Church and State. Methods and instruments were conceived to provide readers with orientation, in different ways, but always based on a principle of selection. Conrad Gessner, for instance, in his *Bibliotheca universalis*, provided information intended to enable his readers to choose according to their needs and interests.[17] The Church and State took measures to channel selection by means of censorship.[18] Early modern compilations and encyclopaedias, too, presented their readers with selected

15   See Zedelmaier, *Werkstätten des Wissens*, pp. 45–74.

16   See Fabian Krämer and Helmut Zedelmaier, "Instruments of invention in Renaissance Europe: the cases of Conrad Gessner and Ulisse Aldrovandi", *Intellectual History Review*, 24: 3 (2014), pp. 321–341.

17   Cf. Zedelmaier, *Werkstätten des Wissens*, pp. 22–32.

18   Cf. Zedelmaier, *Werkstätten des Wissens*, pp. 75–88.

knowledge.[19] While the selection in these works was pre-established or dictated by censorship, early modern manuals on excerption preferred to offer advice on developing personal criteria for selection. These manuals address readers who should learn to choose by themselves from the wealth of information. Although manuals on excerption give ample recommendations on what to read, they always stress that the reader himself must decide which texts to exploit, according to his interests.

Making independent choices implies the ability to make judgements. Among the three classical core competences of early modern science (*memoria*, *iudicium*, *ingenium*), the manuals on excerption pay particular attention to the *iudicium*. A frequently repeated rule states that excerpting does not mean simply gathering, but making a judgment. The argument is almost always accompanied by a reference to Justus Lipsius, the often-quoted model of critical judgement, and his view of excerption: "Non colligo, sed seligo".[20] The emphasis on the individual faculty of judgment as the precondition for independent selection manifests itself in the criticism that manuals on excerption heap upon formalized methods of processing literature. It is important to make excerpts by one's own standard, rather than depending on the parameters of others (of florilegia and encyclopaedias); this is the maxim of the *Aurifodina artium et scientiarum omnium*, published by the Bavarian Jesuit Jeremias Drexel in 1638. With numerous re-prints, it was the seventeenth century's most successful manual on excerption.[21] The self-descriptions of scholars like Jakob Friedrich Reimmann also confirm that excerption favours independent reasoning. Reimmann writes in his autobiography (printed posthumously in 1745) of how "excerpting the most remarkable things and writing them in a storage book" ("die merkwürdigsten Sachen zu excerpiren, und in ein besonders Lagerbuch einzutragen") enabled him, independent of the authorities, to see "with my own eyes" ("mit meinen eigenen Augen"). He relates this practice, in a proto-enlightened gesture, to a critique of thoughtless practices characteristic of academic teaching: At universities "too much is dictated, too little discussed" ("zu viel diktiert, zu wenig diskutiert").[22]

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19   See Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996); Blair, *Too much to know*, pp. 62–116.

20   See, for instance, Udenius, *Excerpendi ratio nova*, p. 7.

21   See Blair, *Too much to know*, pp. 77–85.

22   Jakob Friedrich Reimmann, *Eigene Lebens-Beschreibung Oder historische Nachricht von Sich Selbst, Nahmentlich von Seiner Person und Schriften* (Brunswick: Schröderische Buchhandlung, 1745), pp. 206–208.

Unlike in Reimmann's case, in seventeenth-century manuals on excerption, written earlier by Catholic scholars, particularly Jesuits like Drexel, the preference for independent judgment does not aim at a critique of the authorities in the vein of the Enlightenment. On the contrary, the training in independent thought fostered by excerption has the main purpose of protecting readers, particularly young readers exposed to an unmanageable mass of texts, from dangerous 'influences'. This is the rationale of both the recommended of readings, which provide orientation, and the rules for excerption, which demand slow and controlled, that is, disciplined reading. Excerpts must be read repeatedly and memorized. The independence learned through excerption has the benefit of moral and religious fortification of defenceless readers.[23] Catholic manuals on excerption can be understood as an alternative program to the abundant, printed Protestant compilations, whose commercial success could not be curbed by Catholic censorship. The reader who makes excerpts, the argument goes, does not depend on expensive printed matter.[24]

3.3   Instructions on Excerption: Christoph Just Udenius

After these general considerations on the early modern history of excerption, we return to Udenius and his *Excerpendi ratio nova*. The Protestant preacher shares a concern for the young and a religious tone with his Catholic colleagues. He also shares their critical perspective on the growing mass of books, which, like in Drexel's work (who, according to Udenius, "first broke the ice in excerption"), is the starting point of the *Excerpendi ratio nova*: "What Solomon writes in his Preacher Ch. 12, v. 12: There is no end to the making of books; this could, with even greater reason, be perfectly said today". Today, he explains, 'many useful' but even more "useless books come to daylight".[25] Therefore, it is necessary to warn the 'incautious youth', particularly in the light of 'atheism' and Machiavelli's 'diabolical politics'.[26]

The *Excerpendi ratio nova* addresses 'dear ingenuous youth' rather than "highly learned and experienced people". The reason behind the instructions is, like in Drexel's case, concern for young readers, who must learn to arm themselves in the field of knowledge, with the help of excerption. Udenius is

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23   Cf. Zedelmaier, *Werkstätten des Wissens*, pp. 56–58.

24   Like many authors of manuals on excerption, Udenius argues that not everybody "can buy valuable, useful books". Cf. Udenius, *Excerpendi ratio nova*, p. 3.

25   Udenius, *Excerpendi ratio nova*, Vorrede, s.n.

26   Udenius, *Excerpendi ratio nova*, Vorrede, s.n., and p. 20.

particularly interested in theology (especially in the practice of preaching); however, he also talks about making excerpts in the philosophical disciplines, in medicine, and in jurisprudence. Scholarly interests and the purpose of the acquisition of knowledge determine the choice of means and techniques. Drexel had already emphasized this, together with the remark that the presented methods and techniques are recommendations that everybody can adjust according to his needs. Udenius, too, holds that nobody should be "forced in excerption", that everybody can 'easily' choose his own way.[27]

If we compare the *Excerpendi ratio nova* with earlier manuals on excerption, we see that most of the topics treated there are recycled, often in minute detail. Generally, it appears that seventeenth-century manuals are composed of excerpts from the precursors of the genre. The texts contain identical quotes on excerption, mostly taken from classical authors. There is always a section that attributes the necessity for excerption to the limited capacity of the individual memory (in the face of an unmanageable literary production), in answer to the arguments of those opponents of excerption who criticize the relocation of knowledge in external memory repositories as a danger for the individual's faculty of memory. The particularities of manuals on excerption are few, limited to specific techniques of excerpting and the management of excerpts. The authors frequently refer to their own experiences, in part because they want to distinguish their texts from older manuals. However, these recommendations seem to be partially based on actual experiences in the practice of excerption. Only in this respect is Daniel Georg Morhof, in his *Polyhistor*, correct in his assertion that there are as many opinions as authors who write about the topic.[28] Does Udenius modify the practices of excerption, which provide us with clues as to the transformations of excerption in the transition from the seventeenth to the eighteenth century? This is the topic of the following reflections.

It is necessary to mark excerpts, because they can only be retrieved if they have an address. Today these addresses are called metadata; in the early modern period they are called *tituli*. For Udenius, one of the most important tasks of excerption is to make the excerpt's *Titulus*, "right and proper". Excerpts neither make sense nor have a purpose "until a title is ascribed to the recorded things which is appropriate to the matter".[29] Since only the title guarantees

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27   Udenius, *Excerpendi ratio nova*, Vorrede, s.n.

28   See Daniel Georg Morhof, *Polyhistor, literarius, philosophicus et practicus* (Lubecae: Sumptibus Petri Boeckmanni, 1732³), p. 559 (recte, p. 561).

29   Regarding the following concern, see Udenius, *Excerpendi ratio nova*, pp. 73–77 ("About memorial sheets and the titles in particular" ["Von dem Memorial-Zettul/und den Titulen insonderheit"]).

the functionality of the excerpt, it is essential to choose wisely. Udenius recommends against determining the title in the process of making the excerpts. Titles are the result of careful consideration: Excerpting works with "memorial sheets" (*Memorial-Zettul*), which record everything that is important in no particular order. This assures that the 'thoughts' are not 'dispersed'; with the help of the *Memorial-Zettul*, the reader wins "space and time" to "think up an appropriate title". If excerpts are already marked during the excerpting and included in the excerpt book, it frequently happens that they do not fit, and must be "scraped with the penknife".

This making of addresses for excerpts is "pretty hard labour". They must be formed from simple, common words which, if possible, relate *specialissimi* (that is, not referring to "something universal or general") to the excerpts. However, finding titles is not a problem of topical logic or taxonomy.[30] The construction of titles is pragmatic work, subordinated to the purpose of retrieving the excerpts. The question of which title 'rules' the excerpt (*rei caput*) and how the excerpts are registered in excerpt books, is, in the *Excerpendi ratio nova*, secondary to the question of "finding the material again as quickly as possible". Therefore, the student should not rack his mind over titles; it is also possible to choose a title which "does not correspond to the matter completely. Because it is not so important under which letter of the index the title is listed, as long as the title and the proposition is set in a way that it can be quickly retrieved, if necessary. Because the excerpts are for no one else and are not published, but are gathered for the reader himself and his use".[31]

Pragmatism and flexibility are the rationale of the precepts contained in the *Excerpendi ratio nova* on the composition of the excerpt book. It consists of several layers of white, folded sheets in quarto. They are attached to a cardboard cover, but must not be glued, as Udenius emphasizes repeatedly. The excerpt book should be expandable, "so that more sheets may be added, if necessary".[32] The index of the *tituli*, that is, the retrieval system for the individual excerpts, and the excerpt book properly speaking, must be kept separate. Therefore the first thirty or forty sheets of the book are not filled with excerpts. They are reserved for the *Indices Rerum et Autorum in isthoc volumine citatorum*. The index of *res* lists the *tituli* alphabetically, using three to four sheets for each letter of the alphabet. Again, the sheets must not be permanently bound, because additional sheets may be necessary. The *Index Rerum* is preceded by

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30   Regarding topics, see Wilhelm Schmidt-Biggemann, *Topica universalis. Eine Modellgeschichte humanistischer und barocker Wissenschaft* (Hamburg: Felix Meiner, 1983).

31   Udenius, *Excerpendi ratio nova*, p. 77.

32   Udenius, *Excerpendi ratio nova*, p. 62 (the following quote can also be found there).

an *Index Autorum*. Eight to ten sheets are necessary, on which the authors are listed "from whom the excerpts are taken. They are listed with first and family name, and also in which year and where the book was printed, and whether it is a folio, quarto or octavo or a duodecimo". Udenius justifies the necessity of precise bibliographical data with the observation "that books are printed, after a few years, in different *formats*. Thus, the *chapters* and *page* numbers are changed, producing grave errors in the *excerpts*".[33]

The method of excerption described by Udenius indicates an impulse to emancipate the acquisition of knowledge from pre-established patterns. Excerpts are fragments of texts, but also records of observations and products of reflection not dependent on fixed categories. The individual making the excerpts establishes the rules for assigning addresses and meaning, according to the disciplinary purpose of the acquisition of knowledge and the ensuing necessities. The scholar dedicated to the *Studium Antiquitatis* gathers excerpts on his voyages to the famous cabinets of curiosities and libraries;[34] for the student of medicine, the *Notitiam Herbarum, Mineralium & Metallorum* is as important as the Bible is to the theologian. The medical student uses, among others, a *Volumen Herbarii Vivi* as an excerpt book, in which he glues 'confuse' (that is, not in alphabetical order) and 'in natura' the herbs "coming to his eyes". The herbs are accompanied by explanations of the properties, uses and *experimenta*: "the effects the herb has always had, the benefits it has shown". In this excerpt book, too, the first forty sheets are reserved for an *Index Rerum et Autorum*, which makes it possible to retrieve "everything entered this way" quickly and easily.[35]

This example shows that excerpt books can be data storage for empirical knowledge. In addition, Udenius' principle that excerpt books do not operate according to the rules of pre-established knowledge systems, but must be understood as mobile and expandable retrieval techniques for stored data,[36] applies equally to the repositories Udenius recommends for subjects predominantly relying on 'experience' (*Experientz*).[37] Udenius presents excerption generally as an inductive, open process, in which the selection

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33   Udenius, *Excerpendi ratio nova*, p. 63.

34   Udenius, *Excerpendi ratio nova*, p. 18.

35   Udenius, *Excerpendi ratio nova*, p. 49f.

36   Various techniques are supposed to guarantee expandability. For instance, when there is insufficient space for an excerpt under a particular heading, the entries can be continued on empty sheets, including a reference to the page where the continuation starts. Cf. Udenius, *Excerpendi ratio nova*, p. 80.

37   Udenius, *Excerpendi ratio nova*, p. 57.

criteria and method of organization are subordinate to particular professional interests and needs. Like Drexel, Udenius wants to teach young readers how to acquire knowledge independently, with the help of instructive examples of actual practices of excerption. In this way, subtle nuances and shifts distinguish his manual from Drexel's, revealing the transformation of excerption around 1700: the disciplinary thrust, the numerous examples from the field of empirical knowledge, the insistence that entries be concise (in most cases it suffices to indicate "in which book, chapter and page one can read about it in more detail"),[38] and, related to this, the notion of excerpt books as easily expandable search engines for stored excerpts. The continuous repetition of the excerpts as a honing of reader's memory, which was, for Drexel, an important function of the excerpt books, is not an issue for Udenius.[39] Due to the pragmatic-technological thrust of excerpt management as a secondary mnemonic device, as is fundamental for Udenius' *Excerpendi ratio nova*, the rote memorization of the excerpts is no more feasible.

However, there are limits to the freedom of excerption. They are defined by the religious and moral frame of Udenius' manual. These limits become particularly clear when Udenius talks about the processing of atheist literature which, as he states, "spilled like a deluge all over the world". Everywhere and at every occasion, we find "erroneously imagined wisdom": "something escapes from diabolical books: *De tribus impostoribus* Petri Aretini, Vaninii *Amphitheatro*, Thomae Campanellae *Atheismo triumphato*, Thomae Brunß *De religione Medici*, Mariani Offenen Herzens-Pforte, Praetorii &c, making an impression on the simple man, and cynically tricking the foolish preacher, catechist and inexperienced student of Theology".[40] When excerpting atheist literature, strict rules are necessary. What is gathered from "desperate and evil people" must be entered into a *Volumen in haereseologia atheismi*, divided into eleven chapters with headings that prescribe refutations (*Objectiones*). They range from "That certainly and unerringly one GOD exists" to "One may not refrain from going to Church". In order to associate each entry with the respective "*answer of the orthodox*", Udenius provides ample information about relevant literature,[41] including literature that helps refute the "outrageous errors" of Protestant sects as well as Judaism and Islam.[42]

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38   Udenius, *Excerpendi ratio nova*, p. 80.

39   Udenius proposes further reading, unlike Drexel, who still recommends memorization. See Udenius, *Excerpendi ratio nova*, p. 159f.

40   Udenius, *Excerpendi ratio nova*, p. 32f.

41   Udenius, *Excerpendi ratio nova*, p. 33f.

42   Udenius, *Excerpendi ratio nova*, pp. 34–37.

Udenius' recommendations on excerption oscillate between traditional patterns and new, flexible forms of independently organized knowledge acquisition. In the *Excerpendi ratio nova* we find instruction in the tradition of the rhetorical-dialectic topics, like the advice to divide the excerpts into *Enthymemata, Exempla, Comparationes, Similitudines, Typi, Allegoriae, Tropologiae, Anagogiae* and *Contrariae*;[43] we also find examples of excerption as an act of autonomous thinking, for instance, when Udenius reports that his friend Georg Philipp Harsdörffer told him that, when he lies awake at night, he jots down "many useful things" that occur to him "briefly in the dark", in order to elaborate on them "more extensively" the next day.[44]

3.4   Interlude 1: A Dispute on Slips

This ambivalence is also typical for the manuals on excerption published in the years following the *editio princeps* of the *Excerpendi ratio nova*. Examples are Vincent Placcius' 1689 compilation of excerption manual,[45] the book on excerption included in Morhof's *Polyhistor* (beginning with the 1692 edition),[46] and other treatises on excerption composed around 1700.[47] One focus of these publications is the slip closet, invented by Thomas Harrison around 1640.[48] Udenius was not familiar with this method of managing excerpts independent from the body of the book, first publicized by Placcius. However, we have

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43   He refers to the practice of preaching. See Udenius, *Excerpendi ratio nova*, pp. 77–102.

44   According to Udenius, he owed much to Harsdörffer. See Udenius, *Excerpendi ratio nova*, p. 73. Regarding Harsdörffer's practice of excerption, see Christoph Meinel, "Enzyklopädie der Welt und Verzettelung des Wissens: Aporien der Empirie bei Joachim Jungius", in F.M. Eybl et al. (eds.), *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung* (Tübingen: Max Niemeyer, 1995), pp. 162–187, at p. 170.

45   Placcius says of Udenius: "Nihil novi habet". See Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689), p. 9.

46   Morhof thinks that Udenius should not be discarded; he follows Schrader's method. See Morhof, *Polyhistor*, p. 559 (recte, p. 561).

47   See, for instance, P. Philomusus, *Industria excerpendi brevis, facilis, amoena, a multis impedimentis quibus adhuc tenebatur, exsoluta* (Constantiae: Typis Joannis Jacobi Labhart, 1684); Johann Balthasar Schubert, *Sciagraphia de studio excerpendi* (Lipsiae: Zschauens, 1699).

48   The history of Harrison's slip closet is well researched. See particularly Noel Malcolm, "Thomas Harrison and his *Ark of Studies*: an episode in the history of the organization of knowledge", *The Seventeenth Century*, 19: 2 (2004), pp. 196–232; Richard Yeo, *Notebooks, English virtuosi, and early modern science* (Chicago and London: The University of Chicago Press, 2014), pp. 113–123.

already seen that he also describes the excerpt book as a flexible, that is, expandable and unbound container.

However, in the face of Harrison's project to disassociate excerpt organization from the body of the book, there are also manuals on excerption which defend the tradition of bound excerpt books with fixed titles. Johann Benedict Metzler, a Protestant preacher like Udenius, was a late representative of this position. His 1709 book, titled *Die rechte Kunst zu excerpiren*, also provides clues on how the debate over the slip closet, which Metzler and others criticized as cumbersome, produced the idea of the slip box. Metzler argues that if one prefers to organize excerpts on loose slips, there are easier solutions. He illustrates this idea by describing how the principle of Harrison's slip closet can be realized without using his complicated closet technology.[49] Metzler adds that it would be easier "to take a certain number of small boxes" which receive the *schedulas*. This is not yet a slip box because Metzler does not mention index cards. Nevertheless, his proposal is close to the modern management of slip boxes. "Inventis facile est aliquid addere"; with this maxim, frequently quoted in the early modern period, Metzler ends his discussion of excerpt management with loose slips.[50]

Metzler himself prefers bound excerpt books, which are supposed to guarantee more order, stability, and uniformity than loose slips. When Metzler's book was printed, that is, in the early eighteenth century, his position, though common in seventeenth-century manuals on excerption, was no longer convincing. A dissertation on excerption (*Positiones XXXIV de studio excerpendi*), written at the University of Jena in 1713, illustrates this point. In this dissertation, the issue of slips takes centre stage in relation to Harrison's slip closet and Metzler's critique.[51] Movable slips with excerpts ("Excerpta schedacea, hoc est, chartis non compactis inscripta") are actually more practical, also in the management of excerpts; the related danger of confusion can be avoided if the slip is properly marked.[52]

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49   Johann Benedict Metzler, *Artificium excerpendi genuinum dictus die rechte Kunst zu excerpiren* (Lipsiae: Apud Theophilum Georgl, 1709), p. 92: "Moreover, we do not need a closet with so many subdivisions and capsules. It would be possible to have a row of ledgers full with those notebooks, or hooks from the needle maker which are nailed onto two flexible columns or onto other ledgers, so that it can could be put in the study, carried away etc. One could attach the slips, take them away, paying attention alone to the numbering".

50   Metzler, *Artificium excerpendi*, p. 92.

51   See Fridericus Sidelius and Paulus Sigismundus Schubart, *Positiones XXXIV de studio excerpendi* (Ienae: Fickelscher, 1713), Positio 32, pp. 12–15.

52   Sidelius and Schubart, *Positiones XXXIV de studio excerpendi*, p. 14: "Si vero vel maxime casu aliquo fortuito confusio orta sit, tamen facile per quemvis alium, e.g. scholasticum, in ordinem pristinum redigi possunt, si cuique schedae numeros aut signa apposueris,

3.5   Prudence at Last 1: Johann Friedrich Bertram

Metzler's book was already outdated when it was published, as we can infer
from the scant evidence of an impact on later scholars, and the few remaining
copies in public libraries; electronic catalogues indicate that there is only one
extant (digitized) copy, located in the Saxonian State Library in Dresden. More-
over, Metzler's painstaking and tortuous description of the protracted process
of establishing the title categories for his excerpt book is an anachronism.[53]
The manuals on excerption written after 1700 are generally characterized by a
programmatic brevity of disquisitions, and the exhortation not to dedicate ex-
cessive labour and time to excerpting.[54] The reasons for this changed attitude
are illustrated by a *Discours von der Klugheit zu excerpiren*, printed in 1727.

  The author of this modest, 63-page text was Johann Friedrich Bertram
(1699–1741). Bertram studied Theology in Halle, and afterward worked as a
teacher at the recently founded Paedagogium of the Francke Foundations. He
eventually became rector, court preacher and councillor of the consistory in
East Frisian Aurich.[55] He composed books on the *Historia literaria*, a new for-
mat of learned propaedeutics, cultivated by German scholars in the first half
of the eighteenth century.[56] Compared to seventeenth-century manuals and
Metzler's late treatise, Bertram does not have much to say about excerption.
The actual instructions on excerption are limited to 25 pages, divided into two
chapters: "On the nature, necessity and usefulness of excerpts" ("Von der Be-
schaffenheit, Notwendigkeit und Nutzen der Excerpten") and "On how to make
useful excerpts" ("Von der Art und Weise nützlich zu Excerpiren").[57] With an
eye to the great quantity of manuals on excerption, Bertram justifies himself
by explaining that he was urged to print his method; he explains that he also

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tum involucrum, ad quod spectant, tum schedam sequentem indicantia, alterumque nu-
meros & signa cuique schedae apposita, quod vel tribus verbis fieri potest, edoceas".

53   The title categories should be established and remain unchanged. See Metzler, *Artificium
excerpendi*, pp. 40–49. However, they are painstakingly elaborated for personal use rather
than simply adopted from tradition. This is the topic of Metzler's treatise, which is strong-
ly influenced by Placcius. Similar to Placcius is also the fact that the presentation of the
management of excerpts has strong autobiographical undertones.

54   We find this position in 1699 in Schubert's *Sciagraphia*.

55   See *Allgemeine Deutsche Biographie* (56 vols., Munich and Leipzig: Duncker & Humblot,
1875–1912), II, p. 551, s.v. "Bertram, Johann Friedrich".

56   See the overview in Frank Grunert and Friedrich Vollhardt (eds.), *Historia literaria.
Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin: Akademie Verlag, 2007).

57   Johann Friedrich Bertram, *Discours von der Klugheit zu excerpiren* (Braunschweig: Renger,
1727), pp. 7–20, pp. 20–33.

acceded to this request because the material he had used for years in his teaching was already circulating in transcriptions.[58] His predecessors had used similar arguments and also made the confident claim "that so far nobody has presented this matter in such a way in any book".[59] Is this claim sustainable?

One novelty of Bertram's manual on excerption is 'prudence' or 'intelligence' as a frame of reference. He particularly emphasizes the benefits as well as the utilitarian dimension of the acquisition of knowledge. Individuals who do not have time to look up 'many books', that is, "people with far-ranging offices or who travel frequently", use excerpts to put something to paper, "with ease and little waste of time".[60] The preference for 'real things' and the criticism of formal language teaching, which was closely associated with the humanist tradition of excerption, are also related to this early Enlightenment model of prudence. Excerpts do not consist of "single phrases and speech formulas, as novices in school gather them, but of real things taken from the arts and the higher disciplines, that is, as well from Theology, Jurisprudence and Medicine as from philosophy and philology".[61] Nevertheless, the necessity and the utility of excerption are not discussed along the line of the topics, arguments and historical references, as had been customary since the seventeenth century.[62] The chapter on the methods of excerption conforms to tradition, by and large, although it offers general maxims rather than illustrating them through practical examples, like the earlier manuals had done. There are no recommendations on which literature should be excerpted for a particular purpose, one of Udenius' main interests. Besides the usual rule not to excerpt everything we find, the general advice is to adhere "exclusively to those books whose quality is beyond doubt".[63] Bertram does not specify the criteria of selection and the appropriate contents to be extracted from books.[64]

A look at the techniques of excerption he describes yields similar conclusions. The establishment of the organizing criteria and the subsumption of excerpts under their *Tituli* is pragmatically oriented toward the purpose of

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58　Bertram, *Discours*, p. 4f.

59　Bertram, *Discours*, p. 5.

60　Bertram, *Discours*, p. 12, referring to Placcius' notion of "art of bookkeeping" (*Buchhalter-Kunst*).

61　Bertram, *Discours*, p. 9.

62　Particularly the topic of the necessity of making excerpts, resulting from the mass of books and the weakness of human memory. See Bertram, *Discours*, p. 10.

63　Bertram, *Discours*, p. 21.

64　With the exception of the general rule that it is superfluous to make excerpts from compilations. Cf. Bertram, *Discours*, p. 22. By contrast, Udenius frequently recommends compilations.

knowledge acquisition.[65] While Udenius and Metzler describe in detail the protracted mental labour of the production of titles, Bertram subordinates everything to the threat of a "waste of time" (*Zeit-Verlust*). Bertram rejects Udenius' idea of first writing the excerpts on slips in order to come up with a title, and later transferring them to the excerpt book. The excerpt books (*Collectanea*) are always at hand while reading, so that "as soon as something is seen which we deem worthy of taking note", it may immediately be written down.[66] Excerpt books should be "not too thick", so the reader may place them nearby "to comfortable usage". This and, again, the awareness of "fleeting time", make it necessary to copy the 'passages', not verbatim, but in abbreviated form, and concentrate on "what is the kernel and the best".[67]

The recommendation to make excerpts only from good books and to keep them short is characteristic of manuals on excerption since the end of the seventeenth century. For Bertram, it is an exigency of *Klugheit*, that is, the use of the most simple and comfortable means to assure the ultimate purpose of excerption: the retrieval and recycling of excerpts.[68] Silhouetted against this premise, the common forms of excerpt management are deficient: they are all characterized by 'impracticality'.[69] Bertram does not elaborate on the thought, referring instead to the production of excerpt books which list excerpts under alphabetically structured and preset titles (this was Drexel's recommendation), to the 'excerpt closets' (*Excerpten-Schränke*) mentioned by Placcius,[70] and also to the method of binding empty sheets into bound books which could be used for handwritten notes ('interleaved copies').[71] Bertram only recommends one method explicitly, which he explains in fine detail, deviating from

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65   See, for instance, Bertram, *Discours*, p. 26: "One must not shrink from entering a thing more than once under different titles, because sometimes a thing has different names of which we only remember one or the other when opening the book".

66   Bertram, *Discours*, p. 25f. Matters recognized in readings away from home are underlined in the book or otherwise marked in order to transcribe them afterwards, at home, into the excerpt books.

67   Cf. Bertram, *Discours*, pp. 24–27.

68   Cf. Bertram, *Discours*, p. 24f.

69   Cf. Bertram, *Discours*, p. 28.

70   "Many and diverse" methods of excerption were "prescribed, for example, by Drexel, Sagittarius, Placcius, Stübel, Weise, Morhof, Hubner and others". Cf. Bertram, *Discours*, p. 28.

71   Their *Incommodität* is described as such: "It will only be seen, that the book is rendered nearly useless this way, and will often be too small so that much cannot be annotated". Cf. Bertram, *Discours*, p. 28. Regarding the practice of interleaved copies, see Arndt Brendecke, "'Durchschossene Exemplare'. Über eine Schnittstelle zwischen Handschrift und Buch", *Archiv für Geschichte des Buchwesens*, 59 (2005), pp. 50–64.

his usual style of using general maxims: "From long experience, I have learned that one of the best methods is the one devised by the most famous English philosopher John Locke, which was popularized by Jean Le Clerc. Accordingly he has garnered the most applause in the community of learned men so far".[72]

At the urging of his friends, John Locke published his *Méthode nouvelle de dresser des Recueils* anonymously, with the help of Jean Le Clerc in 1686, in his *Bibliothèque Universelle et Historique*. In 1706, a slightly modified version appeared in English translation and with the author's name.[73] In the early eighteenth century it was, together with Harrison's slip closet, the most discussed method of excerpt management. Jean Le Clerc recommended it explicitly in his *Ars critica*,[74] and many contemporary scholars joined him. Bertram, too, refers to the success of the little treatise. Locke continued to use the book as a medium for his excerpts but, unlike Harrison's slip closet, his excerpt management system was easy. Using an ingenious index system, its unique purpose is the retrieval of information; its mobility would only be surpassed by the slip box. The main criterion is the speed of the entry and the retrieval of excerpts. The index is the principal search engine, determining the organization of the excerpts. Bertram, who has a scheme of Locke's index printed as an appendix ("SCHEME of excerpts, organized in the Lockean manner"),[75] praises his 'intelligent' efficacy: Locke's *Methodus* has the 'least difficulty', the index is short ('at most two sheets'), excerpts can be found "quickly and with little effort", the empty sheets (unavoidable in fixed title systems) can be avoided in the excerpt book.[76] In short, it is possible to make excerpts while reading, filing excerpts quickly without order (but also without the danger of 'confusion') in the excerpt book: "Because I am able to write along, without much leafing, nobody is delayed much".[77] If scholars like Placcius criticize Locke's method, this can be explained by the fact that they have no 'experience' with it.[78] However, Bertram

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72 Bertram, *Discours*, p. 29. For the description of the method, see Bertram, *Discours*, pp. 29–33.

73 For a detailed analysis, see Yeo, *Notebooks*, pp. 175–218. See also Michael Stolberg, "John Locke's 'New Method of Making Common-Place-Books': tradition, innovation and epistemic effects", *Early Science and Medicine*, 19 (2014), pp. 448–470, as well as the contributions to this volume.

74 See Zedelmaier, *Werkstätten des Wissens*, p. 60.

75 Bertram, *Discours*, pp. 59–63.

76 See Bertram, *Discours*, p. 29 and p. 30f.: "In the book itself we do not follow the cumbersome and useless order of the alphabet, but write down the things, one by one, as they appear in our readings".

77 Bertram, *Discours*, p. 32.

78 See Bertram, *Discours*, p. 32.

does not intend to impose Locke's method on anybody. He concludes with the traditional rule that everybody has to find his own way in excerption.[79]

Bertram's presentation of excerption as a prudent or intelligent activity in conformity with the newest trends, as indicated by the example of the great English philosopher, is also related to the fact that excerption was already heavily criticized when the *Discours von der Klugheit zu excerpiren* was published in 1727. In the introduction, Bertram reports "the reasoning of quarrelsome people" (*Tadelsüchtiger Leute raisonnements*).[80] Their criticism does not refer to the danger traditionally associated with excerption – the loss of individual memory. The new critics target the very thing that manuals on excerption since Francesco Sacchini and Jeremias Drexel aimed to foster: independent thinking. For Bertram, this is no longer an issue. Moreover, his disquisitions are limited to books. We do not read anything in Bertram's work about excerption as a method applied not only to texts but also to empirical experiences and original thoughts, as we saw in Udenius. Instead, his treatise is already infected by the critique of excerption. The emphasis he lays on efficiency is also a way to make sure that young people "are not corrupted by excerption".[81]

3.6   Interlude II: *Excerpir-Sucht*

Bertram grapples extensively with the 'quarrelsome people' in a separate section following his actual manual on excerption.[82] The subject of the 'impartial research'[83] is the critique of a certain 'Mr. A.F.A.H.', who can be easily identified as Friedrich Andreas Hallbauer because his treatise, *Anweisung zur verbesserten Teutschen Oratorie*, printed in 1725 in Jena, is mentioned explicitly. Literary historians know Hallbauer as the main proponent of the reform of rhetoric in the early eighteenth century philosophical prudence and the critique of pedantic academic scholarship.[84] In the "improved German rhetoric" he polemicizes sharply against the arsenal of humanist and baroque scholarship. The *Collectanea* are among the instruments he criticizes (*loci topici, ars Lulliana, Cabbala,*

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79   See Bertram, *Discours*, p. 32f.

80   Bertram, *Discours*, p. 5.

81   Bertram, *Discours*, p. 25.

82   See Bertram, *Discours*, pp. 33–52.

83   See Bertram, *Discours*, p. 23f.

84   Regarding Hallbauer, see Anna Echterhölter, "Die Dinge im Vordergrund. Strategien der Sachlichkeit in akademischen Totenreden", in F. Berndt and D. Fulda (eds.), *Die Sachen der Aufklärung. Beiträge zur DGEJ-Jahrestagung 2010 in Halle an der Saale* (Hamburg: Felix Meiner, 2012), pp. 85–96.

Buchstabenspielen).[85] He holds that they are recommended to "young people in schools" as an "incomparable means to erudition", with disastrous effects: "They write a matter several times, from a slip or a writing board into a book; from one book into another; under different titles". If one wants to compose "an oration or a scripture", one "locks oneself up in a room, opens his *Collectanea* and copies them, or one takes several volumes and lifts a mouthful now from this one, now from the other". People excerpt to death, as it were, and guard their excerpt books as "treasure chambers" (*Schatz-Cammern*) and sanctuary (*Heiligthum*), but when the time comes to apply their knowledge they are empty-handed. Only "pedantic or schoolboy orations and scriptures" come from excerpt books. Hallbauer assures us that he recognized the uselessness of *Collectanea* early on, 'Thank God', and burnt them.[86]

Hallbauer condemns the 'excerption mania' (*Excerpir-Sucht*), which processes exclusively foreign materials, advocating instead "individual contemplation". He associates the latter concept, excessively, with notions like 'natural connection', 'experience', and 'new truths'.[87] Although speaking and writing should result from independent thinking, Hallbauer cannot and does not want to dispense with notes and repositories for records, because they are a reality of academic practices of knowledge acquisition. Despite the early Enlightenment rhetoric of reform, programmatically announced by Hallbauer, his proposal harks back to an old method from the palette of pre-established patterns of excerption, which early modern manuals on excerption had countered with the independence of information processing. In every scholarly discipline,

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85   Regarding specifically the *Collectanea*, see Friedrich Andreas Hallbauer, *Anweisung zur verbesserten Teutschen Oratorie, nebst einer Vorrede von den Mängeln der Schul-Oratorie* (Jena: Hartung, 1725; reprint Kronberg/Ts.: Scriptor, 1974), pp. 286–295. He states that *Collectanea* are either "made by others" or "one produces them oneself"; some inherit them from their fathers, some buy them with money; there are numerous printed *Collectanea* (among others, he refers to Theodor Zwinger's *Theatrum humanae vitae*); they can be easily produced, and enjoy commercial success; many have demonstrated in detail how to produce *Collectanea* (among others, he mentions Placcius, Keckermann and Christian Weise); *Collectanea* must be distinguished from *Miscellaneis*; the latter are notes of "the remarkable things one reads or hears", "without making any distinctions"; the entries are made accessible by a "well-organized index"; *Collectanea* "are made according to certain titles", one should not be too 'careful' (Weise argues), using common words as titles ordered alphabetically. It is obvious that Hallbauer is perfectly familiar with the tradition of excerption.

86   Hallbauer, *Anweisung*, p. 235f., p. 290.

87   One example: "However, a clever speech or writing is the product of a coherent and agile contemplation which arranges selected, thorough and relevant things, in an effortless and natural order". Cf. Hallbauer, *Anweisung*, p. 240f.

a single 'good author' is the frame of reference for everything read. The reader writes his notes in this printed basic book at the appropriate place, together with relevant bibliographical notes (thus, the book should be an interleaved copy with empty sheets bound in). Hallbauer holds that this method costs 'little effort' and has far 'greater benefits' than all the *Collectanea*. In the composition process, the writer or orator opens the basic book, retrieves the necessary information, following, if appropriate, the bibliographical references. However, Hallbauer's basic rule is: once one has 'read enough', all books should be dropped, in order to write down "what comes from contemplation".[88]

Hallbauer's proposal shows how, under the rule of 'independent thinking' and the related marginalization of processed foreign knowledge, old models of authority gain new currency. What does Bertram think of Hallbauer's critique, and how does he engage with it?

3.7   Prudence at Last II: Johann Friedrich Bertram Again

Bertram cannot conceal a certain affinity to Hallbauer's plea for a reformed rhetoric.[89] Philosophical prudence is, as we have seen, the guiding principle for his excerption instructions; it is the reason why he feels compelled to define a new program for this problematic practice. However, he does not agree with Hallbauer's radical denunciation of excerption. What are the arguments Bertram marshals against Hallbauer? In his "impartial research", he lists a total of sixteen reasons which Hallbauer had formulated for his criticism of excerption.[90] One by one, Bertram cites the objections, opposing them, one by one, with an 'answer'. Like many early Enlightenment thinkers, he presents his arguments, in spite of the critique of pedantic scholarship, following the cumbersome logic of academic disputations. Bertram looks into the formal mistakes in Hallbauer's critique of excerption and the related practices – the suppression of independent thinking, and also the apparent uselessness and ineffectiveness of excerption (as well as the dangers it presents to health). Moreover, he counters Hallbauer's strict dichotomy of excerption

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88   See Hallbauer, *Anweisung*, p. 294f. In a later treatise, Hallbauer summarizes his critique of *Collectanea*. See Friedrich Andreas Hallbauer, *Anleitung zur Politischen Beredsamkeit* (Jena and Leipzig: Johann Rudolf Cröker, 1736; reprint Kronberg/Ts.: Scriptor, 1974), p. 129f. Regarding the model of reading Hallbauer uses here (probably without being aware of it), see Zedelmaier, *Werkstätten des Wissens*, pp. 8–11.

89   See Bertram, *Discours*, p. 33f.

90   See Hallbauer, *Anweisung*, pp. 291–294. See also Décultot, "Einleitung", p. 42f.

and independent thinking with an attempt to reconcile the two different approaches even while differentiating them. His answer to Hallbauer's first objection (that "Excerption keeps one from thinking") is that excerption as an end in itself is certainly 'most foolish', yet practiced "prudently according to the prescribed rules", that is, following Bertram's own method, it promotes rather than stifles independent thought. He uses the thought experiments of the mathematician and naturalist Ehrenfried Walther von Tschirnhaus, one of the key figures of the early German Enlightenment,[91] to buttress his argument. Bertram's discussion of Hallbauer's recommendation to write down notes in interleaved copies must be seen against the backdrop of the method of excerption conceived by the philosophical authority John Locke. Locke's efficient excerpt management shows that interleaved books are cumbersome: many leaves are not used while others fill up all too quickly; a particular problem is that the recorded information can only be retrieved with great effort. The only advantage Bertram acknowledges is the "systematic connection" (guaranteed by the book's structure).[92]

Bertram accepts the primacy of independent thinking over excerpts. In his programmatic fixation on independent thought processes, Hallbauer rejected the argument, put forward in seventeenth-century manuals on excerption, that excerpts and their organization are the result of a productive intellectual operation in selection and processing, which free the student from pre-established systems of ordering. In Bertram's work, too, this argument is marginal. His *Discours von der Klugheit zu excerpiren* stands Janus-like between tradition and modernity, between the dominance of past (ancient) knowledge and the enlightened enthronement of autonomous thinking. A partial edition of a seventeenth-century manual on excerption that concludes Bertram's little book illustrates this.[93]

Like many manuals on excerption, this text is the product of a *Privatkolleg*, and it is also characteristic that it circulated in manuscript form. Placcius mentions the text in his compilation of methods of excerption, as does Morhof in his *Polyhistor*.[94] The author and lecturer of the private seminar was Christoph Schrader, the professor of rhetoric we encountered in the reconstruction of the origins of Udenius' manual on excerption. Both scholars, Schrader and Udenius, taught excerption at Helmstedt, but only Udenius published a printed manual on excerption a few years later. When he prepared his publication,

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91   See Bertram, *Discours*, p. 37f.
92   See Bertram, *Discours*, p. 49f.
93   See Bertram, *Discours*, pp. 52–59.
94   Bertram also knows that Placcius intended to edit the text. See Bertram, *Discours*, p. 6.

he apparently made use of a manuscript version of Schrader's method, because in his *Excerpendi ratio nova* he refers to "Dn. Christoph. Schraderi *in Manuscr. Methodo Excerpendi*".[95] Udenius does not explain how he got hold of the manuscript. Christoph Meinel, who discovered a version (dated 1660) of Schrader's method on excerption in a bundle of manuscripts owned by Michael Kirsten (1620–1678), a professor of mathematics at Hamburg, suggests that Udenius, who resided in Helmstedt between 1659 and 1663, copied Schrader's text and used it for his own published manual.[96] The degree to which his printed manual depended on Schrader cannot be reconstructed on the basis of Bertram's edition (dated 1668, thus being a later version of Schrader's method of excerption that is not identical with the manuscript found by Meinel), because, aside from the announcement of the seminar (*Programma*, with indication of dates and time of the *Privatkolleg*), Bertram only edited the introduction and a short extract of two pages.

Bertram provides us with scant information on the reasons for this partial edition. Placcius and others had "very much appreciated" the 'Collegium' and he thinks that the selected 'passages' confirm the arguments of his own *Discours*.[97] A closer look at the edition is, at first sight, not very instructive, because the introduction and the extract treat the topic of excerption only in a general manner. For example, departing from a passage in Aristotle's *Economics*, Schrader argues that it is necessary to have at hand what one has heard and read for future use, like the head of a household;[98] the argument is buttressed with an interpretation of Seneca's parable of the bees. Thus, Schrader alludes to the weakness of individual memory and the ensuing necessity of excerpts, which must be managed so that they can be easily retrieved. Finally, he relates cautionary examples of famous scholars who bitterly lamented having neglected to excerpt. These topics appear in many seventeenth-century manuals on excerption, and Bertram also addresses them in his *Discours*. However, these general 'passages' from Schrader's instructions on excerption have little in common with Bertram's specific agenda of re-positioning excerption as a prudent practice. Hence, the edition is more of a historical look back on a waning

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95   See Udenius, *Excerpendi ratio nova*, p. 62.

96   See Meinel, *Enzyklopädie der Welt*, p. 18of. Like Placcius, Kirsten belonged to the circle of Hamburg scholars who dealt intensively with excerption. See also Maria Marten and Carola Piepenbring-Thomas, *Fogels Ordnungen. Aus der Werkstatt des Hamburger Mediziners Martin Fogel (1634–1675)* (Frankfurt am Main: Vittorio Klostermann, 2015).

97   See Bertram, *Discours*, p. 6. Followed by the general statement that he had acquired the manuscript some time ago.

98   Morhof also refers to the Aristotelian head of household in his discussion of excerption. See Zedelmaier, *Werkstätten des Wissens*, p. 58.

pedagogical practice than an expression of interest in the contents treated by Schrader. Much more relevant for Bertram's own project are the criticisms of excerption by scholars like Hallbauer, which have contaminated Bertram's own manual on excerption.

3.8   The Disappearance of Manuals on Excerption: A Brief Obituary

As far as I can see, the manual on excerption as an independent text, as a genre, became extinct with Bertram's *Discours*. However, the most successful representatives of the genre, Francesco Sacchini's *De ratione libros cum profectu legendi libellus* (1613) and Jeremias Drexel's *Aurifodina artium et scientiarum omnium* (1638) were reprinted in eighteenth-century translations. Sacchini's instructions appeared as late as 1832.[99] As a subject of academic teaching, the origin of most manuals, excerption seems to have disappeared in the context of the emerging doctrine of *Selbstdenken* – but this topic still awaits further research.

If we look at the genre of the excerption manual, we can see that Hallbauer's position prevailed over Bertram's. Although we still find instructions on reading in the eighteenth century, for them excerption was of minor or marginal importance. Christoph Meiners' little book, *Anweisungen für Jünglinge zum Arbeiten besonders zum Lesen, Excerpiren, und Schreiben* (1789), was no exception; despite the appearance of the word excerption in the title, it is only briefly addressed.[100] Meiners' instructions are nevertheless interesting, because they show how the new organization of autonomous thinking based on slips came to prevail in the eighteenth century.[101] *Selbstdenken* (in relation to 'independent action' [*Selbstthätigkeit*] and 'self-reliance' [*Selbständigkeit*]) is also the key notion of the *Kunst, Bücher zu lesen* (1799), by the Kantian Johann Adam Bergk. In this work, the 'autonomous mind' must learn "not to be suffocated

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99   See Blair, *Too much to know*, p. 70. See also Herrmann Walchner (ed.), *Über die Lektüre, ihren Nutzen und die Vortheile sie gehörig anzuwenden. Nach dem Lateinischen des P. Sacchini teutsch bearbeitet und mit einem Anhange begleitet* (Karlsruhe: Groos, 1832). However, in his commentary, Walchner criticizes Sacchini's instructions because they do not sufficiently take into account the maxim of independent thinking. See Zedelmaier, *Werkstätten des Wissens*, p. 14.

100   I use the second edition from 1791. Regarding excerption, see Christoph Meiners, *Anweisungen für Jünglinge zum eigenen Arbeiten besonders zum Lesen, Excerpiren, und Schreiben* (Hannover: In der Helwigischen Hofbuchhandlung, 1791), pp. 84–92.

101   See Zedelmaier, *Werkstätten des Wissens*, p. 73.

by the gathering of knowledge".[102] Practices of excerption are no factor in this process. Only pale echoes on a single page refer to the techniques recommended by past excerption manuals; they are immediately superseded by the notion that the reader is the master of what he has read.[103] Only in specialized disciplinary discourse, apparently particularly in the natural sciences, does the subject of excerption still have a certain relevance.

One example is the article "Ueber die vorzüglichsten Methoden Collectaneen und Exzerpte zu sammlen", published by the Göttingen Professor of Medicine Johann Friedrich Blumenbach in 1786 in the *Medicinische Bibliothek*, which he edited himself.[104] The principle focus of his "theory of a good method of excerption" is similar to Bertram's: speed and efficacy. Everything must be accomplished without a "loss of time" (*Zeitverlust*), aiming at 'easy' and 'speedy retrieval'. From this perspective, Blumenbach examines the methods of excerption recommended and practiced since the early modern period. According to Blumenbach, Leibniz and Haller worked with a method of 'loose slips'. He emphasizes that this method had the advantage of flexibility, particularly the possibility of re-arranging the slips; the disadvantage is the danger of losing the slips (already extensively discussed in seventeenth-century manuals on excerption). In order to secure the slips, Leibniz used the slip closet described by Placcius. Blumenbach sees this as the "most inconvenient machine conceivable" (*unbequemste Maschine, die man sich denken kann*). Nevertheless, Blumenbach prefers the slip method to the 'book of *Collectanea*' (*Collectaneen-Buch*). Even if the book is provided with well-organized index systems (such as those used by the Dutch physician Herman Boerhaave), the information could only be retrieved with "great effort and loss of time". Blumenbach's verdict on the combination of the slip method and *Collectaneen-Buch* is similar. His example is the sixteenth-century Swiss naturalist Conrad Gessner, who recommended gluing slips onto bound sheets.[105] After this critical overview of common practices of excerption, Blumenbach describes the method best suited to resolve the problem, based on his own experience, just as traditional excerption manuals did. He makes a distinction between 'minor subjects' (*Nebenfächern*), for which interleaved text books are sufficient, and 'major subjects' (*Hauptfächern*), which require excerpts on slips (arranged "by subjects into thin cardboard coverings or folders"), but 'slip boxes' (*Zettelkästchen*) and

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102   See Zedelmaier, *Werkstätten des Wissens*, p. 14.

103   See Johann Adam Bergk, *Die Kunst, Bücher zu lesen* (Jena: In der Hempelschen Buchhandlung, 1799), p. 408: "Wir müssen die Feder immer bei der Hand haben".

104   Johann Friedrich Blumenbach, "Ueber die vorzüglichsten Methoden Collectaneen und Exzerpte zu sammlen", *Medicinische Bibliothek*, 2: 3 (1786), pp. 547–559.

105   See Blair, *Too much to know*, pp. 212–225.

unstructured notebooks (*Miscellan-memorandum*) can also be used. Thus, Blumenbach uses traditional and new practices of excerption, functionally oriented toward different purposes and particular needs.

Blumenbach's example shows that scholars were still reflecting on excerption in relation to particular disciplines, but excerption was no longer part of the general academic introductory texts that have been known since the end of the seventeenth century as *Historia literaria*. In the second half of the seventeenth century, *Historia literaria* as well as excerption were taught in *Privatkollegien* at certain universities, among them Helmstedt and Kiel.[106] The *Polyhistor*, the result of Morhof's teaching at the University of Kiel and one of the prototypes of the *Historia literaria*, still discusses the art of excerption in an extensive, separate book. Although Morhof was an admired (and often imitated) model for *Historia literaria*-type works around 1700 and afterwards, his book on the art of excerption did not find any epigones in the *Historia literaria* tradition. This cannot be primarily attributed to the ambivalent role excerption had already in Morhof's work,[107] but rather to the fact that authors of *Historia literaria*-style works preferred a different approach to scholarship. Unlike manuals on excerption, they do not teach which techniques make it possible to generate and store knowledge, but rather provide information on books of the different disciplines, the main authors, and also on institutions of knowledge (for instance, libraries), and the question of the progress of the sciences. They are also interested in the history and materiality of writing. For example, in the chapter *De arte scribendi*, Christoph August Heumann, author of the most successful eighteenth-century textbook on *Historia literaria*, discusses the origins of writing, past forms of writing and modes of transmission, and the invention of the printing press, among other topics.[108] Heumann does not even mention excerption in his textbook. When Bertram, three years after his *Discours* on excerption, 'joined' the *Historia literaria* with his *Anfangs-Lehren der Historie der Gelehrsamkeit*, excerption was no longer a topic for him.[109] In the second half of the eighteenth century, we rarely find relevant entries in encyclopaedias

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106   See Nelles, "*Historia literaria* at Helmstedt", pp. 147–176; Nelles, "*Historia literaria* and Morhof", pp. 31–56.

107   See Helmut Zedelmaier, "De ratione excerpendi. Daniel Georg Morhof und das Exzerpieren", in F. Waquet (ed.), *Mapping the world of learning: the* Polyhistor *of Daniel Georg Morhof* (Wiesbaden: Harrassowitz, 2000), pp. 75–92.

108   Christoph August Heumann, *Conspectus reipublicae literariae sive via ad historiam literariam iuventuti studiosae aperta* (Hannover: Apud Nicolaum Foersterum, 1753[6]), pp. 29–66.

109   Johann Friedrich Bertram, *Anfangs-Lehren der Historie der Gelehrsamkeit, zum Gebrauch der auf Schulen studirenden Jugend abgefast* (Braunschweig: Renger, 1730). However, he mentions his manual on excerption (p. 12). In his discussion of the appropriate reading of the Latin classics, he notes that a "librum memorialem" could be helpful (p. 46). The copy

and dictionaries.[110] A cursory overview of introductory works for students in the late eighteenth and nineteenth centuries yields similar results.[111]

Excerption largely disappeared from the discourse on knowledge. Of course, excerption was and still is a common practice;[112] excerpts were and are being managed (in the eighteenth century with slip boxes, today with computers). However, the issue of how this practice is best performed is no longer a focus of scholarly or literary attention. The activity of excerption is governed by the individual's preferences, by the autonomous mind that makes foreign knowledge its own. The knowledge acquired 'went underground'. The author as the 'owner' of his works rules over foreign knowledge just like the main text rules over the footnotes. It is no coincidence that footnotes originated in the eighteenth century.[113] The dominance of autonomous thinking marginalizes practices of excerption and the management of excerpts: the author generally conceals the real material foundations of his knowledge. In seventeenth-century manuals on excerption, this practice has an air of secrecy because the excerpt books should not be revealed to others. In the eighteenth century, excerption is criticized as a danger to *Selbstdenken*. Later, it is regarded as trivial. However, the self-empowerment of the author, who must demonstrate his autonomy, has new effects and precarious consequences. It transforms writing, but also exacerbates the problem of plagiarism. A more detailed analysis of this phenomenon is a topic for another study.

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in the Staatsbibliothek München (digitized, call number: 825298 H.lit.u. 48 825298 H.lit.u. 48) is interleaved (however, with only a few excerpts).

110   One exception is *Deutsche Encyclopädie oder Allgemeines Real-Wörterbuch aller Künste und Wissenschaften*. The short entry 'Excerpiren' emphasizes that everybody makes excerpts "according to his needs and way of thinking", adding the warning that excerption needs "independent thinking" (*eigenes Denken*). The only bibliographical reference is Morhof's *Polyhistor*. See *Deutsche Encyclopädie oder Allgemeines Real-Wörterbuch aller Künste und Wissenschaften* (23 vols., Frankfurt am Main: Varrentrapp and Wenner, 1778–1804), IX, p. 153, s.v. 'Excerpiren'.

111   Erduin Julius Koch mentions the works of Placcius (which contains, according to Koch, references to older works) and Meiners (which does not contain anything new compared to Placcius) as independent works. See Erduin Julius Koch, *Hodegetik für das Universitaets-Studium in allen Facultäten* (Berlin: Franke, 1792), p. 162. Karl Hermann Scheidler also refers to Meiners, but otherwise limits himself to anecdotes. See Karl Hermann Scheidler, *Grundlinien der Hodegetik oder Methodik des akademischen Studiums und Lebens* (Jena: Cröker, 1839²), pp. 299–403.

112   Regarding excerption in the eighteenth century, see the contributions in the collection of essays edited by Décultot (ed.), *Lesen, Kopieren, Schreiben*.

113   See Anthony Grafton, *Die tragischen Ursprünge der deutschen Fußnote* (Berlin: Berlin Verlag, 1995).

The Art of Excerpting in the Eighteenth Century Literature: Subversion and Continuity of an Old Scholarly Practice

Élisabeth Décultot

> O, wenn man die Bücher und die Kollektaneen sähe,
> aus denen oft die unsterblichen Werke erwachsen sind …
> Man muß niemanden für zu groß halten,
> und mit Überzeugung glauben,
> daß alle Werke für die Ewigkeit
> die Frucht des Fleißes und einer angestrengten Aufmerksamkeit
> gewesen sind.
>
> GEORG CHRISTOPH LICHTENBERG, Waste Book G II 209[1]

4.1   Introduction

Although the history of reading constitutes a significant field of study in humanities research, the art of the 'excerpt' or 'extract' (Latin: *excerptum*; German: *Exzerpt*; French: *extrait*; Italian: *estratto*), otherwise known as the art of producing collections of readers' notes, has received relatively little attention, particularly in terms of the eighteenth century. These collections – also called commonplace-books –, serving as simple substitutes for extensive libraries, had a decisive influence on European literature from the sixteenth to the nineteenth centuries. Since the Renaissance, European scholars beginning of their training were asked to themselves create such excerpt books, which could occasionally cover the scope of entire handwritten libraries. Scholars who had the means to do so would hand over the task of excerpting to a secretary, or they would even acquire excerpt books that had been compiled by others.[2]

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1   Cf. Wolfgang Promies (ed.), *Georg Christoph Lichtenberg. Schriften und Briefe* (6 vols., Munich: Carl Hanser, 1967–1992), II, p. 169 ("Oh, if you were to behold the books and the collectanea from which the immortal works have often stemmed. … Nobody should be seen as towering too high, and the belief should hold firm that all works for the ages were the fruits of diligence and attentiveness").

2   On the history of the art of excerpting and the affiliated forms of florilegia between the fifteenth and seventeenth centuries, see especially Helmut Zedelmaier, "Wissen sammeln.

The purpose of these excerpt books – on hand at all times – was not just to record extracts from works that had been read, but also to prepare a variety of materials (information, words, tropes, etc.), with the possible aim of typing out the excerpt collection. The resulting excerpt stores supplied scholars as well as writers in the centuries to follow.[3] In this way, these collections prove to be of extraordinary value in terms of providing insights into two central aspects. On the one hand, of course, they document the reading activity of

Die Geschichte des Exzerpierens", in H. Zedelmaier, *Werkstätten des Wissens zwischen Renaissance und Aufklärung* (Tübingen: Mohr Siebeck, 2015), pp. 45–61; Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010); Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006); Heike Mayer, *Lichtenbergs Rhetorik. Beitrag zu einer Geschichte rhetorischer Kollektaneen im 18. Jahrhundert* (Munich: Liliom, 1999), pp. 23–103; Heike Mayer, "Kollektaneen", in G. Ueding (ed.), *Historisches Wörterbuch der Rhetorik* (11 vols., Darmstadt and Tübingen: Max Niemeyer, 1992–2014), IV, pp. 1125–1130; Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996); Robert Ralph Bolgar, *The classical heritage and its beneficiaries* (Cambridge: Cambridge University Press, 1963); Joan Marie Lechner, *Renaissance concepts of the commonplaces* (New York: Pageant Press, 1962). On further sub-aspects in the same period, see also Ann Blair, "Humanist methods in natural philosophy: the commonplace book", *Journal of the History of Ideas*, 53: 4 (1992), pp. 541–551, at pp. 548–549; Ann Blair, "Bibliothèques portables: les recueils de lieux communs dans la Renaissance tardive", in M. Baratin and C. Jacob (eds.), *Le pouvoir des bibliothèques. La mémoire des livres en Occident* (Paris: Albin Michel, 1996), pp. 84–106; Jean-Marc Chatelain, "Les recueils d'*adversaria* aux XVIe et XVIIe siècles: des pratiques de la lecture savante au style de l'érudition", in F. Barbier et al. (eds.), *Le livre et l'historien. Études offertes en l'honneur du Professeur Henri-Jean Martin* (Geneva: Droz, 1997), pp. 169–186; Anthony Grafton and Lisa Jardine, *From Humanism to the humanities. Education and the liberal arts in 15th and 16th Century Europe* (Cambridge, MA: Harvard University Press, 1986); August Buck, "Die 'Studia Humanitatis' und ihre Methode", in A. Buck (ed.), *Die humanistische Tradition in der Romania* (Bad Homburg et al.: Gehlen, 1968), pp. 141–149; Terence Cave, *The cornucopian text. Problems of writing in the French Renaissance* (Oxford: Oxford University Press, 1979). For the excerpting tradition from antiquity to the Middle Ages, see Sébastien Morlet, *Lire en extraits. Lecture et production des textes, de l'Antiquité à la fin du Moyen Âge* (Paris: Presses de l'Université Paris-Sorbonne, 2015).

3   The importance of these reading notes for writers from the sixteenth and seventeenth centuries such as Montaigne and Shakespeare has already been demonstrated by several studies. For example, see Francis Goyet, "À propos de 'Ces pastissages de lieux communs' (le rôle des notes de lecture dans la genèse des *Essais*)", *Bulletin de la Société des Amis de Montaigne*, 5–6 (1986), pp. 11–26; pp. 7–8; 7 (1987), pp. 9–30; Zachary Schiffman, "Montaigne and the rise of skepticism in early modern Europe: a reappraisal", *Journal of the History of Ideas*, 45 (1984), pp. 499–516, at pp. 503–506; Thomas Whitfield Baldwin, *William Shakespeare's small Latine and lesse Greeke* (2 vols., Urbana: University of Illinois Press, 1944).

the excerpters: they demonstrate their familiarity with, along with a preference for, certain authors or others. Although these excerpt collections can provide valuable information about reading material, their use is not limited to the role of source directories. They are not mere repositories of matter culled from reading and of selected citations; they also form the nucleus of individual writing projects, and provide a glimpse into the writing processes of scholars and creative authors. They make it possible to observe how material from one work can be used and transformed for another.

The object of this paper is to highlight the role that these knowledge and text repositories played for literary and scholarly works of the eighteenth century.[4] This century played an ambivalent role in the excerpting tradition. On the one hand, the humanistic method of reading was subject to sharper criticism during this period; on the other hand, many writers throughout Europe further applied themselves to the practice of excerpting, which they whereby attempted to adapt and reform. With the vacillation between the revival and the questioning of the humanistic tradition, this century shows itself to be especially fruitful for the art of reading; indeed, at this time a new relationship to the read text emerges, as the persistence of old paradigms also remain evident.[5] The German-speaking world, as the guardian of an old scholarly culture, numbers among the regions of Europe that most clearly reflect this conflict between traditional and modern culture of reading. There, the humanistic art of reading was maintained for a particularly long period through the synergistic effects of a solid university system, a strong educational model, and highly developed book production. However, this is precisely where possible alternatives to scholarly reading traditions were sought. In 1688, Daniel Georg Morhof, himself the author of detailed excerpt instructions that were popular until the second half of the eighteenth century, warned against the tyranny of excerpts. In 1725, the progressive educator Friedrich Andreas Hallbauer ranted against the 'excerpt addiction' (*Excerpir-Sucht*) that had befallen the German reader,

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4   For the excerpting tradition in the eighteenth century, see Élisabeth Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014). The present article is based on the introduction of the German translation of this book. Cf. Élisabeth Décultot, "Einleitung: Die Kunst des Exzerpierens. Geschichte, Probleme, Perspektiven", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 7–47.

5   See Francis Goyet, "Encyclopédie et 'lieux communs'", in A. Becq (ed.), *Encyclopédisme* (Paris: Klincksieck, 1991), pp. 493–504.

and in 1792 Georg Christoph Lichtenberg referred to Germany as an *Exzerpier-Comptoir*, that is, to a sort of 'excerpt outlet'.[6]

4.2　Order and Disorder of Reading: On the Classification of Excerpts in the Early Modern Period

In terms of the practice of excerpts, the eighteenth century saw not so much radical changes but rather noticeable shifts in emphasis. First of all, this included the principle of classification of reading records. In the sixteenth and seventeenth centuries, the art of excerpting was dominated by the tradition of topical classification. The development of a free, random classification form for reading records is already evident in the *adversaria* and *miscellanea* collections in the sixteenth century, yet this model was eclipsed for a long time by its counterpart: the collections organized in *loci* or *tituli*. When scholars read with quills in hand, they were incited to order excerpts according to rubrics. *Virtus*, *Vitium sive improbitas*, *Sapientia*, *Stultitia*, *Fortitudo*, *Timor*: these are examples of the rubrics under which their reading records were classified.[7] The long tradition of the *loci*, however, offered a varied arsenal of possible rubrics, from which readers could freely choose categories that best met their needs.[8] In his *Bibliotheca universalis* (1545), Conrad Gessner lists several examples of this type of classification.[9] At the end of the seventeenth century, Christian Weise, who only partially dedicated himself to this tradition, recommended

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6　Daniel Georg Morhof, "Modus in excerpendo non usque adeo operosus esse debet", in D.G. Morhof, *Polyhistor, literarius, philosophicus et practicus* (Lubecae: Sumptibus Petri Boeckmanni, 1747[4]), p. 559, p. 562; Friedrich Andreas Hallbauer, *Anweisung zur verbesserten Teutschen Oratorie, nebst einer Vorrede von den Mängeln der Schul-Oratorie* (Jena: Hartung, 1725; reprint Kronberg/Ts.: Scriptor, 1974), p. 289; Georg Christoph Lichtenberg, *Sudelbuch* JI 1094, in Promies, *Georg Christoph Lichtenberg*, I, p. 806. See also Georg Christoph Lichtenberg, *Sudelbuch* JI 509, in Promies, *Georg Christoph Lichtenberg*, I, p. 728.

7　These terms correspond to the rubrics according to which Georg Meier (who is also referred to as Major or Maior), rector of the Johannes Gymnasium in Magdeburg organized the parables of Erasmus in his anthology *Elegantiores aliquot parabolae ex Erasmi Rote* (1532). See Moss, *Printed commonplace-books*, pp. 186–187.

8　On the diversity of classification models, see Wilhelm Schmidt-Biggemann, *Topica universalis. Eine Modellgeschichte humanistischer und barocker Wissenschaft* (Hamburg: Felix Meiner, 1983); Francis Goyet, *Le sublime du "lieu commun". L'invention rhétorique dans l'Antiquité et à la Renaissance* (Paris: Honoré Champion, 1996), esp. p. 22.

9　Cf. Helmut Zedelmaier, *Bibliotheca universalis und Bibliotheca selecta. Das Problem der Ordnung des gelehrten Wissens in der frühen Neuzeit* (Weimar et al.: Böhlau, 1992), pp. 51–124, esp. p. 89ff.

easily-comprehensible rubrics under which the passages were to be rigorously classified. There was to be a reasonable number of rubrics and they were not to be too specific nor too general, so as to make their usage as comfortable as possible.[10] Despite this variety, however, it can be ascertained that the categories used for the classification of excerpts corresponded to generally accepted templates and were assumed from one excerpt collection to the next with only slight variations, at the most.[11]

Over the course of the seventeenth century, ever more flexible classification patterns appeared with increasing insistency among teaching methods for the art of reading. These classification models were no longer dictated by a predetermined system, but instead primarily determined by the individual needs of the reader and the internal structure of the text. This subject-oriented dimension to the composition and classification of excerpts becomes even more remarkable during this period. In his work *Aurifodina artium et scientiarum omnium* (1638), which provided instruction regarding *excerpendi sollertia*, Augsburg-born Jesuit Jeremias Drexel defended the right of scholars to classify excerpts extracted from the 'goldmine of all arts and sciences' in accordance with their own needs.[12] In his *Polyhistor*, Daniel Georg Morhof insists that only the composition of unimportant excerpts could be delegated to a secretary; it was imperative that the important excerpts, however, should be written down by those who used them, because only they could impress their own order upon their excerpt collections.[13] In Germany, Jesuit educators such as Drexel played a fundamental role in this movement. For them, the focus was on training young readers' *judicium* so they would be steeled against the influence of bad books. This judgment was to be acquired largely through the individual art of reading records, which was not determined by predefined categories, but rather the reading subject's personal system of organization. This emancipation from fixed humanistic classification models was a phenomenon encountered on a European scale. It is found in France, as in the educational

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10   Christian Weise, *Gelehrter Redner, das ist: Ausführliche und getreue Nachricht wie sich ein junger Mensch in seinen Reden klug und complaisant aufführen soll* (Leipzig: Gleditsch, 1692), p. 550.

11   Moss, *Printed commonplace-books*, pp. 188–189, pp. 192–193; Zedelmaier, *Bibliotheca universalis*, p. 73ff.

12   Jeremias Drexel, *Aurifodina artium et scientiarum omnium. Excerpendi sollertia, omnibus litterarum amantibus monstrata* (Munich: Leysserius, 1638). See Florian Neumann, "Jeremias Drexels *Aurifodina* und die *Ars excerpendi* bei den Jesuiten", in H. Zedelmaier and M. Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen: Max Niemeyer, 2001), pp. 51–63.

13   Morhof, *Polyhistor*, p. 559 and p. 562 ("Excerpta usui & scopo nostro accomodanda").

instructions of Bernard Lamy, for example,[14] as well as in England, where John Locke, the tutor of Shaftesbury and author of the famous *Méthode nouvelle de dresser des Recueils* – a work that first appeared in French in 1686 – suggested establishing efficient rubrics strictly adapted to the needs of the reader.[15]

Based on this development, the matter of excerpt sorting, which the humanistic tradition had already treated intensively, took on truly perplexing characteristics at the threshold between the seventeenth and eighteenth centuries. At the beginning of his remarks on the art of excerpting, Morhof gives a comprehensive overview regarding the classification patterns that had been formulated over more than two centuries; Franciscus Bonnaeus advocated for sorting the excerpts according to three major criteria (discipline, history, language); Johannes Sturmius recommended classifying *excerpta* under the four rubrics of theology, physics, technology and anthropology; Jodocus Willich recommended parsing the excerpted texts according to the lexicographical model into lexemes (such as *togo*, *horto*, *vestis*, *vinea*, etc.), not to mention the 76 *loci* under which Johannes Benzius classified the entire Latin text corpus.[16] This list is by no means exhaustive. This inventory has a truly contradictory relationship to its subject matter: organization. Morhof's list of previous taxonomic models leads imperceptibly to the question as to whether the choice of a classification system is not fundamentally subject-oriented and whether the number of taxonomies is not equal to the number of possible excerpters. Does the reading subject absolutely need to abide by a predefined organizational principle? Is the sorting of excerpts not primarily and consistently the result of a personal working method and therefore the attribute of a particular individual? This question became increasingly distinct towards the end of the seventeenth and the beginning of the eighteenth century. The *adversaria* and *miscellanea* collections in which readers noted everything that struck them

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14   Bernard Lamy, *Entretiens sur les sciences dans lesquels on apprend comment l'on doit étudier les sciences et s'en servir pour se faire l'esprit juste et le cœur droit*, ed. by F. Girbal and P. Clair (Paris: Presses Universitaires de France, 1966), pp. 161–164. See also Moss, *Printed commonplace-books*, pp. 275–276.

15   [John Locke], "Méthode nouvelle de dresser des Recueils communiquée par l'Auteur", *Bibliothèque Universelle et Historique*, 2 (1686), pp. 315–340, at pp. 320–321: "Si je veux mettre quelque chose dans mon recueil, je cherche un titre, à quoi je le puisse rapporter, afin de le pouvoir trouver, lorsque j'en ai besoin. Chaque titre doit commencer par un mot important et essentiel à la matière dont il s'agit. … Quand je rencontre quelque chose que je crois devoir mettre dans mon recueil, je cherche d'abord un titre qui soit propre". On Locke's experimental method, see Geoffrey Guy Meynell, "John Locke's method of common-placing, as seen in his drafts and his medical notebooks, Bodleian MSS Locke d. 9, f. 21 and f. 23", *Seventeenth Century*, 8 (1993), pp. 245–267.

16   See Morhof, *Polyhistor*, esp. pp. 561–562, pp. 565–567.

as interesting about a book and even what caught their attention beyond the book itself, were met with growing interest. Daniel Georg Morhof viewed this as a particular characteristic of modernity and insists on their advantages. Collections liberated from a fixed system made it possible to design 'free', unsorted excerpt collections that resulted from individuals' dazzling intellectual curiosity.[17]

4.3   The Rules of the Reading Subject: The Art of Excerpting in the Eighteenth Century

The literary estates of many eighteenth-century writers are of interest in that they reflect the various stages of this development. First, they document the transition from a strict *collectanea* model to a freer one founded on *miscellanea*, for which Jean Paul's excerpt collection provides a very instructive example. Based on the work of Götz Müller and Michael Will, it is possible to parse his activity as an excerpter into two main phases, which differ significantly.[18] In the early phase, Jean Paul's approach to the excerpting practice was marked by traditional *collectanea* models, which he had likely originally learned in secondary school. The eighteen excerpt volumes, which he made in his youth within three years between 1778 and 1781 and that were for the most part to serve for his planned theology study, consist of self-contained, often longer excerpts from the books he read, often word-for-word, with very precise bibliographic references (author, title, edition, place and date of publication, page numbers).[19] Despite the diversity of excerpted material, which

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17   Morhof, *Polyhistor*, p. 563. On the critique of the humanistic topics classification models in France during the seventeenth century, see Moss, *Printed commonplace-books*, pp. 255–269.

18   Götz Müller, *Jean Pauls Exzerpte* (Würzburg: Königshausen & Neumann, 1988); Michael Will, "Die elektronische Edition von Jean Pauls Exzerptheften", *Jahrbuch für Computerphilologie*, 4 (2002), pp. 167–186; Michael Will, "Jean Paul: 'Schreiben – Aufzeichnen – Eingraben'. Aus den unveröffentlichten Exzerptheften (1782–1800)", *Jahrbuch der Jean-Paul-Gesellschaft*, 37 (2002), pp. 2–13; Michael Will, "Jean Pauls (Un-)Ordnung der Dinge", *Jahrbuch der Jean-Paul-Gesellschaft*, 41 (2006), pp. 71–95; Michael Will, "Lesen, um zu schreiben – Jean Pauls Exzerpte", in M. Bernauer et al. (eds.), *Jean Paul. Dintenuniversum. Schreiben ist Wirklichkeit* (Berlin: Ripperger and Kremers, 2013), pp. 39–48. See also Thomas Wirtz, "Die Erschließung von Jean Pauls Exzerptheften", *Jahrbuch der Jean-Paul-Gesellschaft*, 34 (1999), pp. 27–30.

19   On the excerpts from this period, see the estate of Jean Paul, Staatsbibliothek zu Berlin, Facs. Ia, Ib, IVb. See, for example, Facs. Ia, 2, Folio 2r: excerpt from *Über die Krankheiten der Gelehrten und die leichteste und sicherste Art sie abzuhalten und zu heilen* by Johann

preponderantly borrowed from reviews of recent publications, main thematic points – such as theology and philosophy, literature or anthropology – can be identified roughly in these first notebooks. In the course of his development as a writer, Jean Paul gradually gave up his habits as a conscientious copyist of very sophisticated excerpts embellished with precise bibliographic references. In other words, he said goodbye to the *collectanea* tradition in favour of that of *miscellanea*. Starting in 1782, miscellaneous excerpts take up increasing space in his notebooks. The excerpted entries are usually shorter; due to personal reworking or entirely absent references, their provenance is often indeterminable, and their grouping does not provide a clear thematic classification.[20]

A similar trend can be observed in the development of Winckelmann's excerpt practice. In his years as a private tutor, schoolmaster and secretary in Germany, Winckelmann took to writing long, accurate and detailed excerpts from very extensive works such as encyclopaedias or collections of periodicals. As such, he excerpted numerous issues of Leipzig's *Acta eruditorum* in chronological order and read Pierre Bayle's *Historisches und Critisches Wörterbuch* twice in its entirety, and from his thorough reading came three stately excerpt collections: a first one of about 700 pages and two others of around 40 pages that consist of excerpts from excerpts.[21] At the end of his stay in Germany, and especially after his arrival in Rome at the end of 1755, he broke off with this excerpting practice. The excerpts of his later collections are considerably shorter

     Gottlieb Akkermann der Arzneigelahrtheit Doktor. Nürnberg, in der Martin Jakob Lauerischen Buchhandlung, 1777 (the title was specified by Jean Paul in this form).

20   This tendency is evident in the excerpt volume that bears the title *Geschichte. 1. Band. 1782* (Jean Paul estate, Staatsbibliothek zu Berlin, Facs. IIa, 1). An example of this development is provided in the excerpts without references collected under the heading *Anekdoten* (Facs. IIa, 1, Bl. 9ff.) that are consisting of short sentences and paragraphs on various topics.

21   Johann Joachim Winckelmann's excerpts from Peter [Pierre] Bayle, *Historisches und Critisches Wörterbuch*, translated into German from the newest version from 1740; also with a foreword and miscellaneous notes, particularly for objectionable passages, by Johann Christoph Gottscheden, 4 vol., Leipzig 1741–1744, in: Winckelmann estate, Paris, Bibliothèque Nationale de France, Department of manuscripts: German section, vol. 76, pp. 1–676 (here the excerpt books were exceptionally numbered as pages; usually, numbering was based on folio); vol. 72, fols. 176r–191v; Winckelmann estate, Staats- und Universitätsbibliothek Hamburg, Cod. hist. art. 1, 2 (4°), fols. 4r–9v. Winckelmann's excerpts from the *Acta eruditorum* are preserved at the Staats- und Universitätsbibliothek Hamburg: Cod. hist. art. 1, 2 (4°), fols. 122r–139v. See Élisabeth Décultot, "Winckelmanns Lese- und Exzerpierkunst. Übernahme und Subversion einer gelehrten Praxis", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 133–159.

and more targeted, i.e., clearly oriented towards the current needs of the reading and writing subject.

The emergence of this subject-related dimension is especially evident in the shape that the organizational systems take. Most eighteenth-century writers whose excerpt records have remained extant are primarily distinguished by a purely personal method for organizing florilegia that distances itself from traditional, predetermined classification patterns. Winckelmann, Heinse and Jean Paul did not adhere to a predefined taxonomy while writing their excerpts.[22] They followed an individual organizing principle that resulted from the analysis of the reading material or from the logic of their personal work plans – if they had any structure at all. So as to provide some orientation for his huge quantities of excerpts, for example, Jean Paul created highly personal, very sophisticated classification systems so heavily tailored to his own needs that to this day they partly remain indecipherable to outsiders. Even for initiated Jean Paul scholars, it is challenging to find a way through his alphabetical tag registers, tables of contents, registers of registers, *repositoria* of registers, and numbering systems of all kinds.[23] This subject-related type of classification has substantial historical and epistemological importance and is the result of a significant change in the relationship to the previous reading tradition influenced by the humanistic model.

These changes are accompanied by profound transformations in the creation and objectives of excerpt collections. In the eighteenth century, the emphasis on the critical examination of the text became more pronounced. The excerpt collections were not only to contain interesting passages but also all interesting ideas elicited by the work, as shown by Herder's commentary on the passages that he took from Baumgarten.[24] Towards the end of the

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22   See Décultot, "Winckelmanns Lese- und Exzerpierkunst", pp. 133–159; Christian Helmreich, "Die Geburt des Romans aus dem Geist der Gelehrsamkeit. Anmerkungen zu Jean Pauls Exzerptheften", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 243–270; Sylvie Le Moël, "Die handgeschriebene Bibliothek Wilhelm Heinses", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 271–297.

23   Müller, *Jean Pauls Exzerpte*, esp. pp. 9–13 and pp. 327–330; Will, "Jean Pauls (Un-)Ordnung der Dinge", pp. 71–95.

24   Johann Gottfried Herder, "Plan zu einer Ästhetik", in *Werke. Band 1: Frühe Schriften 1764–1772*, ed. by U. Gaier (Frankfurt am Main: Deutscher Klassiker Verlag, 1985), pp. 659–676. See Hans Dietrich Irmscher, "Johann Gottfried Herders Exzerpte", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18.*

eighteenth century, Wilhelm Heinse mixed quotations from works he had read in his excerpts with critical comments, as demonstrated by his excerpts and notes on Winckelmann's *Geschichte der Kunst des Altertums*.[25] In addition, collections of reading records increasingly exceeded the narrow limits of the book to open up to note meaningful discoveries or others' thoughts, i.e., experiences of the author not intrinsic to the book. However, this development should not be seen as a radical break with the early modern period, but as a shift in emphasis: scholars of previous centuries in no way prohibited the incorporation of personal comments in their reading records.

However, in the early modern period there were repeated efforts to set up borders between the 'real' excerpt and other recording methods. For example, Christian Weise's instruction on eloquence from the late seventeenth century still insisted on the distinction between *collectanea* (excerpts strictly originating from the read works and subject to fixed classification) and *miscellanea* (collections of different records that contained not only reading excerpts, but also good, rare 'material' picked up from here and there and freely organized).[26] Everything indicates that this terminological distinction became increasingly permeable with the progression of the eighteenth century. Winckelmann provides an eloquent example of this evolution. For no apparent reason, he fell back on the terms *collectanea* and *miscellanea* for the titles to his precise, verbatim excerpts from antiquarian literature or from Voltaire's writings. In his excerpting practice, the terms no longer refer to clearly distinguishable corpora, as if they had become interchangeable.[27]

Jahrhunderts (Berlin: Ripperger and Kremers, 2014), pp. 187–198. Similar excerpts, provided with critical commentary, can also be found in Montesquieu. See Catherine Volpilhac-Auger, "Mühsame Spurensicherung. Die Rekonstruktion der Exzerptsammlung Montesquieus", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 111–131.

25   Nachlass Heinse, Stadt- und Universitätsbibliothek Frankfurt am Main, N. 55, fols. 1r–46v. See Wilhelm Heinse, *Die Aufzeichnungen. Frankfurter Nachlass*, ed. by M. Bernauer et al. (2 vols., Munich and Vienna: Carl Hanser, 2003), I, pp. 265–318.

26   Weise, *Gelehrter Redner*, p. 40.

27   Johann Joachim Winckelmann's estate, Paris, Bibliothèque Nationale de France, Department of manuscripts, German section, vol. 63, fol. 1r with the title *Antiquitat, Graec. Collect*; vol. 72, fol. 1r with the title *Miscellanea* (begins with excerpts from Voltaire's *Siècle de Louis XIV*); vol. 66, fol. 1r with the title *Extraits of English Poets*; vol. 62, fol. 13r with the title *Extraits touchant la vie des peintres*; vol. 67, fol. 7r with the title *Miscellanea Romana inchoata mense Nov. 1757*. In the last volume, however, Winckelmann seems to stand more closely by the traditional definition of miscellanea, as this collection contains,

The increasingly frequent recourse to a personal taxonomy of excerpts as well as comments on personal and subjective records eventually led to a profound upheaval of the humanistic model. The collections of 'excerpts' – a term which is henceforth to be understood in the broadest sense – now took on the most varied of forms. The terms which the proprietors of excerpt collections used reflect this transformation. With appellations like Lichtenberg's 'miscellaneous musings' (*Vermischte Einfälle*), 'scribbling books' (*Schmierbücher*) and 'waste books' (*Sudelbücher*) and Heinse's 'thought grouping' (*Gedanken Hecke*) and 'momentary sensations' (*Augenblickliche Empfindungen*), these notebooks assumed new functions.[28] They could even serve as the basis for a special kind of autobiographical writing, as an arsenal of notes for one's own life. Winckelmann put down a particularly revealing testimony to this subjective turn. In 1767, one year prior to his violent death, he wrote a booklet entitled *Collectanea zu meinem Leben*, a curious form of autobiographical narrative. He retraced his own life with the help of uncommented quotations from other authors, which he borrowed from his immense store of excerpts. He described his serious youth with the words of Ovid, and he used a passage from Sallust to describe his numerous voyages. A portrait of himself emerged from this cobbling together of quotes from 'others', which was based exclusively on a succession of excerpts (see Fig. 4.1).[29] The subjective turn of the art of excerpting is particularly clear in these remarkable pages. Winckelmann's excerpts from other authors provided the text of his own autobiography. For him, excerpting other works was a form of writing about himself.

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in addition to reading notes on Roman Antiquity, personal comments about thinkers, interesting works of art, galleries, and the like.

28   Georg Christoph Lichtenberg, *Sudelbuch* DII [title], in Promies, *Georg Christoph Lichtenberg*, II, p. 91; Georg Christoph Lichtenberg, *Sudelbuch* JI 1, in Promies, *Georg Christoph Lichtenberg*, I, p. 650; Georg Christoph Lichtenberg, *Sudelbuch* DI 668, in Promies, *Georg Christoph Lichtenberg*, I, p. 341; Heinse, *Die Aufzeichnungen*, I, p. 101, p. 321. See also Bernhard Suphan et al. (eds.), *Herders Sämmtliche Werke* (33 vols., Berlin: Weidmannsche Buchhandlung, 1877–1913; facsimile Hildesheim and New York: Olms, 1967–1968), XXIII, p. 118. For Lichtenberg, see Hans Georg von Arburg, "Lichtenberg, das Exzerpieren und das Problem der Originalität", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014) pp. 161–186. For Heinse, see Le Moël, "Die handgeschriebene Bibliothek Wilhelm Heinses", pp. 271–297.

29   See Wolfgang Schadewaldt, "Winckelmann als Exzerptor und Selbstdarsteller. Mit Beiträgen von Walther Rehm", in W. Schadewaldt (ed.), *Hellas und Hesperien* (Zurich and Stuttgart: Artemis, 1960), pp. 637–657; Élisabeth Décultot, *Untersuchungen zu Winckelmanns Exzerptheften. Ein Beitrag zur Genealogie der Kunstgeschichte im 18. Jahrhundert* (Ruhpolding: Winckelmann-Gesellschaft, 2004), p. 11f.
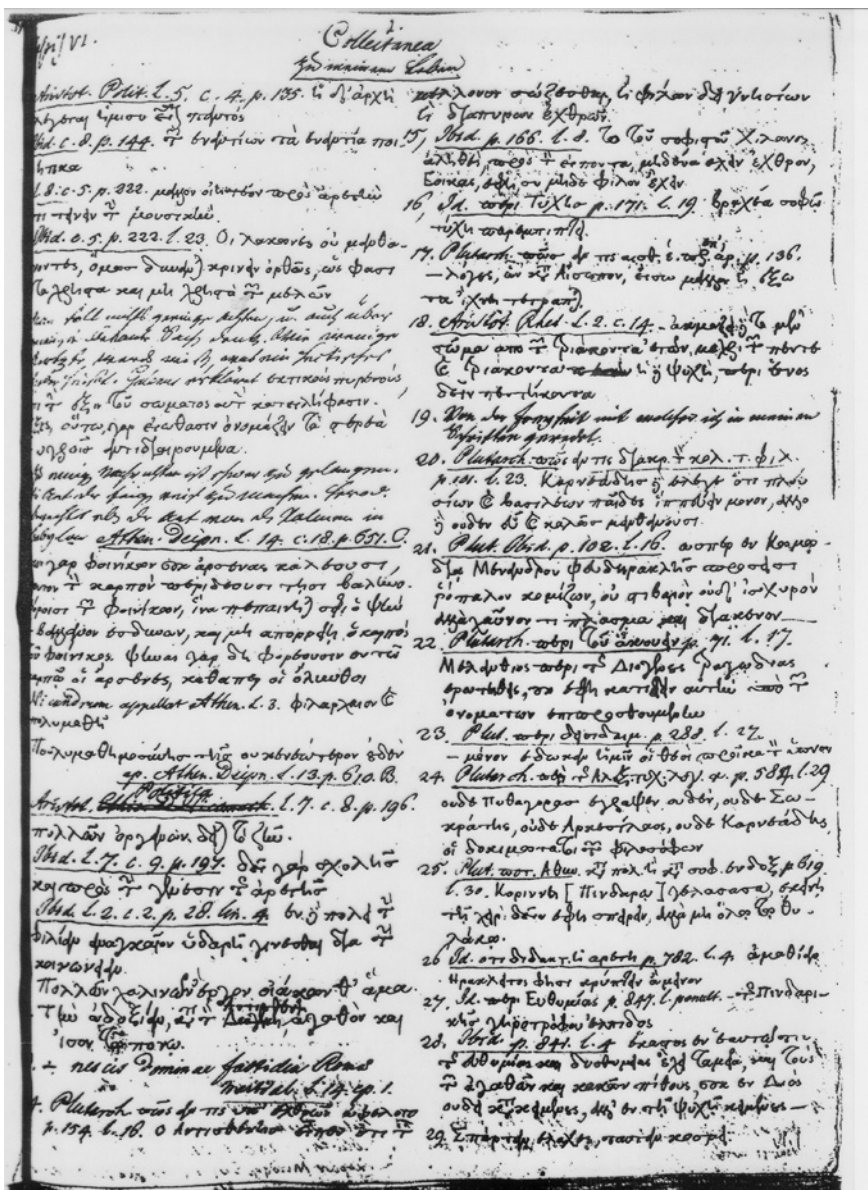
FIGURE 4.1   *Johann Joachim Winckelmann,* Collectanea zu meinem Leben, *Rubiconia
Accademia dei Filopatridi, Savignano sul Rubicone (Italy), estate of Giovanni
Cristofano Amaduzzi (classis VI)*
IMAGE COURTESY OF RUBICONIA ACCADEMIA DEI FILOPATRIDI.

In this way, the distinction between excerpt collections as an arsenal of 'outside' citations and prolegomena to original works became increasingly fluid. As such, Herder drew up comments on excerpts from Winckelmann's work, which are recovered in somewhat elaborate form in his *Kritische Wälder*, which he published starting in 1769.[30] Likewise, the collections of ideas and impressions that Jean Paul gathered over the course of his countless readings provided fodder for his entire corpus of novels.[31] Sometimes these collections, which resulted from a personal journey of reading, acquired such autonomy that they were published on their own. A telling example of this fact is provided by the handwritten notes which Lichtenberg collected in a series of journals and notebooks for more than three decades from 1765 up to his death in 1799. One portion of these approximately 8,000 notes, compiled without any strict system from citations, excerpts, personal observations, reflections based on experimental science, and literary ideas, was published by Albert Leitzmann in 1902 and 1908 as *Georg Christoph Lichtenbergs Aphorismen*.[32] In 1968, Wolfgang Promies published a new, corrected edition of these manuscripts, supplemented considerably with notes that had previously been omitted. He rejected the title of 'aphorisms' as arbitrary and unbalanced and chose the term occasionally used by Lichtenberg, *Sudelbuch* ('waste book').[33] A few decades later, however, Heike Mayer indicated that this term itself is not without its arbitrary qualities, basing her judgment on the sporadic appearance, and self-deprecating nature, of the word *Sudelbuch* in Lichtenberg's notes. The title *Kollektaneen* (*collectanea*) is, according to this Lichtenberg scholar, the appropriate way to refer to these books because Lichtenberg himself was committed to the old rhetorical tradition of florilegia and frequently fell back on this terminology in his notes.[34] These discussions about the proper designation are indicative

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30   Johann Gottfried Herder, "Kritische Wälder. Erstes kritisches Wäldchen", in *Werke. Band 2: Schriften zur Ästhetik und Literatur*, ed. by G.E. Grimm (Frankfurt am Main: Deutscher Klassiker Verlag, 1994), pp. 57–245.

31   See Müller, *Jean Pauls Exzerpte*, esp. pp. 294–317 (here, some examples of these collections are provided). See also Markus Bernauer and Angela Steinsieck, "Vom Geist in der Feder. Jean Pauls Exzerpieren und Registrieren", in H. Gfrereis and E. Strittmatter (eds.), *Zettelkästen. Maschinen der Phantasie* (Marbach am Neckar: Deutsche Schillergesellschaft, 2013), pp. 57–65; Will, "Lesen, um zu schreiben", pp. 44–47; Helmreich, "Die Geburt des Romans", pp. 243–270.

32   Albert Leitzmann (ed.), *Georg Christoph Lichtenbergs Aphorismen, nach den Handschriften* (5 vols., Berlin: Behr, 1902–1908).

33   Promies, *Georg Christoph Lichtenberg*, I, pp. 950–952.

34   Mayer, *Lichtenbergs Rhetorik*, pp. 106–107; Georg Christoph Lichtenberg, *Sudelbuch* DII [title], in Promies, *Georg Christoph Lichtenberg*, II, p. 91; Georg Christoph Lichtenberg,

of the confusion resulting from the detachment of the art of excerpting from traditional patterns: it is not possible to clearly denominate the many modern imitations and remote products of this old art of reading, which are sometimes quite distantly related to the original model.

The art of excerpting became removed from the patterns prevailing in the sixteenth and seventeenth centuries because of these transformations, but they nevertheless remained connected to the original model until the eighteenth century. Even if Winckelmann did not organize his extensive reading records in accordance with the humanist taxonomy of *loci* and *tituli*, he retained the verbatim transcript of the original text and was careful not to add any personal remarks. Jean Paul, despite his seemingly free use of the *ars excerpendi*, also provides evidence for the continuance of traditional paradigms. However, when compiling his notebooks, he followed a personal system with a taxonomy that has no direct connection with the templates of Christian Weise. To organize his diverse register of excerpts, however, he fell back on rubrics, structurally related to the tradition of *tituli*, from instructions issued by many reading educators from previous centuries. According to treatises from the seventeenth century, the main goal of these sophisticated register systems was to easily retrieve the desired entry.[35] Although the author of the *Titan* subjected his countless excerpt notebooks to intensive editing for his own literary production, he did not entirely renounce the humanism-based reading record model. Rather, he endeavoured to intensively use this knowledge system for his literary work.

Ultimately, a fundamental condition closely linked writers and scholars who were excerpting during the eighteenth century with their predecessors: they gave to the gesture of excerpting, of copying, to the handwritten copy a significance which – beyond all practical, sociological and cultural elements – had an inherent and central cognitive dimension. For many of these authors, excerpting was certainly due to socioeconomic factors such as poverty or distance from well-equipped libraries. Winckelmann and Jean Paul surely dedicated themselves to excerpting, particularly when they were young, because they could not afford to buy printed books. In other words, their production of handwritten excerpt notebooks should be considered as a substitute for collecting books, which they could not acquire in printed form due to financial reasons. However, these socioeconomic conditions do not entirely suffice to explain their passionate excerpting activity. If such handwritten libraries

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Sudelbuch LI 186, in Promies, *Georg Christoph Lichtenberg*, I, p. 878; Georg Christoph Lichtenberg, *Sudelbuch* G II 209, in Promies, *Georg Christoph Lichtenberg*, II, p. 169.

35   See Müller, *Jean Pauls Exzerpte*, esp. p. 9, pp. 14–119, p. 319.

were to be regarded only as a surrogate of 'genuine' libraries, then it would be difficult to explain why Winckelmann also excerpted from the printed books that he owned, or why Jean Paul still practiced excerpting when he was able to purchase countless books in print.[36] For all his life, *Titan*'s author contented himself with a rather modest private collection of books. The underlying motivations for the practice of excerpting, irrespective of all historical, sociological, and cultural related conditions, appear to be associated with a highly personal experience in reading, understanding, and recording the content of books. For a passionate excerpter such as Winckelmann, copying was the indispensible, true means for possessing a book. In this way, possession was more than simply purchasing the printed volume, reading it, and setting it on a shelf among others. Owning a book meant copying the printed text, turning the impersonal typesetting into one's own handwriting, and reorganizing the anonymous unity of the published product according to one's own rules. Ownership was achieved only after appropriating another author's text in this highly personal way, after incorporating it into one's own notebooks. Despite their sometimes vociferous protests against outdated forms of learning, many excerpting writers of the eighteenth century are in this respect entirely representative of an old reading and writing culture.

4.4 From Excerpt Collection to Writing Generator: On the Efficient Use of Collectanea

How then, did this widespread excerpting affect the writing activities of eighteenth century authors? From the beginning, these excerpt books were seen as objects not only for documenting the mere act of reading, but also – actually, even more so – for serving the writing process. In other words, they didn't just store what had been read, but were to also function as generators of new texts.

During the eighteenth century, the question of what use excerpt collections served, i.e., what role they played in personal writing, became more and more pressing. The rapid growth of clearly subjective classification modes for reading records and the corresponding abandonment of a predetermined taxonomy of excerpts accompanied the growing consideration of the possible applications for these notes. The emphasis became increasingly focused on the use of excerpt collections by the subject, or their application for personal writing. Clear signs of this development are already evident in the seventeenth century. At this time, many reading educators dealt intensively with the question of

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36   Décultot, "Winckelmanns Lese- und Exzerpierkunst", pp. 133–159.

how to use these *corpora* of reading notes most efficiently. With many eighteenth century writers, this desire for efficiency can be observed in the formal features that they applied in creating their own excerpts, such as the length, bibliographic precision, and thematic organization of excerpt collections. While Winckelmann was still in Germany and not intent on publishing his own works, he tended to take down broadly-ranging excerpts about very different subjects and fields of knowledge (history, medicine, modern literature, antiquarian science, etc.) without a clearly identifiable objective. It wasn't until he was preparing his first publication, *Gedanken über die Nachahmung der griechischen Werke* (1755), that thematically coherent *corpora* – such as for the French *Querelle des Anciens et des Modernes* – appear in his excerpt notebooks. When he arrived in Rome and began working on *Geschichte der Kunst des Alterthums*, his excerpts became more succinct with a clearer thematic focus on Antiquity. From now on, copying indisputably serves his writing project.[37] A similar trend can be observed with Jean Paul. From 1782, when Jean Paul first started on his own writings, the records from his estate show more and more pages on which he had noted short excerpts from various works, without mention of titles or even indications when transitioning from one source to another. The excerpt volumes have now become storehouses of florilegia that no longer need to indicate their source – the book by another author – but aim for the production of new texts.[38]

The principle of the efficient evaluation of excerpt collections was expressed linguistically in repeated references to commercial imagery. Comparisons between excerpting practice and bookkeeping belong to a very old rhetorical tradition, as demonstrated by a metaphor from Cicero's *Pro Quinto Roscio Comoedo*.[39] However, it is important to stress that this association is found with particular frequency in eighteenth-century Germany, where the terms

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37   Décultot, "Winckelmanns Lese- und Exzerpierkunst", pp. 133–159.

38   Starting in 1782, Jean Paul frequently noted excerpts on the same sheet without indicating these breaks with an explicit change in the bibliographic references. This makes it especially difficult to use these records as sources. See Müller, *Jean Pauls Exzerpte*, pp. 120–281.

39   In *Pro Quinto Roscio Comoedo*, Cicero compared the *adversaria* collections with a merchant's 'logbook', or a kind of cash book for tracking daily deposits and withdrawals, in contrast with registers (*codices* or *tabulae*), which organized or neatly filed these records on a month-by-month basis. See Marcus Tullius Cicero, "Rede für den Schauspieler Q. Roscius", in Cicero, *Sämtliche Reden*, ed. by M. Fuhrmann (7 vols., Zurich and Munich: Artemis, 1985), I, pp. 183–207, at p. 185 (Buch II, 7: "Quid est quod neglegenter scribamus adversaria? quid est quod diligenter conficiamus tabulas? qua de causa? Quia haec sunt menstrua, illae sunt aeternae; haec delentur statim, illae servantur sancte; haec parvi temporis memoriam, illae perpetuae existimationis fidem et religionem amplectuntur; haec sunt disiecta, illae sunt in ordinem confectae. Itaque adversaria in iudicium protulit

'bookkeeper', 'bookkeeping', and 'keep the books', commonly used to refer to mercantile affairs, likewise designated the excerpter's activity.[40] Excerpts were goods that scholars, like merchants, had to keep a tally of, recording what they bought on one page and what they sold on the other – in other words, what they copied from others and what they 'translated' into their own writings. In terms of this commercial metaphor, these collections made it possible to establish the financial debit and credit balance of what the copyists borrowed and what they produced in return. This metaphor permeates the entire eighteenth century and is found, for example, in the French author Pitaval:

> J'exige d'un homme d'esprit, lorsqu'il emprunte quelque belle pensée, qu'il paye comptant avec usure, qu'il y mette du sien le double de ce qu'il a reçû. Je veux qu'il fasse comme le diamant qui ne reçoit pas un rayon de lumière qu'il n'embellisse, qu'il ne multiplie.[41]

This Pitaval passage was excerpted in characteristic fashion by Hamann, who was very familiar with the world of commerce and who translated it into German in his *Tagebuch eines Lesers*:

> Ich fordere von einem witzigen Kopf, dass er, wenn er einen schönen Gedanken borgt, ihn brav mit Wucher wiederzahle, und dass er von den seinigen noch einmal soviel zulege, als er bekommen hat. Ich verlange von ihm, dass ers wie der Diamant machen soll, der keinen Lichtstrahl auffängt, den er nicht verschönt und vervielfältigt.[42]

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nemo; codicem protulit, tabulas recitavit"). See also Michael Stolberg's essay in the present volume (fn. 21) and Chatelain, "Les recueils d'*adversaria*", esp. pp. 173–174.

40   This metaphor is quite present in Hamann's works. See Sven Aage Jørgensen, "Exzerpte und Centostil: Funtionen des gelehrten Zitierens bei Hamann", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 199–213. The term *gelehrte Buchalterey* ('scholarly bookkeeping') was also used by the scholar Johann Caspar Hagenbuch. See Klaus Weimar, "Johann Caspar Hagenbuchs *gelehrte Buchhalterey*", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 93–109.

41   François Gayot de Pitaval, *L'Art d'orner l'esprit en l'amusant* (2 vols., Paris: Briasson, 1728–1732), I, Part 2, pp. 266–267 ("When a clever man borrows a thought, I insist that he pay back with interest, that from his own he add twice what he received. I want him to be like the diamond that receives no ray of light that it does not embellish and multiply").

42   Johann Georg Hamann, *Tagebuch eines Lesers, 1753–1788*, in J. Nadler (ed.), *Johann Georg Hamann. Sämtliche Werke. Historisch-kritische Ausgabe* (6 vols., Vienna: Thomas-Morus-Presse im Herder Verlag, 1949–1957), V, p. 267f. As an employee of Riga merchants, Hamann was sent to England in 1758 for business purposes.

What were the means and modalities for using such reading repositories for one's own writing? There are many types of response to this question. The path that leads from excerpting to writing usually begins with the production of catalogues, registers and tables of contents for the excerpt collection – in other words, with the generation of organizational systems to facilitate the recovery and revision of 'outside' excerpts for one's own writing activities. Characteristic of this are Winckelmann's numerous attempts to produce catalogues or directories for his own excerpt library. As his *Geschichte der Kunst des Alterthums* began to take shape shortly after he arrived in Rome, Winckelmann also started to work on a catalogue for his excerpt store, though it never reached completion.[43] At the same time, he started to classify his previous excerpts under certain headings. With the title *Collectanea ad historiam artis*, he gathered excerpts from Pausanias, Strabo, Lucian and Pliny, and then attempted to classify these texts into even more specific categories such as architecture, Olympics, origins and decline of art, and Greek freedom.[44] The stark titles under which the excerpts are subsumed make it possible to determine a kind of intellectual scaffolding for the new writing to come. Even more obvious is this connection between the excerpt catalogue and writing for authors like Jean Paul, who specifically oriented his register with regard to his needs as a writer. The production of such registers thus obtains central importance as a fundamental phase in the personal writing process. It is often the first sign that the excerpt collection no longer aimed to merely reproduce citations from other writers, but to facilitate the production of one's own discourse. With the production of the registers, the excerpt collection could start to become an actual writing generator.

It would be pointless to try to summarize the various modalities for using these reading repositories in a simple typology. Among the writers of the eighteenth century who used excerpts, however, there are some similarities which may be attributable to their common intensive treatment of reading notes. This includes a clear preference for aphoristic formulas, gnomic phrases, and catchy expressions. This is the case both in Winckelmann's first work, *Gedanken über die Nachahmung der griechischen Werke*, as well as in texts by Lichtenberg, Heinse, and Jean Paul. A sure sign of this preference is that these authors' works often gave rise to anthologies, including Jean Paul's *Chrestomathie der*

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43   Winckelmann estate, Paris, vol. 73, fols. 46r–68r (*Catalogus*).

44   Winckelmann estate, Paris, vol. 57, fols. 198r–233v (for rubrics such as *De Architectura*, *Ludi Olympici*, *Libertas Graeciae*, etc.). See also Winckelmann estate, Paris, vol. 59, fols. 252r–273v; vol. 69, fols. 43r–126v.

vorzüglichsten, kräftigsten und gelungensten Stellen and Lichtenberg's *Aphorismen*.[45] Authors not only read the works from which they were excerpting, anthology-like, but even wrote texts that were particularly well-suited to anthologies. It is conceivable that such authors did not only consider this kind of anthological plucking process – a general, erratic, fragmenting type of reading – for their own texts from the outset, but that this was even their intention. "I want someone who knows how to deplume me", said Montaigne in his *Essais* – a work to which the art of the excerpt is greatly indebted.[46]

4.5 Originality and Invention: On the Critique of Excerpts in the Eighteenth Century

It was characteristic of the eighteenth century for scholars to subject the *ars excerpendi* to sharp criticism. Again and again, they evoked the fear that excerpting encouraged sterile imitation or even plagiarism and compromised autonomy and originality of thinking. These reservations were not new. Erasmus of Rotterdam practiced the *ars excerpendi* with skill, yet loved to taunt its zealous adherents.[47] Early on in the humanistic tradition, there were warnings of the dangers of excerpting. With the growing separation between the *honnête homme* and the *érudit*, elegance and pedantry, these reservations against the art of excerpting grew increasingly audible in seventeenth-century France. As early as 1640, Jean-Louis Guez de Balzac, who had himself been accused of plagiarism, mocked the "compilers of *loci communes*" and the "copyists of instructions for eloquence, which were written by others".[48] In an

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45   Jean Paul, *Jean Paul's (Friedrich Richter) Geist, oder Chrestomathie der vorzüglichsten, kräftigsten und gelungensten Stellen* (4 vols., Weimar and Leipzig: Franz, 1816–1818). See also Franz Xaver Wißhofer, *Jean Paul Friedrich Richter. Geist- und kraftvollste Stellen aus dessen sämmtlichen Werken* (Grätz: Verlag der Franz Ferstlschen Buchhandlung and Johann Lorenz Greiner, 1834). For Lichtenberg's *Aphorismen*, see above.

46   Michel de Montaigne, *Essais*, ed. by P. Michel (3 vols., Paris: Gallimard, 1973), II, p. 105: "J'aimerais quelqu'un qui me sache déplumer". See Goyet, "À propos de 'Ces pastissages de lieux communs'".

47   Anthony Grafton, "Die *loci communes* der Humanisten", in É. Décultot (ed.), *Lesen, Kopieren, Schreiben. Lese- und Exzerpierkunst in der europäischen Literatur des 18. Jahrhunderts* (Berlin: Ripperger and Kremers, 2014), pp. 49–66.

48   Jean-Louis Guez de Balzac, "De la grande éloquence. A Monsieur Costar", in J.-L.G. de Balzac, *Les Œuvres de Monsieur de Balzac* (2 vols., Paris: Jolly, 1665), II, p. 522f.: "Les Compilateurs de Lieux communs ..., les Copistes des Rhetoriques d'autruy". See also Marc Fumaroli, *L'Age de l'éloquence. Rhétorique et "res literaria" de la Renaissance au seuil de*

appendix added in 1673 to his work *De la connoissance des bons livres ou Examen de plusieurs autheurs* (1671), Charles Sorel provided detailed instructions for the creation of excerpts, but warns of the "pedants and sophists who take great stores from the *loci communes* so they can have a collection of fine words that they quote anywhere".[49] In the eighteenth century, discussions of the issue became more acerbic. During the Enlightenment, excerpt production had a bad reputation, especially in France, where it was often denounced as genuinely 'German'. The motif is already present in Montaigne, who intensively practiced the art of excerpting, though he enjoyed making fun of how German scholars would 'stuff' their writings with patches of excerpts and *allegata*.[50] In 1741 this criticism was revisited by Voltaire, who taunted the 'German minds' with a biting remark about Leibniz and Wolff, who 'like to read a lot, but understand little'.[51] In 1751, Diderot reviled those 'German compilations pointlessly and tastelessly strewn with Hebrew, Arabic, Greek and Latin, tomes that are already huge, are getting huger, and will continue to do so, rendering them all the worse'.[52]

While critiques of the art of excerpting were very widespread in eighteenth century France, it was also very much present in the German-speaking world at the same time. Since the seventeenth century, even the instructions for the

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l'époque classique (Geneva: Droz, 1980), pp. 544–551; Antoine Compagnon, *La seconde main ou le travail de la citation* (Paris: Éditions du Seuil, 1979); Moss, *Printed commonplace-books*, pp. 255–266.

49   Charles Sorel, *De la connoissance des bons livres ou examen de plusieurs autheurs. Supplément des Traitez de la connoissance des bons livres*, ed. by H.D. Béchade (Geneva and Paris: Slatkine, 1981), p. 15.

50   Montaigne, *Essais*, III, p. 343: "Il ne faut que l'épître liminaire d'un Allemand pour me farcir d'allégations, et nous allons quêter par là une friande gloire, à piper le sot monde. Ces pâtissages de lieux communs, de quoi tant de gens ménagent leur étude, ne servent guère qu'à sujets communs". See Goyet, "À propos de 'Ces pastissages de lieux communs'"; Schiffman, 'Montaigne', p. 504f.

51   Voltaire, "Letter to Jean-Jacques d'Ortous de Mairan, 5 May [1741], D 2479", in T. Besterman (ed.), *Œuvres complètes. The complete works of Voltaire. Correspondence. May 1741–October 1743. Letters D 2471–D 2873* (143 vols., Geneva: Institut et Musée Voltaire, 1970–2012), XCII, pp. 21–22: "Sa raison insuffisante [de Leibniz], sa continuité, son plein, ses monades, etc. sont des germes de confusion dont M. Volf a fait éclore méthodiquement 15 volumes in 4 qui mettront plus que jamais les têtes allemandes dans le goût de lire beaucoup et d'entendre peu".

52   Denis Diderot, "Lettre sur les sourds et muets à l'usage de ceux qui entendent et qui parlent", in *Œuvres complètes de Diderot*, ed. by J. Assézat and M. Tourneux (20 vols., Paris: Garnier Frères, 1875–1877), I, pp. 345–428, at p. 370: "Ces compilations germaniques, hérissées, sans raison et sans goût d'hebreu, d'arabe, de grec et de latin, qui sont déjà fort grosses, qui grossissent encore, qui grossiront toujours, et qui ne sont que plus mauvaises".

art of excerpting for personal use urge against simply copying the excerpted text, and for honing personal judgment and avoiding plagiarism – a number of reminders that become increasingly standard under the auspices of the Enlightenment. One of the most ruthless enemies of *ars excerpendi* in the first half of the eighteenth century was Friedrich Andreas Hallbauer, an educator whose criticism deserves special attention because of its scope. He alleges that excerpt collections result in the production of texts with quotes poorly assembled from other sources without any personal reflection; for these reasons, they are rife with errors. The sixteen points of complaint that Hallbauer lists against the 'oratorical excerpta and collectanea' are:

1. Hält das Excerpiren an und vor sich vom Meditiren ab.
2. Die Collectanea macht man, dem Gedächtniß zu statten zu kommen: allein diesen Endzweck kann man durch leichtere Mittel erhalten.
3. Das Colligiren erfordert viel Zeit.
4. Das viele schreiben macht ungesund.
5. Die Collectanea werden doch nie zu einer Vollkommenheit gebracht.
6. In die collectanea trägt man viel, das man sein Lebtage nicht braucht.
7. Von manchen Materien muß man sehr oft reden: und da werden die collectanea bald erschöpft.
8. Die collectanea werden meist in der Jugend gemacht. … Nun haben die wenigsten in der Jugend ein solches judicium, daß sie das nöthige von unnöthigen, das nützliche von unnützen, das brauchbare von unbrauchbaren unterscheiden könten.
9. Man kann sich auf die collectanea nicht sicher verlassen. In der Jugend sind die meisten so flüchtig, daß sie nichts accurat aufzeichnen.
10. Wer seine Reden aus den collectaneis macht, sagt vieles aus keiner andern Ursache, als weil ers in selbigen fand.
11. Reden aus collectaneis haben gemeiniglich mehr Spielwerck, Vanitäten, unnützes Zeug, als rechte Realien. Man prahlet mehr mit Lectur, als daß man erbauet.
12. Man nehet die Reden oder Schriften aus lauter Stücken zusammen. Es wird alles unterbrochen: es fliesset die Rede nicht, sie hat keine rechte Connexion, kein Leben.
13. In der Zeit, die man aufs Durchlesen … oder aufs Wehlen wenden muß, … hätte man eine weit bessere Rede, vermittelst der Meditation, machen können.
14. Die besten Redner haben ihre Reden nicht aus collectaneis gemacht.
15. Mercken die Zuhörer, daß ein Redner alles aus collectaneis nimmt; so verliehren sie das Vertrauen zu ihm.16. Wer aus gredruckten collectaneis schreibt, protituirt sich noch mehr: denn weil diese in mehrerer Händen

sind, kann der Redner desto eher verrathen werden, mit was vor einem Kalbe er pflüge.[53]

Even at the end of the eighteenth century, Lichtenberg made fun of those "who think to surpass Newton, Gibbon, Priestley, and Franklin, because they learned to make collectanea and to pour other people's wine in one's own bottle".[54] He makes the following sarcastic remark about an erudite scholar whom he does not name: "Er exzerpierte beständig, und alles, was er las, ging aus einem Buche neben dem Kopfe vorbei in ein anderes".[55]

However, the contributions gathered here show that, despite all the criticisms, the art of excerpting was still intensively cultivated in the eighteenth century, though the scaffolding and methods had become more complex. For in the actual practice of this art, the relationship between the copy and the

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53   See Hallbauer, *Anweisung*, pp. 291–294 ("1. Excerpting discourages meditating about and to oneself. 2. The collectanea aim to equip the memory: but this final purpose can be obtained through lighter means. 3. Putting everything together requires a great deal of time. 4. Writing so much is unhealthy. 5. The collectanea will never achieve a state of perfection. 6. In the collectanea there is a great deal that one never needs in one's lifetime. 7. It is necessary to speak very often about many materials: and here the excerpts will soon be exhausted. 8. Collectanea are primarily made in one's youth. Though exceedingly few have in their youth such *judicium* that they can discriminate the necessary from the unnecessary, the useful from the useless, the suitable from the unsuitable. 9. One cannot safely rely on the collectanea. When they are young, most are so careless that they don't record anything accurately. 10. Whoever bases their speeches on the collectanea says nothing more than what was first found in it. 11. Speeches from collectanea commonly have more mechanical works, vanities, and useless material than true realities. People show off more with what's been read and construct less. 12. One puts speeches and writings from sheer pieces. It is all broken: the speech doesn't flow, it has no proper connections, no life. 13. In the time it takes to read materials through … and to choose, … one comes up with a much better speech by meditation. 14. The best speakers did not make their speeches from collectanea. 15. If the audience notices that a speaker has taken everything from collectanea, they lose their trust in the speaker. 16. Those who write from printed collectanea prostitute themselves all the more: since these are in several hands, such orators may be more likely to betray the actual origins of their work").

54   Georg Christoph Lichtenberg, "Brief an Samuel Thomas Sömmerring", in Promies, *Georg Christoph Lichtenberg*, IV, Letter No. 595, p. 788: "… dergleichen es hier wenigstens ein paar Dutzende gibt, die sich im Geiste über Newton, Gibbon, Priestley und Franklin wegsetzen, weil sie Collectanea zu machen und anderer Leute Wein auf Bouteillen zu ziehen gelernt haben" (undated, probably January or February 1791).

55   Georg Christoph Lichtenberg, *Sudelbuch* G II 181, in Promies, *Georg Christoph Lichtenberg*, II, p. 166 ("He excerpted constantly, and everything he read went from one book past his head to another").

original, between other and own was certainly not so simple – that is, not so strictly antithetical – as suggested by Hallbauer's allegations. As such, Herder had no hesitations about integrating metaphors and images into his *Plastik* (1778) that he had lifted directly from Winckelmann's *Geschichte der Kunst des Altertums*.[56] For his contemporaries as well as for today's reader, this collage work can by no means be described as mere copying. On the contrary, the result was a work which was greatly emancipated from its original template and hid criticisms of Winckelmann's conception of the visual arts behind apparent variations on the author's motifs.[57] Winckelmann himself treated the authors he excerpted no differently: his famous formula 'noble simplicity, quiet grandeur', a more or less faithful translation of a *topos* of the European literature on the arts and which he wrote down several times in his excerpts, mainly based on French readings. When transferring these terms into German, he opened up a fertile field that gave rise to new discussions and publications in German-speaking countries.[58] Thus the study of the practice of excerpting in the eighteenth century provides insight into the nature, which was becoming increasingly complex at this time, of the concepts of copy and original – a complexity that the excerpting authors already fully assessed and actually experienced while composing their own written works. The fact that some of these authors – such as Winckelmann and Jean Paul – closely and precisely dealt with the question of imitation and originality in the visual arts and in literature is probably due in part to the fact that as excerpters they were quite familiar with the business of copying.

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56   For Herder's excerpts from the works of Winckelmann, Mendelssohn and Hagedorn in relation to *Plastik*, see Suphan et al. (eds.), *Herders Sämmtliche Werke*, VIII, pp. 116–163.

57   Élisabeth Décultot, "'Voll vortrefflicher Grundsätze …; aber …'. Herders Auseinandersetzung mit Winckelmanns Schriften zur Kunst", in É. Décultot and G. Lauer (eds.), *Herder und die Künste. Ästhetik, Kunsttheorie, Kunstgeschichte* (Heidelberg: Universitätsverlag Winter Heidelberg, 2013), pp. 77–95.

58   See Décultot, "Winckelmanns Lese- und Exzerpierkunst", pp. 133–159; Décultot, *Untersuchungen*, pp. 179–183.

Notebooks, Recollection, and External Memory: Some Early Modern English Ideas and Practices

Richard Yeo

> If your lordship will tell me that these thinges will be too manie to re-member: I answere, that I had rather you trusted your note booke then your memorie.[1]

5.1   Introduction

In his *Introduction to the history of science* (1927–1948), George Sarton (1884–1956) reflected on his research habits and tools of trade over a long life as a bibliographer and historian. He made special mention of his books and associated notes. This apparatus, as he called it, seemed "insignificant compared with the library, yet from my own point of view, it is the central thing, and the library but a gigantic annex to it".[2] He was sure every scholar would appreciate this. My aim in this chapter is to examine Sarton's claim in the light of some recent work in cognitive psychology and philosophy of mind, before discussing early modern European ideas about the relationships between memory, note-taking, and external repositories of information and knowledge. In this way, I confront the obvious question about the notion of a 'forgetting machine' – namely, given the well-known weakness and fragility of natural memory, why would anyone want one of these? By looking at the role of notebooks we can think about practices that allow one to forget and later retrieve, or recollect, what has been forgotten – either by consulting a stable record, such as a book or document, or by recollection from natural memory triggered by an external prompt, such as an image or note.

Sarton's depiction of the scholar working with his or her notes in conjunction with a larger repository resonates with the 'extended mind' thesis,

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1 Francis Bacon, "Third letter of advice to the Earl of Rutland (1595)", in *The Oxford Francis Bacon. I. Early Writings 1584–1596*, ed. by A. Stewart (Oxford: Oxford University Press, 2012), pp. 671–673, at p. 672. For debate about authorship of this letter, see in the same volume pp. 664–666. The addressee, Roger Manners (1576–1612), was the fifth Earl of Rutland.

2 George Sarton, *Introduction to the history of science* (3 vols., Baltimore: The Carnegie Institution of Washington, 1927–1948), II, Preface, p. xii. He used the Widener Library at Harvard.

a notion now associated with a range of authors such as Merlin Donald and Andy Clark.[3] In a recent set of articles, the editors explain that "remembering does not always occur entirely inside the brain but is often distributed across heterogeneous systems combining neural, bodily, social, and technological resources".[4] The notion of 'external memory' has come to refer to the situation in which various objects and spatial settings outside the biological organism are involved in acts of remembering.[5] Indeed, in one of the foundational contributions to this line of inquiry, Andy Clark and David Chalmers posed the scenario in which an Alzheimer's patient ('Otto') relies on a notebook as an external surrogate for his compromised biological memory.[6] It is worth comparing Sigmund Freud's observation in 1924–5:

> If I distrust my memory – neurotics, as we know, do so to a remarkable extent, but normal people have every reason for doing so as well – I am able to supplement and guarantee its working by making a note in writing. In that case the surface upon which the note is preserved, the pocket-book or sheet of paper, is as it were a materialized portion of my mnemic apparatus, which I otherwise carry about with me invisible.[7]

There has been criticism of attempts to argue that such examples of 'external memory' function in ways comparable to internal (or biological) memory, and

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3 See Merlin Donald, *Origins of the modern mind: three stages in the evolution of culture and cognition* (Cambridge, MA: Harvard University Press, 1991); Andy Clark, *Being there. Putting brain, body and world together again* (Cambridge, MA: The MIT Press, 1997); Andy Clark, *Supersizing the mind. Embodiment, action, and cognitive extension* (Oxford: Oxford University Press, 2008).

4 Kourken Michaelian and John Sutton, "Distributed cognition and memory research: history and current directions", *Review of Philosophy and Psychology*, 4 (2013), pp. 1–24, at p. 1.

5 Donald, *Origins of the modern mind*, p. 309 and p. 311 emphasised that "the memory system, once collectivized into the external symbolic storage system" allowed "humans to accumulate experience and knowledge". My focus is on individual minds interacting with portions of this 'external memory', namely, notebooks. For more recent approaches, see Richard Menary (ed.), *The extended mind* (Cambridge, MA: The MIT Press, 2010).

6 Andy Clark and David J. Chalmers, "The extended mind", *Analysis*, 58: 1 (1998), pp. 7–19; reprint in Richard Menary (ed.), *The extended mind* (Cambridge, MA: The MIT Press, 2010), pp. 27–42.

7 Sigmund Freud, "Notiz über den Wunderblock", in J. Strachey (ed.), *The standard edition of the complete psychological works of Sigmund Freud* (24 vols., London: Hogarth Press, 1961), XIX, pp. 227–232, at p. 227. Freud used a new kind of notebook, the 'Wunderblock' (or magic notepad), to illustrate his views on the relations between "conscious, preconscious and perceptual-conscious systems".

that such interactions between the mind and certain objects in the physical world can be construed as occurring within an 'extended' cognitive system.[8] One of the issues is whether the consultation of a notebook substantially mirrors the process of recalling material from natural memory. When Otto checks his notebook for an address or for the date of a meeting, he is retrieving forgotten information exactly as it was recorded in his original notebook entry. This contrasts with instances of recall from natural memory in which the original datum (for example, a point of information or a personal experience) is interpreted or re-constructed in the act of remembering.[9] The revival in the 1970s of Frederic Bartlett's *Remembering* (1932) did much to make notice of this phenomenon almost *de rigueur*.[10] Andy Clark has offered a "rough-and-ready set of additional criteria to be met by nonbiological candidates for inclusion into an individual's cognitive system".[11] By way of summary, Paul Loader says that these include the following criteria: "the [external] resource must be a constant in the life of the user, that the information it provides is directly available without difficulty and that it is automatically endorsable, having been consciously endorsed previously".[12] Furthermore, as John Sutton has proposed, in such "extended cognitive systems, external states and processes need not mimic or replicate the formats, dynamics, or functions of inner states and processes".[13]

   In any given situation, we still need to decide whether or not an external object can be construed as a cue or stimulus in an act of remembering. Thus, with respect to Sarton's musings, I take it that there is no point in describing the Widener library as an external memory (or 'secondary memory', to use the early modern terminology which I discuss below): it is only selected material from a library, captured in notes (perhaps including those jotted in margins of a physical book), that acts as external memory in tandem with internal or biological memory. Of course, historical circumstances are instructive: in earlier

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8   On this debate, see Kourken Michaelian, "Is external memory memory? Biological memory and extended mind", *Consciousness and Cognition*, 21 (2012), pp. 1154–1165.

9   For other contrasts, see Michael Wheeler, "In search of clarity about parity", *Philosophical Studies*, 152 (2011), pp. 417–425, at p. 418.

10   On Bartlett, see Alison Winter, *Memory. Fragment of a modern history* (Chicago: The University of Chicago Press, 2012), Ch. 9.

11   Andy Clark, "Memento's revenge: the extended mind, extended", in R. Menary (ed.), *The extended mind* (Cambridge, MA: The MIT Press, 2010), pp. 43–66, at p. 46.

12   Paul Loader, "Is my memory an extended notebook?" *Review of Philosophy and Psychology*, 4 (2013), pp. 167–184, at pp. 169–170.

13   John Sutton, "Exograms and interdisciplinarity: history, the extended mind, and the civilizing process", in R. Menary (ed.), *The extended mind* (Cambridge, MA: The MIT Press, 2010), pp. 189–225, at p. 194.

times, some personal libraries were small, perhaps kept deliberately so, and all the books in them had been read by their owner. Thus in the late sixteenth century, Michel de Montaigne (1533–1592) gave this account: "My library is round in shape, squared off only for the needs of my table and chair; as it curves round it offers me at a glance every one of my books ranged on five shelves all the way along".[14] In this case, every book might well have served external memory functions in combination with Montaigne's memory.

The scenario posed by Clark and Chalmers about Otto's notebook has been provocative and useful. However, if we wish to explore the ways in which notebooks may function as external components in combination with natural memory, we have more complex examples to choose from. I will consider both the principles and practice of note-taking and its uses among some seventeenth-century figures, especially those involved in the pursuit of empirical scientific inquiry under the aegis of the Royal Society of London, founded in 1660. I will discuss three major figures: Robert Boyle (1627–1691), John Locke (1632–1704), and Robert Hooke (1635–1703). In presenting this historical material, I am more concerned with showing what seventeenth-century contemporaries thought about memory and notebooks than in contributing to the theory of distributed memory and cognition. However, I believe that this recent and ongoing research may suggest new questions about what one author has called "the person-plus-notebook system" – one that has been active in Western culture over a considerable period.[15] Can we learn more about this by examining the habits and thoughts of a group of people who kept notebooks of various kinds at a time when reflection on this practice was more explicit than it is today?

5.2   Early Modern Ideas about Memory and Notes

During the Renaissance and into the seventeenth century, most of the scholarly habits Sarton mentioned were covered by the notion of *ars excerpendi*, that is, the art or method of making excerpts from a larger body of material. The aim was to prevent loss through forgetting, and to encourage recollection

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14   Michael Andrew Screech (ed.), *Michel de Montaigne: the complete essays* (London: Penguin Books, 1987), Book III, Ch. 3, p. 933.

15   Wheeler, "In search of clarity", p. 418. For a famous twentieth-century example, see Vannevar Bush, "As we may think", *Atlantic Monthly*, July (1945), pp. 101–108; Richard Yeo, "Before Memex: Robert Hooke, John Locke, and Vannevar Bush on external memory", *Science in Context*, 20 (2007), pp. 21–47.

and recombination of material not available to immediate recall. In early modern European culture, there was near universal agreement on the likelihood and danger of forgetting, but far less consensus on the best ways to promote remembering. I will deal with these in turn.

In his *De oratore* (55 BC), Cicero recounted the story of the Greek politician, Themistocles (524–459 BC) who, when offered instruction by a master of the 'art of memory' (*ars memoriae*), replied that "he would oblige him much more if he could instruct him how to forget, rather than to remember what he chose".[16] However, the prevailing view in the seventeenth century was that the process of forgetting could not be controlled: important and trivial ideas, experiences, and information were candidates for oblivion. Indeed, there was appreciation of Cicero's observation that Themistocles' request only made sense because he possessed a remarkable natural memory that retained more than it lost.[17] Forgetting was endemic because the faculty of memory was an inner corporeal sense.[18]

Two major writers on the limits and capacities of human understanding, Thomas Hobbes (1588–1679) and John Locke, made the consequences clear. In his *Elements of law* (1640), Hobbes said that memory "may be accounted a sixth sense, but internal, not external as the rest", and he regarded forgetting as the natural, gradual decay of a conception originating in sensory perception. This, he said, often happens 'little by little', growing more and more obscure.[19] As a physician and a philosopher, Locke was well aware of the dependence of memory on bodily health. As he put it, "we oftentimes find a Disease quite strip the Mind of all its Ideas".[20] Yet, even without bodily trauma or disease, decay of memories over time was to be expected because the brain could not retain the impressions of all the sensations it received from the senses. Even when our 'understanding' abstracted ideas from sensory input, many of these ideas were often not well impressed in memory and soon faded. Locke realized that

16   Marcus Tullius Cicero, *De oratore*, in J.S. Watson (ed.), *Cicero on oratory and orators* (Carbondale: Southern Illinois University Press, 1970), pp. 171–172.

17   For a comment of the naturalist, Martin Lister (1639–1712), see Bodleian Library, MS Lister, vol. 10, fol. 194r, under 'Memoria': "Themistocles was of so great a memory, that his desiderata be taught the art of forgetfulness". In this and other quotations from manuscripts, I have expanded all contractions.

18   Ruth Harvey, *The inward wits. Psychological theory in the middle ages and the Renaissance* (London: Warburg Institute, 1975).

19   Thomas Hobbes, *The elements of law: natural and politic*, ed. by F. Tönnies (London: Frank Cass, 1969), p. 11.

20   John Locke, *An essay concerning human understanding*, ed. by P.H. Nidditch (Oxford: Clarendon Press, 1975), Book II, Ch. 10, § 5.

without special precautions, our ideas fade rapidly, "leaving no more footsteps or remaining Characters of themselves, than Shadows do flying over Fields of Corn; and the Mind is as void of them, as if they never had been there".[21] Some could be lost entirely. Locke observed that "the Ideas, as well as Children, of our Youth, often die before us".[22]

Given this weakness of memory as a faculty, what could be done to help the act of remembering? In order to appreciate why note-taking figured so strongly as a response, we need to understand the distinction contemporaries made between memory and recollection. Here they followed Aristotle, who argued that 'memory' (*memoria*), as a corporeal faculty, was possessed by some animals, whereas recollection involved a deliberate search for something stored in memory and was therefore akin to reasoning.[23] Recollection was a rational activity involving a process of searching, reviewing, and comparing ideas stored in memory; as such, it was an attribute of the intellectual or 'thinking soul'.[24] This distinction between memory and recollection was often obscured (as it is today) by the tendency to use memory, or remembering, as general terms. In his *Leviathan* (1651), Hobbes explained the distinction in this way: recollection is a "Calling to mind: the Latines call it *Reminiscentia*, as it were a Reconning of our former actions".[25] Elsewhere he said that *reminiscentia* is the attempt to "recover something lost, proceeding from the present backward", and that it involves the 'sagacity' displayed in 'hunting or tracing'.[26] The trick was knowing how to restrict the space to be searched, as when "one would sweep a room, to find a jewell; or as a Spaniel ranges the field, till he find a scent".[27] In his *De augmentis* (1623), Francis Bacon (1561–1626), who for a time employed Hobbes as his secretary, warned against casting about "hither and thither as if in infinite space", likening the preferred effect to "the hunting of a deer within an enclosure".[28]

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21   Locke, *An essay*, Book II, Ch. 10, § 4.

22   Locke, *An essay*, Book II, Ch. 10, § 5.

23   Aristotle, *De memoria et reminiscentia*, in R. Sorabji (ed.), *Aristotle on memory* (London: Duckworth, 1972), pp. 52–60; also pp. 35–46 for editor's account.

24   David Bloch, *Aristotle on memory and recollection* (Leiden: Brill, 2007), pp. 72–77, at p. 75.

25   Thomas Hobbes, *Leviathan*, ed. by N. Malcolm (3 vols., Oxford: Clarendon Press, 2012), II, p. 42. When translating the Latin *reminiscentia*, Hobbes used the word 'remembrance'.

26   Hobbes, *The elements of law*, p. 14.

27   Hobbes, *Leviathan*, II, p. 42.

28   Francis Bacon, *De dignitate et augmentis scientiarum* (called *De augmentis*), in J. Spedding et al. (eds.), *The works of Francis Bacon* (14 vols., Stuttgart and Bad Cannstat: F. Frommann and G. Holzboog, 1963), IV, p. 436; V, p. 648 (for the original Latin). This work is the enlarged Latin translation of the *Advancement of learning* (1605). For more on Bacon,

In modern cognitive psychology, the term 'recollection' is seldom used, being largely replaced by the experimental concept of 'cued recall' in which a stimulus (for example, a word, sound, or image) elicits a memory of another item with which it is linked. In contrast, 'free recall' involves remembering items without a specific cue and in no prescribed sequence.[29] However, for early modern European thinkers who accepted Aristotle's account, recollection in its most advanced form produced far more than an automatic, triggered association. It involved a search, aided by reasoning in terms of likely categories or associations. These authors postulated the concept of 'secondary memory' as a necessary support for natural memory. What is now called 'external memory' encompasses a range of cues or stimuli, such as notes, images, or other peoples' conversations. This view is compatible with the early modern understanding of how objects in the world may prompt recovery of material stored in natural memory. In reviewing the methods of note-taking in his *De arte excerpendi*, Vincent Placcius argued that this practice built up over time a *memoria subsidiaria* more reliable than natural memory, but also working in tandem with it.[30] In 1708, the Italian historian Lodovico Antonio Muratori (1672–1750) wrote of 'esterna Memoria' as more stable and secure than natural memory.[31] There is a possible formulation of this concept in Jonathan Swift's view that a commonplace book of excerpts and one's own thoughts "is in the nature of a supplemental memory".[32] However, among early modern writers there was the realization that the act of recollection could fail, just as Hobbes' spaniel might not find a rabbit, or it might recover something other than the initial target. Recollection required mental effort, as Locke emphasized in saying that if an Idea was "sought after by the mind, and with pain and endeavour found, and brought again in view, 'tis Recollection".[33]

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see Rhodri Lewis, "A kind of sagacity: Francis Bacon, the *ars memoriae* and the pursuit of natural knowledge", *Intellectual History Review*, 19 (2009), pp. 155–175.

29   See Bennet Murdock Jr., "The serial position effect of free recall", *Journal of Experimental Psychology*, 64 (1962), pp. 482–488.

30   Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689), pp. 16–17. See Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006), p. 261, fn. 98 for Johann Alsted's use of *memoria subsidiaria* in 1630.

31   Lodovico Antonio Muratori, *Delle riflessioni sopra il buon gusto nelle scienze e nelle arti* [orig. ed. 1708] (2 vols., Venice: Presso Nicolò Pezzana, 1723), I, Ch. VIII, p. 229, cited in Alberto Cevolini's chapter in this volume.

32   Jonathan Swift, "A letter of advice to a young poet (1721)", in T. Scott (ed.), *The prose works of Jonathan Swift* (12 vols., London: G. Bell, 1897–1908), XI, pp. 89–111, at p. 103.

33   Locke, *An essay*, Book II, Ch. 19, § 1.

5.3   Note-Taking and Recollection

How could notes be taken and used in order to assist recollection of material stored in memory? The way in which this was done was thought to be crucial for the ability to retain and retrieve copious material for the purposes of conversation, oratory, and literary composition. The Dutch humanist, Desiderius Erasmus, provided a manual of rich examples and advice about this in his influential *De copia* (1512). With many other Renaissance scholars, such as Juan Luis Vives, Philipp Melanchthon, and Rudolph Agricola he recommended the method of 'commonplacing' by which quotations, tropes, proverbs, or arguments were grouped under appropriate *Heads* (or headings) in a notebook. In his *De ratione studii* (1512), Erasmus urged that every student "have at the ready some commonplace book of systems and topics, so that wherever something noteworthy occurs he may write it down in the appropriate column".[34] The commonplace book became the notebook of choice for education and scholarship.[35] However, many sophisticated variants, including combinations with notes taken first in diary format and only later arranged under topical *Heads* were discussed and used. Such methods were compared and elaborated by two Jesuit pedagogues – Francesco Sacchini (1570–1625) in *De ratione libros cum profectu legendi libellus* of 1613, and Jeremias Drexel (1581–1638) in *Aurifodina artium et scientiarum omnium* [the goldmine of all arts and sciences] of 1638.[36] Later, the German scholar, Vincent Placcius (mentioned above), reviewed and extended these and similar manuals on note-taking in his *De arte excerpendi*.[37]

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34   Desiderius Erasmus, *De ratione studii* (1512), in C.R. Thomson (ed.), *Literary and educational writings 2. De copia/De ratione studii*, in *The collected works of Erasmus* (89 vols., Toronto: University of Toronto Press, 1978), XXIV, pp. 661–691, at p. 672.

35   See Robert Ralph Bolgar, *The classical heritage and its beneficiaries* (Cambridge: Cambridge University Press, 1963), Ch. 7; Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996); Earle Havens, *Commonplace books. A history of manuscripts and printed books from antiquity to the twentieth century* (New Haven: University Press of New England, 2001); David Allan, *Commonplace books and reading in Georgian England* (Cambridge: Cambridge University Press, 2010), Ch. 3.

36   Francesco Sacchini, *De ratione libros cum profectu legendi libellus* (Sammieli: F. du Bois, 1615); Jeremias Drexel, *Aurifodina artium et scientiarum omnium. Excerpendi sollertia, omnibus litterarum amantibus monstrata* (Antuerpiae: Apud Viduam Ioannis Cnobbari, 1638). On these works, see Cevolini, *De arte excerpendi*; Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), pp. 77–80 and pp. 83–87.

37   Placcius, *De arte excerpendi*.

Significantly, these authors felt the need to defend note-taking against the charge that it weakened memory. Bacon acknowledged that "transferring things we read and learn into commonplace-place books" was denounced by some as inviting "the memory to take holiday" ("Memoriam ad feriandum invitet").[38] This negative attitude had two sources: first, an ancient one in Socrates' suspicion about writing per se, as conveyed by Plato in his *Phaedrus*; and second, a more recent one connected with various educational practices that favoured rote memorizing of texts and near verbatim recall of sermons and lectures, demonstrated in the ability to perform 'without book'.[39]

The ancient celebration of memory performance rested, in part, on the mnemonic technique which Cicero referred to as *artificiosa memoria* (artificial memory). By cultivating this technique, its proponents claimed to enhance the ability of natural memory to recollect. The earliest extant work, *Ad Herennium*, an anonymous Latin text (c. 88 BC), referred to earlier Greek practices involving two principal components – backgrounds or 'places' (*loci*) and 'images' (*imagines*).[40] The practitioner of this art imagined a structure of some kind, such as a palace with several rooms, and took care to furnish it with clearly marked places, such as "an intercolumnar space, a recess, an arch, or the like". These places were memorized as an ordered series, thus forming a familiar, permanent mental background. In the next stage, specially chosen 'vivid images' (*imagines agentes*) were deposited in these places as reminders of the things, quotations, or arguments. When one walked mentally through this imagined space in a strict sequence, the images in each of the places gave up their associated content. Crucially, the choice of images was an individual affair: as the author of this text explained, an image "that is well-defined to us appears relatively inconspicuous to others. Everybody, therefore, should in equipping himself with images suit his own convenience".[41] The art of memory itself imposed a load on memory: it involved the double task of remembering

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38   Bacon, *De augmentis*, IV, p. 435; V, p. 647.

39   Plato, *Phaedrus* (Cambridge: Cambridge University Press, 1972), 274B-275; John Brinsley, *Ludus literarius: or, the grammar schoole* [orig. ed. 1612] (Menston: Scolar Press, 1968), p. 51; Meric Casaubon, *Generall learning. A seventeenth-century treatise on the formation of the general scholar*, ed. by R. Serjeantson (Cambridge: RTM Publications, 1999), p. 126 and p. 160.

40   The title indicates that it is addressed to Gaius Herennius. Another influential Latin work is Quintilian's *Institutio oratoria* (end of the first century), although his support for the technique is muted. See Frances A. Yates, *The art of memory* (London: Routledge and Kegan Paul, 1966), p. 35.

41   *Ad Herennium*, ed. by H. Caplan (Cambridge, MA: Harvard University Press, 1954), Book III, pp. 207–225 and p. 233. On visual encoding as the key feature, see Daniel Schacter,

the stable background and a personal set of mental associations between images and content. The payoff was that this background could be internalised as mental scaffolding that functioned like an external prompt for the recollection of names, textual passages, or arguments.[42]

In replying to the criticism of note-taking, Sacchini and Drexel did not question the power of carefully chosen mental images to prompt recollection of material. However, they contended that written notes were more reliable cues, especially over the long-term, since paper, in most cases, was a more durable preserver of information than natural memory. Moreover, they were able to repeat recent contentions that artificial memory techniques depended on the foundation supplied by natural memory, which itself might be cluttered by the required stock of places and images. In 1568, Agrippa von Nettesheim made this charge in the last chapter of *The vanity of the sciences*.[43] Interestingly, Bacon was not worried by an overload of images, but he did complain that the current uses of the art of memory resembled the "tricks and antics of clowns and rope dancers". This art could support 'marvellous and prodigious' feats, but it gave little assistance to memory in everyday life.[44] Methodical note-taking, its proponents argued, did precisely this.

The claim that memorisation was preferable to reliance on notes was more difficult to debunk. Hobbes ridiculed rote memory and parrot-like talk, "as it is with beggars, when they say their paternoster, ... having no images or conceptions in their minds answering to the words they speak".[45] However, expectations about memorising, either with or without initial consultation of a text, were embedded in educational and religious practices. Undergraduates were required to argue the 'pros' and 'cons' of propositions set in formal disputations. A study manual, used in Isaac Newton's student days at Cambridge, advised that "When you dispute, be sure you get the Arguments perfectly by

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        Searching for memory. The brain, the mind, and the past (New York: Basic Books, 1996), pp. 46–48.

42   John Sutton, "Porous memory and the cognitive life of things", in D. Tofts (ed.), *Prefiguring cyberculture. An intellectual history* (Cambridge, MA: The MIT Press, 2002), pp. 130–141. For the medieval period, see Mary Carruthers, *The book of memory. A study of memory in medieval culture* (Cambridge: Cambridge University Press, 1990).

43   Heinrich Cornelius Agrippa von Nettesheim, *Of the vanitie and uncertaintie of the artes and sciences* (London: H. Wykes, 1569), pp. 24–25: "Artificial memory cannot stande without natural Memorie, whiche oftentimes is dulled with monstrouse Images".

44   Bacon, *De dignitate augmentis*, IV, p. 436. See also the passage in Francis Bacon, *The Oxford Francis Bacon. IV. The advancement of learning*, ed. by M. Kiernan (Oxford: Oxford University Press, 2000), p. 118.

45   Hobbes, *The elements of law*, p. 23.

heart", so as to perform convincingly 'without book'.[46] The response of Sacchini and Drexel was not so much that memorisation did not work, but rather that it failed to evince the full possibilities of recollection. They argued that reading without noting was likely to yield only superficial knowledge because it was not accompanied by the attention and thought required to make a well-considered note.[47] They emphasised that methodical note-taking, such as that involved in commonplacing, involved attention and judgement at the time when extracts were selected and assigned to appropriate *Heads*. Consequently, when one returned to an excerpt, this original mental effort encouraged recollection by way of a pathway of categories and associations that delivered more than the actual content of the note. The aim was not verbatim recall of a specific passage, but learned improvisation on a topic. Recollection enabled recombination of ideas, thus aiding thinking as well as memory. In contrast, rote memorizing or, in the language of the day, conning, parroting, learning by heart, or 'without book' was a dead end, leading to nothing more than fixed content.

5.4   Scientific Virtuosi and Note-Taking

Before turning to some examples drawn from the history of early modern science, consider the following points. First, although the general points made so far about notes prompting recollection remain applicable, we have to be aware of the special demands of different subjects or disciplines. The *ars excerpendi* tradition dealt mainly with scholarly textual practices; however, there was a strong conviction that its methods could also be valuable in empirical scientific inquiry.[48] Indeed, John Aubrey, a fellow of the Royal Society, endorsed "the admonition of Father Drexelius" about habitual note-taking ('semper excerpe'), saying that this created 'nest eggs' for the future; but he also implied that the material gathered should not be confined to that offered in books. Rather, notebooks could be "excerpts of observations", thus going beyond the "common way of precepts as the knowledge of a traveller exceeds that which is

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46   [James Duport], "Dr. Duport's Rules", Cambridge University Library Add. 6986, [p. 17]. See Richard Holdsworth, "Directions for a student in the universitie", in H.F. Fletcher, *The intellectual development of John Milton* (2 vols., Urbana: University of Illinois Press, 1956–1961), II, pp. 623–655, at p. 639 (no. 25), at p. 641 (no. 30).

47   Sacchini, *De ratione*, pp. 75–76, p. 81.

48   See Richard Yeo, *Notebooks, English virtuosi, and early modern science* (Chicago and London: The University of Chicago Press, 2014).

gotten by a map".[49] Nevertheless, although those engaged in scientific inquiry certainly did read and make notes from books as aids to memory and recollection, there were other important uses of notes, such as keeping track of steps in an argument or demonstration, and maintaining precise records of empirical data.[50]

The second consideration is that most advanced note-taking advice stressed that general principles should be adapted by individuals. Drexel granted this licence: "If these precepts and rules of note-taking do not please you, draw up other precepts for yourself, fewer in number, shorter, suited to your studies, just as long as you take notes".[51] My examples will show the use of various kinds of notebook and different routines for making, storing, and consulting notes. Thus, Boyle often relied on loose notes rather than systematically arranged notebooks; Locke maintained a large set of notebooks organized by his own method; and Hooke, although he kept a diary, also made regular use of the formal committee records of the Royal Society, of which he was a Secretary from 1677 to 1682. Across this range of practices, early modern note-taking meets the criteria, suggested by Clark and others, for conceptualizing objects or spaces in the physical world as performing functions of external memory. We can therefore explore historical material to investigate realistically complex examples of how notes may serve external memory. As this material reveals, there are important nuances related to the degree to which individuals rely on notes primarily as a summary of content to be memorised and recalled, or as prompts to recollection and thought, or as durable records of information that can be retrieved in the future, and possibly shared with others.

5.5   Robert Boyle

In March 1693, the German polymath, Gottfried Wilhelm Leibniz, confessed that "After having done something, I forget it almost entirely within a few months, and rather than searching for it amid a chaos of jottings that I do not

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49   James E. Stephens (ed.), *Aubrey on education. A hitherto unpublished manuscript by the author of "Brief Lives"* (London and Boston: Routledge, 1972), p. 36, pp. 56–57. See Bodl. MS Aubrey, vol. 10, fol. 94r for his marginal reference to the *Aurifodina*.

50   On noting steps in trains of thought, see René Descartes, *Rules for the direction of the mind*, in *The philosophical writings of Descartes* (2 vols., Cambridge: Cambridge University Press, 1991), I, pp. 7–78, at p. 25 (rule 7), at p. 67 (rule 16). The original work was not published until 1701, as *Regulae ad directionem ingenii*. See also Yeo, *Notebooks*, pp. 169–170.

51   Drexel, *Aurifodina*, sig. A8r, cited and translated in Ann Blair, "The rise of note-taking in early modern Europe", *Intellectual History Review*, 20 (2010), pp. 303–316, at pp. 313–314.

have the leisure to arrange and mark with headings, I am obliged to do the work all over again".[52] Leibniz knew that he was ignoring the precepts about keeping notes under appropriate *Heads* in notebooks, as stipulated by humanist and Jesuit scholars. The English chemist and natural philosopher, Robert Boyle, was another intransigent. He did not maintain commonplace books of the recommended kind; rather, he made what he called 'loose notes'. Yet, he claimed that these, too, performed the well-known dual function of notes as both prompting memory and relieving it. Justifying this use of loose notes (and also loose sheets for draft prose works), he said he did not fear losing them because "I could sometimes easily repair out of my Memory".[53] Given Boyle's flouting of advice about the immediate allocation of material to categories or topics as an aid to recollection at later date, we need to understand how this was so.

Among Boyle's extant papers, there are forty sets of folio sheets stitched together and folded to make small, pocket-sized, booklets. Following Michael Hunter and Charles Littleton, we now call these the 'workdiaries', although Boyle referred to them as 'Memorials', 'Adversaria', or simply as 'loose notes'.[54] The titles he gave to some of these diaries imply miscellaneous collections: for example, "Promiscuous Observations begun the 24th of September 1655".[55] However, physically loose sheets need not be conceptually loose notes. Boyle made long chronological sequences of short entries, often numbered in 'centuries', that is, from 1 to 100, emulating Bacon's *Sylva sylvarum* (1627) with its ten centuries, or 1000 observations and experiments.[56] He added marginal *Heads*

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52   Leibniz to G.F. de L'Hôpital, mid-March 1693, in Gottfried Wilhelm Leibniz, *Mathematische Schriften*, ed. by C.I. Gerhardt (7 vols., Hildesheim: Olms, 1962), II, pp. 227–232; cited and translated in James G. O'Hara, "'A chaos of jottings that I do not have the leisure to arrange and mark with headings': Leibniz's manuscript papers and their repository", in M. Hunter (ed.), *Archives of the scientific revolution. The formation and exchange of ideas in seventeenth-century Europe* (Woodbridge: The Boydell Press, 1998), pp. 159–170, at p. 160.

53   Boyle Papers (BP), The Royal Society of London, vol. 36, fol. 6r; also in Michael Hunter and Edward B. Davis (eds.), *The works of Robert Boyle* (14 vols., London: Pickering & Chatto, 1999–2000), XII, pp. 359–360, at p. 360. For a detailed account of Boyle's note-taking, see Yeo, *Notebooks*, Ch 6.

54   Michael Hunter and Charles Littleton, "The work-diaries of Robert Boyle: a newly discovered source and its internet publication", in M. Hunter, *The Boyle Papers. Understanding the manuscripts of Robert Boyle* (Aldershot: Ashgate, 2007), pp. 137–176.

55   See Boyle, Workdiary 13, in BP, vol. 25, pp. 153–156, pp. 177–183 (1655); also Workdiary 21, in BP, vol. 27, pp. 5–159 (late 1660s); and Workdiary 25, in BP, vol. 27, pp. 219–220 (late 1660s).

56   Robert Boyle, *Certain physiological essays and other tracts* (London: Printed for Henry Herringman, 1669²), p. 14: "And that my intended Centuries might resemble his [Bacon's

to some of these entries, usually at a later date. In 1688 Boyle described this method, referring to:

> four or five Centuries of Experiments of my Own, and other Matters of Fact, which from time to time I had committed to Paper, as they were made and observ'd, and had been by way partly of a Diary, and partly of Adversaria, register'd and set down one Century after another, that I might have them in readiness to be made use of in my design'd Treatises.[57]

This combination of chronological diary-like entries and the topical headings of commonplace books (often called *adversaria*) meant that Boyle's notes could function both as memory aids and written records.

Although most of Boyle's notes were entered as they occurred to him, and without being immediately assigned to topics, he acknowledged the importance of *Heads* as prompts to recollection. Indeed, he expected to be able to recollect additional ideas and information not recorded in the notes themselves. One recurring theme is his belief that he could recover at least part of lost materials if they were originally entered under a memorable *Head*. In a manuscript draft from 1660–1680, Boyle explained that he had lost the original, fuller, version "but yet, since I retain some memory of the chief heads it consisted of, I shall here present you with a summary of them".[58] It is likely that such memories were sustained by a habit of reading over notes. In 1665, he told Henry Oldenburg that he had come across "some rough copys of my notes about some subjects ... & some of them I have not yet, that I remember read over this 5 or 7 years, the cheife heads are about sensation in generall, about the pores of greater & figures of smaller Bodys; & about Occult Qualitys".[59] Boyle even inscribed this conviction about recollection into a notebook of 1689–90, describing some entries as "A Continuation of loose notes &c most of them set down to recall to minde fuller passages referable to them, Jan 25th".[60]

Sylva sylvarum], to which they were to be annex'd". See also Hunter and Davis (eds.), *The works of Robert Boyle*, 11, p. 17.

57   Hunter and Davis (eds.), *The works of Robert Boyle*, XI, p. 169.

58   Robert Boyle, "Of the several degrees or kinds of natural knowledge", in BP, vol. 8, fols. 184r–187r, at fol. 184r. See Hunter, *The Boyle Papers*, p. 330 for the date of this manuscript as 1660s–1680s.

59   Robert Boyle to Henry Oldenburg, 9 December 1665, in Michael Hunter et al. (eds.), *The correspondence of Robert Boyle, 1636–1691* (6 vols., London: Pickering and Chatto, 2001), II, pp. 596–598, at p. 598. Boyle also made lists of things to remember, usually opening with "Remember ...". See, for example, BP, vol. 9, fol. 22.

60   Robert Boyle, The Royal Society of London, MS 189, fol. 162r.

Boyle's notes worked for him, despite the fact that the declining condition of his eyes meant that he could not reliably make his own notes.[61] In *New experiments, physico-mechanical* (1660), he said that "the distemper in my eyes forbidding me not onely to write my self so much as one Experiment, but even to read over my self what I dictated to others".[62] From the mid-1650s, he relied mainly on amanuenses.[63] This situation jarred with the standard assumption that the sequence of reading, excerpting, and writing a note helped to fix content in memory and encourage later recollection – even more so than did repeated readings of the material. On this view, in not making his own notes, Boyle was deprived of crucial mnemonic and intellectual supports. However, some of his actual practice explains why he had confidence in the power of his notes to assist recollection. From an early age, Boyle practiced meditation and rehearsal of ideas; and his work habits cultivated and maintained episodic memories.

The young Boyle wrote works of moral edification concerned with careful reading and proper direction of thoughts. He aimed to enrich his experiences by building up associations to the places, times, and circumstances in which these occurred. Cultivated in this fashion, memory supported thinking by providing a stock of experiences and by retaining previously forged links between them. The discipline Boyle prescribed – careful selection of materials, repeated reflection on key themes, and rehearsal of a skeletal direction of meditation – promised to expand the experience stored in memory and facilitate its retrieval.[64] He argued that experiences must be actively examined and analysed so that "our Reflections on what we have observ'd, improves it into consequences new Axioms and Uses".[65] In *Occasional reflections* (1665), Boyle maintained that this method allowed the individual to recall experiences and

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61   Robert Boyle to J. Mallet, 5 September 1655, in Hunter et al. (eds.), *The correspondence of Robert Boyle*, I, p. 189. See also Robert Maddison, *The life of the honourable Robert Boyle* (London: Taylor and Francis, 1969), p. 85 and p. 219. He consulted the physician William Harvey in 1656–57; see Richard A. Hunter and Ida Macalpine, "William Harvey and Robert Boyle", *Notes and Records of the Royal Society of London*, 13 (1958), pp. 115–127.

62   "To the Reader", in Robert Boyle, *New experiments physico-mechanical, touching the spring of the air, and its effects* (Oxford: Printed for T. Robinson, 1660), sig. A43r. This introduction is in the form of a letter to Viscount Dungarvon dated 20 December 1659; also in Hunter and Davis (eds.), *The works of Robert Boyle*, I, p. 145.

63   Michael Hunter, "Robert Boyle and his archive", in Hunter, *The Boyle Papers*, pp. 1–72, at pp. 46–52.

64   Robert Boyle, "Doctrine of thinking", in J.T. Harwood (ed.), *The early essays and ethics of Robert Boyle* (Carbondale: Southern Illinois University Press, 1991), pp. 198–199 for reference to a 'Modell' or plan of meditation.

65   Boyle, "Dayly Reflection", in Harwood (ed.), *The early essays*, p. 208.

trains of thought without assistance from notes.[66] However, another way of looking at this is that notes made in the context of such close meditation were especially likely to evoke copious recollections.

Boyle's scientific observation and reflection, as captured in the workdiaries, was built, in part, on this cultivation of episodic memories. A significant number of entries in the workdiaries are actually records of what Boyle reported orally to an amanuensis – as memories. Boyle used the phrase 'I remember' (or variants such as 'if I misremember not') in twenty-one of his forty workdiaries; and within some diaries he repeated the phrase: workdiary 21 has twenty-nine instances of this kind. Some of these entries contained quite specific empirical details, either relating to Boyle's own experiments, or to what people had reported to him about events, animals, and natural phenomena. His retention and recovery of these particulars were associated with temporal and spatial circumstances; some were perhaps activated by his train of thought during dictations to amanuenses. In any case, Boyle made a note of an existing memory, turning it into a permanent record. Such a note could also provoke recollection.

By relying on a combination of brief notes, dictation sessions with amanuenses, and other conversations, Boyle displayed a personal mastery of the rich data he collected. His notes provoked recollection of what seem to have been strong episodic memories of past actions and observations, strongly laid down by his habit of entertaining vivid mental impressions of experiences, and by thinking about the circumstances and consequences of observations and ideas. Many of his notes are not laboratory records but meditations on past and recent experiments: once these notes were on paper he was able to think with them.

5.6   John Locke

Locke not only kept meticulous notebooks, but published an account of how he entered and retrieved notes. At least forty-five notebooks have survived, thirteen or fourteen of these being commonplace books arranged for the most part by a method of entering and indexing that Locke began to use from about 1660.[67] In July 1686, while in exile in The Netherlands, Locke wrote an anonymous article for the *Bibliothèque universelle*, a journal edited by the French

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66   Robert Boyle, *Occasional reflections upon several subjects. Whereto is premis'd a discourse about such kind of thoughts* (1665), in Hunter and Davis (eds.), *The works of Robert Boyle*, v, pp. 3–187, at pp. 30–31.

67   John R. Milton, "Locke at Oxford", in G.A.J. Rogers (ed.), *Locke's philosophy: content and context* (Oxford: Clarendon Press, 1994), pp. 29–47, at pp. 34–37. Locke's early use of this

Huguenot scholar, Jean le Clerc, and published in Amsterdam.[68] In the French original, Locke referred to his 'Méthode nouvelle' for making notes; when this article was published in English in 1706, it was called *A New and Easie Method of a Common-Place-Book*.[69] Both versions of the article are set out like a miniature notebook, opening with an index on two facing pages. In this index, an alphabet of twenty letters is arranged in four columns.[70] Each column is divided horizontally into twenty-five cells, allowing five letters to a column with each letter further subdivided into five cells, one for each vowel – thus making 100 cells in the index (see Fig. 5.1).

When making an entry in one of his notebooks, Locke chose a 'Title' and wrote this in the margin next to the entry. The more usual term in English for such keywords was 'Head', as in the translation of 1706. Locke used Latin for the 'Title' (usually one word, but occasionally two), irrespective of the language of the source text, although almost invariably he wrote out the extract in the language of the source. One distinctive feature of the 'New Method' (as we now call it) is that indexing happened at the same time as entering rather than, post facto, when the notebook was filled. The selected 'Title' delivered an alphabetical code determined by the first letter and the next vowel of the word, so that for *Adversariorum Methodus*, this is *Ae*.[71] Locke called this a 'class' ('une classe'); each of the 100 cells in the index represented one of these classes, starting with *Aa*. If he wished to make an entry under the title *Adversariorum Methodus*, Locke first checked the *Ae* cell of the index. If there was no page number there, he turned to the first unused double opening in the notebook;

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method is evident in the medical notebooks, British Library (BL), Add. MS 32554 and Bodl. MS Locke, f. 19, first used, respectively, in 1660 and 1661 or 1662.

68   [John Locke], "Méthode nouvelle de dresser des Recueuils communiquée par l'Auteur", *Bibliothèque Universelle et Historique*, 2 (1686), pp. 315–340. For a full account of this work and its manuscript versions, see John R. Milton and Richard Yeo, "General introduction: writings on the New Method", in J. Locke, *Literary and historical writings*, ed. by J.R. Milton (Oxford: Clarendon Press, forthcoming).

69   John Locke, "A Letter from Mr. Locke to Mr. Toignard, containing a New and Easie Method of a Common-Place-Book, to which an Index of two pages is sufficient", in P. King and A. Collins (eds.), *Posthumous works of Mr. John Locke* (London: A. and J. Churchill, 1706), pp. 314–336.

70   Locke used twenty letters only, explaining that "I omit three Letters of the Alphabet as of no use to me, viz., K.Y.W., which are supplied by C.I.U. that are equivalent to them". He put *Qu* in the last of the Z cells. He also omitted J and U, since these were modern variants on the Roman I and V; although the index in the 1706 edition used 'U'. See Locke, "A Letter from Mr. Locke to Mr. Toignard", p. 313 (see Fig. 5.1), and p. 317.

71   If a keyword began with a vowel, this was treated as the first letter, followed by the next vowel: thus, for *Anima*, the code is *Ai*.

312   *A New* METHOD *of*

a COMMON-PLACE-BOOK.   313

	a		a	
	e 4		e	
A	i	F	i	
	o		o	
	u		u	
	a		a	
	e		e	
B	i	G	i	
	o		o	
	u		u	
	a		a 16. 20.	
	e		e	
C	i	H	i	
	o 18. 24.		o	
	u		u	
	a		a	
	e		e	
D	i	I	i	
	o		o	
	u		u	
	a		a	
	e		e	
E	i. 2. 14.	L	i	
	o		o	
	u		u	

	a		a	
	e		e	
M	i	S	i	
	o		o	
	u		u	
	a		a	
	e		e	
N	i	T	i	
	o		o	
	u		u	
	a		a	
	e		e	
O	i	U	i	
	o		o	
	u		u	
	a		a	
	e		e	
P	i	X	i	
	o		o	
	u		u	
	a		a	
	e		e	
R	i	Z	i	
	o		o	
	u	Q	u	
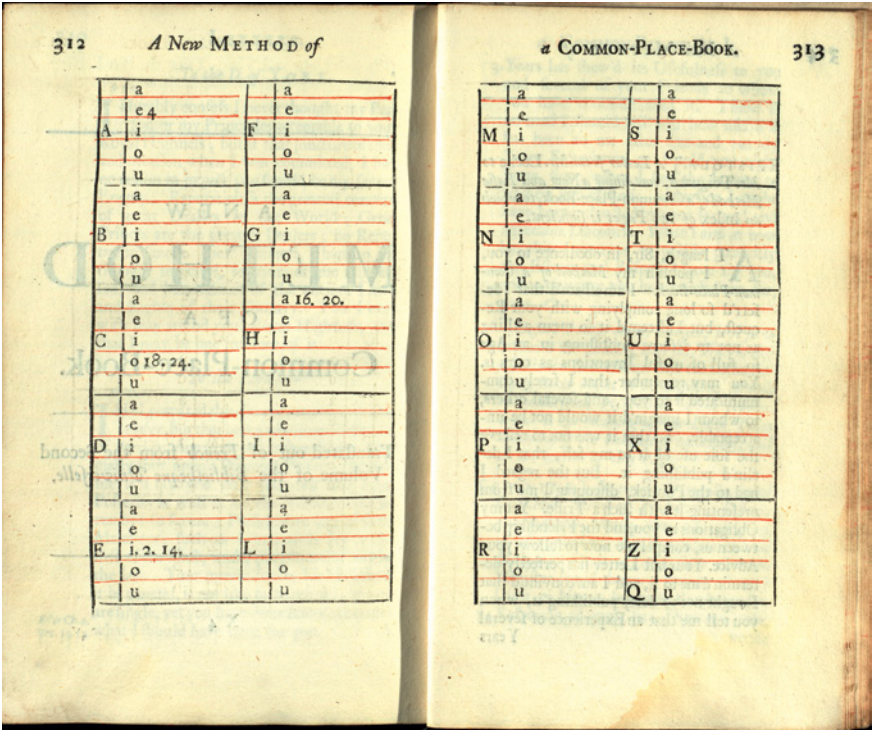
FIGURE 5.1   *Locke's two-page index in his 'New Method'. Horizontal lines within each letter/vowel set are ruled in red, and sets are separated by black lines*
JOHN LOCKE, "A NEW METHOD OF A COMMON-PLACE-BOOK", IN P. KING AND A. COLLINS (EDS.), *POSTHUMOUS WORKS OF MR. JOHN LOCKE* (LONDON: A. AND J. CHURCHILL, 1706), PP. 312–313. KINDLY SUPPLIED WITH PERMISSION OF RARE BOOKS AND SPECIAL COLLECTIONS, THE UNIVERSITY OF SYDNEY, LIBRARY.

he wrote this page number in the *Ae* cell of the index, and then made the entry on the blank page. If the letter combination he wanted had already been used, this was indicated by a page reference in the index (see Fig. 5.1 for the page numbers in cells *Ae*, *Co*, and *Ha*). Locke then turned to that page and added the entry directly under those already there.[72]

Each page in the notebook was reserved for entries sharing the same first letter/next vowel code as that of the first entry on that page. One consequence was that entries about very different subjects such as *Veterinaria* and *Vertigo*, or *Sal volatile* and *Sanguis*, could be made on the same page, whereas cognate

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72   If that page was full, he looked for the next new double opening, even if it was pages away in the notebook.

topics such as *Hypochondria*, *Hysterica*, *Melancholia*, and *Mania* registered under different titles could be scattered over different pages.[73] The index was therefore essential for locating the page on which an entry was placed; it recorded the page numbers at which titles sharing the same first letter/next vowel code were located in the notebook. Locke was more interested in being able to find entries on specific topics than in keeping closely related topics together on the same pages or sections of a notebook – a practice formerly regarded as central to the principle of noting common topics in common places as a way aiding memory of subjects and their relationships to each other.

Some other implications of the 'New Method' may be noticed. Although Locke distributed material under topics, labelled with titles, these were not necessarily standard categories or themes derived from an established philosophical system or pedagogy. He gave users of a commonplace book complete license to choose the heads that best suited their needs – a permission already granted by Drexel and some other authors.[74] The examples of titles that Locke gave in 1686 – such as *Haeretici* and *Confessio fidei* – pertained to the subject of toleration on which he was writing at the time; his *Epistola de tolerantia* appeared in 1689.[75] This personal choice of heads facilitated the task of finding entries at a later date. As Locke stated in his original English draft of 1685: "When any thing occurs that I thinke convenient to write in my *Adversaria* I first consider under what title I thinke I shall be apt to looke for it".[76]

When Ephraim Chambers described commonplace books in his *Cyclopaedia* (1727), relying heavily on Locke's account in the 'New Method', he stressed the value of notes as long-lasting records:

> Common-Places, Adversaria, among the Learned, are a Register, or orderly Collection of what things occur worthy to be noted, and retain'd

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73   These examples occur, respectively, in Bodl. ᴍꜱ Locke d. 9, p. 2, Bodl. ᴍꜱ Locke f. 19, p. 272, and Bodl. ᴍꜱ Locke d. 9, p. 6, p. 10, p. 112, p. 170, pp. 182–183, p. 268.

74   See Blair, *Too much to know*, p. 85; Yeo, *Notebooks*, pp. 50–53.

75   John Locke, *Epistola de tolerantia* (Gouda: Apud Justum ab Hoeve, 1689); English transl. *A letter concerning toleration* (London: A. Churchill, 1689).

76   John Locke, English draft of "Méthode nouvelle", ʙʟ Add. ᴍꜱ 28728, fol. 58r. But see [Locke], "Méthode nouvelle", pp. 320–321 for a version of this caveat. Readers of the English version saw this rendition of Locke's statement: "If I would put any thing in my Common-Place-Book, I find out a Head to which I may refer it. Each Head ought to be some important and essential Word to the matter in hand, and in that Word regard is to be had to the first Letter, and the Vowel that follows it; for upon these two Letters depend all the use of the *Index*". See Locke, "A Letter from Mr. Locke to Mr. Toignard", pp. 316–317.

> in the Course of a Man's reading, or Study; so despos'd, as that among a
> Multiplicity of Heads, and Things of all Kinds, any one may be found, and
> turn'd to at pleasure.

For Chambers, the ability to retrieve with ease was a feature of Locke's method.
He praised the index as a "commodious Contrivance" that handled "a sufficient
Copia, or Variety of Materials, without any Confusion".[77] This emphasis on
retrieval of notes as records contrasts with the earlier enthusiasm for mem-
orising choice passages for the purpose of writing and conversation – as
summarised by the twentieth-century scholar, Robert Ralph Bolgar:

> The whole purpose of the Humanists in transmogrifying Greek and Latin
> literature into a series of notes was to produce a body of material which
> could be easily retained and repeated. They made titanic efforts to re-
> member the contents of the note-books they compiled. The Renaissance
> was the age of memorizing.[78]

Furthermore, a method such as Locke's that ensures the effective retrieval of
notes also allows the possibility that such material will initiate recollection.

There are tens of thousands of notes in Locke's extant notebooks. This in
itself suggests that memorisation of content was not his aim; however, it is also
clear that some of these notes were not merely abandoned records but, rather,
active agents in his mental life. At a basic level this was so because, as just
mentioned, the 'New Method' depended on the ability of the owner of a note-
book to remember the *Heads* under which a particular entry would have been
made – the index displayed only alphabetical combinations, such as *Co* and
Me. Other aspects of Locke's practice helped him recall the intellectual prov-
enance of particular entries. In the early 1660s, as he began to make notes of his
scholarly reading, Locke regarded this material as belonging to two main cat-
egories: either *Physica*, for medical and scientific subjects, or *Ethica* for moral,
philosophical, and political topics. He kept separate notebooks for these two
categories, setting up notebooks labelled *Adversaria Physica* and *Adversaria
Ethica*. This is the procedure to which he later alluded in the publication of
1686: namely, that it was easier to search for entries if one used "severall books
for severall sciences or at least if he make two different repositorys for those

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77   Ephraim Chambers, *Cyclopaedia, or an universal dictionary of arts and sciences* (2 vols.,
      London: Printed for James and John Knapton, 1727), I, entry for "Common-Places".
78   Bolgar, *The classical heritage*, p. 274.

two great branches of knowledg morall & naturall".[79] In addition, Locke regarded the categories of *Physica* and *Ethica* as part of a larger classification of knowledge and disciplines. During the 1670s, he drew up various schemata showing how knowledge might be classified into a range of subjects, including *Theologia*, *Politia*, *Prudentia*, *Physica*, *Metaphysica*, *Historia*, and *Semiotica*.[80] In the same period, while living in France, he reflected in his journal for 1677 on the reason for doing this: "A great help to the memory & meanes to avoid confusion in our thoughts is to draw out & have frequently before us a scheme of those sciences we imploy our studys in, a map as it were of the mundus intelligibilis".[81]

Chambers was correct in saying that Locke's 'New Method' enabled the owner of a notebook to find an entry among a great array of material. However, from what is known of Locke's own practice, we can say that at least a certain portion of his many notes functioned not only as records in an archive, but as external memory in partnership with his mind. When Locke found an entry, such as an excerpt from a book, an observation, or an experimental report, there can be little doubt that such an item prompted his recollection of the material from which it was drawn, the circumstances in which it was made, or the issues that it represented. Indeed, on the basis of traditional advice from humanists and Jesuits, this additional payoff was more than likely because Locke had, on his own account, made judgements about where entries sat in the maps of knowledge he had devised and refined. Moreover, for topics pertaining to his personal projects, say, medical diagnosis and treatments, Baconian natural histories, and other philosophical and ethical subjects, Locke's various notes aided not only his memory (via recollection), but his thinking.

A full description of Locke's note-taking must include more than the method of entering and indexing that characterize his 'New Method'. There were additional habitual practices that help explain how his notes functioned as external memory. I will briefly sketch three of these.

Most of Locke's notes were excerpts in the genre of *ars excerpendi*, drawn from books, other printed or manuscript sources, as well as from testimony. He always recorded details that could lead him back to the full source on a later occasion: for books, he noted complete publishing data, including the exact number of pages in the copy he consulted; for correspondents and informants,

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79   Locke, English draft of "Méthode nouvelle", BL Add. MS 28728, fol. 6ov; also [Locke], "Méthode nouvelle", pp. 325–326.

80   See Yeo, *Notebooks*, pp. 203–205.

81   John Locke, Bodl. MS Locke f. 2, p. 128.

the name and expertise of the person.[82] However, in another kind of entry, Locke registered his observations and thoughts. Invariably, he initialled these entries with his signature – J.L., or, in the famous case of Draft A of his *Essay*, made as a long entry in the commonplace book, *Adversaria Ethica*, he wrote "Sic Cogitavit de Intellectu humano Jo:Locke anno 1671".[83] More usually, such entries were short comments connected with books he was reading, or made as free-standing thoughts or observations identified, like all entries, by a title. The signed entries were quite different from those in which Locke copied a passage from a book; these notes were self-consciously marked as his own, made at a certain time and place. Indeed, his use of the past tense in the annotation at the start of Draft A – "thus thought … John Locke in 1671" – carried the possibility of him reading it, in the future, as a historical record of his thinking: "this is what I thought in 1671".[84]

Secondly, Locke attached 'queries' to particular topics, especially those related to medicine and natural history. These queries appeared in two forms: a 'Q' placed in the margin of a single entry; and lists with numbered points concerning a specific topic. There are examples of the first kind in *Adversaria Physica*: Locke wrote 'Q' next to some entries, including *Salvatio*, *Arthritis*, *Colica*, *Purgatio*, and *Pulsus*, usually initialling his comment.[85] The second kind of query, in the form of a list, was often posed in question form: for example, under "Preliminary Topics or Articles of enquiry in order to the history of Diseases", Locke wrote "What Climates are more subject to give the disease [?]".[86] In a small memorandum book used mainly between 1664 and 1666, there is a run of pages devoted to chemical queries. For example, under the marginal title *Sal*, the entry asks "Whether volatile or urinous salts acid & alcalizat may by

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82   See Richard Yeo, "John Locke's 'New Method' of commonplacing: managing memory and information", *Eighteenth-Century Thought*, 2 (2004), pp. 1–38; Richard Yeo, "John Locke on conversation with friends and strangers", *Parergon*, 26 (2009), pp. 11–37.

83   John Locke, *Drafts for the essay concerning human understanding and other philosophical writings*, ed. by P.H. Nidditch and G.A.J. Rogers (3 vols., Oxford: Clarendon Press, 1990), I, p. 1. For the original, see *Adversaria Ethica* (also called *Adversaria 1661*), fol. 56 (at the start of the entry). This commonplace book is not in the Lovelace Collection at the Bodleian Library, and thus has no catalogue number. It is in private ownership. Microfilm copies are held at the Bodleian Library, Oxford, and the Houghton Library, Harvard.

84   Locke's daily journal entries were, of course, dated; but he did not begin to date his commonplace books entries until after 1679; and even then he usually recorded only the year, unless he was copying from one of his journal entries or recording an experiment or observation. See Yeo, *Notebooks*, p. 187.

85   See Bodl. MS Locke d. 9, p. 30, p. 51, p. 53, p. 54, p. 110. These entries were made in 1667–1668.

86   Bodl. MS Locke c. 42, Part 1, p. 98; also pp. 266–267 (a list of ways of producing flames).

any art of chymistry be changed into another & what difference is to be found amongst the particulars of each of these 3 species".[87] These queries collated information on a specific topic in one place, thus avoiding the usual scattering of material across different pages of a notebook. They also acted as a unit that could be copied and shared, as Locke and Boyle did.

Thirdly, Locke's habit of transferring material from one notebook to another, often from a journal to a commonplace book, created a further level of engagement with his notes. He copied many entries from the journals he kept in France into some of his commonplace books, such as *Adversaria Physica*. This meant that he not only revisited the notes, experiencing whatever recollections they evoked, but also interacted with the content in new ways. Locke did not always simply make a verbatim copy. Thus, in 1681 when transferring an entry on *Hysterica* of 8 July 1676, he expanded the shorthand of the journal into longhand, adding a cross reference in the margin of the journal to show that the material was now also in *Adversaria Physica*.[88] The collation of entries gave him the chance to order material in new ways, sometimes taking account of extant entries in the notebook to which they were added, as is evident in the entries on hysteria and related psychosomatic complaints.[89] This transfer of entries served as an opportunity to review both his information and his thoughts. These entries (many marked with 'Q') and signed as his speculations, exemplify what Locke described as the best way to make hypotheses about causal factors – by joining analogous instances and cognate material. Such hypotheses could then serve, as he later wrote, as "great helps to the Memory" and, by extension, as aids to thinking. In considering how best to theorise about diseases, he acknowledged that hypotheses contracted key features of phenomena and hence could act "as distinct arts of memory" provided they did not hinder observation.[90] At the very least, by transferring notes Locke was

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87   Bodl. MS Locke f. 27, p. 1 [fol. 169v]. These entries start at the back of the notebook. For Locke's scientific interests, see Peter Anstey, *John Locke and natural philosophy* (Oxford: Oxford University Press, 2011).

88   Bodl. MS Locke f. 1, pp. 311–312, with the annotation "<u>60</u>, p. 183" indicating that the entry had been copied into *Adversaria Physica*. Reciprocally, at p. 268 of this notebook there is a reference to the journal entry as "<u>76</u>, p. 312", where 76 indicates the year of the journal.

89   See Bodl. MS Locke f. 2, p. 72, p. 235, pp. 366–367 (hydrophobia, hysterica, hypocondriacus); Bodl. MS Locke d. 9, pp. 10–11, p. 182, p. 268, p. 300.

90   Locke, *An essay*, Book IV, Ch. 12, § 13; and Locke to Thomas Molyneux, 20 January 1693, in E.S. De Beer (ed.), *The correspondence of John Locke* (9 vols., Oxford: Clarendon Press, 1976–1989), IV, no. 1593. See also Locke to William Molyneux, 15 June 1697, in De Beer (ed.), *The correspondence*, VI, no. 2277.

able to consolidate cognate material, to benefit from the stimulus of seeing older notes, and to revise or amplify his thoughts from earlier occasions.

5.7   Conclusion

These examples show how two leading figures of the Royal Society made and used their personal notes. As understood within the physiological and psychological doctrines of their day, the excerpts and notes prompted recollection of more than these actually contained, thus suggesting related or antithetical ideas, and the circumstances in which the notes were taken. Despite differences in styles of note-taking, for both Boyle and Locke this process of recollection allowed notes to operate as elements of what we now call external memory. This process worked for semantic material – thus, textual excerpts elicited memory of the work from which they were taken, and short queries and other ideas reactivated trains of thought. In Boyle's case, especially, it also seems that episodic memories were recovered and put to use in the present.

However, the benefits of recollection from notes were reaped in full only by the person who made the note. Bacon explained this in a letter in response to an inquiry about the delegation of note-taking for a large project. Even with precautions, Bacon questioned the value of entrusting note-taking to another person:

> Therefore to speake plainelie of the gathering of heades or Common places; I thinke firste that one mans generall notes will little profitt another, because one mans conceipt doth so much differ from anothers, and also because the bare note it self is nothinge so much worth as the suggestions it geves the reader.[91]

This insight goes to the heart of the matter: notes work as a prompt or 'suggestions' to recollect more than the 'bare note'; but this process favours the maker of the original note. Delegation of note-taking greatly reduced the likely benefits. The conundrum of note-taking was that what worked to stimulate recollection (and thought) for the maker of the note did not do so

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91   Francis Bacon, "Letter of advice to Fulke Greville (c. 1589)", in *The Oxford Francis Bacon. I. Early Writings 1584–1596*, pp. 207–212, at p. 211. For attribution of this letter to Bacon, see pp. 200–203 in the same volume. Fulke Greville (1554–1628) was a courtier and poet.

for others – unless the notes were made in an agreed fashion to accomplish a specified objective.[92]

Robert Hooke, a key member of the Royal Society who served as curator of experiments and as one of the Secretaries, was well aware of the problem of making notes work for members of an institution. He kept his own personal diary as an aid to memory, and he reflected on the contemporary mental model in which information was stored in 'Memory' for analysis by 'Reason'. However, there remained the problem of putting particular ideas at the disposal of reason or judgement, when required. In addition to the tendency to forget, Hooke believed that memory "cannot so well propound all it does remember, to be examin'd at once by the Judgment; but prefers some things first in order, before others, and some things with more Vehemence and greater concern".[93] He concluded that there had to be an external storehouse of material which could be analysed and re-arranged.

> The next remedies in this universal cure of the Mind are to be applied to the Memory, and they are to consist of such Directions as may inform us, what things are best to be stor'd up for our purpose, and which is the best way of so disposing them, that they may not only be kept in safety, but ready and convenient, to be at any time produc'd for use, as occasion shall require.[94]

Hooke imagined a set of loose sheets and bound notebooks that could be used to collate and analyse information submitted (after suitable vetting and pruning) by members of the Society.[95] He described a method of keeping a large book into which slips of 'very fine Paper' could be inserted; this would help the process of continual sifting and resorting, which could not be accomplished so well by natural memory. These paperbooks would aid

> the Memory by writing and entering all things, ranged in the best and most Natural Order; so as not only to make them material and sensible,

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92   On collaborative note-taking, see also Ann Blair's essay in this volume.

93   Robert Hooke, "A General Scheme, or idea of the present state of natural philosophy", in R. Waller (ed.), *The posthumous works of Robert Hooke* (London: Printed by S. Smith and B. Walford, 1705), pp. 1–70, at p. 6. This work was composed circa 1668; see Yeo, *Notebooks*, p. 239, p. 330 (fn. 117).

94   Robert Hooke, *Micrographia, or, some physiological descriptions of minute bodies made by magnifying glasses* (London: Printed by Jo. Martyn and Ja. Allestry, 1665), Preface, sig. b1v.

95   Yeo, *Notebooks*, pp. 249–250.

> but impossible to be lost, forgot, or omitted, [and thereby] the Ratiocination is helped first, by being left alone and undisturbed to it self, having all the Intention of the Mind bent wholly to its Work, without being any other ways at the same time imployed in the Drudgery and Slavery of the Memory.[96]

This scenario recapitulated the one in which personal notes stimulated the recollection (and thinking) of their maker, something Hooke took for granted.

Could this process work for groups of people contributing various information and ideas? In Hooke's account there is an admission that individuals may need to adjust institutional note-keeping protocols to suit themselves:

> On these large sides he may place them either according to the Method of the Queries, which he has at first propounded to himself, or according to their first appearing Plainness, or Difficulty, or after any other Method of Inquiry, or Proceeding, which every one will be best able to adapt for himself, according to the Subject whereon he makes his Inquiry, or according to his particular Aim and Scope in examining it, or according to the Knowledge he has already acquir'd in it.[97]

Hooke realized that standardization of the ways in which material was recorded and accessed would help to ensure the stability of an institutional record, one that could perform as an element of external memory.[98] However, he made the significant concession that an individual might 'adapt' these conventions. There was a difficult balance to be struck between arranging material for reliable retrieval by a group of researchers, and allowing individuals to interact with this material in a way that resembled their use of their own notebooks. In a letter of 1669, Henry Oldenburg, one of the first Secretaries of the Royal Society, described the *Philosophical transactions* (begun in 1665) as "these philosophical commonplace books".[99] This metaphor paid deference to the humanist method of scholarship, and to the fact that many Fellows of

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96   Hooke, "A General Scheme", p. 34.

97   Hooke, "A General Scheme", p. 64.

98   For this issue in navigation systems on large ships, see Edwin Hutchins, *Cognition in the wild* (Cambridge, MA: The MIT Press, 1995).

99   Henry Oldenburg to René Sluse, 2 April 1669, in A.R. Hall and M.B. Hall (eds.), *The correspondence of Henry Oldenburg* (13 vols., Madison: University of Wisconsin Press, 1965–1986), V, pp. 469–470; Oldenburg's Latin here is "Adversaria Philosophica". Sluse was a Belgian mathematician.

the Society used such notebooks in assembling empirical material. However, it failed to acknowledge the implications of the shift from personal notebooks supporting the recollection of their makers, to a periodical journal (in fact, the first 'scientific' journal) whose prime function was the storage of accurate and stable records for retrieval.

As mentioned above, Locke identified the process by which an Idea was "sought after by the mind, and with pain and endeavour found, and brought again in view …". He called this *Recollection*.[100] However, from the examples I have presented, it seems clear that the use of notes as prompts to recollection was more often successful than painful. Nevertheless, this mental process was not automatic and constant; it was affected by the practices adopted by makers of notes, such as, in Boyle's case, his regular reflection and review of material, and his conversation with amanuenses; and in Locke's, by the transfer and comparison of notes which were themselves imagined within a schema of subjects and categories. External memory can be usefully understood as comprising notes, objects, and images in interaction with the mind via recollection. However, in complex, real-life situations, this process depends on habits, routines, and the framework of personal projects that enhance the power of notes.[101]

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100   Locke, *An essay*, Book II, Ch. 19, § 1.
101   For helpful criticism and suggestions, I thank Mary Louise Yeo.

Storing Expansions: Openness and Closure in Secondary Memories

Alberto Cevolini

6.1 Openness and Closure in Secondary Memories

One of the most promising hypotheses of cultural studies is that media shape knowledge management. Consequently, media also shape how we think. Media represent a technical constraint on cognitive activity. Our understanding of this constraint is still evolving and unclear. As we work towards a general theory of media, it can be useful to investigate some historical reactions to the introduction of new media. In this essay, I focus on several effects that the printing press had on early modern Europe. Over the last fifty years, historical research has convincingly demonstrated that the advent of typographic technology compelled European scholars to drastically change their intellectual habits. During the period between 1550 and 1750, this change led to important educational developments and reflections regarding the method of studies and the methodological rules of a scholarly work. In turn, the printing press ensured that a subject whose emergence it had fostered would enjoy wide circulation.

One topic that aroused particular interest during this period was how to best read a book. The fact that this very question was the subject of a book and that, while reading, the reader was involved in a self-observation, however, went unnoticed. Scholars rediscovered a pillar of ancient and medieval education: the art of note-taking. This skill was deeply embedded in the rhetorical culture; consequently, the evolutionary advance of which the art of making excerpts from readings was simultaneously cause and effect was somehow misunderstood. Today, it is difficult to grasp the social nature of the long-lasting transitional stage that dismantled the old habits of European scholars and introduced the modern rules of studies. The contemporary sources must be read carefully to determine what makes a difference in meaning. If the social scientist is not to be deceived, he must discover where the contemporary authors deceived themselves, so to speak.

Before I address the sources upon which this study is based, it is helpful to quote an almost unknown text of a well-known learned man. This text offers a reflection that is missing in the prominent literature on the art of note-taking.

Its relevance might better be grasped from the perspective of the theory of modern society. In *Lettre sur la Métode* [sic] *des Extraits*, which was written during the first half of the eighteenth century, Charles-Irénée Castel, abbé de Saint Pierre praises the notes that his addressee (a noblewoman) has taken from moral books. The letter provides an opportunity for more general speculation on the (almost moral) usefulness of note-taking. Saint Pierre distinguishes between pleasure and usefulness and links this distinction to time. Pleasure is enjoyed in the present, whereas usefulness refers to the future. Notably, children are by nature prone to enjoy current pleasures because their reason is not yet ripe. By contrast, adults can appreciate future utility and are thus far wiser than children.[1] Learned women who seek not only pleasurable but also useful thoughts and who wish to develop them in conversation with enlightened men should follow this advice. The practical device best suited to achieve this type of *politesse* is a commonplace-book.

The temporal habit praised by Saint Pierre is striking when we consider that in European culture until the seventeenth century, stoicism preserved its privileged position with respect to how time should be interpreted. From the perspective of this philosophical attitude, Saint Pierre reverses the order of priorities. According to stoicism, only the present belongs to man. Those who delay lose everything because they alienate the only good that men possess for themselves: the present. "Dum differtur vita transcurrit" (while they defer, life goes on), Seneca warned. True virtue is not to need future and is to avoid being preoccupied by worries about time that has yet to come.[2]

This statement is also true for memory, a faculty of the soul often associated with ethics until the end of the Middle Ages. In addition, memory is an internal good that should not be entrusted to an external support, according to Plato. To trust retrieval for when the need occurs is risky. One can be in danger – I return to this topic below – of lacking subject matters and arguments if suddenly the written support is not close at hand or if its hypomnematic function is disrupted.

When usefulness (i.e., the future) is valued more than pleasure (i.e., the present), a new temporal structure arises: the principle of deferred gratification,

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1 Charles-Irénée Castel, abbé de Saint Pierre, "Lettre sur la métode des extraits", in C.-I.C., abbé de Saint Pierre, *Ouvrajes de morale et de politique* (16 vols., Rotterdam: Chez Jean Daniel Beman, 1740), XIV, p. 14: "C'est un défaut de Sagesse & de Raizon, de donner trop d'estime à l'agréable prézant, & d'estimer peu le plus utile qui est beaucoup agréable, & plus durable, mais qui n'est que futur".

2 Seneca, *Ep. ad Luc.*, 1, 3; 92, 25: "Quid est in virtute praecipuum? Futuro non indigere nec dies suos computare".

which represents a pillar of modern society.[3] American sociology of the 1950s linked this temporal structure to social stratification and regarded it as characteristic behaviour of the middle class. According to this approach, a middle-class citizen prefers to defer employment and economic independence in favour of earning a degree and thus more attractive employment opportunities in the future. In a sense, it is a question of relinquishing certain possibilities to create additional possibilities, increasing the complexity of the situation. In such abstract terms, the principle of postponing gratification is not only a facet of modern society but also an evolutionary principle. The most impressive examples involve money and law court (in place of self-satisfaction of punishment).

In the case of memory, the question is whether to relinquish the saturation of cognitive energies that is required to remember something, and to delay the construction of recollections. The weight of this relinquishment is better appreciated if one reminds that in the art of recollection the construction of a storehouse (*thesaurus*) – the architecture of the spaces in which the orator stored images that were to be used as mnemonic hooks – was a difficult task, but also a way of fixing memorable matters in the mind and keeping them at one's immediate bidding. By contrast, by keeping a commonplace-book, early modern scholars committed themselves to performing a combinatory activity that could not be foreseen or pre-arranged (like the future itself) and that depended on opportunity. In addition, what was entrusted to the book was typically forgotten.

An advantage of this form of forgetfulness (that made it bearable) was that it released previously saturated cognitive energies and maintained them for subsequent use.[4] In other words, what caused scholars to accept the disadvantages of relinquishing fixed notions in the mind of matters that were worth remembering was the seemingly paradoxical fact that relinquishing itself was advantageous. Social science should explain the circumstances under which such an improbable change became possible.

Implementing Saint Pierre's advice in practice requires a memory that can cope with an open future. The card index seems to be a fitting solution. As with every secondary memory (e.g., archive or library), the card index is open in a twofold sense. First, it is understood as infinitely expandable – the expansion

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3 Cf. Louis Schneider and Sverre Lysgaard, "The deferred gratification pattern: a preliminary study", *American Sociological Review*, 18 (1953), pp. 142–149.

4 On the combination of saturation and release of cognitive energies for recalling, see Heinz von Foerster, *Das Gedächtnis. Eine quantenphysikalische Untersuchung* (Wien: Franz Deuticke, 1948).

being performed either by adding new entries or by adding new items to existing entries. This limitlessness clearly distinguishes a filing cabinet from a rhetorical storehouse and was eagerly emphasized by early modern creators of filing systems. For instance, Jeremias Drexel was very proud of his note-taking method because it enabled students to daily add new headings. Thus, the number of entries (i.e., *lemmata*) in the commonplace-book could be endlessly increased ("in infinitum augeri possunt").[5] A half century later, Vincent Placcius stated that the advantage of excerpts in the form of loose file cards (*schedacea excerpta*) compared with bound commonplace-books was that a scholar could add new entries to his filing cabinet ("novis accessionibus semper augere possit") wherever he was.[6] In this sense, secondary memory is a historical machine because its content is contingent on the (not necessarily planned) sequence of readings and observations of its trainer. Moreover, its enlargement is in the first place physical: additional drawers are added to the filing cabinet and additional shelves or containers to the library.

However, the card index is also open in a different sense. The user may enlarge his collection of extracts, but he can also multiply the number of cross-references, links, and pointers (*remissiones*). Cross-references solve the problem of multiple storage, thus avoiding wasting time in copying an excerpt that must be stored under different entries because it has multiple meanings. References can also be associative; their function is to provide the card index with a self-referential closure and to structure new and surprising relationships.

Historical research has demonstrated that scholars became aware of this structural feature between the seventeenth and eighteenth centuries. For example, according to Christoph Meiners, the connection of facts and thoughts which are entrusted to a private card file can produce a substantial number of combinations and insights that otherwise might not have existed.[7] Similarly, to legitimize his encyclopaedic work, Ephraim Chambers admitted that dismembering knowledge into loose entries compelled scholars to abandon their systematized arrangements, and one advantage of such dismembering was that

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5   Jeremias Drexel, *Aurifodina artium et scientiarum omnium. Excerpendi sollertia, omnibus litterarum amantibus monstrata* (Antuerpiae: Apud Viduam Ioannis Cnobbari, 1638), p. 100.

6   Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689), p. 70.

7   I quote the passage in full because of its intrinsic value: "Selbst die Vereinigung von so vielen Factis und Gedanken, als man in vollständigen Excerpten zusammengebracht hat, veranlaßt eine Menge von Combinationen und Aussichten, die man sonst niemahls gemacht, oder erhalten hätte". Cf. Christoph Meiners, *Anweisungen für Jünglinge zum eigenen Arbeiten besonders zum Lesen, Excerpiren, und Schreiben* (Hannover: In der Helwigschen Hofbuchhandlung, 1791), pp. 91–92.

scholars might occasionally discover relationships that they would otherwise not have noticed.[8]

The combinatory possibilities are directly proportional to the degree of loosening. Epistemologically speaking, this loosening implies the dissolution of the metaphysical order of knowledge. Practically speaking, this loosening coincides with bound notebooks being replaced by filing cabinets or scholarly chests. Early modern scholars understood that a secondary memory of this type might foster "Combinations and Coordinations of propositions" and that this manner of prompting recollections was in fact "the Argumentative part" of the card index. This memory practice eventually defused the primacy of syllogistic reasoning, that is, that form of rationality on which the art of recollection had been traditionally based.[9]

Despite certain hesitations and reasonable second thoughts, the cognitive saltation implied (and enabled) by card files was irreversible. The saltation was thematized at the end of a long-lasting transitional stage that developed until the second half of the seventeenth century. Robert Boyle noted that the arrangement of knowledge can be "either systematical, or more loose and unconfin'd". The former solution implies the production of methodical treatises, whose real advantage is that they help memory. Their disadvantage is that science will quickly outgrow such treatises, as clothes suddenly no longer fit a child. The latter method of managing knowledge is of substantial value because it helps understanding. However, it can "scarce avoid the [sic] being plundered by systematical writers", who can easily "cull out those things, that they like best, and insert them in their methodical books …".[10] Boyle did not

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8   Cf. Ephraim Chambers, *Cyclopaedia, or an universal dictionary of arts and sciences* (2 vols., London: Printed for James and John Knapton, 1727), I, Preface, p. xxix. See also Maurizio Mamiani, *La mappa del sapere. La classificazione delle scienze nella* Cyclopaedia *di E. Chambers* (Milan: Franco Angeli, 1983), esp. p. 34.

9   See the diary annotations of Samuel Hartlib (Hartlib Papers 30/4/47A, Ephemerides 1640, Part 2) concerning the *arca studiorum* invented by Thomas Harrison. Cf. Noel Malcolm, "Thomas Harrison and his *Ark of Studies*: an episode in the history of the organization of knowledge", *The Seventeenth Century*, 19: 2 (2004), esp. pp. 208–209. On the combination of syllogism and recollection, see Aristotle, *De mem. et rem.*, 453a5; Thomas Aquinas, *S. Th.*, I, q. 78, art. 4, resp. According to the latter philosopher, the recollection of subject matters is re-actualized "quasi syllogistice inquirendo".

10   Robert Boyle, "The excellency of theology, compared with natural philosophy" [orig. ed. 1674], in *The works of the honourable Robert Boyle* (6 vols., London: Printed for W. Johnston et al., 1772), IV, esp. pp. 54–55. Cf. Richard Yeo, "Loose notes and capacious memory: Robert Boyle's note-taking and its rationale", *Intellectual History Review*, 20: 3 (2010), pp. 335–354.

look down on the efforts of compilers who produced "systems of a taking order", yet he believed that the true scientist "discover(s) latent truths", which may be best achieved when scholars relieve themselves – as Boyle did – of the burden of repetition and adopt a loose collection of observations that can be re-combined at will.

One of the most – if not the most – important cognitive resources is attention. In the art of reminiscence, attention was used to remember. Scholars made use of strange, odd, vivid 'active images', according to the rule that familiar, trivial events do not elicit attention and are thus soon forgotten. Images were cues that triggered meaning associations that could presentify the past when correctly used – such as milk for white, white for air, air for wetness, and wetness for autumn in Aristotle's famous example or as testicles (*testes*) in the hand in order to recall that there are witnesses (*testes*) of a murder, in the well-known example of the rhetorical treatise to Herennius.[11]

If attention is relieved of this burden, it can be employed for different purposes. According to Descartes, who clearly understood this change, the advantage of entrusting all the certain cognitions that he grasped – from the simplest towards the more complicated – to a booklet instead of to his mind was that "with relieved memory I can turn my loosened mind to something else".[12] In a sense, the energies that are spared in this manner are conceived of as a form of intelligence that scholars in the seventeenth century first realized that they possessed. Such intelligence enabled them to discover remote neighbourhoods that had remained unrecognized or to notice inconsistencies that had been previously disregarded. The eventual oddity is that from this point forward, scholars paid attention to be surprised. Their opinion was: comparison is better than repetition, and what is unknown is more exciting than what is known. In short, from this point forward, memory was paradoxically employed to produce novelties.[13]

To achieve this result, memory must be stocked not only with contents but also with cross-references and links between contents. Thus, in addition to redundancy, a variety of searching pathways can be discovered. These pathways usually are unexpected and thus surprising for the user of the card index. In this respect, secondary memory enjoys not only a physical but also a cognitive

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11   Aristotle, *De mem. et rem.*, 452a15; *Ad Her.*, III, § 33.

12   René Descartes, *Regulae ad directionem ingenii*, in *Œuvres de Descartes*, ed. by C. Adam and P. Tannery (11 vols., Paris: Léopold Cerf, 1908), X, p. 379: "… exonerata memoria possim liberiorem animum ad caetera transferre".

13   Elena Esposito, *Soziales Vergessen. Formen und Medien des Gedächtnisses der Gesellschaft* (Frankfurt am Main: Suhrkamp, 2002), p. 228.

expansion. Memory functions in the manner of a historical machine in the cybernetic sense of the term. Every reaction of the machine is contingent on the past. Consequently, the relationship between input and output is not invariant but variable;[14] it depends not only on the fact that the user will discover new file cards when searching through the filing cabinet but also (and even more) on the fact that the structure itself may enlarge each time the user triggers the combinatory structure of his private archive and the number of possible combinations increases. Therefore, the card index is not simply a data storage system but a genuine structural device that (in addition to data) stores neighbourhood relationships, i.e., associative cross-references and links between data.[15]

This scenario has a twofold advantage. First, memorability undergoes exponential growth. Users can retrieve the same data through different exploratory routes, whereas the same data can become an opportunity to address a network of meaning associations that trigger latent data. The wider the network, the larger the retrievability.[16] Second, the machine becomes unpredictable, and interaction with it has an information value for users. In any access, the users enter a maze that has changed in the interim. Thus, a search is no longer a means of discovering what exists (*inventio*) but is instead a genuine exploration (*invention*). The function of memory is not to produce the correct answer for any question as if it simply stored a list of records. Instead, the machine is built such that it changes after interaction with the user and stores the outcome of this interaction in the changed structure. The machine is user-adaptive and exploits this ability to enhance its inner structure.[17] After each changing interaction, the machine reacts (even to the same promptings)

14   Cf. Heinz von Foerster, "Cibernetica ed epistemologia: storia e prospettive", in G. Bocchi and M. Ceruti (eds.), *La sfida della complessità* (Milan: Feltrinelli, 1985), p. 131; Heinz von Foerster, "Perception of the future and the future of perception", in H. von Foerster, *Understanding understanding. Essays on cybernetics and cognition* (New York et al.: Springer, 2003), pp. 207–208.

15   Cf. Heinz von Foerster, "Technology: what will it mean to librarians?" in H. von Foerster, *Observing systems* (Seaside, CA: Intersystems Publications, 1984²), esp. p. 216; Klaus Krippendorff, "Some principles of information storage and retrieval in society", *General Systems*, 20 (1975), esp. p. 26.

16   Psychological research on the didactical use of card files has also experimentally proved it. Cf. Fritz Staub, "Notizenmachen: Funktionen, Formen und Werkzeugcharakter von Notizen", in H. Mandl and H.F. Friedrich (eds.), *Handbuch Lernstrategien* (Göttingen: Hogrefe, 2006), pp. 59–71.

17   On this distinction between machine-invariant and user-adaptive systems, see von Foerster, 'Technology', esp. p. 219ff.

through the changed structure. Since the machine learns from the users, the users can learn from the machine. Their interaction is a true communication process and involves two black boxes, both of which behave as Alter Egos with respect to one another.[18]

To initiate this singular learning system, users must trigger the web of references that constitutes the inner structure of secondary memory. The filing cabinet reacts to itself and – through such self-reaction – also to the user. This process occurs first by means of *self-resistance*. The issue is not simply to search the filing cabinet for what is there but also for what is not there. Meaning associations are never created at will, and neighbourhood relationships among data follow a logic although they remain contingent. Furthermore, the user must eliminate any possible inconsistency by carefully maintaining the catalogue. The same entry cannot be tagged with two different numbers, and two different entries cannot have the same number. Resistance also occurs when an entry comes to nothing or (even worse) when an entry is missing. In any case, resistance is always inside, not outside; resistance is in the system and not in the environment.

Self-resistance is combined with *joining capacity*. In this case, the question is how to reproduce variety through selection.[19] Like every self-referential system, memory is not simply a store of data. Adding new elements exponentially increases the number of connections. Thus, a single element can produce an overload of connecting possibilities (which is the meaning of complexity). Selection results in a variety that requires additional selection. One filing slip is followed by another filing slip in the same entry, or a slip refers to other excerpts stored under different entries, which subsequently unfolds into another branching off of possible references. Once the network of references is triggered, the filing cabinet reproduces not only connection but also *connectibility*. In other words, in principle, every excerpt is possessed of the possibility of unlimited meaning associations. Thus, the joining capacity is not simply repetition of the same.

Florilegia contained large collections of quotations organized into commonplaces. However, such anthologies were not conceived of as a means of searching for novelties. By contrast, while users are coping with secondary

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18   The filing cabinet behaves as a true communication partner. Cf. Niklas Luhmann, "Kommunikation mit Zettelkästen: Ein Erfahrungsbericht", in N. Luhmann, *Universität als Milieu. Kleine Schriften*, ed. by A. Kieserling (Bielefeld: Haux, 1992), pp. 53–61, and Johannes Schmidt's essay in this volume.

19   This performance and the dynamics of meaning coincide. Cf. Niklas Luhmann, *Soziale Systeme. Grundriß einer allgemeinen Theorie* (Frankfurt am Main: Suhrkamp, 1984), p. 92ff.

memory, the system itself reproduces elements through systemic elements and reproduces reproducibility. In other words, memory functions as an *autopoietic* system.[20] Reproduction is self-reproduction because the combinatory performances that the card index can produce when its structure of references is triggered enjoy autonomy.[21] The outcome is surprising because the structure is recursive. Every new entry and every new link affects the horizon of variety, i.e., the background against which data become information. The content of the filing cabinet may be the same, but its information value changes because – in addition to the variety that the user must address – the selectivity of the selection changes. How was such an improbable evolutionary advance possible?

6.2   Evolution as Deviation-Amplifying Process

The triggering point of every evolutionary advance is deviation. Without deviation, reality would always remain the same. However, deviation alone is insufficient. Systems can determine whether to accept or reject differences. Compared with rejection, acceptance is highly improbable. The theory of evolution aims at explaining how it is possible that the high improbability of a process getting started turns into the high probability of that process maintaining itself.[22]

   From the perspective of social memory, deviation means forgetting learning. In short, evolution can be described as a process that fosters forgetting through communication memory becoming increasingly autonomous from the memory of individual consciousnesses.[23] The social theory hypothesis posits that during early modernity the printing industry provided this autonomy the impetus it required to take off – an outcome that writing alone did not achieve because it was subordinate to orality in knowledge management. In the literature on the art of note-taking that spread in Europe between the

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20   This concept is drawn from Humberto Maturana and Francisco Varela, *De maquinas y seres vivos* (Santiago: Editorial Universitaria, 1972). For a sociological use of the same concept, see Luhmann, *Soziale Systeme*, esp. p. 62, p. 79, and p. 258.

21   Cf. Niklas Luhmann, "Interdisziplinäre Theoriebildung in den Sozialwissenschaften", in N. Luhmann, *Universität als Milieu. Kleine Schriften*, ed. by A. Kieserling (Bielefeld: Haux, 1992), p. 66.

22   Magoroh Maruyama, "A postscript to the second cybernetics", *American Scientist*, 51 (1963), esp. p. 256A. See also Niklas Luhmann, *Die Gesellschaft der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1997), p. 414.

23   Cf. Esposito, *Soziales Vergessen*, p. 24ff.

seventeenth and the first half of the eighteenth centuries, there is substantial and compelling evidence of this structural change. There is a shared awareness that to be deviant is for many reasons much more suitable than to abide by the rules.

The first and perhaps most striking shift in thinking was the strong opposition exhibited by scholars to the use of the imagination to remember. Against the background of the art of recollection and its success until early modernity, such an opposition appears nearly irreverent. In the mid-sixteenth century, scholars realized that using the imagination for knowledge management was childish and even ridiculous. According to Drexel, to stock the storehouse of memory with a copious volume of images for later retrieval not only required great effort but also wasted time because images escape from this storehouse as prisoners escape from a jail without guards.[24] Students who wished to entrust their recollections to reliable keepers – Drexel recommended – should make annotations ("notas & excerpta").

In fact, nearly a century earlier, Agrippa von Nettesheim had written a savage criticism of the art of remembrance as taught by Cicero and Quintilian. Artificial memory burdens "natural memory with infinite images of things and words". Thus, it "methodically drives those who are not satisfied with natural limits mad".[25] Compared with Agrippa's criticism, the attitude of later scholars remained the same. According to Alexandre Fichet, trusting psychic memory was like trying to drink from a running river using a sieve or entrusting one's treasure (literally one's storehouse) to a thief.[26]

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24   Drexel, *Aurifodina*, pp. 3–4.

25   Heinrich Cornelius Agrippa von Nettesheim, *Della incertitudine e della vanità delle scienze* (Venice: Farri, 1547; reprint ed. by T. Provvidera, Turin: Nino Aragno Editore, 2004), Ch. 10, p. 83. This statement also makes clear the foolishness of those who attempted to artificially extend their storehouse to remain abreast of the steady growth of knowledge (on this subject, see Koji Kuwakino's essay in this volume). Agrippa's work was originally published with the title *De incertitudine et vanitate scientiarum et artium, atque excellentia Verbi Dei, declamatio* (Antuerpiae: I. Grapheus, 1530). It is worth noting that it is a *declamatio*, i.e., a rhetorical exercise in finding plausible arguments for often unconventional or paradoxical positions (for this valuable remark, I am indebted and grateful to the anonymous reviewer of this volume).

26   Alexandre Fichet, *Arcana studiorum omnium methodus, et bibliotheca scientiarum, librorumque, earum ordine tributorum, universalis* (Lugduni: Apud Guillelmum Barbier, 1649), Book 1, Ch. 2, p. 4. See also Drexel, *Aurifodina*, p. 258: "Quosdam memoriae magistros rideo, qui nescio quot domunculas aedificant, & in domunculis cellulas, rerumque imagines multiplicant in infinitum" (how foolish of those who teach us to build up houses and rooms to endlessly stock them with images of memorable subjects).

The opposition to this system of mental knowledge retrieval peaked at the end of the seventeenth century. The striking fact is that this opposition was always combined with a comparison with the clear advantages that the art of note-taking offered scholars and that were only then becoming apparent. For instance, in discussing artificial memory, Lodovico Antonio Muratori argued that – compared with the art of note-taking (*trascegliere e notare*) – the technique employed for recollecting had little use and should be abandoned. According to Muratori, the absurdity of this technique was that it doubled references. In addition to the memory required to store images in a fixed structure of places, another memory was required to recollect all meaning associations (*applicazioni*) that coupled memorable things with images,[27] thus leading to an endless regression.

However, memory is always contingent upon a doubling of references, and the way in which this doubling is put into practice reveals the type of social memory that scholars are dealing with. Doubling is required because if it were possible to retain the presence of everything that must be remembered (as autumn by Aristotle), nothing would be forgotten. Therefore, there would be no need to create a system for recollection. Instead, by doubling references, it is possible to combine self- and hetero-references, and as with every technique, scholars must train this combination of references to be able to achieve a good performance. Thus, Muratori's objection is somewhat naïve. But it becomes reasonable against the background of an option that previously was unavailable. This option consisted of entrusting recollections to paper – again, a deviation from the transmitted rhetorical culture.

The Renaissance revival of the commonplace-book was based on the firm belief that paper was a more reliable mnemonic device for knowledge retrieval. According to Drexel – a learned man with a deeply ingrained typographic mentality –, there was a circular relationship between paper and memory. Because knowledge was increasingly retrieved from books, it was to books that scholars should entrust all the knowledge they did not want to forget.[28]

The novelty of this opinion can be grasped against the background of Plato's opposition to the use of writing to manage knowledge. Plato was genuinely frightened by the prospect of what we calmly regard now as an evolutionary advance. In particular, Plato was afraid that those scholars who had acquainted

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27   Lodovico Antonio Muratori, *Delle riflessioni sopra il buon gusto nelle scienze e nelle arti* [orig. ed. 1708] (2 vols., Venice: Presso Nicolò Pezzana, 1723), I, Ch. VIII, pp. 223–241 (esp. pp. 224–226).

28   Drexel, *Aurifodina*, p. 57: "Uti saepius è charta sapere, ita etiam saepissime è charta meminisse ac recordari cogimur".

themselves with the use of writing to recollect scholarly knowledge were placing increasingly more trust in an external support. On the one hand, this reliance on writing implied a loss of control over the circulation of texts because, once it is published, a text becomes independent of its author. On the other hand, learned men had become dependent on the texts to which they had to resort to remember what they had neglected to fix in their minds.[29] The decay of society that concerned Plato implied not only a reflection on the ambivalent relationship between writing and forgetting but also the feeling that knowledge could be autonomously managed through the recursiveness of texts rather than through oral communication – an outcome of the increasing differentiation of interaction and society that only the advent of the printing press would definitively effect.

Renaissance scholars who encouraged the recourse to paper (obviously also in a metonymic sense) were aware that Plato's objections might be exploited by opponents to challenge the usefulness of the art of note-taking because paper as a hypomnematic device was a good alibi to neglect learning.[30] Nonetheless, they chose paper. For instance, Muratori argued that paper is a *stable external memory* which reason has to consult in order to retrieve with more certainty what gifted men find inside themselves – although less quickly.[31] And nearly twenty-five years earlier, returning to Drexel, Andreas M. Stübel distinguished between psychic memory, which is a type of primary paper, and the commonplace-book, which is, in contrast, a secondary and subsidiary memory (*memoria secundaria & subsidiaria*) to which scholars should entrust their knowledge.[32] Evidently, Muratori and Stübel distrusted personal memory – it is unstable compared with books – and re-assessed note-taking as an external memory aid. They shared the opinion that the student who makes excerpts does not repudiate memory's usefulness but simply considers excerpts to be a more effective device (*adminiculum*) against forgetting.

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29   Plato, *Phaedrus*, 274B–278E. The problem regarding the lack of control over communication became clear only after the invention of the printing press. Cf. Jack Goody, *Literacy and the diffusion of knowledge across cultures and times* (Milan: Fondazione Enrico Mattei, 1996), p. 12.

30   Cf. Francesco Sacchini, *De ratione libros cum profectu legendi libellus* (Romae: Apud Bartholomaeum Zannettum, 1613), Ch. 10, pp. 49–53.

31   Muratori, *Delle riflessioni sopra il buon gusto*, I, Ch. VIII, p. 229 (italics added): "... una *stabile esterna Memoria* con cui consigliandosi l'Intelletto, men prontamente sì, ma spesso con più sicurezza ritruova ciò, che altri più fortunati truovano dentro di se medesimi".

32   Andreas M. Stübel, *Exercitatio academica de excerptis adornandis* (Lipsiae: Literis Johannis Coleri, 1684), p. 33 (italics added).

The evolutionary advance became clear when deviation was widely accepted and consequently made subject of publications. This transition occurred between the first and second halves of the seventeenth century. Perhaps no one expressed the preference for deviation so convincingly as Drexel. According to the German Jesuit, teachers of rhetoric were foolish, and the use of a virtual space to fill up with images that act as mnemonic hooks was a waste of time. In addition, every technique whose purpose was to train psychic memory was self-defeating. Drexel argued that his *Goldmine* aimed to teach how to make excerpts, not how to remember, and he implicitly meant that, while reading his book, the reader could learn how to forget.[33]

However, such evolutionary advance did not occur instantaneously. Even the most fervent supporters of commonplace-books had hesitations and second thoughts. In a sense, the selection of deviation implied a performative paradox. In other words, long after printing had become an industry, contemporaries still had only an outdated language to describe a new habit. Weighing pros and cons, they oscillated between excitement regarding the cognitive advantages offered by the evolutionary advance and scruples prompted by the cognitive habits transmitted by a still authoritative tradition. In fact, the book market enabled one to develop a good command of classical and medieval culture at little expense, but it also tempted learned men with a plethora of discoveries and new disciplines. Thus, considering the effects of his teaching, Francesco Sacchini sensed a danger in the use of secondary memories: the atrophy of personal memory. Therefore, he advised students not only to make excerpts but also to learn annotations by rote to prevent memory from becoming lazy. That he was teaching to file, he added, did not mean that he considered mnemonic training to be negligible.[34]

When Drexel, who availed himself of this reasoning, similarly stated that it does not suffice to make excerpts but that students must also repeatedly read the excerpts and fix them in their minds,[35] he did not realize his advice to be a contradiction. If the duty of teachers was not to teach how to recollect

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33   Drexel, *Aurifodina*, p. 258: "Excerpere, *non meminisse* hic doceo" (italics added). A half century later, a scholar whose pseudonym was Philomusus pontificated that memory is childish because adults make excerpts. Cf. P. Philomusus, *Industria excerpendi brevis, facilis, amoena, a multis impedimentis quibus adhuc tenebatur, exsoluta* (Constantiae: Typis Joannis Jacobi Labhart, 1684), p. 3: "*Memoria puerorum, excerpta virorum*".

34   Sacchini, *De ratione*, p. 57: "Primum, ne hebescat memoria, illustriores quidam loci non solum scribendi, sed etiam ediscendi sunt. Non enim, cum excerpendum dicimus, memoriae exercitationem, quae vere dicitur excolendo augeri, omittendam existimamus". See also Drexel, *Aurifodina*, p. 66: "Minus memoriae student, qui Excerpta curant".

35   Drexel, *Aurifodina*, p. 84: "*Edisce* quaedam, non tantum *exscribe & relege*".

(*meminisse*), they should not advise students to learn by rote (*ediscere*) what they annotated. This paradox emerges even more clearly when Drexel observes that it does not suffice to write down annotations but that students must also remember whether and what they annotated.[36] They were in fact compelled to recall what they tried to forget while annotating.

This genuine puzzle derives from the fact that an individual who trains a secondary memory abandons training his personal memory. Sacchini himself was well aware that the learned man worthy of this epithet should not stock his library with books but his mind with cognitions, and he should not stuff his commonplace-books with excerpts but note what is memorable in his soul. Nevertheless, if he taught to take notes, the reason was that memory – far from being neglected – was substantially more effective (*felicius*), as Drexel also noted.[37] First, because note-taking prompts the reader's attention. Consequently, the reader reflects longer on what he is reading, and the matter becomes more clearly understood. Second, what is read can be better fixed in the mind because note-taking compels the reader to pause over the text, to re-read it, and to engage with it more thoroughly than he otherwise might have. Third, for all these reasons, excerpts and annotations represent a highly effective remedy for oblivion.[38]

The question could be raised as to who was right? Those who believed that the habit of note-taking makes memory lazy – in this respect, Francis Bacon stated that knowledge can be stored either in writing or in memory and that although a good digest of commonplaces is highly useful, one must also remember that commonplace-books cause "a retardation of reading, and some sloth or relaxation of memory"[39] – or those who stated that the same habit strengthens memory, instead? The answer is both. Indeed, when one becomes accustomed to using a filing cabinet, what is atrophied is simply the psychic memory, not the social memory. In fact, the latter is strengthened. Like any secondary memory, the filing cabinet enables society to remember substantially more than was previously possible because it enables users to forget substantially more.[40] It is somewhat reasonable that this oddity was not

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36   Drexel, *Aurifodina*, p. 67: "Nec enim satis est excerpere, nisi memineris, an & quid excerpseris".

37   Sacchini, *De ratione*, p. 52; Drexel, *Aurifodina*, p. 67.

38   Sacchini, *De ratione*, p. 54; Drexel, *Aurifodina*, p. 56 and p. 57.

39   Francis Bacon, *The two books of the proficience and advancement of learning, divine and human, to the King* [orig. ed. 1605], in *The works of Francis Bacon, Baron of Verulam* (5 vols., London: Printed for J. Rivington and Sons, 1778), I, p. 81.

40   Cf. Esposito, *Soziales Vergessen*, p. 239ff., and Elena Esposito's contribution to this volume. According to Ann Blair, "Note-taking as an art of transmission", *Critical Inquiry*, 31: 1

immediately understood by contemporaries. For some time, the situation remained, as Élisabeth Décultot aptly stated, "incontestablement équivoque".[41] Thus, although scholars believed that they were entrusting knowledge to the filing cabinet to remember it better, they gradually and irreversibly became accustomed to forgetting.

6.3   Storing Expansions

Selecting deviation is not enough. An evolutionary advance occurs when it becomes clear that deviation presents so many advantages that only deviant individuals would abide by the old rules. Gradually, deviation becomes so normal that individuals simply disregard what was previously novel. Society adapts to the cognitive opportunities that it itself makes available, which represents a type of systemic self-adaptation rather than an adaptation of the system to the environment. In this respect, evolutionary theory speaks of 're-stabilization'. Because the evolutionary advance that is the subject of this essay concerns knowledge management, it is reasonable to ask what re-stabilization consists of when scholars make use of secondary memories. However, investigation becomes more difficult because re-stabilization attracted less attention than deviation and was only occasionally addressed by contemporaries.

Social knowledge management always implies a special circularity that is contingent on available media. The evolution of such circularity hides in metaphors by means of which society represents to itself its own relationship with knowledge. Semantics furnishes plenty of empirical cases. For example, in early modern Europe the word *arca* suddenly ceased to refer to the rhetorical storehouse and became a synonym for secondary memory. Similarly, knowledge was unexpectedly conceived of as a *systema*, a term that previously (although incidentally) existed in the Greek philosophical language, disappeared during the Middle Ages, and suddenly re-emerged at the beginning of the seventeenth century as a keyword in the title of philosophical and theological handbooks.[42]

(2004), p. 103, excerpts have a hypomnematic function, but they also relieve "the memory and free up the mind", so that their compilation can be performed as a "quasi-mechanical process that might be best delegated to someone else".

41   Élisabeth Décultot, "Introduction. L'art de l'extrait: définition, évolution, enjeux", in É. Décultot (ed.), *Lire, copier, écrire. Les bibliothèques manuscrites et leurs usages au XVIIIe siècle* (Paris: Centre National de la Recherche Scientifique, 2003), p. 14.

42   The semantics of the term 'system' has been already investigated, yet without anchoring it to social structures. Cf. Otto Ritschl, *System und systematische Methode in der Geschichte des wissenschaftlichen Sprachgebrauchs und der philosophischen Methodologie* (Bonn: A.

This type of semantic shifting may be understood as compelling evidence that cognitive habits were changing, although no contemporary could yet explain how.

Novelties in the methodology of studies and scientific research compelled early modern scholars to re-assess the form and function of the book. An idea that began to strike scholars during the early modern period was that as books are required to feed a filing cabinet, so a filing cabinet is required to publish books. During the same period, the format of the book underwent a substantial transformation. On one side, commonplace-books were deemed a substitute for libraries.[43] On the other side, books were increasingly edited to enable their usefulness as card indexes. They were equipped with large subject indices, and this feature soon became a marketing device (i.e., a form of advertising) behind which was hidden an awareness that an index fulfilled reader expectations. Scholars perceived the book less as a repository of memory and more as a type of bookkeeping system that might be consulted as the need occurred. As a card index, a book should be readable in a highly selective manner, such that each reader might obtain information *per se*. In short, the book was understood as an *ouvrage de référence* that was made not to be read from the first to the last page but to be consulted *per intervalla* (by skipping pages), as Conrad Gessner noted in the mid-sixteenth century.[44]

When scholars understood that they could entrust everything to their own filing cabinet, there was no reason not to read and select everything memorable they found in books. This experience intensified in a period when the typographic industry was whetting reader appetites that the industry itself aimed to satisfy with the continuous production of books. Thus, when Drexel boasted that students could read one hundred or six hundred authors in different languages in a day and in whatever sequence if they used his annotation

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Marcus und E. Webers Verlag, 1906); Alois von der Stein, "Der Systembegriff in seiner geschichtlichen Entwicklung", in A. Diemer (ed.), *System und Klassifikation in Wissenschaft und Dokumentation* (Meisenheim am Glan: Verlag Anton Hain, 1969), pp. 1–14; Mario G. Losano, *Sistema e struttura nel diritto. 1. Dalle origini alla Scuola storica* (Milan: Giuffrè, 2002).

43   Drexel, *Aurifodina*, p. 61: "Excerpta nobis instar bibliothecae sunt"; Johann Friedrich Bertram, *Discours von der Klugheit zu excerpiren* (Braunschweig: Renger, 1727), p. 11: "*Excerpta* sind gleichsam ein Register über eine ganze *Bibliotheque*".

44   Conrad Gessner, *Historia animalium. 1. De quadrupedibus viviparis* (Tiguri: Excudebat Christophorus Froschoverus, 1551), p. beta 1v. Cf. Ann Blair, "Le florilège latin comme point de comparaison", in *Extrême-Orient, Extrême-Occident* (Saint-Denis: Presses Universitaires de Vincennes, 2007), esp. pp. 189–190.

system (*enotandi methodus*), his hyperbole clearly displays the feeling of free-dom from the task of mnemonic reading that drove early modern scholars.[45]

The habit of excerpting inverted another essential rule. In the rhetorical cul-ture, reading too many books was considered to be a vice. Until the end of the Middle Ages, the prevailing notion was that an individual who reads too many books cannot store them in his mind, as someone who eats too much ends up vomiting. Consequently, scholars were supposed to acquaint themselves with few authorities. The common view was that someone who reads all he can is akin to a vagrant who finds many hosts but no friends.[46] Reading should not be agitated and disorganized. As Petrarca posited, scholars must stock their mem-ories – and not their libraries – with books; thus, knowledge must be stored in the mind, not filed away on bookshelves. From the copiousness of books (*copia*), only aversion and laziness (*inopia*) result.[47]

Two centuries after the invention of the printing press, in a culture that had definitively absorbed the typographic mentality, the habits of scholars radically changed. In the mid-seventeenth century, John Locke stated that a learned man is a 'a bookish one'. A century later, Johann Andreas Fabricius reinforced the notion that it was impossible to become a learned man without reading a large volume of books ("Man muß nicht ohne Bücher wollen gelehrt werden").[48] And since there was no limit to the production of new books, a type of memory was required that could provide unlimited storage.

In this respect, the evolutionary advantage of the filing cabinet becomes clear. What actually changes during the first two centuries after the invention of printing technology is the function of commonplaces. In the rhetorical cul-ture, according to Quintilian's standard definition, commonplaces were 'seats

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45   Drexel, *Aurifodina*, p. 87.

46   Cf. Sacchini, *De ratione*, esp. p. 33. The original source is Seneca, *Ep. ad Luc.*, 2. In the same letter, Seneca advised to make at least one note, to select at least one memorable thought every day ("unum excerpe").

47   Francesco Petrarca, *De remediis utriusque fortunae* (München: Wilhelm Fink, 1975), pp. 90–92 and pp. 102–104. See also Hugh of St. Victor, *Eruditionis didascalicae libri septem*, in H. of St. Victor, *Opera omnia*, ed. by J.-P. Migne (2 vols., Paris: Garnier, 1880), I, col. 796A: "Infinitus est librorum numerus: tu nolis sequi infinita" (the number of books is unlim-ited; you must not follow what has no limit).

48   John Locke, *Of study* [orig. ed. 1677], in J. Axtell (ed.), *The educational writings of John Locke* (Cambridge: Cambridge University Press, 1968), pp. 418–419; Johann Andreas Fabricius, *Abriß einer allgemeinen Historie der Gelehrsamkeit* (3 vols., Leipzig: In der Weidmannischen Buchhandlung, 1752), I, p. 52. Cf. Alberto Cevolini, "Verzetteln lernen. Gelehrsamkeit als Medium des Wissens in der frühen Neuzeit", *Soziale Systeme*, 10: 2 (2004), pp. 233–256.

of arguments', and topics were stored there in preparation for later retrieval.[49] This notion of places was practically managed through multi-chambered virtual constructions which could be supplied with images of memorable subjects. One of the essential rules of the construction of these buildings was that they should be neither too large nor too small. If they were too large, the orator might lose his bearings (i.e., he would forget). Should they be too small, there would not be sufficient space to store everything.[50]

Between the sixteenth and the seventeenth centuries, this idea of artificial memory underwent a radical change. Instead of training in walking through the storehouse, learned men compiled commonplace-books to be used – as previously discussed – no longer as mnemonic aid but as a secondary memory, a 'stable external memory', as Muratori called it, which every user could browse through to obtain information. One of the most striking effect of this transformation was that memory no longer had limits in a physical and in a structural sense, as well. Topics were no longer understood as a place for storing latency but as "a place for storing *dilations* and *expansions* of a theme".[51] As a consequence, the primary concern was no longer with training individual memory but instead with institutionalizing the advancement of learning.

To achieve this result, scholars had to abandon the certainty of permanent knowledge to which additional contributions could be made without changing the geographical order of topics, and to accept the odd, initially striking idea that knowledge is transitory and that it ages. The regular practice of annotation supported this transition by triggering a causal loop of positive feedback. In the era of the printing press, reading does not entail gathering all the knowledge that is worth being remembered but searching for interesting facts, hunting for information. Readers no longer aim to remember but to expand their filing cabinets by adding new file cards and entries that they can freely recombine. Thus, Renaissance education based on the compilation of commonplace-books changed intellectual priorities and emphasized the dismemberment of knowledge into loose entries. If students had to select commonplaces with which to compile their copybooks while reading, they also approached knowledge with dismemberment purposes, so to speak, by looking at previously compiled commonplaces. The unanticipated consequence of this approach was a type of knowledge self-reaction and the arising of combinatory habits that led to unexpected cognitive opportunities.

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49   Quintilian, *Inst. orat.*, V, 10, 20: "Locos appello … sedes argumentorum, in quibus latent, ex quibus sunt petenda".

50   *Ad Her.*, III, § 31: "Et magnitudine modica et mediocris locos habere oportet".

51   Joan Marie Lechner, *Renaissance concepts of the commonplaces* (New York: Pageant Press, 1962), p. 178.

'Storing expansions' may be understood with double meaning. On one side, the goal is to store the continual knowledge expansion enabled by the typographic industry. On the other side, the goal is to expand the storage potential of secondary memories. The card index fulfils both duties, and it is 'future-centric' in this sense.[52] Like archives and libraries, the card index is oriented towards an open future. Each new entry (or file card) provides memory with unexplored relationships and meaning associations, and every expansion reproduces additional expansibility, as a consequence.

This outcome is precisely what the rhetorical storehouse could not afford. As large as it was, it remained a closed space. Only in this way could an orator orient himself, that is remember. If he wished to add new recollections or to replace previous recollections, he had to destroy many images stored in the virtual buildings of his artificial memory. This activity was exhausting because what the orator had fixed in his mind could only be erased with difficulty. By contrast, the loosening of knowledge into elementary units and the careful maintenance of the filing system offered an unusual freedom (compared with the past). In principle, everything could be placed into the card index without regard for the consistency of the content. The primary condition was that every entry was linked to the network of references of which the memory structure consisted. The check of consistency was no longer contingent on space (the intellectual activity of medieval scholars was in fact highly similar to a local movement) but on catalogue. For the same reason, the card index was "supremely tolerant of cognitive dissonance".[53]

The function of commonplace-books also changed. Compared with topics, whose function was to store redundancy and keep it handy, early modern commonplace-books were used to reproduce variety. In the former case, the orator consulted the book to retrieve a known matter that he had forgotten over time. In the latter case, the user exploited the combinatory craft of the filing cabinet to determine what was stored and then to search for novelties. In other words, early modern commonplace-books functioned as engines of variety, not as engines of copy.[54]

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52   This concept is drawn from Krzysztof Pomian, "Les archives. Du Trésor des chartes au Caran", in P. Nora (ed.), *Les lieux de mémoire* (Paris: Gallimard, 1997), p. 4058.

53   Ann Blair, "Humanist methods in natural philosophy: the commonplace book", *Journal of the History of Ideas*, 53: 4 (1992), pp. 547–548. On the check of consistency in rhetorical storehouses and archives, see Esposito, *Soziales Vergessen*, p. 158ff. and p. 239ff.

54   I draw this opposition from Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), p. 236, who yet refers to the so called *ouvrages de référence*.

The counter-intuitive outcome is that selections made through annotations were not only a means of avoiding too much variety (i.e., too much to know) but were also a requisite for reproducing substantially more variety than before. This double performance explains Drexel's paradoxical statement in which he emphasized that Justus Lipsius had been able to develop his large and distinguished erudition ("tam *copiosa*(*m*) et illustr(em) eruditio(nem)") and to edit so many books ("tot librorum fecundita(tem)") because he had not only read a great deal but also employed a filing system. Thus, the copiousness of his scholarly production – a common feature of learned men who used card indexing systems – resulted because he learnt by *selecting* and making excerpts ("*seligendo* et excerpendo").[55]

From an evolutionary perspective, this situation could be re-described by stating that in early modern Europe, social knowledge management was re-stabilized by selecting a continual (one could also say methodical) reproduction of variety. Perhaps the most striking aspect of the evolutionary process that resulted in the construction of secondary memories is this form of dynamic stability.[56] However, the advent of typographic technology alone is insufficient to explain this evolutionary advance. The dynamic side of stability depends on the reproduction of new knowledge. In turn, this reproduction is the function of a system, that of science, which did not develop autonomy until early modernity. This change of social structures is the topic of the next chapter.

6.4   The Systemic Closure of Science

The printing press significantly changed scholars' relationship with the book, which ceased to be a proprietary good and began to be perceived as a consumer good. As a proprietary good, the book was jealously stored in a closet (the so-called *armarium librorum*) and was not made to be lent out except for copying. As a consumer good, the book became an opportunity to open a market that combined supply and demand, such that everything that could be sold was intentionally printed.

The changing relationship with the book also led to a changing relationship with knowledge. In one and a half centuries, printing technology made clear how much knowledge was available regardless of where one lived or the institution at which one was learning. Consequently, the reaction of scholars was a desire to increase and improve this knowledge store. A widely shared opinion

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55   Drexel, *Aurifodina*, pp. 18–19 (italics added).
56   Cf. Luhmann, *Die Gesellschaft der Gesellschaft*, esp. p. 492.

was that those who could 'unfold' ideas which had been only suggested (occasionally by accident) by prior authors were to be praised. Like the artist who creates a statuette from elephant tusks, scholars were supposed to improve what they found in the books of others.[57]

This educational habit eschewed the rhetorical rule of imitation. This rule caused scholars to appropriate matters developed by someone else but also to re-manage them by adding, removing, or changing reasoning such that the final outcome appeared wholly different from that which the scholars had been imitating.[58] Such was the variety of discourse, whose relationship with the imitated matters should replicate the resemblance between son and father, not that between portrait and original. Aristotle had warned the orator not to create the impression before his audience of repeating what he had learned by rote, lest he arouse suspicions in the listeners that he were setting a trap for them, like an innkeeper who waters down his wine.[59] The audience expected that the orator would repeat something already known – listeners who recognize the matters that the orator is addressing enjoy the speech, as Aristotle noted – but without seeming to be repetitive. In short, an orator was supposed to display an artificial naturalness.

The printing press led to a large redundancy and established knowledge management on the basis of second-order observation. Those who wrote in order to be published were compelled to assume that the public already knew what everyone could learn by reading. Authors expected that the reading public was looking for something new, including an emended or augmented edition of an old book. Thus, the printing press encouraged a more complicated production of knowledge. The medium of publications enabled readers to observe reading scholars. Consequently, plagiarism, that is trying to appropriate in different ways someone else's searching efforts ("in più maniere … delle fatiche d'altrui studii"), was a waste of time. Sooner or later, society would have discovered the robbery ('il ladroneccio').[60] For the same reason, while reading

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57   Daniello Bartoli, *L'uomo di lettere* [orig. ed. 1645] (Venice: Girolamo Tasso, 1845), pp. 98–100 and p. 102.

58   According to Bernardino Partenio, *Della imitatione poetica* (In Vinegia: Appresso Gabriel Giolito De' Ferrari, 1560), p. 26; reprint in B. Weinberg (ed.), *Trattati di poetica e retorica del Cinquecento* (4 vols., Bari: Laterza, 1970), I, p. 540. See also the famous letter of Francesco Petrarca, *Familiarium rerum libri*, in F. Petrarca, *Opere* (Florence: Sansoni, 1992), Book I, Letter 8, pp. 274–279, on the topic of imitation.

59   Seneca, *Ep. ad Luc.*, 84; *Ad Her.*, I, § 11 ("Ut non adparata videatur oratio"); Aristotle, *Rhet.*, III, 1404b2.

60   Bartoli, *L'uomo di lettere*, esp. pp. 77–84.

the books of others, one had to draw more attention to what was lacking in them than to what they offered.[61]

The main idea was that scholars should obtain new books from old ones. According to Daniello Bartoli, the learned man should not steal from someone else but independently discover something new ("non tòrre l'altrui, ma trovar cose nuove di suo"). Similarly, while asking whether the abundance of books that the printing press had produced did not plunge students into despair rather than encourage them, François de La Mothe Le Vayer indicated that those who publish should urge those who are coming after them to join new knowledge to their own ("exciter ceux qui viennent après eux à joindre de nouvelles connoissances aux leurs").[62]

Obviously, no one denied that by careful reading and learning, students could extend what had been stated by prior authorities. If they were to contribute to the advancement of learning, these students should have a thorough knowledge of the current state of a discipline. Careful reading was also required to avoid the illusion of stating something new that had previously been stated by another. For the same purpose, the printing press produced a new literary genre: bibliography. This genre was used to determine the number of books addressing a topic and to distinguish good books from poor books, necessary books from unnecessary books. Additionally, bibliography offered a history of the discipline concerned, i.e., a *notitia rei literariae*, and a compass for sailing, so to speak, on the ocean of publications, that is, a *notitia librorum*. In short, bibliography was a type of "secondary information memory".[63]

An odd effect of bibliography, which not coincidentally enjoyed substantial commercial success in early modern society, was that the public sharing of information begot more variety instead of more redundancy (or both simultaneously). La Mothe Le Vayer noted that the conditions of the *gens de lettres* would be depressing if students were compelled to simply repeat what the Ancients had said. By contrast, modern scholars should rely on the fact that the gardens of the Muses are public and sufficiently large to enable everyone "de s'y promener, soit par de nouveaux sentiers, soit en suivant la piste de ceux qui nous ont devancé".[64]

However, only those who read a great deal had an interest in continuing to read new books. In this respect, Muratori spoke of "dealing with many Authors"

61   Cf. Muratori, *Delle riflessioni sopra il buon gusto*, II, Ch. XVI, p. 334.

62   Bartoli, *L'uomo di lettere*, p. 85; François de La Mothe Le Vayer, *Observations diverses sur la composition et sur la lecture des livres* (Paris: Chez Louis Billaine, 1668), p. 114.

63   Luigi Balsamo, *La bibliografia. Storia di una tradizione* (Milan: Sansoni, 2000), p. 9.

64   La Mothe Le Vayer, *Observations diverses*, p. 115.

("maneggio di molti Autori") – a vice to be criticized by a medieval scholar such as Petrarca – and stated that the advantage of this 'dealing with' was that it facilitates recognizing what authors are only poorly or not at all or badly dealing with ("riconoscere ciò, che è trattato poco o nulla dagli Autori, o poco ben dai medesimi"). He added that this recognition may encourage scholars to more successfully address the same topic ("può servire [all'erudito] d'incentivo per trattare meglio, e con più fortuna, quella stessa Materia"), and that such improvement is highly desirable because most of beauty consists of novelty ("nel Nuovo consiste non poca parte del Bello").[65]

This appeal to novelty, which spread during the seventeenth century, is striking because it is autological. To appeal to the production of new knowledge is itself a novelty. In evolutionary terms, it is a deviation compared with the preference for the repetition of old knowledge that prevailed in the rhetorical culture. The question nonetheless remains: what does this novelty consist of? The novel habit of looking for novelties (which in modern society is nearly an obsession) is that 'new' is no longer considered to be what simply clashes with or ridicules a transmitted tradition but what has not yet been stated and cannot be found elsewhere. The concept of 'novelty' is thus temporalized. The primary difference is no longer between conformity and deviance but between known and unknown.[66]

The printing press created the right circumstances for this reassessment because it offered a clear rule for determining what is truly new: in the typographic era, new is what is published for the first time. Contemporaneously, the printing press took advantage of this market opportunity. During the seventeenth century, hundreds of books were published whose titles used the adjective 'new' – a type of banner to promote sales.[67] However, the most

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65   Muratori, *Delle riflessioni sopra il buon gusto*, II, Ch. XVI, p. 334. This statement is even true for history: it must not only be useful but also able to state something new because human minds are not willing to be bound to those who compel them to read something they already know (Muratori, *Delle riflessioni sopra il buon gusto*, II, Ch. XIII, p. 262). See also Saint Pierre, "Lettre sur la métode des extraits", p. 22: "Ainsi une pensée est belle à proporsion qu'elle paroit ranfermer quelque choze de nouveau, de grand, d'inportant".

66   Cf. Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1990), esp. pp. 216–220.

67   Cf. Luhmann, *Die Wissenschaft der Gesellschaft*, p. 296; Lynn Thorndike, "Newness and novelty in Seventeenth-Century science and medicine", in P.P. Wiener and A. Noland (eds.), *Roots of scientific thought. A cultural perspective* (New York: Basic Books, 1957), pp. 443–457 determined that terms like *novus* and *inauditus* arose at the end of the sixteenth century and were disseminated in the seventeenth century. They mostly appeared in the titles of scientific (astronomical, chemical, and medical) works. However,

relevant novelty was that what was new was no longer perceived as an affront to the old. Knowledge was now understood as a contingent observation of reality, i.e., an ever perfectible system that could be likely improved if the search were continued. Muratori describes these circumstances when he states that learned men, such as Gassendi, Bacon, Vives and Descartes, admitted that scholars must revere Aristotle, Galen, and Ptolemy but that such reverence should not prevent the *freedom of improving the search for Truth* and of renouncing these learned men and their doctrine if reasoning, principles, and *more probable* or better grounded *systems* are available ("si dee venerare Aristotele, Galeno, Tolomeo, ma che tal venerazione non dee impedire *la libertà di meglio ricercare il Vero*, e di abbandonargli, ove si parano davanti ragioni, sentenze, e *sistemi più verisimili*, o meglio fondati").[68]

In fact, in modern science, the semantics of novelty plays an important part. From the sixteenth century onward, science and novelty legitimate one another. The semantics of novelty disseminated by the printing press by continually publishing new books encourages the differentiation of a social system specialized in the communication of scientific research. Subsequently, science encourages scholars to search for new knowledge and publish their scientific discoveries.[69] Moreover, the function of the system of science is not to search for truth but for new knowledge. Like every binary code, the distinction between true and false is simply used to structure the self-production of information by the system. The positive value of the code, that is, truth, cannot become a goal or be exploited in striving to achieve a goal. Otherwise, science would risk becoming a form of epistemological fundamentalism. Once the truth was achieved, ultimate knowledge would be available, and any additional knowledge gained would inevitably be false. This development would mean the end of science, that is, the shutting down of its operations. Moreover, scientific results should not be manipulated for purposes of extra-scientific aims, such as juridical decisions or economic profit.[70] Like every functionally differentiated

it is worth being remembered that often these works were not so innovative as they proclaimed. Authors simply tried to fulfil reader expectations.

68   Muratori, *Delle riflessioni sopra il buon gusto*, I, Ch. V, p. 172 (italics added). See also Niklas Luhmann, "Die Ausdifferenzierung von Erkenntnisgewinn: Zur Genese von Wissenschaft" [orig. ed. 1981], in N. Luhmann, *Ideenevolution. Beiträge zur Wissenssoziologie*, ed. by A. Kieserling (Frankfurt am Main: Suhrkamp, 2008), p. 169: the one who challenges authorities does not behave 'pietätlos' (without pity).

69   Cf. Luhmann, "Die Ausdifferenzierung von Erkenntnisgewinn", p. 168ff.; Luhmann, *Die Wissenschaft der Gesellschaft*, esp. p. 297.

70   Cf. Luhmann, "Die Ausdifferenzierung von Erkenntnisgewinn", p. 143ff.; Luhmann, *Die Wissenschaft der Gesellschaft*, p. 194ff., p. 271ff., and p. 371.

system, science is not teleological. Its primary concern is the reproduction of its own operations, which occurs only when the scientific research that has been produced prompts the reproduction of new knowledge.

A prerequisite and simultaneously unexpected effect of this reproduction of elements (i.e., communication events) on the base of elements reproduced by the same system is that both knowledge and not-knowledge increase. According to a contemporary source, the issue is that the more we read, the more we learn that we are ignorant and that we know less ("quanto più si legge, tanto più s'impara, che siamo ignoranti, e che men sappiamo").[71] Such paradox assures science an inexhaustible supply of operational power. There is no total amount of knowledge. Thus, every gain in knowledge that science achieves through the reproduction of its operations does not represent a progressive depletion of available supplies. Instead, like economic system, science is growth-oriented. Here, again, a comparison with rhetorical culture is instructive.

Throughout the Middle Ages, the opinion was widely shared that one who skips from one book to the next in the thirst for knowledge lives in a condition of restlessness. Erratic behaviours produced by reading lead to anxiety and carelessness. On the contrary, in modern science, what is faulted is the publication of what is previously known. To make collections and to transform a discipline into a system suggests a lack of mind. Memory and intelligence are perceived as opposite faculties of the soul. Those who are learning know that they do not know. Scholars are deserving of praise only if they contribute to science in the form of a knowledge gain. Science operates in a condition of continual restlessness that science itself creates. In this sense, science operates as an autopoietic system.[72]

The system of science can perform its function because it operates recursively. To know what is new, one must first know what is old. In fact, this knowledge is required to determine what is lacking, what might be better stated – in short, what the observed observer did not grasp. A side effect of this combination of known and the unknown is that the more that the world is new, the more it is old. Every information gain enables knowledge to increase, and future inquiries must investigated this increased knowledge as part of the search for information. Thus, scientific inquiry is not a sequence produced by the sum of discoveries. Instead, it is a circular process produced by the combination of past consistencies and future perspectives, which are contingent on one another. Bartoli masterfully expressed the circular nature of this

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71   Muratori, *Delle riflessioni sopra il buon gusto*, II, Ch. XVI, p. 330.

72   Cf. Luhmann, *Die Wissenschaft der Gesellschaft*, p. 371 (autopoiesis is a type of "sich selbst fortsetzende Unruhe").

recursiveness when he realized that when scholars search for what no one has discovered, they eventually discover what no one has searched for.[73] Finally, the issue is that the scholar who searches for a solution finds problems. In this sense, science functions as a historical machine – and the card index too.

The recursiveness of scientific communication is performed through the medium of publications. The printing press is a basic condition for the recursive reproduction of science because it fundamentally changes the nature of the book, as previously discussed, which is now understood as a special form of artificial memory. Thus, scientific communication gains an autonomy that is largely independent of the consciousness of researchers.

In this respect, printing offers many advantages. First, it standardizes texts, so everyone can rely on the same references when addressing knowledge. Such references are used not only to link observations recursively but also to perform second-order observations. For instance, the footnote is a paratextual device produced by typographic technology that enables readers to view not only what the author read but also (and particularly) what he did not read. In this way, Muratori's advice is effectively put into practice.[74]

Besides, publications provides ideas with social life. Thus, ideas can be embedded in a web of references that selectively reproduce the joining capacity of scientific communication, which helps 'thicken' that inner referentiality within the universe of available publications that forces every observation made in the same universe to be observable.[75] In turn, knowledge is de-anthropomorphized, which, again, represents an essential boost to scientific advancement. Publications have their own market and are publicly available thanks to the modern institution of the library. Hence, plagiarism can be easily discovered

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73   Bartoli, *L'uomo di lettere*, p. 87.

74   Cf. Niklas Luhmann, "Contingency as modern society's defining attribute", in N. Luhmann, *Observations on modernity* (Stanford, CA: Stanford University Press, 1998), p. 58: the author must enable "others to observe how and what he has observed". On the history of footnote see Anthony Grafton, *The footnote. A curious history* (Cambridge, MA: Harvard University Press, 1999). Contrary to the argument of Rudolf Stichweh, "Die Autopoiesis der Wissenschaft", in D. Baecker (ed.), *Theorie als Passion* (Frankfurt am Main: Suhrkamp, 1987), esp. p. 460, I think that every quotation embedded in a footnote is not a form of hetero-reference but of self-reference (of scientific knowledge). This fact became definitively clear in the mid-twentieth Century, when the first citation indexes for science were designed to highlight associations of ideas based on the assumption that ideas themselves are not mental states but structures of communication.

75   Cf. Luhmann, *Die Wissenschaft der Gesellschaft*, p. 321 and p. 432. See also Christoph Meinel, "Enzyklopädie der Welt und Verzettelung des Wissens: Aporien der Empirie bei Joachim Jungius", in F.M. Eybl et al. (eds.), *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung* (Tübingen: Max Niemeyer, 1995), esp. p. 167.

in a society in which publications circulate. Nevertheless, it is meaningless to claim as property the knowledge offered "to the Publick" in a Commonwealth of Learning. Like a spoken language, knowledge 'divulged in print' belongs to everyone, although everybody makes a personal use of it.[76]

The outcome of the early modern transition from a rhetorical culture to a typographic mentality is the *autopoietic closure* of the social system of science.[77] All knowledge that the printing press makes visible prompts scholars, as La Mothe Le Vayer stated, to join new knowledge with old knowledge. In fact, those who wish to speak in the system of scientific communication cannot do so at will. Each communication is an event within a recursive network of communications of the same type that must be addressed by the speaker. Science reproduces itself if it can steer this recursiveness, which implies the reproduction of variety through selection. In this respect, Bartoli observed that in the field of scholarship the outcome of previous inquiries should be used as a starting point for additional research and that scholars must commence where a predecessor left off ("servono a noi di principii, quelle [conoscenze] che ad altrui furono conseguenze, e di lì cominciamo noi a cercare, dove essi cercando finirono"), which is a well-phrased formulation of the primary rule of every autopoietic process: every end is a starting point for subsequent operations.[78] Moreover, this autopoietic closure fosters the temporalization of systemic elements. Without the self-reaction of knowledge that publications accelerate and the relieving of consciousness by means of secondary memories, the continual search for novelty could not be borne by society. By comparison, the intellectual habits of medieval scholars and their management of cognitive energies were a viable reaction to the available media.

6.5   The Aim of Studies

In sum, the primary hypothesis of this essay is that the cognitive openness of the card index is a co-evolutionary outcome of the operational closure of the system of science. In short, the card index is a secondary memory that fits the

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76   Chambers, *Cyclopaedia*, I, Preface, p. xxix. See also Mamiani, *La mappa del sapere*, p. 11ff. and p. 29ff.

77   Cf. Luhmann, *Die Wissenschaft der Gesellschaft*, p. 432.

78   Bartoli, *L'uomo di lettere*, p. 202; Luhmann, *Die Wissenschaft der Gesellschaft*, p. 319 ("Jedes Ende ist zugleich ein Anfang"). This connection means dynamic stability again. According to Marin Mersenne, *Les questions théologiques, physiques, morales, et mathématiques* (Paris: Chez Henry Guenon, 1634), q. 23, p. 114, "l'on desire *toujours passer outre*, de sorte que le veritez acquises ne servent que de degrez pour arriver à d'autres" (italics added).

systemic closure of scientific communication. In fact, memory is not something that is inserted into the system from the outside (thus, if the systemic reference is the communication system, it is meaningless to state that the secondary memory is an 'external' memory). Instead, it is the arising outcome of recursiveness in the self-reproduction of systemic operations. The card index is open because the system of science is closed. It embodies openness because of closure. This hypothesis prompts several additional speculations.

First, how can the difference between redundancy and variety – between old and new – be managed? The matter is not simply one of producing new books from old ones. The question is: how is it possible to cope with an open future that leaves a continually expanding past in its wake? In the typographic culture between 1550 and 1750, one can perceive an increasing intolerance of the rhetorical order of knowledge and of a pre-arranged topography of commonplaces in which memorable things and words were to be stored. That certain scholars – such as Bacon – preferred a loosening of knowledge into elementary units (e.g., aphorisms) is evidence of the modern intellectual habit, which consists of saving cognitive energies and relinquishing memory in favour of information processing.[79] This change went largely unnoticed because the loosening occurred by means of the same commonplaces that tradition had transmitted and taught scholars to compile in order to create an abundant and ever-convenient supply of communicable knowledge. A number of scholars strongly resisted this dismemberment. Many learned men in fact advised that commonplace-books should be organised according to the structure of a given discipline or simply by copying subject matter from among the universal topics that the publication of florilegia had made easily available in early modernity.

By contrast, those who grasped the cognitive advantage of evolution preferred a looser order – an order based (in a sense) on the seeming lack of order of the commonplace-book. On the one hand, there were those (e.g., Johann Friedrich Hodannus) who suggested compiling *excerpta methodica* (systematic excerpts). Readers should arrange their notebooks in advance by carefully dividing the space for collecting topics *naturali ordine* (according to the natural order of the matter – nearly an oxymoron). This filing system would have saved

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79   Cf. Lorraine Daston, "Perché i fatti sono brevi?", *Quaderni storici*, 108 (2001), pp. 745–770; Lorraine Daston, "Taking note(s)", *Isis*, 95 (2004), pp. 443–448. See also Carlo Augusto Viano, "La biblioteca e l'oblio", in P. Rossi (ed.), *La memoria del sapere. Forme di conservazione e strutture organizzative dall'antichità a oggi* (Rome and Bari: Laterza, 1988), esp. pp. 249–251.

the effort of compiling and skimming through a subject index.[80] On the other hand, those who were of the opposite mind (e.g., Jeremias Drexel) encouraged students to adopt a filing system that enabled them to copy any memorable matter into their notebooks while reading or listening without excessive concern for order. Order could be re-constructed later when the students would recombine topics and matters using an alphabetical subject index.[81]

Filing systems of this type share the practical advantage that they do not slow reading or tire readers. Moreover, they make comparisons possible and relationships visible, which in a 'systematical' organization of knowledge was otherwise hidden by the order of the discipline. In economic terms, these methods save paper and avoid the inconvenience of notebooks increasing in number although they are half blank (because although certain entries are quickly stuffed, many lack annotations). Thanks to the standardization of texts produced by the printing press, excerpts (*adversaria*) can even be replaced by bibliographic references (*lemmata*). The latter may simply contain author's name, the publication year, and the numbers of the pages on which the respective topic can be found. That no one would choose to learn such information (i.e., alpha-numeric references) by rote is also compelling evidence that the commonplace-book was considered a device to enable forgetting, rather than a memory aid.

The dismemberment of knowledge became literal as scholars abandoned bound notebooks and adopted loose file cards. Personal accounts well supplied with documentary evidence, such as those of Conrad Gessner, Joachim Jungius, Robert Boyle, Secondo Lancellotti or Ulisse Aldrovandi, in addition to Thomas Harrison's invention of the *arca studiorum*, suggest that the greater that the loosening was, the larger the combinatory craft became that could be employed to process information. Order became an ex-post outcome – as opposed to an ex-ante requisite – for knowledge production. Its function was no longer to get one's bearings in a virtual space to retrieve memorable matters but to determine what had not yet been stated. Indeed, as Johannes Sturmius pointed out in the mid-sixteenth century, the basic idea was that it

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80   Cf. Johannes Fridericus Hodannus, *Ars excerpendi nova prorsus ratione exculta, sistens titulos philosophicos & theologicos ad excerpta methodica conficienda necessarios* (Brunsvigae: Literis Henrici Kelseri, 1702); Johannes Fridericus Hodannus, *Adminicula sapientiae atque eloquentiae, sive exempla artis methodice excerpendi* (Hanoverae: Sumptibus Nicolai Foersteri, 1713), § 20, p. 22, and § 23, p. 24.

81   Those who adopted Drexel's filing system could indeed annotate everything "nihil attendendum ad ordinem: quo res loco venerit, eo recipiatur; in solo indice ordinata series Alphabeti observanda". Drexel, *Aurifodina*, p. 87.

is impossible and tiresome to learn so many topics by rote. Instead, it is more useful to remember where one can retrieve what one has forgotten.[82]

The outcome of this praxis was large and seemingly chaotic collections of scraps and paper slips glued onto bound sheets, stored in canvas bags, or hung upon hooks, as the scholar who owned a filing cabinet of the type invented by Thomas Harrison and technically improved by Vincent Placcius was supposed to do.[83] The result was an arranged chaos, a *sylva* (forest), as early modern scholars often called it, whose advantage was that the one who fed it had a "nice own Capital" ("buon Capitale proprio"), as Muratori stated.[84] In fact, as money loosens bonds and keeps the present past available to an undetermined future, so the dismemberment (performed through commonplaces) of the topical order of transmitted culture 'capitalizes' knowledge that anyone can obtain through publications made for the purpose of producing new knowledge.[85] In this sense, whereas the rhetorical storehouse preserved tight couplings, i.e., combinations, the filing cabinet stores loose couplings, i.e., combinatory opportunities. Moreover, as in the case of money, the use of entries does not exploit the combinatory craft. Instead, it reproduces and increases it by equipping the structure of secondary memory with new references and links. Memory can perform this combination of loosening and recombination because when the work is finished, the file cards are re-entered into the filing cabinet in their right places without leaving a trace. In other words, their previous use is forgotten. The filing cabinet exploits information-processing possibilities, i.e., saturates cognitive energies that only occupy the time required to edit a text. Immediately thereafter, they are released for

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82   Johannes Sturmius, *Linguae Latinae resolvendae ratio* (Argentorati: Excudebat Nicolaus Wyriot, 1581), p. 51: "Scire enim ubi possis invenire, quae memoriae non mandas, satis est".

83   Cf. Placcius, *De arte excerpendi*, p. 124ff. On this invention, see Malcolm, "Thomas Harrison and his *Ark of Studies*", pp. 196–232. On loosening and dismembering practices in early modern Italian culture, see also Alberto Cevolini, "The art of *trascegliere e notare* in early modern Italian culture", *Intellectual History Review*, 26: 4 (2016), forthcoming.

84   Muratori, *Delle riflessioni sopra il buon gusto*, II, Ch. VII, p. 134. On the literary genre called *sylva* and its Renaissance success, see Paolo Cherchi, "La selva rinascimentale: profilo di un genere", in P. Cherchi (ed.), *Ricerche sulle selve rinascimentali* (Ravenna: Longo, 1999), pp. 9–41. Cherchi notes that the success of these books was based on their ability to prompt reader curiosity through an erudition that was in fact not new in the least.

85   Here again secondary memories display structural features which are common to the whole modern society. See Giancarlo Corsi, "Die Ordnung der Zahlen und die Intrasparenz der Öffentlichkeit", in A. Cevolini (ed.), *Die Ordnung des Kontingenten. Beiträge zur zahlenmäßigen Selbstbeschreibung der modernen Gesellschaft* (Wiesbaden: Springer VS, 2014), esp. pp. 65–66.

unforeseeable future uses. To achieve this result, there are two requisites: selection and order.

Regarding selection, the issue is that the reader must exclude something if he desires to store a memorable content in the cabinet. In fact, what is excluded while reading is substantially more than what is selected for annotation. To select everything would mean to exclude nothing. As a result, one would no longer know what is worth remembering and what instead can be forgotten. By contrast, to select nothing would be to exclude everything. As a result, the book would have been read in vain. As Drexel observed, to read without selecting anything means to be negligent.[86] The counter-intuitive effect of these assumptions is that forgetting is required if one wishes to remember something.[87] Against the background of what is excluded and thus forgotten, selection is clearly a difficult task. Every exclusion makes selection contingent. What was excluded might also be selected, and what was selected might be useless in the future. In this respect, the text to be read provides no instruction. The reader must hold himself responsible for what is discarded, and keeping records is a risky operation, in this sense.

Selection alone is insufficient. If excerpts were roughly piled up without an order that make them retrievable as the need occurs, the filing cabinet would be useless. Therefore, the card index must be equipped with an inner structure, and excerpts must be linked to a network of references that the user can access to learn how the card index reacts to his promptings. What is not linked is inevitably lost and can be retrieved only by accident.

The obsession for order that is widespread in the early modern literature on libraries and card indexing systems demonstrates that the founders of these secondary memories were aware that the failure or success of this new form of remembering depended on the question of memory's inner structure. According to Daniel Georg Morhof, no library should lack order. Johann Heinrich Hottinger believed that a library without order was like a buried treasure that no one could enjoy. Christoph Just Udenius noted that to make excerpts and then place them into the filing cabinet without any order was a waste of time and would be the same as if one had made no excerpt at all.[88]

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86   Drexel, *Aurifodina*, p. 2: "Legere, & nihil seligere, meo judicio, prorsus negligere est".

87   "Discarding and forgetting are crucial to effective information management" (Blair, *Too much to know*, p. 65). On the memory function of continuous discrimination between remembering and forgetting, see Elena Esposito, "Social forgetting: a systems-theory approach", in A. Erll and A. Nünning (eds.), *A companion to cultural memory studies* (Berlin and New York: Walter de Gruyter, 2010), p. 181ff.; Esposito, *Soziales Vergessen*, p. 27ff.

88   Morhof, *Polyhistor*, Book I, § 1, p. 34: "Nulla sine ordine Bibliotheca est, aut esse debet"; Johann Heinrich Hottinger, *Bibliothecarius quadripartitus* (Tiguri: Sumptibus Melchioris

The relationship between order and selection offers an opportunity to return to the temporal speculation that Saint Pierre introduced to justify the habit of note-taking. The early modern literature on filing systems nearly obsessively repeats that one must extract from readings only what is considered to be of future utility.[89] This advice is tautological: one must remember only what is memorable, and one must keep available for future use only what is useful. The situation is exacerbated when one tries to avoid tautology. How is it possible to know in the present which past one will require in the future? No one can foresee under which circumstances he will discriminate between recollection and forgetting. Drexel's advice "Excerpe, & Nota; selige, ac futuro para"[90] (make excerpts, and take notes; select, and keep ready for the future) outlines the problem but does not solve it. Early modern users of secondary memories found a solution in the notion of 'aim'.

In abstract terms, an aim is a future-referred difference that inserts an asymmetry into the observer's self-referential circularity. In this manner, the arbitrariness of the present becomes contingency.[91] The future is closed in the form of a certain aim, whereas the past is open to several viable options. The observer has no certainty regarding correct behaviour. However, he can at least find his way in an otherwise dumb reality, and he can observe himself while striving to achieve his aim. Thus, the future of the filing cabinet is simultaneously open and closed. It is open insofar as the archive is indifferent to what can be stored, and thanks to this indifference, it is an universal machine. It is closed insofar as the one who files does not file haphazardly. These

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Stauffacheri, 1664), p. 3; Christoph Just Udenius, *Excerpendi ratio nova, das ist eine neue Art und sonderbare Anweisung, wie die studirende Jugend in jeden Wissenschaften, Disciplinen, und Fakultäten, vornemlich aber in Theologia Homiletica ihre Locos Communes füglich einrichten* (Northusae: Sumptibus Johannis Daeterstadii Bibliopolio, 1687), p. 61: "Denn ob gleich einer viel auss den Büchern *excerpirt*, nicht alles aber ordentlich einträget, und wenn ers benöthiget, nicht wieder finden kann; so ists eben alss wenn er nichts *excerpiret* und alle Mühe vergebens angewendet hätte".

89   Among many others, see Placcius, *De arte excerpendi*, p. 27 (scholars should excerpt "sola *notatu digna*, id est utilia futura"). Fridericus Sidelius and Paulus Sigismundus Schubart, *Positiones XXXIV de studio excerpendi* (Ienae: Fickelscher, 1713), Positio 7, p. 8, similarly argued that at any time, scholars must handy keep all memorable things that are required ("illa, quae occurrunt, memorabilia suo tempore in promptu habere"). The same rule can be found in Caspar B. Sagittarius, *Commentariolus modos excerpendi omnium ordinum studiosis summa cum cura monstrans* (Helmstadii: Süstermann, 1703), p. 3.

90   Drexel, *Aurifodina*, p. 290.

91   Cf. Niklas Luhmann, "Selbstreferenz und Teleologie in gesellschaftstheoretischer Perspektive", in N. Luhmann, *Gesellschaftsstruktur und Semantik. Studien zur Wissenssoziologie der modernen Gesellschaft* (4 vols., Frankfurt am Main: Suhrkamp, 1981), II, esp. p. 32ff. and p. 41.

circumstances do not prevent the production of chances. The aim can be determined in such generalized terms (for instance, 'future utility', 'all you must remember') that even an unforeseen reading, a suddenly emerging idea, a pure coincidence, can become an opportunity to enlarge the filing cabinet with an excerpt or a new associative link. In addition, the storage of this material is so loose that the outcome for the reader who is coping with the filing cabinet is the selective production of surprises.[92]

However, memory has no aims. Recollections cannot be planned. On the contrary, secondary memory must be arranged in a manner that enables recollection to be operatively managed. The aim of the aim is simply to transform a vicious circle into a virtuous circle. In turn, secondary memory remains a historical machine that functions recursively. Thus, it is meaningless to ask how one should begin to make excerpts to maintain one's own card index. If a structure is provided, the beginning is simply the system's self-referentiality. Social memory always arises 'in the meantime', so to speak. A new topic is comprehensible if it is linked to the network of meaning references that is reproduced by those same ideas that society uses to communicate. Topics appear and disappear. They may remain buried in books for long periods and suddenly re-emerge when evolution makes them interesting in a changed frame of meaning associations. Such was the case of the ancient *ars excerpendi*. With respect to this type of memory practice, Michael Kirsten pointed out that students first must acquaint themselves with the discipline they will annotate if they wish to make excerpts in a fitting, efficient way. And Placcius recalled that Kirsten persuaded him, when he was young and eager, to delay excerpting so he would not pile up incoherent annotations that he would be compelled to destroy.[93]

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92   On the production of chances by means of filing systems, see Luhmann, "Kommunikation mit Zettelkästen", esp. pp. 53–54 and pp. 59–60. The principle of chance had been formulated by Jean Paul too. Cf. Götz Müller, *Jean Pauls Exzerpte* (Würzburg: Königshausen & Neumann, 1988), esp. p. 321; Alberto Cevolini, "Teoria e storia della schedatura", *Storiografia*, 10 (2006), esp. pp. 75–76.

93   Michael Kirsten, *De excerptis colligendis* (c. 1667), Ms. in Nachlass Joachim Jungius, Hamburg, Staats- und Universitätsbibliothek, Wo. 28, Ch. II, § III, fol. 1012; Placcius, *De arte excerpendi*, p. 45. In his book review to Placcius' handbook on excerpting systems, Tentzel focused on this point and noted that those who are not acquainted with the discipline run the risk of excerpting either too few or too much or in the wrong way ("entweder zu wenig, oder zu viel, oder in unrichtiger Ordnung"), thus bitterly regretting time and effort they wasted to perform their labour ("die Zeit und Mühe, so darauff gewendet"). Cf. Wilhelm Ernst Tentzel, *Monatliche Unterredungen Einiger Guten Freunde, von Allerhand Büchern und andern annehmlichen Geschichten; Allen Liebhabern der Curiositäten zur Ergetzlichkeit und Nachsinnen herausgegeben; Junius 1689* (Thoren and Leipzig: In Verlegung Johann Christian Laurers and Bey Johann Friedrich Gleditschen, 1690), p. 629.

Johann Amos Comenius: Early Modern Metaphysics of Knowledge and *ars excerpendi*

Iveta Nakládalová

7.1 Introduction

Excerpere, the habit, so to speak, of note-taking and making summaries and annotations while studying a text, is an ancient practice. It was not, however, until the early modern period that specific treatises – *artes excerpendi* – devoted entirely to the methodology of systematic compilation and scholarly reading were produced.

In general, contemporary scholarship emphasizes two key aspects of *excerpere*. It is linked, on the one hand, to rhetorical artifice. It constitutes an efficient device for invention with respect to the categories of verbal abundance and copiousness (*copia verborum*), since the annotations serve as repositories for textual fragments (commonplaces, *exempla*, maxims, *sententiae*, *adagia*, etc.) which can be reused in future discourse. On the other hand, *excerpere* also serves as a tool for managing knowledge, as a means of acquiring, storing, sorting, and organizing factual information.[1] As such, it represents an important epistemological formula, a powerful strategy for selecting, assembling and classifying appropriate knowledge. Both of these aspects are closely related to mnemonics and the rules of artificial memory and both can be found in the multiple genres of early modern scholarly *collectanea* (the polyantheas, florilegia, repertoires, theatres and storehouses of wisdom and learning), in other words, all the forms of scholarly *compendia* that were built up to a great extent on textual accumulation and compilation. These reference works, key instruments of pre-modern textuality, were already used in the Middle Ages, although their massive expansion was observed in particular in the second half of the sixteenth century, and systematic treatises on *excerpere* appeared from the beginning of the seventeenth century.

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1 Ann Blair, "Note-taking as an art of transmission", *Critical Inquiry*, 31: 1 (2004), pp. 85–107, at p. 85: "Notes can take many forms – oral, written, or electronic. At its deepest level, whatever the medium, note taking involves variations on and combinations of a few basic maneuvers, which I propose to identify as the four Ss: storing, sorting, summarizing, and selecting".

One of the chief reasons in fact why the *artes excerpendi* were omnipresent in the seventeenth century is to be found in the spread of the printing press, which led to the multiplication of books (*multitudo librorum*) and a quantity of written material that was impossible to grasp, retain in the memory or control without a specific methodology. This feeling of *information overload* pervaded contemporary imagery,[2] as a 1640 entry in one of Samuel Hartlib's diaries shows: "If wee had but gathered all that which is known and done already O what a world of profitable matters should wee enjoy. But now all things are confounded within themselves, the first and last degrees are neglected and the middle untowardly followed".[3] In this context, *excerpere* tackled the necessary task of reducing *multum in parvo* by filtering, selecting and cataloguing the material extracted from books.

This process of reduction and abstraction was, nevertheless, characterized by several major paradoxes. The first is that the ultimate aim of *excerpere*, gnoseological *oeconomia*, was achieved precisely by means of managing the *abundantia*, by the accumulation of different passages. Furthermore, *excerpere* in general, and the multiple varieties of the learned *collectanea* in particular, aspired to transmit a sort of *collective secondary memory*, a more or less stable, bounded body of knowledge that was public and collectively agreed upon, and carried out using a common *methodus*.[4] At the same time, however, *excerpta* also formed a sort of personal archive, the result of a highly individualized practice and an intimate trace of private memory.

Many cases of note-taking practice, moreover, display no systematization at all (or follow criteria that are highly individualized and heterogeneous, as different personal commonplace books clearly show). Nonetheless, the *excerpere* methodology, for the most part, adopts a complex organizational logic in an effort, not only to select and accommodate the most important facts, but also to impose order on them by assigning the excerpts to appropriate headings or

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2   See the monographical edition of the *Journal of the History of Ideas*, 64: 1 (2003), entitled "Early modern information overload".

3   Hartlib Papers 30/4/60B, Ephemerides 1640, quoted in Richard Yeo, *Notebooks, English virtuosi, and early modern science* (Chicago and London: The University of Chicago Press, 2014), at p. 100.

4   For *excerpere* as a collective practice, see Yeo, *Notebooks*, Ch. 8 ("Collective note-taking and Robert Hooke's dynamic archive"). As a matter of fact, Comenius also recommends the practice of collective note-taking: "Vel per studium socium. Legant aliquot socij, singuli singulos authores, excerpentes omnia notabilia, et consignantes in Loc. Comm. certo autem tempore convenientes conferant in unum, et referat qvisque qvid legerit, et caeteri sibi consignent idem". Johannes Amos Comenius, *Pansophia*, in J.A. Comenius, *De rerum humanarum emendatione consultatio catholica* (2 vols., Pragae: Academia, 1966), I, p. 517.

categories. In fact, the aim of *excerpere* adopted by many forms of learned *collectanea* in the prescription of *loci* (conventional rhetorical and logical classes) was often to set up a *hierarchy* or *map of knowledge*, to systematize learning in a coherent and functional way and provide tools (indexes, tables, cross-references) that enabled the rapid retrieval of the information. From this point of view, *excerpere* is often seen as universal systematization and can be applied to all branches of study, not just to rhetoric and dialectic. According to Leopoldus Dickius, for example, the author of a sixteenth-century educational treatise (*De discendi atque docendi ratio*, 1588), every discipline should be sorted into *loci communes* and all extracted passages should be classified according to them, "nihil enim est, quod has effugere possit".[5] In short, as some authors have reported, the purpose of the methodology is to create a sort of compendium of knowledge that is both coherent and complete, which brings it very close, of course, to the contemporary encyclopaedic enterprise. In the description of his famous *machina*, to quote just one example, Vincent Placcius states explicitly that his invention would serve the purpose of Comenius' *Pansophia* ("I leave for others to judge in what measure this invention of mine can contribute to the purpose of establishing the renowned Comenius' *Pansophia*").[6] His observation brings us directly, then, to the protagonist of the present study, Johann Amos Comenius, who, in his brief treatise on *excerpere* entitled *De primario ingenia colendi instrumento solerter versando libris, oratio*, defined the practice of taking notes as a tool for creating a map of knowledge, a way to

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5   Leopoldus Dickius, *De optima studiorum ratione, idq. in omni facultatum genere methodus*, in *Institutionis literatae, sive de discendi atque docendi ratione tomvs tertius* (Torunii Borussorum: Excudebat Andreas Cotenius, 1588), pp. 756–804, at p. 776: "In primis studiosis omnibus maxime necessarij sunt Loci communes, non absq. ratione praescripti; in quos referant, reponant & describant, quicquid legendo vel audiendo assecuti fuerint: vt ex huiusmodi thesauro possint, quamdocunq. necessaria materia se offeret vel dicendi vel scribendi, quacunq. mox expromere, & facilem copiam in numerato habere. Ad hos locos recte constituendos, partienda erit vniversa doctrina mossa, seu ipsa philosophia, in Rationalem, Moralem, & Naturalem. Et in has tres classes omnium autorum scripta congerenda sunt: nihil enim est, quod has effugere possit. Huiusmodi loci licet pro cuiusque arbitratu siant, est tamen ordo attendendus, quem nonnulli suis scriptis indicarunt".

6   Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689), p. 148: "Quantum autem inventum hoc *ad* nobile illud Clariss. *Comenii de Pansophia* ornanda *propositum*, omnium sane litteratorum, Magnatum, Academiarum, Principum votis, auxiliisq. fovendum, *conferre possit*, (nisi commodiorem forte viam aliquam, sublime illud ingenium ante hac excogitavit) aliis judicandum relinquo, ubi certe multorum (ut video) oculis manibusque in legendis auctoribus, rebusq. exscribendis uti necesse erit, licet paucorum, aut unius tantum in recensendis, dijudicandis, methodoque justa componendis judicio & acumine".

attain *polyhistoria* (that is, of becoming an *omniscius*), since it was only by excerpting that a scholar could acquire sufficient complete knowledge to enable him to be called a "living mobile library" (*viva et obambulans bibliotheca*).[7]

7.2 Johann Amos Comenius' *Pansophia*

Comenius was a seventeenth-century Moravian theologian, philosopher and polymath, acclaimed especially for his pedagogical reform (no modern account of his life and works fails to refer to him as "the father of modern education"). It should be added, though, that he was, first and foremost, the architect of an elaborate noetic project and epistemological *methodus*, closely linked to the contemporary encyclopaedic pursuit of complete knowledge, and even his pedagogical reform should always be considered as part of this broad philosophical framework.

The objective of the present study is to examine Comenius' model of *Pansophia*, or "generall knowledge", which can be understood not only as a direct response to endless multiplication in the *farrago of books*,[8] but also as a potential solution to Samuel Hartlib's *epistemological distress* regarding the confusion of things 'within themselves'. My chief purpose is to review and compare some of the essential assumptions, premises and metaphorical imagery informing the practice of *excerpere*, on the one hand, and the pansophical project, on the other. I shall examine the aims that they set out to accomplish, and the

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7   Johannes Amos Comenius, *De primario ingenia colendi instrumento solerter versando, libris, oratio*, in *Johannis Amos Comenii Opera Omnia* (27 vols., Pragae: Academia, 1992), XV/3, Ch. IV, § 110, p. 280: "*Quartus fructus* erit, *quod hoc opulenter congeasto excerptorum thesauro tuo, rem incredibilem obtinere poteris: ut vel sexcentos authores uno die percurrere et in dubiis consulere* (tot nempe, quot legisti et emedullasti) *possis; ut quasi nihil noxie ignores; ut viva et obambulans bibliotheca dici queas; ut omniscius videaris*, oraculi instar (apud imperitos hujus arcani) habendus".

8   "*Jacobus Acontius*, a most excellent man, offended at the evill disposition of our scribling age wished that it might be provided, *that none should write and publish any thing, unless it were some new thing … For few Writers* (says hee) *bring any thing of their own: but onely steal, things and words, of which they make Books, etc.* Which they know to be most truly spoken, who are to peruse that *farrago* of Books, wherewith we are yearly little less than overwhelmed". Johannes Amos Comenius, *Naturall philosophie reformed by Divine light: or, a synopsis of physicks by J. A. Comenius; exposed to the censure of those that are lovers of learning, and desire to be taught by God* (London: Printed by Robert and William Leybourn for Thomas Pierrepont, 1651), the author's preface "To the truly studious of wisdom, from Christ the fountain of wisdom, greeting".

problems that they were designed to resolve in their common effort to correctly and judiciously select and arrange the right knowledge. Not only do they both address the problem raised by the *multitudo librorum* and, by extension, the question of *information overload*, but they also seem to share certain teleological features, some of which go far beyond the mere sorting and ordering of knowledge; as I shall argue further on, the seemingly insignificant routine of taking notes, together with the digests that were built on this practice, was perceived by early modern scholars as a means to a basic gnoseological apprehension of the world.

The case of Comenius embraces both these aspects. He attempted to provide an effective epistemological formula for selecting and organizing knowledge, while, at the same time, his *pansophism* was influenced by a theological doctrine and complex metaphysical perspective (leading some contemporary scholars to define it as a 'pansophical metaphysics')[9] that sought to grasp the very essence of the world and the *order* of the universe. The complexity of this framework does not allow pansophy to be regarded as a mere theory for acquiring and classifying knowledge.

In addition to the already mentioned treatise, Comenius refers explicitly to the method of *excerpere* in various works. In the seventh chapter of *Pansophia*, he discusses the *anagnostica*, the ability to read and interpret books correctly (*ars libros legendi et intelligendi*),[10] which he regarded as the basic requirement for the advancement of learning. He comments that pupils should take notes whenever they read and mentions Jeremias Drexel's well-known *Aurifodina artium et scientiarum omnium* (1638), which he wanted to incorporate into his *Pansophia*.[11] He then follows the basic method of *ars excerpendi*, recommending that the *excerpta* be sorted into *loci communes*.[12]

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9   Cf. Dagmar Čapková in her introduction to the Czech translation of Comenius' *Consultatio*: Johannes Amos Comenius [Jan Amos Komenský], *Obecná porada o nápravě věcí lidských* (Praha: Svoboda, 1992), p. 20.

10   Comenius, *Pansophia*, p. 506: "Anagnostica. Definitio. Est ars libros legendi et intelligendi pro augenda scientia".

11   Comenius, *Pansophia*, p. 507: "*Qvicqvid legis excerpe.* (Huc ta excerpendi ars Drexelij spectat, et transferenda est)".

12   See also his recommendation in *De primario ingenia colendi instrumento*: "Hic unus solidus lectionis fructus est, ut *qvae qvis legerit sua faciat, excerpendo.* Hoc qvippe solum est, qvod legentis attentionem acuit, et animum in attentione detinet, et observata memoriae imprimit, et mentem majore semper lumine tingit. *Nihil è libris velle seligere est omnia negligere. Velleqve nudae memoriae res committere, est eas vento inscribere,* quia memoria nostra perflatilis est, multa admittit, quae mox rursum dimittit et amittit, cancellis scripturae non adjuta". Comenius, *De primario ingenia*, p. 279. As far as Comenius'

In an important passage of his treatise *De primario ingenia colendi instrumento*, Comenius also comments on the practice of note-taking with reference to his own *Janua linguarum* which, he states, if it is carried out perfectly, will make it a true encyclopaedia. Significantly, this *total* universal book (the most eloquent and exploited metaphor for his pansophical project) resorts explicitly to the methodology of *excerpere*.[13] In other works, Comenius elaborates further on his concept of this total book, constantly using imagery associated with *excerpere*. In one of these, Comenius – after the customary lament over the *multitudo librorum* ("I. Of making many Bookes there is no end, and much study is a wearinesse of the flesh …") – expresses his desire that "a booke be made, which one may be instead of all, a most true Inventory of all Divine and humane Wisdome; in which all things may be proposed facilely, that nothing may bee more easie; and briefely, that nothing may be shorter, and yet sufficiently, that nothing may be more sufficient".[14] If such a book could be compiled, "it *alone, in stead of all*, should be the Spense, and Store-house of Universall Learning".[15] As Comenius argues further on, this "Universal Knowledge, Possession, and Use of all things"[16] can be achieved by the "1. *revising* of all our goods, with all the inventories of them", and more importantly, by the "2. Comparing of those Inventories, with the things themselves, to see whether they are so indeed, as our registers, and accounts relate unto us".[17] This image

recommendation for the distribution of the *excerpta* is concerned, see Johannes Amos Comenius, *Novissima linguarum methodus*, in *Johannis Amos Comenii Opera omnia* (27 vols., Pragae: Academia, 1989), XV/2, p. 199: "[*Tertiò*], *ut nobis condamus repertoria propria* sive *diaria* repetitioni quotidianae servientia, sive *digesta* seu *locos communes* velut rerum tabulaturas universales, ad quas omnia digna referamus suisque locis digeramus. Cujusmodi libri quoniam *memoriae thesauri* sunt, cùm inventioni copiam (quoties opus) ministrant, tùm judicii aciem in unum contrahunt".

13   Comenius, *De primario ingenia*, p. 280: "Qualis libellus *Janua linguarum novissima est, totius encyclopaediae faciem habens; aut certe habitura*, qualis ultimo jam prodibit, cum Deo. Huic si chartas assueris sufficientes, quidvis inscribere poteris".

14   Johannes Amos Comenius, *The delineation of the pansophicall temple*, in J.A. Comenius, *A patterne of universall knowledge, in a plaine and true draught: or a diatyposis*, ed. by J. Collier (London: Printed for T.H. and Jo. Collins, 1651), fols. 81–82.

15   Johannes Amos Comenius, *A reformation of schooles, designed in two excellent treatises* (London: Printed for Michael Sparke senior, 1642), fol. 25.

16   Comenius, *A reformation of schooles*, fol. 29.

17   Comenius, *A reformation of schooles*, fol. 29. Cf. also Johann Amos Comenius, *A patterne of universall knowledge, in a plaine and true draught: or a diatyposis*, ed. by J. Collier (London: Printed for T.H. and Jo. Collins, 1651), fol. 4: "We determine therefore, that a Booke should be compiled, for the containing all things which are necessary to be knowne and done, believed and hoped for by man, in respect of this and the life to come, *viz.* an entire

is, of course, remarkably analogous to the symbolic representation of *excerpere*, since both are determined by the operations of compilation and *accounting for*, the image of the *register* and the *inventory*, and the express desire to create *storehouses* of learning.

The parallels do not end there; Comenius proposes that pansophy, "although one continued Systeme, be either divided or distinguished into certain parts, books, and heads".[18] His intention, however, should not be understood in terms of mere accumulation, "that the various opinions of severall Authors should be heaped up in this booke, as their practice is, who esteeme of learning by much reading, and who take no further care, if they can but recite the divers opinions of divers men, or spread their names a little by publishing some botcherly mingle-mangle of collections out of others".[19] This *heaping up*, or disorderly piling up, is a characteristic that Comenius attributes to the encyclopaedic projects of the time, to the "systemata of the arts under such universal titles as Encyclopaedias, Polymathias, Pandects, Panaugias, and the like …",[20] and to those

> ancients … and many late writers … who have composed their *Encyclopaedias, Polymatheias, Panepistemonas, Artes Cyclognomicas, Syntaxes, Artis mirabilis, Instaurationes magnas, Transformationes Scientiarum, Theatra Sapientiae humanae, Omniscientias Christianas, Pansophias, Panangias, Panarchias, Pancosmias*, and many other intituled in the like manner … The purpose of some was to digest into one body all the variety of learning, which is to be found in Libraries onely scattered and intermingled. Others would do it but not without choyce, some of subtilties, some of elegancies, some of things for use of life, and some againe in a

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> narration of those things which we know already, with an exact Index of such things as we are ignorant of, whether they be those whose knowledge is altogether unattainable, or those that are left for further search".

18   Comenius, *A patterne of universall knowledge*, fol. 98.

19   Johannes Amos Comenius, *A dilvcidation, answering certaine obiections, made against the endeavovrs and means of reformation in common learning* (London: Printed for Michael Sparke senior, 1642), fol. 69.

20   Johannes Amos Comenius, *Pampaedia*, in J.A. Comenius, *De rerum humanarum emendatione consultatio catholica* (2 vols., Pragae: Academia, 1966), II, Ch. III, § 5, p. 24: "Nec desunt hodie, qui qvicqvid bonarum de ulla sub Sole re observationum haberi potest, in artium Systemata colligentes, sub *Encyclopaediarum, Polymathiarum, Pandectarum, Panaugiarum*, vel etiam *Pansophiarum*, et similibus universalibus titulis publici juris et usus faciunt. Rursum autem non desunt ingenia, qvae quod alij liberali manu offerunt, liberali excipiunt gremio, doctrinisqve universis universim explere gaudent animos".

method more strict, and tyed to the things themselves, others have taken more liberty of discourse according to their owne humours.[21]

His biggest objection to those contemporary compendia, whose "successe hath beene divers",[22] is that "whatsoever some *Encyclopaedias*, or *Syntaxes*, or books of *Pansophy*, have pretended to in their titles", he could "never find any thing answerable unto the amplitude of things; or which would *fetch in the whole universality of them within its compasse*",[23] or, as he puts it in another section, this "whole provision of humane understanding" is not "raised upon its certain and eternal principles, that all things were chained, and linked together, from the beginning to the end without any rent, or chink of truth".[24] It is in this context that we should situate his metaphor for the contemporary encyclopaedia, which he likens to "a pile of wood, very neatly laid in order, with great care, and diligence, but nothing like unto a tree arising from its living roots, which by its inbred vertue spreads it selfe into boughs, and leaves, and yeeldeth fruit".[25] His own project, on the other hand, seeks to design a "solid breviary of universall

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21   Comenius, *A dilvcidation*, fol. 69.

22   Comenius, *A dilvcidation*, fol. 69.

23   Comenius, *A reformation of schooles*, fol. 15. Nevertheless, in the *Patterne of universal knowledge*, Comenius is less critical of the compilations of his age, even though he does insist that his own intention goes far beyond these: "For we interpret those various endeavours of diverse men of our age to tend hither, who have compiled and communicated to the worlds Pandects, and Syntagma's, and Bodies and summes of Encyclopedies, and Panstraties, and of Divinity, Philosophy, Law, Physics, and Theaters also of humane wisedome, transformations of Sciences, great instaurations, Christian omnisciences, and such like works: whose endeavour of reducing things manifold into one, things dispersed into order, things obscure into light, if it do not displease good minds, why should ours displease, who persuade to the making out of all things some one, even more generall and common than all those, and more accommodated to the Universall ends?". Comenius, *A patterne of universall knowledge*, fol. 55.

24   Comenius, *A reformation of schooles*, fol. 15.

25   Comenius, *A reformation of schooles*, fol. 24: "The most exact Enyclopaedias, or sums of Art, which I could ever lay my eyes upon, seemed to me like a chaine neatly framed of many linkes, but nothing comparable to a perpetuall mover, so artificially made with wheeles, that it turnes it selfe: or like a pile of wood, very neatly laid in order, with great care, and diligence, but nothing like unto a tree arising from its living roots, which by its inbred vertue spreads it selfe into boughs, and leaves, and yeeldeth fruit. But that which we desire, is to have a living tree, with living roots, and living fruits of all the Arts, and Sciences, I meane Pansophy, which is a lively image of the Universe, every way closing, and agreeing with it selfe, every where quickning it selfe, and covering it selfe with fruit".

learning"[26] and "a cleare light for humane understanding; An exact, and stable rule of Truth; A certaine and directive Register of the affaires of our life; And lastly, an happy LADDER towards God himselfe",[27] a book that would "square and proportion the universall principles of things, that they might be the certain limits to bound in that every-way-streaming variety of things".[28]

Such a book, instead of displaying random piles of wood, should rather follow the "familiar example of an ordinary Clocke", in order to manifest the "concatenation in all things" and so be a truer image of the "Orbe of things, in which you can find nothing but moves and is moved, changes and is changed, acts, and suffers".[29] In short, the structure of this new encyclopaedia, the *total universal book,* is governed by the correct order and measure of things; it is

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26   Comenius, *A reformation of schooles*, fol. 24.

27   Comenius, *A reformation of schooles*, fol. 24. In fact, one of the criticisms of Comenius in his opposition to contemporary encyclopaedias is that they do not include divine learning and divine revelation, as he explains in *A dilvcidation*, fol. 64: "While D. Peter Laurenberg sets out under the Title of *Pansophia*, and *Encyclopaedia*, or generall comprehension of all the arts, which having viewed with great desire, and expectation, and not finding it answerable to the amplenesse of the title (for nothing was therein contained of the object and fountaine of true wisedome, which is Christ, nothing of the life to come, and the way thereto, &c. wherein to be wise is wisedome indeed) I thought it a fit occasion to supply, what was there wanting: that whatsoever is fit to be taught, and learned in Christian Schooles, might be comprised in one Summary, and in such a method, which might instill the knowledge of all things into youth ... more suitably to the intents both of the present, and the future life ... my intent was to epitomize those bookes of God, Nature, Scripture, and mans Conscience, that what things soever are, they might be all here digested into one continued series and order, Divine Revelations might be applyed to illustrate them withall, and the common and inbred notions and apprehensions of humane minds might be referred to their several uses".

28   Comenius, *A reformation of schooles*, fol. 15.

29   The metaphor of the Clock is mentioned in the following context: "There's such a Concatination in all things, as no one may be idle but hinder or further another ... And a little after you shall understand this by the familiar example of an ordinary Clocke. For if you would know how it strikes hourely, its meet you looke round all the wheeles from the first to the last, and what moves the first, and how this another, and that others, even to the last, &c. We must imagine the same in the great Orbe of things, in which you can find nothing but moves and is moved, changes and is changed, acts, and suffers. PANSOPHY therefore by wholesome Counsel takes all things in generall into its consideration". Comenius, *A patterne of universall knowledge*, fol. 16. Comenius does, however, retain the name of 'encyclopaedia' for his pansophical project: "and this is the first reason, why we have thought fit to entitle this our new *Encyclopaedie*, or generall comprehension of knowledge, with the name Temple, because preparation is here made of an universall structure, as it were, from whence mans mind turning to every side, may with pleasing

also a compendium of the three books of God,[30] because Comenius' theory of knowledge is built upon the idea of three sources of knowledge (nature, the senses, the Holy Scriptures), which conjointly, and only conjointly, provide an exhaustive picture of the universe.

This basic outline of the idea of pansophy was developed in various of Comenius' works, the so-called *pansophical corpus*. The first one was *Conatuum Comenianorum praeludia*,[31] a treatise that Comenius sent to his friend and intellectual counterpart in England, Samuel Hartlib. Hartlib published the treatise without Comenius' knowledge (1637), which came as a considerable and unpleasant surprise to him. This volume was later properly reworked by Comenius and published – this time with his approval – as *Prodromus Pansophiae* (1639), literally 'precursor of Pansophy', and translated into English as *A reformation of schooles* as early as 1642. Since the unauthorized edition of *Pansophiae praeludium* created a huge controversy, not only among the Moravian Brethren (*Unitas Fratrum*), of which Comenius was the last bishop, but also among the members of the so-called *Hartlib Circle*, Comenius later presented a sort of commentary and a further expansion of his pansophical ideas, entitled *Conatuum Comenianorum dilucidatio* (1639).[32]

The pansophical *methodus* is also discussed in *Pansophiae diatyposis* (1643), translated into English as *A pattern of universal knowledge. In a plaine and true draught; or a diatyposis* (1652). It should be stressed, however, that his pansophical theory cannot be abstracted from a single group of the vast *Corpus Comenii*; it represents the essential first premise that informs his whole work

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contemplation looke upon every thing in the world, visible and invisible, temporall and eternall, so farre as they are revealed". Comenius, *A dilvcidation*, fol. 72.

30   For the idea of the *pansophia* as the compendium of the three books of God, see above fn. 27. See also the preface to the *Pansophia*, entitled "De condendo Pansophiae libro consultatio": "LIBRUM *talem condendum dico*, qvia conditus hucusqve non est: nec forte alicui venit in mentem, *ex trino Dei libro confici posse unum*. Quod si poterit, hoc unum erit qvasi novum, tale qvid (instillante Deo) venisse in mentem alicui: Caetera omnia erunt antiqva, Operum scilicet, Verborum, Cogitationumqve Dei, fluxus perpetuus. *LIBRUM dico non Libros*, qvia num, indivulsum, undiqve sui plenum, volo: cujus legendi si quis fecerit initium, finem non reperiat nisi in fine. Nempe qvomodo *unum Ens entium* est DEUS; et *unum Systema systematum*, Mundus, et *unum Speculum speculorum*: Mens; et *unus Commentarius commentariorum*, Scriptura Sacra; *unus* denique *Interpres interpretum,* Lingua; ita *ut unus Liber Librorum sit Pansophia, docens omnia*". Comenius, *Pansophia*, p. 180.

31   Johannes Amos Comenius, *Conatuum Comenianorum praeludia* (Oxoniae: Excudebat G. Turnerus, 1637).

32   It was translated into English and printed, together with the English version of *Prodromus*, in Comenius, *A reformation of schooles*.

(although its exact shape in Comenius' thought evolved only gradually in his writing). Its culmination, the definitive expression of Comenius' intellectual project, is the *Consultatio* (*De rerum humanarum emendatione consultatio catholica*), whose manuscript was lost (in its entirety) for almost 300 years before being re-discovered in 1934.

The *Consultatio* represents the definitive expression of Comenius' *pansophical metaphysics*, rooted as it is in a complex philosophical system and a specific account of the Creation, strongly influenced by Neoplatonic doctrine. It seeks to understand the process of the creation of the world from the divine archetype, conceptualized as a gradual unfolding from initial unity and leading up in a continuous manner to original perfection and reunification with the divine.

This metaphysical vision is determined, first and foremost, by the Neoplatonic concept of archetypal ideas, *notiones communes innatae*, since "all things are partakers of divine Ideas".[33] The decisive influence of Neoplatonism is also noticeable in Comenius' postulate of essential unity, a single unique principle that results in the universal harmony of things[34] ("Universall harmony, or a consonance and agreement of each thing to other")[35] and in the omnipresent analogies established between the various layers of being. These parallelisms and correspondences "partake one of another, and are proportioned one to the other",[36] and manifest themselves, gnoseologically, in the measures, "weights and valuations of all things", which not only condition the *res* themselves, but also men's possibility of perceiving them.[37] The *res* are thus bound

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33   Comenius, *A reformation of schooles*, fol. 38.

34   Cf. Johannes Amos Comenius, *Panaugia*, in J.A. Comenius, *De rerum humanarum emendatione consultatio catholica* (2 vols., Pragae: Academia, 1966), I, Ch. X, § 15, p. 130: "Dum ergo nos in usu Librorum DEI *Harmoniam*, hoc est *Parallelismum*, et *Proportionem* mutuam, et *Symmetriam*, tanqvam *Errorum* et hallucinatioum *antidota*, commendamus, qvod volumus hoc est: *ut ista divinitus data Lucis adminicula et directoria adhibeantur a nobis* (1) *Omnia*: (2) *Ordine legitimo*: (3) *Auxilioqve mutuo*, donec eadem ubiqve pateat Rerum veritas, bonitas, unitas; nec discrepantiae aut dubitationis relinqvatur aliqvid".

35   Comenius, *A patterne of universall knowledge*, fol. 6.

36   Comenius, *A reformation of schooles*, fol. 38.

37   Comenius, *A patterne of universall knowledge*, fol. 14. See also the following formulation: "We wish therefore, that the whole orbe of Things and humane knowledge being taken, the true centers of essences may be found, by an exact measuring of the proportion of all things among themselves: that so venerable Truth discovering its amiable face to us in abstract formes, wee may be the sooner acquainted with it, when we meete it concrete in particular Things". Comenius, *A dilvcidation*, fol. 75.

into a system, a coherent, stratified and graduated hierarchy, which manifests itself as a stable concatenation of all things.[38]

Consequently, the process of cognition must follow the innate inner order of the things themselves, an order that is able to guide the mind upwards from the first and lowest to the last and highest.[39] It is perceived as a movement upwards, and its ultimate goal is knowledge of God Himself, the knowledge of divine things. This order can be traced back to archetypal ideas, the very essence of things ("the most nature of [those] very things"),[40] which should be "knowne as they are … according as they were made",[41] and which are all governed by a limited number of essential principles, the *venae rerum*, or 'true veines of things'.[42]

This is, in fact, the basis of Comenius' criticism of contemporary encyclopaedias, that they are based on an incorrect partitioning and division of

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38   Cf. Comenius, *A patterne of universall knowledge*, fol. 106: "The second vertue of Pansophical method is Gradation: whereby things are so conjoyn'd with things, as always and every where the latter may seeme of their owne accord to arise out of the former … Even as we see it to be in a tree, that the Stock riseth from the Root, from the Stock Boughs, from Boughs Twigs; from these Buds, Leaves, Blossoms, Fruits, in an unseparable order, whereby always the latter are both produced, and strenghtened, and enlivened by the former. By such a graduall concatenation of things we labour to obtain, that the minds of Learners may not onely suffice to raise them to all things by degrees, but that they may likewise expresse their joy, fearing no danger of falling back or swerving".

39   Cf. Comenius, *Pansophia*, p. 181: "Qvali ORDINE scribendum putas? Non aliqvo ad placitum ficto, aut bonas qvascunque de rebus observationes in congeriem coacervante: sed ORDINE RERUM ipsarum, a primis et imis, per intermedia omnia, sic ad ultima et summa Mentem elevante, ut qvid prius aut posterius, magisque aut minus amari, ambigi, agi, oporteat, in evidenti sit".

40   Comenius, *A patterne of universall knowledge*, fol. 6.

41   Comenius, *A reformation of schooles*, fol. 36. The following passage explains Comenius' conception of *idea*: "Every thing was made according to its proper Idea, that is according to such a conception, by which it might be such as it is … Therefore all things that are, are made according to their Idea's, whether they be workes of God, of Nature, or of Art. For seeing an Idea is a certaine rule of things, God cannot bee thought to doe any thing without Idea's, that is, without a certaine rule, as who is of himselfe the rule of all rules: So likewise Nature when she effects most orderly workes, cannot worke without a rule, as neither can Art, which is natures Ape. Art borrowes the Ideas of its works from Nature, Nature from God, but God hath them onely from himselfe". Comenius, *A reformation of schooles*, fol. 37.

42   Comenius, *A reformation of schooles*, fol. 50.

knowledge and are therefore unable to convey the basic unity and interconnectedness of all things.[43] Comenius, on the other hand, aspires to find an "easie entrance into all Arts and Sciences whatsoever", by opening the "gate unto the things themselves".[44]

The most important assertion in relation with pansophy as an epistemological formula is that any gnoseological model of the world must reveal this innate disposition and order of things:

> PANSOPHY therefore by wholesome Counsel takes all things in generall into its consideration, that it may evidently and most clearly appeare, how lesser things are, and come to be subordinate to the greater, the greater to the greatest, the former to the latter, and the latter to the last: infinite things to finite, and the finite to one: that is, all visible things to man, temporall things to eternity, and things created to their Creator.[45]

Pansophy, in this sense, represented an exhaustive, systematic and coherent *methodus* of knowledge, whose main objective was to reveal the inner organization and harmony of being and so to arrive at the *prima causa*, the agent of all agents, the basic form of all forms and the end of all ends towards which everything is tending.[46] This method would allow "all the veines, and

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43   Cf. Comenius, *A reformation of schooles*, fol. 6: "Good God! what vast volumes are compiled almost of every matter, which if they were laid together, would raise such heapes, that many millions of years would be required to peruse them? … learning is too farre diffused, and scattered about, beyond the modell, and reach of mens capacities … Hence comes that (so commonly used) parcelling and tearing of learning into peeces, that men making their choyce of this, or that Art, or Science, take no care so much, as to looke into any of the rest … Every faculty boundeth out a severall Kingdome for its selfe, without those common, certaine, and immovable grounds and Lawes, which should bind them all together".

44   Comenius, *A reformation of schooles*, fol. 4.

45   Comenius, *A patterne of universall knowledge*, fol. 16.

46   Cf. Comenius, *Pansophia*, p. 234: "Si rerum cohaerentias spectes, occurrunt ubiqve Connexiones perpetuae, qva omnis res alteri collata, illi est Causa vel effectum, Subjectum vel Adjunctum, Genus vel Species, Totum vel Pars, Eadem vel Diversa, Similis vel Dissimilis, etc. Ergo si sic omnia per totum Universum sibi connectuntur, cuinam ipsum Universum? Atqve si ubiqve Causarum et effectorum series est irrupta, necessario veniendum est ad primum aliqvem et ultimum Catenae hujus annulum, à quo tantus ille rerum nexus incipit, et in qvem definit. Necessario inqvam veniendum est ad primam Causam, omnium Efficientium Efficientem, omnium Formarum formam, omnium Finium finem, in qvem tendant, et in quo quiescant Omnia, ipsum etiam Universum. Tolle ordinem hunc universum, erit Chaos et tricae: quod non esse, pulcherrimus rerum Ordo ostendit".

joynts thereof [to] be so cleared, and laid bare, that there may nothing lie hid from our sight, but every thing may appear in his proper place without any confusion",[47] to "divide and dispose things for our sight, according as they are"[48] and, ultimately, to produce – and this may be considered the ultimate metaphor of Pansophy – a "new Anatomy of the Universe".[49]

With respect to its methodology, the aim of Pansophy was to offer a new *register* of all things, since the existing methods produced merely a 'mixt mass', in which "things and words lay for the most part scatteringly, nor rightly disposed in their Classes or ranks, nor bound up amongst themselves with perpetuall ties".[50] Pansophy, by contrast, should, as we have seen, reveal "Perpetuall Coherence ... Gradation ... Uniformity",[51] concatenation and interdependence, a "marriage of things and words being found out and established by intervening bonds of right conceits (if conceits accurately and punctually abstracted from things, may again accurately and punctually imprint themselves in words)".[52]

It should be observed that one of the chief devices used to abstract the essentials and find the relations between them involved an operation of reduction, or rather contraction. Pansophy implied *restraint* in a purely material way (so preventing or counteracting the *multiplying of bookes*);[53] more importantly, though, it embodied, in a manner of speaking, the gnoseological formula of gradual *condensation*, which was also conceived as a taxonomical device. Comenius explains that the very gradation of being ("Certainly, as in things, individualls next of all make the *species*, the *species* the *genus*, the *genuses* the most general *genus*") "requires that particular things [in the conceits of our understanding] be contracted into summes, and summes into a summe of summes".[54]

Indeed, Comenius asserts that "all such things as come in the compasse of human understanding, might be reduced unto some certaine rules, which

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47   Comenius, *A reformation of schooles*, fol. 42.

48   Comenius, *A reformation of schooles*, fol. 50.

49   Comenius, *A reformation of schooles*, fol. 50.

50   Comenius, *The delineation of the pansophicall temple*, fol. 94.

51   Comenius, *The delineation of the pansophicall temple*, fol. 94.

52   Comenius, *The delineation of the pansophicall temple*, fol. 94.

53   Cf. Comenius, *A patterne of universall knowledge*, fol. 43: "In this Age, which would be tearmed learned, Bookes, Schooles, Methods, and various opinions concerning various things are multiplyed even to admiration, Learners are utterly confounded ... we shall either read nothing, or believe nothing. If some bar or restraint be not layd upon this Age, as luxurious in conceiving opinions, as multiplying Bookes; and the Learners freed both from the wearisomenesse of reading many things".

54   Comenius, *A patterne of universall knowledge*, fol. 56.

being finite, and perhaps not very many in number, yet should be of infinite use"; abstracting the underlying rules of things however will enable them to be applied indefinitely to all analogous cases.[55] In other words, reducing the multiplicity of things and words ("all the rivulets of humane observations, as also the greater streames of divine works, and words") "to their proper fountaines", and "again dispersed in their true veines"[56] is *the* method for accessing universal knowledge *and* for categorising it properly.

Unlike contemporary encyclopaedic works, pansophy represented the true encyclopaedia, in other words, 'Universall Harmony', in which "observations delivered here and there concerning things ... shall not be amassed and throwne upon an heape here".[57] The main objective, the "light of the method", is a "Ladder happily erected, to climb and mount by to the tops of things".[58] Pansophy "displays all in the very order of things", so that "each thing may stand in its own place, as it followes from the premises, and begets consequents from it selfe, and hereby all precedents cannot but give light and lustre to their sequents".[59] The pansophical quest is for the very essence of things and is attained via a process of abstraction, or rather, distillation. Pansophia, this book "when tis rightly trimmed and set out (as one which will be a certain Quintessence of bookes)", will be like the quintessence 'praised by Chymicks' because it will be "of so exquisite a temperature, that being applied to all things, it bestowes that on severalls which is needfull for every one: a cooling to things hot, an heat to things cold, moisture to dry things, and a dryenesse to things moist"; and therefore "tis a present remedy for every disease".[60]

7.3   Pansophy and *excerpere*

Pansophy, in short, not only represents *knowledge properly reduced* (in the sense that it formally rejects everything that is superfluous, expendable and irrelevant), but also constitutes a *methodus* capable of revealing to us the innermost order of things and enabling us to ascend the successive layers of being to the very "top of all things (the Majesty of the highest God)".[61] I am well aware

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55   Comenius, *A reformation of schooles*, fol. 48.

56   Comenius, *A dilvcidation*, fol. 67.

57   Comenius, *A patterne of universall knowledge*, fol. 6.

58   Comenius, *A patterne of universall knowledge*, fol. 20.

59   Comenius, *A patterne of universall knowledge*, fol. 22.

60   Comenius, *A patterne of universall knowledge*, fol. 66.

61   Comenius, *A reformation of schooles*, fol. 22.

that, seen from this point of view, a comparison or analogy between pansophy and *excerpere* is likely to appear greatly exaggerated, pretentious and forced, a purely discursive device for uniting two concepts that are completely different in origin, scope and purpose. Nonetheless, I am convinced that pansophy and *excerpere* should be considered as having their origins in a single framework of thought, as the products of the same epistemological impulse and desire. Comenius in fact explicitly associates them by, paradoxically, emphasizing their difference; for him, pansophy is intended to "prove a Gate, not onely into the reading of Authors, but rather into the whole universality of things", not by "unprofitable, and superstitious diligence, making Catalogues of all, and singular things, but rather by a true discovery of the grounds of all things".[62] If true Pansophy were achieved, we could "even free ourselves from the never-ending troubles with libraries … when the sun of Pansophy comes out and the day breaks for the whole world, we won't need them anymore".[63] Comenius, therefore, seems to be making a major case against contemporary encyclopaedic efforts and by extension against the practice of excerpting and compilation generally. Surprisingly, though, the fundamental mechanisms and operations of his pansophy are identical to those of *excerpere*, namely to "*collect* together scattered Truths, both Naturall, Artificiall, Morall, and Divine; to *digest* them in such a continued *order* … and so digested to direct, and fit them for the ready use of Schooles, or of any, who would desire to take a *compendious view of the amphitheater of Gods wisdome*",[64] which is a remarkably similar manifesto of intent to the declarations made in the prefaces of countless learned *collectanea*.[65]

I would argue that there is an explicit dialectic in Comenius' thought between contemporary encyclopaedic projects (or certain types of them) and his own *pansophia*. Paradoxically, the operations and images traditionally associated with the practice of *excerpere* enable him to define *by opposition* his own pansophical proposal, which seeks to transcend them, since his quest is not merely for knowledge itself, but for the very *roots* of knowledge, the universal

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62   Comenius, *A reformation of schooles*, fol. 49.

63   Comenius, *Pansophia*, p. 764: "*Promittit etiam Pansophia liberationem ex infinitis tricis Bibliothecarum* (Tanta enim varietas et multitudo Librorum nihil aliud era, qvam particulares per ignorantiae noctem varie accensi lychni: qvibus opus non erit, Pansophiae sole orto, dieqve toti Orbi invecta) ex labyrinthis negotiorum – et frustratione desideriorum".

64   Comenius, *A dilvcidation*, fol. 66.

65   Cf. Comenius, *A dilvcidation*, fol. 66: "Our intent is to unveil before all mens eyes, the true and amiable faces of Things, as they were formed by that eternall wisdome, and imprinted in Things".

principles that govern all things.[66] This is why his pansophy allows for projection into the future, because it is even able to accommodate and categorize that which is as yet unknown: "If therefore such common notions, and Ideas were accurately abstracted from all things, it would prove a generall key to let us in unto the knowledge of things, a rule for all sorts of operations" and "it would point out many new inventions, and be the touchstone of all opinions, in a word, a most large field for all pleasant speculations".[67] It should also be mentioned that the same projection into the future can be attributed to the methodology of *excerpere* since the *loci* are intended to accommodate not only all past and present fragments of reading, but also all future ones.

In short, while *excerpere* can be defined as a methodology for collecting proper knowledge from books and classifying it in a *functional* order, Comenius' pansophy aspires to grasp the universe of things by making reference to the appropriate innate structure of reality. As such, it constitutes a true *scala rerum*, a Jacob's ladder[68] that does not anticipate or generate its own order, because the order is provided for by the things themselves; it merely *conveys* and *mirrors* the design of the universe and so becomes a 'lively image' of it.[69]

It should also be noted, however, that early modern practices of note-taking go far beyond mere information storage and retrieval. In certain cases, at least, the ultimate goal of *excerpere* can *also* be considered as the major gnoseological apprehension of the world. According to some contemporary authors, *excerpere* embodies not only the pursuit of order in a particular corpus of knowledge, but an essential quest for the *true* order of things (*res*), an order that would reveal and mirror the innate relationship between them. Ann Blair, in her seminal study *Too much to know*, quotes Theodor Zwinger, who complained about the "arbitrary and inadequate headings used by many of his predecessors in the genre" in his famous commonplace book, *Theatrum vitae humanae*

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66   In certain formulations, this quest adopts quasi-mystical formulas and a clear transcendental dimension: "Let therefore this Christian Pansophy, unfolding the Ternary mysteries be sacred unto that eternall Trinity, Jehovah, God onely wise, Almighty, most good, and ever to be worshipped". Comenius, *A reformation of schooles*, fol. 52.

67   Comenius, *A reformation of schooles*, fol. 41.

68   Comenius, *Pansophia*, p. 192: "Ain vero? *Jacobeam optas Scalam, per qvam de Terra in Coelos ascendatur?* Prorsus Scalam, qvalem Jacobo Deus ostendit (Gen. 28.12) nobis autem Sapientiam aeternam carne vestitam mittendo reipsa exhibuit (Joh. 1.52) per qvam Angeli Dei (omnis rationalis creatura) de Terra in Coelos ascendant, ed de Coelo in Terram descendant. Hoc est Homo a seipso, per Mundum totum penetrando in Deum: rursumqve a Deo per OMNIA inferiora, desdendendo in SEIPSUM jungere discat Coelum Terrae, Terramqve Coelo, ad implendam aeqve in Terra atqve in Coelis omnem Dei Voluntatem".

69   Comenius, *A reformation of schooles*, fol. 24.

(1565). Zwinger claimed that "they all labored under a great shortage of head-ings and they heaped headings rather than linking them and from their own advantage rather than from the nature of reality", adding that "another order had to be instituted which was dependent not on the will of the writer, but on art and which could thus be eternal. The method of the art had to be deduced from the *essence of things*".[70] It is worth noting that Melanchthon, in his *De lo-cis communibus ratio* (1531), also asserts that the *loci* do not constitute the *sedes argumentorum* (that is, they are not only concerned with the dialectical pre-cepts of argumentation), but should be viewed as *sedes naturae*, mirroring the superior design and order of nature: "Do not think that commonplaces are to be invented casually or arbitrarily: they are derived from the deep structures of nature, they are the sets and patterns to which all things correspond".[71] In this way, the underlying reason for the architecture of certain learned *collectanea*, despite the fact that Comenius perceived them as conflicting and incompat-ible with his own project, is to serve not only as a "grid for writing knowledge

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70   Theodor Zwinger, *Theatrum humanae vitae* (Basel: Per Eusebium Episcopum, 1586), pp. 6r-v, quoted in Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), p. 150.

71   Philippe Mélanchthon, *De locis communibus ratio*, in P. Mélanchthon, *Opera*, ed. by C.G. Bretschneider and H.E. Bindseil (28 vols., Brunswick et al.: C.A. Schwetschke et filium, 1854), XX, col. 698, quoted in Ann Moss, *Printed commonplace-books and the struc-turing of Renaissance thought* (Oxford: Clarendon Press, 1996), p. 121. The examples of this tendency are numerous; for example, Edmond Richer, author of the educational treatise *Obstetrix animorum* (1608), asserts that the *loci communes* are analogous to *loci naturales*; they should not therefore be perceived in a restricted sense as purely rhetorical catego-ries. Like many of his contemporaries, Richer believes that they can accommodate all the sciences and even the mechanical arts: "*C'est* [locus communis] *comme vne espargne où par ordre nous estudions, & d'où nous tirons tout ce qui peut accommoder nos estudes. Qua ex descriptione apparet loci communis nomen ad omnes scientias, atque etiam me-chanicas artes extendi: neque vt apud Rhetores angustissimis generis demonstratiui, de-liberatiui, aut iuridicialis finibus restringi. Quamobrem locos secundum varia artium & scientiarum genera ex quibus colliguntur & conficiuntur ita partiri & diuidere poterimus, vt Theologi, Philosophi, Mathematici, Iurisconsulti, Politici, Oeconomici, Grammatici, Causidici, Poetae, Historici, Dialectici: Architecti item, Pictores, Statuarij, nautae, & alij artifices, proprios & peculiare habeant locos, ex artium suarum institutionibus petitos & aceruatos*". Edmond Richer, *Obstetrix animorum, hoc est brevis et expedita ratio do-cendi, studendi, conuersandi, imitandi, iudicandi, componendi* (Parisiis: Apud Ambrosivm Drovart, 1600), p. 165. Also John Locke, "A new method of a commonplace book", in J. Locke, *An essay concerning human understanding* (2 vols., Boston: Cummings & Hilliard and J.T. Buckingham, 1813), II, pp. 395–413, at p. 403 suggests the use of "a book for each science, upon which one makes collections, or at least two for the two heads, to which one may refer *all our knowledge*".

into a formalized system",[72] but as a way of apprehending the innate divisions (the *formae rerum*, in the words of Melanchthon) of reality.[73] That this impressive (and rather pompous) theoretical requirement was not necessarily accomplished in practice can be inferred from a critical note by Francis Bacon who, much as he approves of the practice of commonplacing, comments, nevertheless, that "of the methods and frameworks of common-places which I have hitherto seen, there is none of any worth; all of them carrying in their titles merely the face of the school and *not the world*; and using vulgar and pedantical divisions, not such as *pierce to the pith and heart of things*".[74]

The *loci* were perceived, therefore, at least in theory, not only as more or less systematic headings to help readers organize the material gathered in their books, but also as categories that mirrored the innate order of things. From this point of view, the practice of *excerpere* can also become an essential *organ of knowledge*, motivated, in the words of Ann Blair, by the "quest for a true order, derived from the nature of things ... that could stand for all eternity".[75] In this sense, *excerpere*, like pansophy, is conditioned by the way in which the early modern episteme contemplates reality and the texts that transmit knowledge of it.

7.4   Conclusion

In conclusion, both the early modern practices of *excerpere* and Comenius' model of universal knowledge display striking similarities, which should not be attributed uniquely to a common 'field of reference', the pre-modern search for a *true* encyclopaedia, a coherent, all-inclusive, all-embracing and exhaustive circle of learning. They are both motivated by the desire to apprehend and display, via the correct distribution of knowledge, the innate categories of the universe and to mirror and reproduce the intrinsic structure of being.

Naturally, they should also be viewed as paradigms that could not possibly have anticipated the future development of knowledge acquisition and management. Comenius' pansophy, shaped as it was by the imperative

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72   Moss, *Printed commonplace-books*, p. 122.

73   Mélanchthon, *De locis communibus ratio*, as quoted in Moss, *Printed commonplace-books*, p. 119.

74   Francis Bacon, *De augmentis scientiarum*, in *The philosophical works of Francis Bacon*, ed. by J.M. Robertson (London: Routledge, 2013), Ch. v, p. 519.

75   Blair, *Too much to know*, p. 149.

concurrence of profane and divine wisdom,[76] stands in sharp contrast to modern epistemology, governed by the Cartesian split between spirit and matter. In a similar way, the methodology of *excerpere*, motivated directly by the early modern concern for textual authority (*auctoritas*) and the paradigms of *experientia litterata* (that is, the conviction that all necessary knowledge can be gathered almost exclusively from books and not from direct experience), could not satisfy the needs of the embryonic scientific and empirical understanding of the world.

Viewed from this perspective, the two models bear witness to an episteme that our modern rationalistic way of thinking finds quite difficult to grasp; they are nonetheless perfect examples of the early modern gnoseological paradigm and are both indispensable for understanding how knowledge was apprehended, conceived of and managed in a pre-modern scholarly culture. They both pose the question of the extent to which the early modern episteme was inspired by the confidence that there was a coherent order to the universe and that human beings could reveal and reproduce it. Both models display an obsession for finding the *right* transcendental order – a hierarchy of being – which is not aimed exclusively (as in contemporary knowledge management) at the prospect of future retrieval. They both, to a certain extent, seek to uncover the "pattern governing Creation, to gain access to the heavenly architect's blueprint",[77] in other words, they are both marked by faith in an ultimately *comprehensible* universe, which, if properly understood, could be properly *categorized*. Due to their common metaphysical and gnoseological transcendence, they should not be considered as minor textual or cultural practices, as mere *note-taking* (in the case of *excerpere*) or as a quasi-mystical epistemological project, incapable of anticipating or responding to the future development of human learning. They are both of undoubted interest from the point of view of early modern information management, but they are even more significant for our understanding of the early modern cosmovision, its conception of the universe and of the human ability to reveal its secrets.

Last but not least, the two models pose the extremely intriguing question about the possible accomplishment of all their exalted aspirations. Can a

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76   Cf. Comenius, *A reformation of schooles*, fol. 42: "Therefore the rules, whereby our Pansophy is to bee erected, must be borrowed from these two, Nature, and Scripture, whereby all things great and small, high and low, first and last, visible, created and uncreated, may be reduced to such an Harmony (or Pan-harmony rather) as which is true, perfect, and every way compleat, and satisfactory to it selfe, and to things themselves".

77   John T. Young, *Faith, medical alchemy and natural philosophy: Johann Moriaen, reformed intelligencer, and the Hartlib Circle* (Aldershot: Ashgate, 1998), p. 110.

textual methodology such as *excerpere*, which concentrates chiefly on infor-
mation collection and management, really mirror the innate categories of
things and, at the same time, accommodate every single concept? Can any
pansophical or encyclopaedic enterprise encompass the richness, magnitude
and breadth of the design of *natura*? Can a purely human understanding grasp
God's architecture, the divine project of Creation?

The 'White Book' of Miguel de Salinas: Design, Matter, and Destiny of a *codex excerptorius*

José Aragüés Aldaz

8.1 Introduction

Rhetórica en lengua castellana (1541) by Miguel de Salinas hides an interesting *ars excerpendi* within its last pages. The reader who approaches the work will find, almost without expecting it, a complete series of recommendations about how to read the texts and obtain a generous set of examples and sayings. This task usually required the preparation of an organised notebook or *codex excerptorius*.[1] On this point, Salinas did not settle for summarizing some theories about the subject, but instead meticulously described his experience in the preparation of his personal *codex*, called the *libro blanco* ('white book'). Thus, he provided very valuable information about the structure of these types of handwritten catalogues, the 'material space' where humanism constructed some of its rhetorical and literary keys.

The immediate purpose of Salinas' 'white book' was to provide its author with appropriate material to expand his sermons. However, his *codex* is also a means of connecting between the culture of the classics and the new erudition of Renaissance man. Salinas also conceived the book as a long project that would take his lifetime to complete and was based on a meticulous and patient examination of the texts. Reading, therefore, becomes a type of study, and the 'white book' overcomes its condition as a warehouse of quotes thereby becoming a true store of knowledge. The boldness and the optimism of the book designed (and shared) by Salinas can only be understood through their comparison with the paths, which were somewhat more practical, that these types of tools followed in later decades.

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1 *Exceptorius* (and not *excerptorius*) is what it is called by some Spanish humanists as Nebrija or Palmireno, and is registered as such in Covarrubias' *Tesoro de la lengua castellana o española*. However, the original term coined by Juan Luis Vives is *excerptorius* (from *excerpo*, 'I make excerpts'). See José María Maestre Maestre, "El influjo de Juan Luis Vives en Juan Lorenzo Palmireno: ¿*Codex Exceptorius* o *Codex Excerptorius*?", in M.C. Pimentel and P. Farmhouse Alberto (eds.), *"Vir bonus peritissimus aeque". Estudos de homenagem a Arnaldo do Espírito Santo* (Lisbon: Centro de Estudos Clássicos, 2013), pp. 661–682. This work is indebted to the *Comedic* Research Project, of the Ministry of Education, Culture and Sports of the Spanish Government [Ministerio de Educación, Cultura y Deporte del Gobierno de España] (FFI2012-32259).

8.2   A Rhetoric in Castilian

On 8 February 1541, at his workshops in Alcalá de Henares, the humanist and printer Juan de Brocar finished the only original edition of *Rhetórica en lengua castellana*.[2] The work appeared anonymously there, although the cover stated that it had been composed "by a monk from the Order of Saint Jerome". Miguel de Salinas had, indeed, joined the order when he was twenty-one, at the monastery of Santa Engracia in Zaragoza, where he is believed to have been born in 1501. At this monastery, he would later attain the post of "Master of Novices", which he would hold without interruption for thirty-five years until his death in 1567. The dedication of the author to learning and his clear sensitivity to linguistic problems explain the subject of two of his works, which were concerned with pronunciation and the correct reading of Latin and Castilian texts.[3]

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2 I am using Encarnación Sánchez García's excellent edition of Miguel de Salinas' *Rhetórica en lengua castellana* (Naples: L'Orientale Editrice, 1999), to which the adduced passages refer. But I also consulted a 1541 edition (Biblioteca Universitaria de Zaragoza, H-I-118), which is very useful in order to gain some understanding of the details related to the typographical distribution of the text. Elena Casas, *La retórica en España* (Madrid: Editora Nacional, 1980), pp. 39–200 had offered a partial edition of the work. The rather brief chapter dedicated to memory had been reproduced by Elena Artaza, *Antología de textos retóricos españoles del siglo XVI* (Bilbao: Universidad de Deusto, 1997), pp. 257–260. But it was Peter E. Russell, "Un libro indebidamente olvidado: *La Retórica en lengua castellana* (1541) de Fray Miguel de Salinas", in *Libro-Homenaje a Antonio Pérez-Gómez* (2 vols., Cieza: La Fonte que Mana y Corre, 1978), II, pp. 133–142, who first called attention to the importance of the text.

3 I am referring to the *Tratado para saber bien leer y escrebir, pronunciar y cantar letra, así en latín como en romance* (Treatise on how to write and read well, pronounce and chant word in Latin and in romance, 1551) and to the *Libro apologético que defiende la buena y docta pronunciación que guardaron los antiguos* (Apologetic book defending the good and learned pronunciation which the ancients held, 1563). A biographical profile of the author written by Sánchez García may be found in Salinas, *Rhetórica*, pp. vi–xii. Sánchez García summarizes Fray José de Sigüenza, *Tercera parte de la Historia de la Orden de San Jerónimo* (Madrid: Imprenta Real, 1605), p. 450, and León Benito Martón, *Origen y antigüedades de el Subterráneo Santuario de Santa María de las Santas Massas* (Zaragoza: Juan Malo, 1737), pp. 539–542. The attribution of the *Rhetórica* to Salinas does not figure in any of those ancient sources, but does so in other very early works, such as *Aganipe de los cisnes aragoneses* by Juan Francisco Andrés de Uztarroz (1606–1653) or Diego Murillo's *Fundación milagrosa de la Capilla Angélica de la Madre de Dios del Pilar* (1616). Yet, the most conclusive proof is the Epistle placed at the beginning of another work of the author (the *Libro Apologético*), signed by the bookseller Luis Gutiérrez, but surely written by Salinas himself (see Salinas, *Rhetórica*, pp. xi–xii). Nonetheless Francisco Calero Calero offers a recent discussion on the authorship of the text in *Juan Luis Vives o Fray Miguel de Salinas. A propósito de la "Rhetórica en lengua*

In a sense, *Rhetórica en lengua castellana* can be understood as the first fruit of said educational calling. The text reveals the importance that the practice of oratory had in the monastic context and, at the same time, shows the position of the author regarding another linguistic subject of primary importance in the Renaissance: the debate about the status of vernacular languages.[4] In fact, the work is the first original rhetoric written in Spanish, as its first three preliminary texts emphasize: the author's prologue and two epistles, written respectively by Ioannes Petreius, professor of rhetoric at Complutense University, in Alcalá de Henares, and by the aforementioned Juan de Brocar, a disciple of Antonio de Nebrija.[5]

The writing of the work itself (a rhetoric in Castilian devoted exclusively to defining speech in Castilian) offers dual recognition of the possibilities of vernacular languages as vehicles for the transmission of culture. It is clear that, from a more practical point of view, the drafting of the work first of all attempts to reduce a shortcoming: the lack of knowledge of Latin by many readers interested in learning about the principles of the art of oratory. Actually, *Rhetórica en lengua castellana* is introduced in its prologue as the result of a specific request. The request had been made by a powerful person who "not knowing Latin … wished to understand something about what Latin and Greek rhetoric said about the science of speaking and writing well". Salinas fulfilled the request but, as he himself states in the prologue, the resulting handwritten work was "left in a corner for over a year". Once rescued, the author was in two minds whether to tear it up or to keep it for himself, although he ended up showing it to "some friends and other learned people", who urged him to publish it and Salinas could do nothing to avoid this. It is difficult to say if this story of the text's gestation is simply a fiction for the purposes of the prologue or is based on real circumstances. If the latter is true, it is also difficult to discover who the

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castellana" (Madrid: Fundación Universitaria Española and Universidad Pontificia de Salamanca, 2008).

4 Cf. Salinas, *Rhetórica*, p. xii. For Salinas's linguistic ideas see Carlos Moriyón Mójica, "Valdés y Salinas. Dos actitudes frente a la lengua", *Estudios de Lingüística*, 5 (1988–1989), pp. 291–301; Dolors Poch Olivé, "La buena y docta pronunciación según Miguel de Salinas", in E. Montero Cartelle and C. Manzano Rovira (eds.), *Actas del VIII Congreso Internacional de Historia de la Lengua Española* (2 vols., Santiago de Compostela: Meubook and Asociación de Historia de la Lengua Española, 2012), II, pp. 1753–1764.

5 An excellent analysis of these prolegomena can be found in Salinas, *Rhetórica*, pp. xix–xxx; at p. v there is a clarification on conditions of the first original rhetoric in Spanish language. Nonetheless, there was no lack of Spanish translations of classical rhetoric, such as the version of Cicero's *De inventione* by Alfonso de Cartagena in the first third of the fifteenth century.

person was who assigned the work to Salinas. It has even been suggested that it could have been the future Phillip II of Spain: his difficulties in learning Latin and the fact that Juan de Brocar dedicated the edition to him force us to at least consider the possibility.[6]

Whether this was the case or not, *Rhetórica en lengua castellana* was finally offered to a very wide audience and, under the protection of anonymity, was presented as the learned fruit of the monks of the Santa Engracia monastery in Zaragoza, which was quite well-known as a cultural hub in Spain at the beginning of the sixteenth century; the Emperor Charles V used to stay at the monastery when he passed through Zaragoza and Brother Juan Regla, confessor of the Emperor and of Phillip II, and Brother Pedro de la Vega, the General of the Order, among others, lived there.[7] However, the publication of *Rhetórica en lengua castellana* must also be understood within the context of the interests of the printing office where it was produced. The office belonging to Arnau Guillén de Brocar and his son, the aforementioned Juan de Brocar, had been specializing in the publication of texts drafted at Complutense University or as requested by it. These were texts aimed at the dissemination of *studia humanitatis*, including ones devoted to the art of oratory that, logically, played an important role.

Encarnación Sánchez García has stated that there are striking similarities between the list of rhetoric works published at said printing office and the authors cited by Juan de Brocar as sources of *Rhetórica en lengua castellana*: Trebizond, Hermogenes, Cicero, Quintilian "and other modern Latin authors" (an expression that appears to preferably allude to Nebrija and Erasmus).[8] With these select materials, the author had constructed an organised overview of all the topics in the discipline, which was useful, according to the prologue, for a wide variety of fields: legal debate, religious oratory, learned writing, familiar speech and private letters (*cartas mensajeras*).[9] The cover of the work

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6 Cf. Salinas, *Rhetórica*, pp. xvii–xix. See also Russell, "Un libro indebidamente olvidado", p. 135.

7 Pedro de la Vega revised another key text in this design of a new literature in romance language: *Flos Sanctorum renacentista*. The work was started at the Hieronymite monastery of Guadalupe, and was later corrected and expanded at Santa Engracia for its dissemination throughout Spain. The same Pedro de la Vega is the author of a *Chronicle of the Order*, and of a translation of Titus Livy, which he offered Emperor Charles V when the latter stayed at Santa Engracia en route to Italy in 1529 (Salinas, *Rhetórica*, p. ix). Fray Juan Regla entered Santa Engracia in 1536.

8 Cf. Salinas, *Rhetórica*, pp. xx–xxiii and xxxiv–xxxvii.

9 For the specific contents of the *Rhetórica*, see Russell, "Un libro indebidamente olvidado"; Salinas, *Rhetórica*, pp. xxvii–xl. See also Encarnación Sánchez García, "*Alta sciencia y provechosa*: la *Rhetórica en lengua castellana* (Alcalá, 1541) de Miguel de Salinas", in J. Whicker (ed.), *Actas del VIII Congreso de la Asociación Internacional de Hispanistas* (3 vols., Birmingham:

included the whole range of virtues of the text, that is, its considerable brevity, its use as a model for verbal and written discourse and, more originally, its value in order to appreciate the beauty of the spoken and written word: *Rhetórica en lengua castellana, en la cual se pone muy en breve lo necesario para saber bien hablar y escribir, y conocer quién habla y escribe bien* (Rhetoric in the Castilian language, where what is required to know how to speak and write well and to know who speaks and writes well is briefly explained).

8.3 New Oratory

This concern with brevity also constitutes a real *leitmotif* in the work. In fact, the author added at the end of his explanation of the principles of rhetoric a very useful summary of them, as a "table … to help the memory". This *Summa de toda la rhetórica* (*Summa* of all rhetoric) was in effect designed to be kept by young orators, being offered as a short guide to the discipline, thereby confirming the practical spirit that motivated the writing of the text.

However, *Rhetórica en lengua castellana* does not end there. In fact, the most interesting pages of the work are probably those located after said *Summa*, in the two (or three) appendices that completed the volume. These additional materials again have a clearly practical intention, and reflect the adaptation of the work to the new interests of Renaissance readers. The first of these chapters is a *Regla para poner por ejercicio las reglas de la Rhetórica pasada* (Rule to put into practice the rules of past rhetoric), that is, a collection of guidelines for the drafting of any kind of discourse, verbal or written, based on a certain subject or *thema*: whether taken from a poet or historian or simply invented ("condemn war or persuade a sister of mine to raise with her own milk a child that she gave birth to, or a friend of mine to devote himself to the study of the

University of Birmingham, 1998), III, pp. 221–228; Encarnación Sánchez García, "Nebrija y Erasmo en la *Rhetórica en lengua castellana* de Miguel de Salinas", *Edad de Oro*, 19 (2000), pp. 287–298. For more specific issues, see Luis Alburquerque García, "La *inventio* en la Retórica de Miguel de Salinas", in J.N. Romera Castillo and A. Yllera Fernández (eds.), *Investigaciones semióticas III. Actas del III Simposio Internacional de la Asociación Española de Semiótica* (Madrid: UNED, 1990), pp. 119–126; Ascensión Rivas Hernández, "Miguel de Salinas, la retórica y la Modernidad", in M. Labiano Ilundáin et al. (eds.), *Retórica, política e ideología: desde la Antigüedad hasta nuestros días. Actas del II Congreso Internacional* (2 vols., Salamanca: Asociación Española de Estudios sobre Lengua, Pensamiento y Cultura Clásica, 2000), II, pp. 47–52; Francisco Vicente Gómez, "La tensión *inventio-elocutio* en la *Rhetórica en lengua castellana* de Miguel de Salinas", in *Los humanistas españoles y el humanismo europeo. IV Simposio de Filología Clásica* (Murcia: Universidad de Murcia, 1990), pp. 255–260.

arts"). The appendix includes numerous personal reflections and is reminiscent of the Greco-Latin *progymnasmata*, recovered in the sixteenth century. However, a close reading reveals that this is a surprising adaptation (and decontextualization) of various passages devoted by Erasmus of Rotterdam to a much more specific subject (the drafting of letters), in his treatise *De conscribendis epistolis*.[10]

The influence of another work by Erasmus (*De duplici copia rerum ac verborum*) can also be seen in the following appendix to the Castilian text: *Tratado de las maneras de dilatar la materia con palabras y sentencias y otras cosas cuando fuere necesario* (Treatise on ways to expand a subject using words and sayings and other things as necessary). In fact, it could be said that *De copia* by Erasmus works as a pattern, onto which Miguel de Salinas projects new reflections, born from his experience as an orator (and, ultimately, as a reader). Therefore, Salinas' appendix constitutes a truly valuable tool to "expand the subject being spoken or written about or to fill the indicated time that is usually spent on similar acts such as sermons (on which approximately an hour is spent) or because the subject is so dry that it provides little to say or it is necessary to say or write something without knowing about what yet".[11]

8.4   *Tratado de la forma que se debe tener en leer los autores*

Erasmus alluded in *De copia* to eleven resources to cover the vast array of subjects in discourse (the *copia rerum*). The last of these was the use of *exempla*, a very broad concept that included forms as varied as historic and fabulous anecdotes, similes and even proverbs. In his work, Erasmus included a long reflection on the usefulness of these forms, completed by an interesting chapter devoted to explaining the methods of their collection: the *ratio colligendi exempla*.

This final chapter enjoyed a certain good fortune in later literature. In fact, Salinas would also conclude his work with a similar section: *Forma que se*

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10   For the sources of this passage see José Aragüés Aldaz, "*El apetito desordenado de saber. Erudición escolar y discurso renacentista en el* Tratado de la forma que se deve tener en leer los autores *de Miguel de Salinas*", *Revista de Filología Española*, 80 (2000), pp. 287–317, at pp. 291–294. Of course, Salinas could have gone to other more pertinent sources to exemplify the modes of rhetorical training. Erasmus himself had taken up the matter in his *De ratione studii*.

11   Salinas, *Rhetórica*, p. 159.

debe tener en sacar los ejemplos y sentencias de los autores que se leen (How examples and sayings should be taken when quoting from authors). However, this section appears to have taken a higher place in the hierarchy in the Castilian work. Actually, although the typography of the copy printed by Juan de Brocar appears to confirm that these pages form part of the previous appendix (the *Treatise on how to expand a subject*, the overall translation of *De copia*, as we have said earlier), the cover of the volume considers it as a separate chapter, presenting it under the ambitious title of *Tratado de la forma que se debe tener en leer los autores y sacar de ellos lo mejor para poderse de ello aprovechar cuando fuere menester* (Treatise on how examples and sentences should be taken when quoting from authors and how to get the most from them in order to use them as necessary).[12] To a large degree, this 'separation' goes against the ultimate source of the appendix, but it cannot be said that it is totally incongruous. For one thing, it shows the commercial sense of the printer Juan de Brocar, by indicating the presence in the volume of materials that were very attractive for new orators and, in the background, it is worthy of the implication of its author, Miguel de Salinas, in the drafting of these pages: some profoundly original pages that cannot, in any way, be understood as a mere translation of the corresponding chapter in *De copia*.[13]

As we have stated above, in his text Erasmus proposed a very broad understanding of the *exemplum*. Salinas gave the word *ejemplo* a more restrictive and traditional meaning, disassociating it from proverbs.[14] However, this does not mean a restriction on the interests of *Tratado de la forma que se*

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12   Unlike what happened with *De copia* (where the *ratio colligendi exempla* constituted a natural continuation of the reflections on the *exemplum*), in the *Rhetórica en lengua castellana* various paragraphs separate the 'analysis' of the 'example' (placed between the 'arguments' and the 'proofs') from that *Tratado*.

13   The *Tratado de la forma que se debe tener en leer los autores*, in Salinas, *Rhetórica*, pp. 188–209 (in the 1541 edition, folios 103v–117v). For a wider analysis of that appendix, see Aragüés Aldaz, "*El apetito desordenado de saber*". See also Iveta Nakládalová, *La lectura docta en la Primera Edad Moderna (1450–1650)* (Madrid: Abada Editores, 2013), esp. pp. 138–155.

14   For Salinas's relatively novel interpretation of the *exemplum*, see Aragüés Aldaz, "*El apetito desordenado de saber*", esp. pp. 297–299. Otherwise, the particular affinity between the 'abundance of discourse' and the *copia exemplorum* appears already insinuated in Quintilian's *Institutio oratoria,* and is confirmed in Erasmus' *De copia*. Cf. José Aragüés Aldaz, *'Deus concionator'. Mundo predicado y retórica del 'exemplum' en los Siglos de Oro* (Amsterdam and Atlanta: Rodopi, 1999).

debe tener en leer los autores. On the contrary, in the volume, Salinas focused on the compilation of both examples and sayings, because in both forms there is "all that is required to quote any author for advice or learning". In other passages, Salinas also recommended compiling 'comparisons' and 'metaphors' and 'examples and authorities from the Holy Bible'. With this broad range of options, the treatise that closes *Rhetórica en lengua castellana* constitutes a true *ars excerpendi*: that is, a comprehensive program for the organised selection and annotation of any read material that deserved to be remembered.[15]

8.5   The "Disordered Appetite for Knowledge"

However, Salinas' treatise is also a reflection on the act of reading. The search for examples and sayings required the orator's consultation of a limited number of books, which were subject to an extraordinarily detailed reading. The treatise therefore encouraged an attitude to the written word that was opposed to that of most contemporary readers, who were dominated, according to Salinas, by the rush of the "disordered appetite for knowledge". This phrase can undoubtedly be found in Thomas Aquinas' *Summa Theologica* and was linked by Salinas to another topic (that of the damages caused by the "excessive number of books") heightened by the arrival of the printing press.[16] Salinas was aware of the difficulties of his method of reading and annotating, which was "quite arduous, especially at the beginning", because readers could find themselves "with a page that would be sufficient for a whole day's reading". However, the advantages were equally clear. First of all, compilers would "in a short time" obtain a great wealth of materials for their discourses, but they would also "not need (or not often need) to read an author again once read, because they would have extracted everything worthwhile from him", thereby avoiding those troubles caused when "remembering having read something ... and not knowing where or how". Additionally, continuous thought on what had been read would make compilers learn "by rote, or nearly by rote", thereby

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15   On the general purpose and the concept and history of the *ars excerpendi*, see Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006), with an excellent bibliography.

16   Regarding the "disordered appetite for knowledge", see Tomás de Aquino, *Suma Teológica* (4 vols., Madrid: Biblioteca de Autores Cristianos, 1994), IV, II-II, qq. 166–167, pp. 551–557. See also David Gibbons, "Alimentary metaphors in Dante's *Paradiso*", *The Modern Language Review*, 96 (2001), pp. 693–706.

distancing themselves from those who skim over books "like a cat on hot coals" and "within a year" of having read a book can "read it again as if they had never seen it before".

The *ars excerpendi* does indeed require a constant reflection on the possibilities of the future use of read material. The idea of selection is a pulse between memory and forgetting, and humanists need to balance the demands of abundance (*copia*) with the demands of brevity (*brevitas*); these are the two pillars upon which all reflections on *ars* are based. However, the concept of order (*dispositio*) is equally important. One of the essential tasks of a compiler was, effectively, to ascribe each of those sequences to a certain concept or theme, which would facilitate their annotation in the *codex* and make it easier to find at a later time. On this point, Salinas was especially insistent on one idea: that of the multiple use of each annotated passage. According to the Hieronymite monk, "there are many authorities, mainly in the form of examples, that cannot be applied to just one subject, but to six or eight, or more". The idea appeared exemplified by Erasmus in the *De copia* (the ultimate source of the Castilian *Tratado*) through a mythological fable (that of Charybdis), a tale by Aesop (the fox and the goat trapped in a well) and a moral example (the death of Socrates). Salinas replaced the first sequence with a new example (the prohibition by Metellus of Postumius going to war without offering a sacrifice to the god Mars), applying it to five different purposes. He also explained the other two sequences in a highly original way, incorporating new readings to them and adding various personal reflections.[17] In effect, Salinas seems to place all the weight of his *ars excerpendi* on meditation and the discovery of 'possible' (and sometimes 'hidden') readings of each passage or, to be more precise, the 'economy' itself of his method; applying an example "to a subject that its author applies it to, or to that which at first sight appears to suit" should not be enough, but "if it is as fitting for eight or ten subjects as for one, indicate this in all of them, because it is not good to waste something that has been collected correctly once".

8.6   Around the World

The task of reading and compiling constitutes the culmination of a process that began some time ago. In material terms, orators had to first design and

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17   For a more complete analysis of this relationship between Salinas's exposition and Erasmus' postulates, see Aragüés Aldaz, "*El apetito desordenado de saber*", esp. pp. 308–309.

prepare a notebook or *codex excerptorius* for the safekeeping of said valuable material. As we know, Salinas shared here with readers his own experience in the preparation of this notebook or 'white book'. Therefore, this book had to cover a series of thematic concepts, that is, *títulos* (titles) or *lugares comunes* (commonplaces) as Salinas called them. Here, he merely translated, although a little equivocally, the terms *tituli* and *loci* proposed by Erasmus.[18] Compilers had to arrange these titles ("vices and virtues and other subjects that must commonly be discussed") by considering their "affinity, relationship and difference" and "assigning each of them the blank sheet of paper that it was believed could be required". In any case, it was necessary to place a 'table' at the front of the notebook, divided into columns, where all these concepts could be compiled in the same order in which they had been arranged, with a reference to the precise page where they were located. A second list of contents, in alphabetical order, would help to find any of these titles in the table and, by using it, inside the 'white book'.

The design of the *codex* was therefore focused on the selection of an appropriate pattern of commonplaces. Erasmus had indicated the usefulness, in this respect, of the system of virtues and vices present in the works of Aristotle, Cicero, Pliny, Valerius Maximus and Thomas Aquinas. Salinas reduced this list to the last three, adding a new alternative: *Valeriana escrita en castellano* (that is, *Crónica abreviada de España* by Diego de Valera). In any case, Salinas also admitted the possibility that orators could organise this pattern for themselves. In this light, we can understand his decision to include in the *Tratado*, "as a sample and aid", the table that organised his own 'white book', or, to be more precise, a version of the table adapted to suit the interests of readers of *Rhetórica en lengua castellana*, that is, in summary, because "romance languages do not cover as many subjects as Latin".

Salinas presented his table emphasizing the benefits of the logical order (that is, by similar and contrasting themes) of its titles. Compared to alphabetical order, this logical organisation helped orators in two ways, both when looking for quotes in the *codex*, and when retrieving them to use in discourses. In the first case, the proximity of similar concepts makes it possible to rapidly locate a single example from all of the epigraphs related to it; in the second case, orators can follow the organisation of the notebook itself to connect

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18   The phrase *lugar común* in Salinas appropriately translates the sense of Erasmus' *locus*. But, in the case of Erasmus, the phrase *locus communis* is more complex and seems to allude, above all, to proverbial forms (e.g., *Bis dat qui cibo dat*, 'He who gives first, gives twice').

their discourse to thematically linked subjects. Salinas stated that in his 'white book' he used the "device of moral and theological virtues", with "their opposites and types", using this itinerary to include, "where it appeared to me they fitted well", other subjects or concepts. More specifically, Salinas stated that he followed "the order of moral philosophy, especially from *Secunda Secundae* of Saint Thomas" (that is, the third part of *Summa Theologica*). However, in reality, Salinas manipulated this academic pattern with complete freedom, both with regard to the order of presentation and concerning the inclusion in the table of some certainly original epigraphs.

The table presented by Salinas begins with a title dedicated to "virtues in general". After this, there is a epigraph devoted to the theological virtues (faith, hope and charity) and one devoted to the cardinal virtues (prudence, justice, fortitude and temperance), to which orators could add, if they wished, one more epigraph based on the affinity or similarity of some virtues with others. After these general chapters, the table begins its route through each of the virtues and their types. However, compared to what is proposed in *Summa Theologica*, this tour begins with the cardinal virtues, specifically prudence. The consideration of this virtue offers a space to add around thirty titles to the table. These include memory, forgetfulness, and madness. After these, Salinas includes a similar number related to the second cardinal virtue (actually the fourth of those considered by Thomas Aquinas): temperance. Here, Salinas moves much closer to the order of *Summa Theologica*, including abstinence, continence and their opposites, to then drift towards a series of interrelated subjects (adultery, incest and sodomy) that the author recommends be dealt with under one title: "On lustful loves". Always following Saint Thomas, Salinas completes the titles relating to temperance with everything related to 'natural passions' (cruelty, hatred), to then end with some more original titles: laughter, silence and eloquence. Even more original is the consideration of the other cardinal virtues: fortitude and justice (third and second respectively in Thomas Aquinas' work). The treatment of justice, in this sense, is the most detailed in the entire table (as was the case in *Summa Theologica*). Salinas once again begins his tour by following the pattern of the work above, but does not hesitate to abandon it to introduce new concepts. Therefore, after including the titles relating to the law, the table deals with relationships between parents and children, with lineage ("Those from lowly lineage who rose to be bright and powerful") or fidelity (between spouses or by slaves to their masters): epigraphs that clearly no longer refer to *Summa Theologica*, but instead constitute a reference to some of the epigraphs of the most famous collection of *exempla* in antiquity, *Dicta et facta memorabilia* by Valerius Maximus. In accordance with this same freedom in presentation, the table

does not hesitate to return to the suggestions of *Summa Theologica* to deal with other questions related to law and religion, in a tour that includes some strange epigraphs, such as the one devoted to "organs and other instruments used in the temple".

For its part, the route through the theological virtues begins with some preliminary chapters dedicated to God, the Trinity, the end of the world and the final judgment. These chapters appeared at the start and end of *Summa Theologica,* and not in the aforementioned *Secunda Secundae* section.[19] The pattern of *Secunda Secundae* returns, however, in the epigraphs specifically devoted to faith, hope and charity. Again, the treatment of these virtues is a chance to introduce some more suggestive titles. Therefore, connected to charity and one of its works of mercy ("Teach those who do not know") the 'white book' includes some chapters devoted to grammar, rhetoric and poetry.

The treatment of the deadly sins ends this tour through 'virtues and vices' that constitute the "subjects that are most commonly discussed". However, Salinas was aware that, in this task of the overall design of a table, it was still necessary to "travel around the world, to find what was missing, or at least to ensure that it was not missing so much". This voyage of the imagination made it possible to include a complete series of new epigraphs, starting with those devoted to the sky and the four elements, and then continuing with a route on the 'Great Chain of Being': about men and women (their beauty and fidelity, ages and nations), animals, trees and seas, rivers and mountains. The table rises again, this time to heaven, to include the titles dealing with God and the Virgin Mary. This geography of the beyond is completed by a visit to hell, purgatory, the Elysian Fields and earthly paradise. In fact, no fewer than eighty chapters complete this latest 'voyage around the world'. With this, Salinas' table moves away from virtues and vices, which occupied its beginnings, towards the areas of eternal life, granting central space to the field of natural curiosity, of anecdotes, marvels and wonders.

Thanks to this organised route, the table became a very valuable itinerary in order to understand the relationships between natural or spiritual beings; in short, in a faithful reflection of the 'order' of reality. In light of this, the 'white book' not only provides an endless series of short forms, it also ends up offering numerous keys for the overall design of sermons or literary documents, which were so often constructed upon this same set of similar and contrasting

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19   Sanchez García had already called attention to this detail; see Salinas, *Rhetórica*, at
      p. 199.

concepts, and upon this itinerary that leads from God to creatures and from them back to God.

8.7   A Castilian *ars excerpendi*

The *Tratado* by Salinas offers a gradual precision regarding its contents. The theoretical presentation of the benefits of the *ars excerpendi* gives way to a complete review of the titles that organise his 'white book' and to this, Salinas added some points that are even more specific regarding the material appearance of the 'white book'. He, therefore, did not hesitate to reproduce the exact beginning of the table located at the front of the book (divided as it was into columns) or to indicate his habit of placing some marginal annotations at the side of certain examples, when these could be used to illustrate a subject in detail (annotations made in "red or black writing" and emphasized "by a line underneath").

The final paragraphs of his presentation reiterate the perfectible nature of the presented table (subject, in fact, to additions and improvements "every day") and, consequently, the aforementioned condition as a mere sample for readers. However, the modesty of this point made by Salinas did not stop him from recognizing the shortcomings of contemporary books in organising all details regarding the practice of compilation, which "of the few that I have seen, not one has appeared to me to state everything required to put into practice such an arduous task", or, at least, "none states it as completely as here". This passage is especially significant if we bear in mind the distant source of the pages that readers held in their hands. It was the desire to summarize *De copia* by Erasmus (that is, to write the *Tratado de dilatar la materia*) that had led Salinas to adapt one of his essential chapters: a *ratio colligendi exempla* which then became the ambitious *Tratado de la forma que se debe tener en leer los autores*. However, it is true that the latter work had gradually abandoned his debt to Erasmus, thereby legitimizing this silence about its source. It is also true that Castilian readers, for the first and almost last time, were able to find an *ars excerpendi* in the pages of the *Rhetórica* in their own language.[20]

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[20]   On the utility of the *codex excerptorius* there are allusions, with more or less detail, in numerous Spanish authors of the sixteenth century and first decades of the seventeenth century, such as Vives, Palmireno, Fray Luis de Granada, Terrones del Caño, Juan Palomeque or Francisco Murcia de la Llana. Only Terrones del Caño (1551–1563) will do it in Castilian as does Salinas. Regarding these authors, see the bibliography collected in José Aragüés

8.8   Paths of the *codex*

The construction of the *codex excerptorius* was the 'material' support, as we stated above, of some of the literary keys of humanism, from the rhetoric of quotations to the poetry of abundance. The 'white book' proposed by Salinas therefore had to become a bridge between the past and the present, filling out old quotations with the most contemporary romance prose. However, its destiny was somewhat more ambitious. Its use appears to be connected to a lifetime of reading and study, marking a clear distance between it and other compilation 'notebooks': the modest notebook in which Renaissance scholars saved their first lessons or their professional repertoires, solely interested in the collection of technical subjects. The acquisition of knowledge is, in effect, inseparable from the writing of the 'white book' and, in this sense, can even be contrasted with the 'ordinary route' of study: "anyone who uses it will be more learned and capable of writing or speaking about anything within one year, than through the ordinary route of studying for four years, and whoever uses it well could be considered as one of the most learned among the ancient sages".

Salinas' program was therefore presented as something truly new. From this point of view, the contribution of his 'white book' was not an attempt to provide a model for the construction of the notebook, but more to simply encourage its use. It is difficult to assess the implementation of these reading and annotation techniques in the Spain of 1541, and it is even more difficult to gauge the influence that Salinas' text might have had on that process. In this sense, Salinas' words testify to a desire for sound learning, founded on the direct reading of the *auctores*. It was perhaps an unrealistic desire at the time, given the recent flourishing of a whole universe of printed learning treasures: anthologies, encyclopaedia, commonplace books.[21]

Aldaz, "Caminos de la ejemplaridad: los consejos sobre el acopio de *exempla*, de Erasmo al Padre Isla", *Criticón*, 110 (2010), pp. 9–25, esp. pp. 13–14.

21   Indispensable for the origin and development of these collections is Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996), with a complete bibliography. For the Hispanic world, see also Víctor Infantes, "De *Officinas* y *Polyantheas*: los diccionarios secretos del Siglo de Oro", in *Homenaje a Eugenio Asensio* (Madrid: Gredos, 1988), pp. 243–257; Sagrario López Poza, "Polianteas y otros repertorios de utilidad para la edición de textos del Siglo de Oro", *La Perinola*, 4 (2000), pp. 191–214; Sagrario López Poza, "Florilegios, polyantheas, repertorios de sentencias y lugares comunes", *Criticón*, 49 (1990), pp. 61–75; José Aragüés Aldaz, "Otoño del humanismo y erudición ejemplar", *La Perinola*, 7 (2003), pp. 21–59; José Aragüés Aldaz, "Caminos de la ejemplaridad"; Teresa Jiménez Calvente, "Los humanistas y sus herramientas filológicas:

The series of relationships between these printed repertoires and private codices is almost endless. It is not just the fact that some share very similar organisational techniques or that they are based on the same balance between variety and brevity: it is also true that private codices could end up being sold and that many collections initially designed for individual use ended up being printed. The development of these printed treasures went hand in hand with the advice regarding the *ars excerpendi* disseminated by humanist and Baroque authors. In this sense, the consultation of these treasures for the construction of the *codex excerptorius* (to the detriment of a direct reading of the *auctores*) would have been accepted or even recommended on many occasions, opening a 'third route' (and a 'transitional form') between two opposing positions: the honest notebook dreamed of by Salinas and the reality of a gradual abandonment of written compilation practices in favour of an *ad hoc* consultation of printed repertoires. It is not the purpose of this paper to examine the history and consequences of this abandonment.[22]

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de polianteas, florilegios y otros útiles similares", *La Corónica*, 37: 1 (2008), pp. 217–244; Teresa Jiménez Calvente, "Un tipo de lectura profesional: los humanistas y los textos", *eHumanista*, 27 (2014), pp. 329–349.

22   I dealt extensively on the history of those relations between individual compilation and the usage of printed repertoires in Aragüés Aldaz, "Otoño del humanismo y erudición ejemplar", and Aragüés Aldaz, "Caminos de la ejemplaridad".

Albrecht von Haller as an 'Enlightened' Reader-Observer

Fabian Krämer

9.1 Introduction

Notwithstanding their recurrent rhetoric of experience, 'enlightened' naturalists did not generally read less or spend more time observing than did their predecessors in the Renaissance. But scholarly reading practices had undergone dramatic changes over the course of the early modern period, possibly even more so than had the practices of scientific observation: an enlightened reader was no longer supposed to collect and memorize the 'factoids'[1] that he found in the texts of others and add them to his own ones. Rather, he was expected to practice the use of his *iudicium* to critically assess the content of what he was reading. Scholarly reading had become, at least in theory, an act of criticism, and observation an integral part of one's reading practices.

Despite the belief shared by many eighteenth-century naturalists that an observation had to be repeated to minimise the chance of error, (re)assessing the observations of others was as much a matter of reading as it was one of observing. What is more, if the observed phenomena were considered to be rare, preternatural, or even fantastical, one could hardly hope to repeat the observation. Which left reading.

In what follows, the eminent Swiss physiologist Albrecht von Haller (1708–1777) will be used to exemplify these traits of enlightened reading practices. We can study the ways in which he dealt with texts through at least three monuments of his reading practices: his extant reading notes, the thousands of book reviews that we know he authored, and his *Bibliotheca medica*, an impressive example of *Historia literaria*. Von Haller's extant reading notes, short summaries

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1 The term 'factoid' was introduced by Ann Blair for the titbits of knowledge that Renaissance scholars culled from their reading and entered into their commonplace books for later retrieval and use. See Ann Blair, "Humanist methods in natural philosophy: the commonplace book", *Journal of the History of Ideas*, 53: 4 (1992), pp. 541–551, at p. 545. I am grateful to Claire Gantet and Helmut Zedelmaier, from whose comments and suggestions on an earlier version of this essay I profited very much.

and critiques which he entered into his *Iudicia librorum*, appear to have provided the raw materials both for many of his book reviews and his *Bibliotheca*.[2] Together they form a triangle that bears witness to his particular brand of 'learned empiricism'.[3] Much research needs to be done before we fully understand how the three corners of the triangle related to one another. In what follows, I will mostly use the little studied *Bibliotheca medica* to arrive at some preliminary insights regarding von Haller's reading practices. First, I will clarify the place that reading occupied in Albrecht von Haller's scholarship; after all, he is known first and foremost for his 'empirical' work. I will then proceed to discuss his *Bibliotheca medica* in some detail before sketching how observational and reading practices were interrelated in his work.[4]

9.2 The Most Celebrated Scientific Observer of the Enlightenment: A Reader

Albrecht von Haller has deservedly been characterised as "the most celebrated scientific observer of the Enlightenment".[5] The notebooks that he used to document his observations extant in his *Nachlass* bear witness to the fact that he was an assiduous and disciplined observer. In case of doubt especially he made sure that the same observation was carried out more than once.[6]

But even the most distinguished observer could not do without recourse to the knowledge and especially the observations of others. In the mid-eighteenth century the *respublica literaria medica* was characterised by a collective empiricism that had emerged during the early modern period. Despite the contemporary claim that observation was key to the production of knowledge about nature, many aspects of eighteenth-century empiricism are still reminiscent

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2   Gunter Mann hints at the role that they seem to have played for the *Bibliotheca medica*. Cf. Albrecht von Haller, *Bibliotheca botanica I. Mit einem Vorwort von Gunter Mann* (Hildesheim and New York: Olms, 1969), p. viii.

3   On this notion, see Gianna Pomata and Nancy G. Siraisi, "Introduction", in G. Pomata and N.G. Siraisi (eds.), *Historia. Empiricism and erudition in early modern Europe* (Cambridge, MA: The MIT Press, 2005), pp. 1–38, esp. p. 17.

4   On von Haller's reading practices, especially vis-à-vis monsters, see also Fabian Krämer, *Ein Zentaur in London. Lektüre und Beobachtung in der frühneuzeitlichen Naturforschung*, *Kulturgeschichten* (Affalterbach: Didymos, 2014), esp. Ch. 5.

5   Lorraine Daston, "The empire of observation, 1600–1800", in L. Daston and E. Lunbeck (eds.), *Histories of scientific observation* (Chicago and London: The University of Chicago Press, 2010), pp. 81–113, at p. 106.

6   Cf. Daston, "The empire of observation", p. 113 (fn. 103).

of early modern 'learned empiricism'. Albrecht von Haller was no exception; reading was an essential part of his practice as a researcher. He systematically sifted through both the older and the more recent literature for information on the phenomena he was researching. Given the many subjects he treated during his long career, there was a lot to read.

Albrecht von Haller was born in Bern, Switzerland, in 1708, where he grew up under modest circumstances in a family that was neither rich nor influential. Since he wanted to become a physician, he enrolled as a student of medicine at the University of Tübingen in 1724. As soon as in 1725, however, he moved on to Leiden to study with the famous botanist and physician Hermann Boerhaave (1668–1738). He also studied anatomy with Bernhard Siegfried Albinus (1697–1770). In the same year he started taking the critical notes on his reading that would later amount to the 28 volumes of his *Iudicia librorum*.[7] His graduation as *doctor medicinae* followed three years later.

During the rest of that year and until 1728 he went on his *Grand Tour* to London, Oxford, Paris and Strasbourg. Rather than returning immediately to Bern he spent spring and summer in Basel to study advanced mathematics with Johann I Bernoulli (1667–1748). An alpine journey during the following months enabled him to study the alpine flora. At the same time he set up his botanical collection that would later form the basis for his Swiss flora. Soon afterwards, he followed the invitation to lecture on anatomy in Basel during the winter term 1728–1729, after which year he returned to Bern to practice medicine.

In 1736 he successfully applied for a professorship in anatomy, surgery, and medicine at the University of Göttingen, which had only been established two years earlier. In Göttingen, von Haller established a botanical garden and herbarium and famously developed his physiological theory of sensibility and irritability. Over the course of the following two decades he became one of the most influential European physiologists, anatomists, and embryologists of his time, and a member of a large number of scientific academies both in the Holy Roman Empire and abroad, while never ceasing to engage also with botany.[8]

In 1745 von Haller was elected member of the cantonal council of his hometown Bern. Hoping for a political career built upon this council membership, he resigned his professorship and left Göttingen in 1753. Back in Bern he was elected *Rathausmann*. During the years 1758 through 1764 he left his hometown

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7   For an overview of the manuscripts in the Haller-*Nachlass* in Bern and Milan, see Barbara Braun-Bucher, "Hallers Bibliothek und Nachlass", in H. Steinke et al. (eds.), *Albrecht von Haller. Leben – Werk – Epoche* (Göttingen: Wallstein Verlag, 2008), pp. 515–526, at pp. 522–523.

8   For an account of the many facets of von Haller's work, see Hubert Steinke et al. (eds.), *Albrecht von Haller. Leben – Werk – Epoche* (Göttingen: Wallstein Verlag, 2008).

for one last time, to oversee the Bern saltworks from Roche, before returning for good. He spent the rest of his life combining his work as a naturalist with public service, and he also wrote fictional literature. Less prominently, he now set out to write his many-volume *Bibliotheca medica.* Albrecht von Haller died in Bern in 1777.[9]

If we compare the way in which von Haller read with the reading practices of his early modern predecessors, we cannot fail to notice that he read more critically and selectively than many of them did. Martin Stuber, Stefan Hächler and Luc Lienhard rightly characterise his approach to the study of nature as follows:

> It is a mark of his *Wissenschaft* that one's own experience, as systematic as possible and based on observation and experiment, combined with a critical assessment of all that has been written on the matter at hand is meant to provide the foundations of a discipline.[10]

The rise of the book review that we witness in the eighteenth century can be seen as a symptom of the stress that the contemporaries put on critically assessing the literature. Von Haller had his part in the rise of the genre: between 1747 and 1753 he edited the *Göttingischer Gelehrter Anzeiger*, a review journal to which he alone contributed around 9000 book reviews.[11]

Less well known, but no less instructive with regard to von Haller's extensive and critical reading practices is his *Bibliotheca medica.* As Erich Hintzsche puts it, "[t]hroughout his scientific career, Haller thoroughly studied everything that had been published on any given subject; it is therefore natural that he turned his systematic instincts toward bibliography".[12] His *Bibliotheca medica*, published between 1771 and 1788, is perhaps the most impressive monument of this aspect of his work.[13]

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9   The biographical sketch is largely based upon Erich Hintzsche, "Haller, (Victor) Albrecht von", in C.C. Gillispie (ed.), *Dictionary of scientific biography* (16 vols., New York: Scribner, 1972), VI, pp. 61–67.

10   Martin Stuber et al. (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel: Schwabe Verlag, 2005), p. 5; unless otherwise indicated, all translations are mine.

11   See Stuber et al. (eds.), *Hallers Netz*, p. 5. The large number of reviews authored by von Haller was considered astounding already in the eighteenth century. See, for instance, Johann Georg Heinzmann (ed.), *Albrechts von Haller Tagebuch seiner Beobachtungen über Schriftsteller und über sich selbst …* (Bern: In der Hallerschen Buchhandlung, 1787), p. iv.

12   Hintzsche, 'Haller', p. 66.

13   Another material correlative of enlightened reading practices can be located on the level of the 'paper technology' used for storing and parsing one's reading: from the seventeenth century onward, learned authors increasingly turned away from book-bound technology

9.3   Albrecht von Haller's *Bibliotheca medica*

After his return to Bern in 1753, von Haller started publishing his *Bibliotheca medica*, which spans four parts of medicine: botany, surgery, anatomy, and practical medicine. Von Haller managed to complete and publish the *Bibliotheca botanica* (1771–1772), the *Bibliotheca chirurgica* (1774–1775), and the *Bibliotheca anatomica* (1774–1777), each of which comprises two volumes. He was no longer able to finish his fourth projected *Bibliotheca*, which was meant to be an exhaustive *Bibliotheca medicinae practicae*. It was edited and amended on the basis of von Haller's manuscripts by the physician Joachim Diterich (or Dietrich) Brandis (1762–1846) and published posthumously in 1788.[14] In toto,

such as the commonplace book in favour of loose slips of paper like the ones used by Carl von Linné. Von Haller also used index cards for his reading notes. See Braun-Bucher, "Hallers Bibliothek und Nachlass", p. 521. On the term 'paper technology', see Anke te Heesen, "The notebook: a paper-technology", in B. Latour and P. Weibel (eds.), *Making things public. Atmospheres of democracy* (Cambridge, MA: The MIT Press, 2005), pp. 582–589. Cf. also Volker Hess and Andrew Mendelsohn, "*Paper technology* und Wissenschaftsgeschichte", *NTM – Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin*, 1 (2013), pp. 1–10. On Linné's index cards, see Staffan Müller-Wille and Sara Scharf, "Indexing nature: Carl Linnaeus (1707–1778) and his fact-gathering strategies", *Working papers on the nature of evidence. How well do 'facts' travel?* 36: 8 (2009), pp. 1–39; Staffan Müller-Wille, "Vom Sexsystem zur Karteikarte. Carl von Linnés Papiertechnologien", in T. Bäumler et al. (eds.), *Nicht Fisch – nicht Fleisch. Ordnungssysteme und ihre Störfälle* (Zürich: Diaphanes, 2011), pp. 33–50; Staffan Müller-Wille and Isabelle Charmantier, "Natural history and information overload: the case of Linnaeus", *Studies in history and philosophy of science part C. Studies in history and philosophy of biological and biomedical sciences*, 43: 1 (2012), pp. 4–15. For an overview of the techniques that scholars used for storing and parsing their reading from the early modern period up to the present day and a discussion of the reasons why from the late seventeenth century onward the use of index cards can increasingly be traced in the sources, see Helmut Zedelmaier, "Buch, Exzerpt, Zettelschrank, Zettelkasten", in L. Scholz and H. Pompe (eds.), *Archivprozesse. Die Kommunikation der Aufbewahrung* (Köln: DuMont, 2002), pp. 38–53; Alberto Cevolini, *De arte excerpendi. Imparare a dimenticare nella modernità* (Florence: Leo S. Olschki, 2006).

14   Albrecht von Haller, *Bibliotheca botanica …* (2 vols., Tiguri: Apud Orell, Gessner, Fuessli, et Socc., 1771–1772); Albrecht von Haller, *Bibliotheca chirurgica …* (2 vols., Bernae and Basileae: Em. Haller and Joh. Schweighauser, 1774–1775); Albrecht von Haller, *Bibliotheca anatomica …* (2 vols., Tiguri: Apud Orell, Gessner, Fuessli, et Socc., 1774–1777); Albrecht von Haller, *Bibliotheca medicinae practicae …* (4 vols., Bernae and Basileae: Em. Haller and Joh. Schweighauser, 1776–1788). Cf. Hintzsche, 'Haller', p. 66 and p. 67, and Sicco Lehmann-Brauns, "Neukonturierung und methodologische Reflexion der Wissenschaftsgeschichte. Heumanns *Conspectus reipublicae literariae* als Lehrbuch der aufgeklärten Historia literaria", in F. Grunert and F. Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im*

the *Bibliotheca medica* lists and comments upon about 50,000 titles, many of which are marked with a star indicating that they were contained in von Haller's large private library.[15]

Two aspects of these works in particular deserve our attention: first, they are chronologically ordered and become ever more detailed the closer one gets to von Haller's lifetime, which is indicative of von Haller's view on how the 'sciences' develop over time. Second, they are annotated bibliographies and thus bespeak his decidedly critical take on the literature. In the following, I will discuss these aspects of von Haller's *Bibliothecae*. But first, we need to place them in the genre tradition to which they belong.

From the sixteenth century onward, the term *Bibliotheca* was used for works that represented ideal libraries on paper. The most famous work of this kind at the time was the *Bibliotheca universalis* (1545–1548) of the Swiss naturalist and polymath Conrad Gessner (1516–1565). Its first volume presents the available scholarly knowledge written in Latin, Greek and Hebrew, ordered alphabetically according to the author names and thus easily accessible. Its second volume, the *Pandectae*, orders these texts systematically and offers a method for the processing of one's reading following the topical grid used by Gessner.[16]

The contemporaries in the eighteenth century were used to calling the systematic documentation of the relevant literature on a given subject matter, coupled with instructions on how to access and read it, *Historia literaria*. *Historia literaria* flourished from the late seventeenth century through the mid-eighteenth century, in the Holy Roman Empire in particular.[17] It was the

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17. und 18. Jahrhundert (Berlin: Akademie Verlag, 2007), pp. 129–160, at p. 158 (fn. 111). Both accounts are incomplete and leave one part of the *Bibliotheca medica* unmentioned.

15   Hintzsche, 'Haller', p. 66.

16   Helmut Zedelmaier, *Bibliotheca universalis und Bibliotheca selecta. Das Problem der Ordnung des gelehrten Wissens in der frühen Neuzeit* (Weimar et al.: Böhlau, 1992).

17   See Helmut Zedelmaier, "Heumanns *Conspectus Reipublicae Literariae* – Besonderheit, Kontext, Grenzen", in K.R. Eskildsen et al. (eds.), *Christoph August Heumann. Stile und Themen frühaufklärerischer Gelehrsamkeit* (Stuttgart: Franz Steiner, 2016), in print. Historians of science and of ideas began but recently to research into *Historia literaria*. See Frank Grunert and Friedrich Vollhardt, "Einleitung", in F. Grunert and F. Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin: Akademie Verlag, 2007), pp. vii–xi. We have a small number of studies with a limited scope, notably Martin Gierl, "Bestandsaufnahme im gelehrten Bereich. Zur Entwicklung der 'Historia literaria' im 18. Jahrhundert", in M. Gierl (ed.), *Denkhorizonte und Handlungsspielräume. Festschrift für Rudolf Vierhaus zum 70. Geburtstag* (Göttingen: Wallstein Verlag, 1992), pp. 53–80; Herbert Jaumann, "Jakob Friedrich Reimmanns Bayle-Kritik und das Konzept der Historia literaria. Mit einem Anhang über Reimmanns Periodisierung der deutschen Literaturgeschichte", in M. Mulsow and H. Zedelmaier (eds.), *Skepsis,*

philosopher and Lord Chancellor of England Francis Bacon (1561–1626) who laid the programmatic foundations of *Historia literaria* when he commented on the desideratum of a *Historia Literarum* in the second book of his *De dignitate et augmentis scientiarum* (1623; English 1605).[18] From its Baconian beginnings, the genre was decidedly forward-looking.

For Bacon, *Historia Literarum* did not document the extant knowledge for its own sake. It was meant to enable and direct future research. Bacon thought that a critical assessment of all knowledge pertaining to particular sciences would render their present deficits visible. Only by knowing what we already know would one be able to decide where to turn next. This idea became paradigmatic for the works entitled *Historia litteraria* that were published in the late seventeenth and the eighteenth century, even though they differed conceptually as well as methodically and typically focussed on learned knowledge only, whereas Bacon had a wider conception of knowledge in mind.[19] Most of the authors who followed Bacon's lead publishing *Historiae litterariae* – or introductions to it – shared a wide conception of *historia* as experience-based knowledge, not history in the narrow, modern sense. The term denoted "the descriptive-atemporal, pre-scientific status of the insights (*notitia*) it transmits".[20]

Providenz, Polyhistorie. Jakob Friedrich Reimmann (1668–1743) (Tübingen: Max Niemeyer, 1998), pp. 200–213; Helmut Zedelmaier, "*Historia literaria*. Über den epistemologischen Ort des gelehrten Wissens in der ersten Hälfte des 18. Jahrhunderts", *Das Achtzehnte Jahrhundert*, 22: 1 (1998), pp. 11–21; Paul Nelles, "*Historia literaria* at Helmstedt. Books, professors, and students in the early Enlightenment university", in H. Zedelmaier and M. Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen: Max Niemeyer, 2001), pp. 147–175; Frank Grunert et al., "Ein Leitfaden durch das Labyrinth. Zur Funktion der Gelehrsamkeitsgeschichte in der Frühen Neuzeit", *Mitteilungen des Sonderforschungsbereichs 573*, 2 (2006), pp. 35–42. For a more comprehensive treatment of the subject, see Frank Grunert and Friedrich Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin: Akademie Verlag, 2007).

18   On Bacon's programme of a *Historia Literarum*, see Anette Syndikus, "Die Anfänge der Historia literaria im 17. Jahrhundert. Programmatik und gelehrte Praxis", in F. Grunert and F. Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin: Akademie Verlag, 2007), pp. 3–36, esp. pp. 6–14.

19   Cf. Zedelmaier, "Heumanns *Conspectus Reipublicae Literariae*".

20   Cf. Zedelmaier, "Heumanns *Conspectus Reipublicae Literariae*". On the two main meanings of *historia* in scholarly parlance in the early modern period, see Arno Seifert, *Cognitio historica. Die Geschichte als Namengeberin der frühneuzeitlichen Empire* (Berlin: Duncker und Humblot, 1976); Gianna Pomata and Nancy G. Siraisi (eds.), *Historia. Empiricism and erudition in early modern Europe* (Cambridge, MA: The MIT Press, 2005).

From the early eighteenth century onwards, Baconian *Historia literaria* received ever more attention because it fitted into the early enlightenment project of 'criticism'.[21] *Historia literaria* textbooks such as Christoph August Heumann's (1681–1764) *Conspectus reipublicae literariae* (1718), which at the time was the definite book on the subject,[22] are often informed by a progress model of the history of the sciences.[23] Furthermore, Heumann particularly stressed the critical character of *Historia literaria*: he understood his *Conspectus reipublicae literariae* to be a blueprint for a *Historia literaria critica*.[24]

It was common in the eighteenth century to sub-divide the *Historia literaria* genre according to the subject matter treated by a given work, into *Historia literaria universalis*, *particularis*, and *specialis*. In contrast to *Historia literaria universalis*, *Historia literaria particularis* or *specialis* focused on a particular aspect of the history of learning – a field or discipline. Von Haller's *Bibliotheca medica* falls into this category.[25]

For his *Bibliotheca*, von Haller could build on several works of the Genevan physician Jean-Jacques Manget (1652–1742). Manget wrote, amongst many others books, a *Bibliotheca scriptorum medicorum veterum et recentiorum* (1731) in four volumes, and a *Bibliotheca chemica curiosa* (1702) in two volumes. Together with a second Genevan physician, Daniel Le Clerc (or Leclerc, 1652–1728), Manget also published an influential two-volumes *Bibliotheca anatomica* (1685). Together, these *Bibliothecae* provide a good overview of the medical knowledge available in the seventeenth century.[26] Albrecht von Haller not only treats Manget in his *Bibliotheca medicinae practicae* but also mentions that they were relatives.[27] However, von Haller's *Bibliotheca medica* is

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21   Cf. Lehmann-Brauns, "Neukonturierung", esp. pp. 131–132.

22   Cf. Zedelmaier, "Heumanns *Conspectus Reipublicae Literariae*".

23   On Heumann's *Historia literaria* in this context, see Lehmann-Brauns, "Neukonturierung", p. 154.

24   Christoph August Heumann, *Conspectus reipublicae literariae sive via ad historiam literariam iuventuti studiosae aperta* (Hannover: Apud Nicolaum Foersterum, 1718), Ch. 2, § XVIII, pp. 28–29; cf. Zedelmaier, "Heumanns *Conspectus Reipublicae Literariae*".

25   On this division, see Zedelmaier, *Bibliotheca universalis*, p. 1, and Lehmann-Brauns, "Neukonturierung", pp. 158–159 and p. 138 on Heumann's concepts *Historia literaria universalis* and *specialis*.

26   Jean-Jacques Manget, *Bibliotheca scriptorum medicorum veterum et recentiorum* (4 vols., Genevae: Perachon & Cramer, 1731); Jean-Jacques Manget, *Bibliotheca medico-practica* (4 vols., Genevae: Chouet & Cramer, 1695–1698); Jean-Jacques Manget, *Bibliotheca chemica curiosa* (2 vols., Genevae: Chouet & Cramer et al., 1702); Daniel Le Clerc and Jean-Jacques Manget, *Bibliotheca anatomica* (2 vols., Genevae: Chouet, 1685).

27   Haller, *Bibliotheca medicinae practicae*, III, p. 603.

characterised by a more critical stance towards the literature than the writings by Manget and Le Clerc.[28]

Von Haller's *Bibliothecae* are informed by a view of the historicity of knowledge that characterized most contributions to *Historia literaria* of the time: von Haller believed that the history of science was a history of steady progress; and he considered it normal that much knowledge had to be revised within 20 or 25 years.[29] The *Bibliotheca anatomica* (1774–1777) is well suited to exemplify this trait of von Haller's reading practice. It summarizes the then extant anatomical and physiological knowledge on 1680 quarto pages and, unlike Manget's and Le Clerc's *Bibliotheca anatomica*, also critically comments on it.[30] The *Bibliotheca anatomica*,

> as a bibliographical counterpart to the *Elementa* [*physiologiae*, F.K.] giving more place to historical development, provided a researcher with all the literature pertaining to the questions that occupied him. Despite its documenting character, the *Bibliotheca anatomica* was a work aimed at future research.[31]

It is significant in this regard that Albrecht von Haller organised his *Bibliotheca anatomica*, as well as the other parts of his *Bibliotheca medica*, chronologically. With some time periods he associates particular steps in the development of the field. *Liber I. Graeci* in book one of the *Bibliotheca anatomica*, for instance, has as its subject matter what von Haller considered the Greek roots of anatomy. Its very first paragraph, *§.1. Primordia*, begins with him stating that the practical knowledge (*peritia*) of anatomy is not in the same way ancient (*antiquam*) as that of plants (*herbarum*), after which he goes on to discuss animal sacrifices in ancient Egypt.[32] Closer to his own times *Liber V. Schola Italica* discusses what historians of science today consider the anatomical Renaissance. *Liber VI. Animalium Incisiones* contains works that were written later on in the early modern period, after anatomy, which so far had flourished predominantly in Italy, as von Haller observes, had fanned out north of the

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28   Cf. Marie-Louise Portmann, "Jean-Jacques Manget (1652–1742), médecin, écrivain et collectionneur genevois", *Gesnerus*, 32: 1–2 (1975), pp. 147–152, at p. 152.

29   Hubert Steinke, "Anatomie und Physiologie", in H. Steinke et al. (eds.), *Albrecht von Haller. Leben – Werk – Epoche* (Göttingen: Wallstein Verlag, 2008), pp. 226–254, at p. 246 and, on the entire paragraph, pp. 246–248.

30   On the scope and content of the *Bibliotheca anatomica*, see Steinke, "Anatomie und Physiologie", p. 249.

31   Steinke, "Anatomie und Physiologie", p. 249.

32   Haller, *Bibliotheca anatomica*, I, pp. 1–2.

Alps.[33] The volume closes with *Liber VII. Anatome Humana*, which assesses the anatomical literature that was published in the final years of the seventeenth century and up to the year 1700.

That von Haller considered the history of anatomy as a progress history becomes still more obvious if we consider how he subdivides it into the two volumes of his *Bibliotheca anatomica*: while the first volume covers the entire (pre-)history of anatomy up to ca. 1700, volume two commences with *Liber VIII. Anatome Doctior*, the very first paragraph of which, *§.1. DCCLXI Ant. Pacchioni*, discusses works published in 1701. The entire volume is taken up by the few decades between 1700 and 1776, that is, shortly before von Haller finished writing it.[34] In the contemporary reader this will not have failed to leave the impression of an exponential growth in anatomical knowledge culminating in the present. The same applies to the other parts of the *Bibliotheca medica* published during von Haller's lifetime; volume one also of the *Bibliotheca botanica* and the *Bibliotheca chirurgica* cover the time up to ca. 1700, whereas the entirety of the second volumes is taken up by the remaining decades up to the time of von Haller's writing them.

When von Haller read, he did not do so primarily to *collect* bits of knowledge, as did many of his predecessors in the sixteenth and seventeenth centuries. Rather, his reading practice was 'critical' and, closely connected to this, *selective*. This was in line with a more general trend among learned readers. In the enlightenment,

> mere memorized knowledge is increasingly devaluated and replaced by the model of 'thinking for oneself'. According to the *Art of reading books* by the Kantian Adam Bergk, the 'self-acting intellect' had to learn how to 'dominate' the reading that corresponded to [this new model, F.K.] in order not to be 'suffocated by the collecting of insights'.[35]

That von Haller's *Bibliotheca medica* was an exercise in thinking for oneself is indicated already on the title pages of its volumes. They advertise the

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33   Haller, *Bibliotheca anatomica*, I, p. 362.

34   Albrecht von Haller signed the *Praefatio* in volume two with "Bern in Switzerland, 13 March 1777". Haller, *Bibliotheca anatomica*, II, p. 2.

35   Cf. Helmut Zedelmaier, "Lesetechniken. Die Praktiken der Lektüre in der Neuzeit", in H. Zedelmaier and M. Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen: Max Niemeyer, 2001), pp. 11–30, at p. 28.

respective parts of the *Bibliotheca* as offering not merely an overview of the writings pertaining to their field but one that musters (*recensere*) these writings. The title of the first volume of the *Bibliotheca botanica*, for example, reads: *Bibliotheca botanica. Qua scripta ad rem herbariam facientia a rerum initiis recensentur. … Tomus I. Tempora ante Tournefortium.* The use of this term for the activity of the author of a *Bibliotheca* as such is hardly surprising. Conrad Gessner already uses it when expounding his method in the dedicatory epistle of the first volume of his *Bibliotheca universalis* (1545).[36] However, it assumes a new prominence in von Haller as it was elevated onto the title pages of his *Bibliotheca medica*.

Similarly, von Haller's forewords repeatedly stress the important role that the *iudicium* played for their composition. The *iudicium* was crucial for the early modern *ars excerpendi*: it came in when a reader had to decide on which parts of a text he should take notes. But in von Haller, and not untypically for an eighteenth-century scholar, it assumed a second function: to critically assess the contents of the text in question.

In the preface of the first volume of the *Bibliotheca anatomica*, for instance, the term *iudicium* – or *judicium*, as von Haller spells it, comes up twice. He uses it for the first time when conceding that he did not read all of the texts he mentions. Given his poverty and the lack of public libraries in the mediocre city (*urbe modica*) of Bern, he argues, he had hardly anything but himself at hand, not the most glorious equipment (*amplissimam suppellectilem*), from whence to arrive at a certain judgments (*certa judicia*) about the books. He therefore knew many titles he lists only through book catalogues and admits that he may well have overlooked many others.[37] The *iudicium* is invoked again in the next sentence: if anything about the work is useful, it is for the candour (*ingenuitas*) of its judgements (*judiciorum*).[38] Von Haller took particular pride in the critical

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36 "Quod ad me, statueram ab initio veteres tantum et melioris notæ nostri sæculi scriptores enumerare, nec alios quamque qui hodieque extarent: sed cum eadem opera, nec multo maiori labore, omnes cuiuscunque generis sriptores colligi posse viderem, quotquot et qualescunque reperi libros secundum nomina authorum per alphabeti ordinem *recensui* in tribus præcipuis linguis, Latina, Græca, et Hebraica, extantes et non extantes, veteres ac recentiores, doctos cum indoctis, excusos et adhuc latentes: adiectis plærunque centuris, argumentis, præfationibus, aut capitibus ut vocant, sive omnibus illis, sive nonnullis, ubi fieri commode potuit". Cf. Conrad Gessner, *Bibliotheca universalis, sive catalogus omnium scriptorum locupletissimus* (Tiguri: Excudebat Christophorus Froschoverus, 1545), fol. *3r (italics added).

37 Haller, *Bibliotheca anatomica*, I, pp. iv–v.

38 Haller, *Bibliotheca medicinae practicae*, I, p. v.

assessment of the works he lists; and he considered this assessment a practice of his *iudicium*.

But even with regard to the more traditional function of the *iudicium* in the *ars excerpendi* von Haller went further than was usual in that he consulted even minor works believing that even they might contain one or two passages of merit. He developed this approach when he completed the *Methodus studii medici* (1751) of his teacher Boerhaave, which contains more than a hundred pages of bibliographical information pertaining to different fields of the study of nature. In the preface of the *Bibliotheca botanica* von Haller comments on this episode: twenty years ago, he writes, he edited a fairly similar work, that is, the *Methodus*. But the present work differs tremendously from the former one. Back then his foremost goal was to eliminate errors (*vitia*) in order to aid Boerhaave's name. It was thus necessary to adhere to the order (*ordo*) that Boerhaave had devised for the work. At first this was unproblematic. The beginning of the work was hardly in need of von Haller's *iudicium*. But the further he proceeded, the more his dissatisfaction grew: he realised that Boerhaave left many books that were worthy of being treated unmentioned – books, that is, that are not helpful from cover to cover, but in part. Unlike his teacher, von Haller felt unable to ignore these. Hence he added much information on them to the *Methodus*. The end result, however, appeared to him as very unsatisfying; the sparse beginning did not seem to match the richer parts towards its end. Furthermore, Boerhaave's *ordo* resulted in several repetitions throughout the work. Marcello Malpighi (1628–1694), for instance, had to be mentioned in different places.

When he saw these flaws, he realized how to emend them, von Haller goes on to argue: the different parts of medicine should be treated separately; each author should be mustered in the part of the work dealing with his time; and nothing should be left out. But this was possible only if he started afresh and wrote an entirely new work – his *Bibliotheca medica*.[39]

9.4   How to Assess the Observations of Others?

Reading had not lost in importance in the study of nature in the eighteenth century. What is more, it was tied in with the empiricism of its practitioners. Naturalist reading practices at the time were intimately connected, albeit in a new way, to observational practices through the imperative to repeat observations. After all, naturalists learnt about most of the observations that their

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39   On this and on the preceding paragraph, see Haller, *Bibliotheca botanica I*, pp. ix–xi.

colleagues had conducted through the literature. For instance, von Haller repeated the observations made by his Italian seventeenth-century predecessor Marcello Malpighi on the development of a chick in a chicken's egg. He did not do so because he considered Malphighi's observations as fundamentally untrustworthy. He merely followed the protocol for 'scientific' observation of the time: observations, be they your own ones or those of your colleagues, had to be repeated to minimize the chance of error.[40]

The imperative of repetition was not the only aspect with regard to which von Haller's approach to the observations of others differs from those of earlier generations of scholars: he and his contemporaries frequently called the truthfulness of reports written by naturalists into question. By contrast, the myriad reports on rare phenomena that were published in the minutes of seventeenth-century academies such as the *Royal Society*, the *Academia Naturae Curiosorum* or the *Académie Royale*, were rarely ever called into question. In order to understand what was new about the way in which von Haller and contemporaries assessed the observations of others, we have to briefly turn to their predecessors in the seventeenth century.

That the report of a scientific observation should always also provide the name of the observer if it was to be considered worthy of discussion among European naturalists was not a novel conviction. Observations had to be 'authored' at least from the late seventeenth century onwards.[41] However, the standards of verification were raised in the eighteenth century, especially vis-à-vis reports of rare and preternatural phenomena. In addition, observations made by fellow learned naturalists were no longer per se considered as trustworthy.

Until the early eighteenth century, the trustworthiness of observations published in naturalist journals was very rarely called into doubt. This is the more noticeable since it hinged for the most part on the testimony of their authors (and potentially of that of further witnesses whose names and professions were sometimes given in the text). There are a number of reasons for this; they have been researched most thoroughly in the case of the *Royal Society* and its journal, the *Philosophical Transactions*. First, it was considered an insult "to gainsay the word of a gentleman – and most correspondents of the Royal Society counted themselves as gentlemen".[42] Second, the collective empiricism of academies such as the *Royal Society* required that many were willing to

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40   See Daston, "The empire of observation", p. 113 (fn. 103).

41   See Krämer, *Ein Zentaur in London*, Ch. 4.

42   Lorraine Daston and Katharine Park, *Wonders and the order of nature 1150–1750* (New York: Zone Books, 1998), p. 249. Cf. Steven Shapin, *A social history of truth. Civility and science*

contribute to their endeavours – even though they may not themselves have been members of the academy in question. It was inevitable to invest some trust in them, especially if the phenomena they observed were rare or even exceptions from the usual course of nature. Third, Francis Bacon's programme for the reform of natural philosophy had granted the study of unheard-of phenomena a special significance. Fourth,

> there were metaphysical grounds for lowering the threshold of belief for strange facts. Although phrases like 'the laws of nature' had become common currency in late-seventeenth-century natural philosophy, such laws were seldom taken to imply strict, much less mathematical, regularity throughout nature. Interlocking 'municipal' and 'catholic' laws could create as much variability in nature as they did within the polity whence the metaphor was borrowed.[43]

By the mid-eighteenth century, the situation had changed considerably. There were at least two reasons for this: first, the conception of nature had changed. Over most of the early modern period, nature was seen as bound by custom, not law. It was assumed to occasionally stray from its usual path and produce *lusus naturae*, or marvels.[44] Second, the naturalists' attitudes toward his own sensibilities while observing nature had changed. Wonder was no longer an acceptable sensibility for a man of letters. These shifts, at the levels of conceptions of nature and scientific sensibility, lead to an increased scepticism among intellectuals towards the rare exceptions of nature of which Renaissance naturalists had been so fond. "Nature abandoned loose customs for inviolable laws; the naturalist abandoned open-mouthed wonder for sceptical sangfroid",[45] as Katharine Park and Lorraine Daston put it.

Renaissance naturalists had a tendency to cherish *copia* and *varietas* in nature's productions and thus devoted pride of time to collecting, as exhaustively as possible, the factoids on the rare and wonderful they could lay hands

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in seventeenth-century England (Chicago and London: The University of Chicago Press, 1994), p. 221 and p. 287.

43   Daston and Park, *Wonders*, pp. 250–251 and, on the entire paragraph, pp. 248–251. On the changes that the conception of nature underwent in the early modern period, see also Lorraine Daston, "The nature of nature in early modern Europe", *Configurations. A Journal of Literature, Science, and Technology*, 6: 1 (1998), pp. 149–172.

44   Paula Findlen, "Jokes of nature and jokes of knowledge. The playfulness of scientific discourse in early modern Europe", *Renaissance Quarterly*, 43: 2 (1990), pp. 292–331.

45   Daston and Park, *Wonders*, p. 331 and, on the entire paragraph, Ch. 9. See also Daston, "The nature of nature", pp. 158–169.

on.[46] Not so von Haller and his contemporaries. It now seemed more urgent to thoroughly review extant knowledge rather than to continue collecting factoids, especially if the knowledge at hand concerned rare things of nature. Untrustworthy factoids, they felt, had to be sorted out. This was a reversal of sorts: the accidental inclusion of a false report was now considered more damaging than the exclusion of trustworthy ones.[47]

This shift did not happen overnight but had gathered momentum over decades. Scholars in the late seventeenth century had begun to introduce a new criterion for the assessment of the trustworthiness of an observation. Before that, testimony had often been the decisive factor. But now the intrinsic plausibility of the report was considered as well.[48]

An important prerequisite for this was "a genuinely novel addition to the early modern repertoire of proof and persuasion: mathematical probability".[49] The origins of mathematical theories of probability have mostly been sought in the learned discourse on games of chance. But seventeenth-century authors who treated logic, the soul or theoretical issues concerning historiographic knowledge also considered it increasingly vital to be able to judge the probability of a statement or an historical event. The new tool of mathematical probability was an obvious choice.[50]

In their *Logique de Port-Royal* (1662), Antoine Arnauld and Pierre Nicole applied the new statistical method to historiography. An historian assessing the trustworthiness of a report, they advised, should not only consider the trustworthiness of the person testifying to it but also the intrinsic plausibility of the reported event.[51] The success of the *Logique de Port-Royal* was comparatively swift and by no means restricted to France. Even during Arnauld's and Nicole's lifetimes four French revisions were published, the last one of which

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46   On *copia* and *varietas* in Renaissance naturalists, see Krämer, *Ein Zentaur in London*, esp. Ch. 2 and Ch. 4.

47   Cf. Daston and Park, *Wonders*, p. 252.

48   Cf. Daston and Park, *Wonders*, pp. 347–348.

49   Richard W. Serjeantson, "Proof and persuasion", in L. Daston and K. Park (eds.), *The Cambridge history of science. Vol. 3: Early modern Science* (Cambridge: Cambridge University Press, 2006), pp. 132–175, at p. 162. See also the ground breaking study of Ian Hacking, *The emergence of probability. A philosophical study of early ideas about probability, induction, and statistical inference* (Cambridge: Cambridge University Press, 1975).

50   See Serjeantson, "Proof and persuasion", p. 162.

51   Antoine Arnaud and Pierre Nicole, *La logique ou l'art de penser* [orig. ed. 1662] (Paris: Presses Universitaires de France, 1965), p. 340. See Daston and Park, *Wonders*, p. 251 and, on the application of statistical methods on historiography in the *Logique*, Serjeantson, "Proof and persuasion", p. 263.

first appeared in 1683. The first of many Latin versions appeared in 1674, the first of several English ones in 1685.[52]

John Locke transferred the distinction proposed by Arnauld and Nicole, which was already present *in nuce* in early modern rhetoric,[53] to natural philosophy. According to Locke, the probability of a report varies not only according to "the number and credibility of testimonies" but also depending on the degree to which it is in agreement with our knowledge, on the certainty of the observations and on "the frequency and constancy of experience".[54] As Daston and Park have stressed, Locke's argument was not aimed at criticising credulity; on the contrary:

> As might be expected from a Fellow of the Royal Society, Locke used his criteria of probability to warn against excessive incredulity, relating the story of the King of Siam who had rashly dismissed the Dutch ambassador for tall tales about how water became hard in winter.[55]

Some of his contemporaries did, however, turn the new instrument against what they considered as credulity in dealing with reports about rare phenomena in the study of nature. Reports about (purported) prodigies and wonders were particularly closely examined. Rotterdam professor Pierre Bayle is a good example. Commenting on the comet of 1680, he argued that the great number of testimonies was insufficient to justify belief in the phenomenon,

> for the 'fabulous opinions' recently discredited in natural history had been supported by the testimony of innumerable persons. "One may rest assured," he asserted, "that an intelligent man who pronounces only upon that which he has long pondered, and which he has found proof against all his doubts, gives greater weight to his belief, than one hundred thousand vulgar minds who only follow like sheep". Bayle also insisted

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52   For a comprehensive list of early modern and modern editions of the *Logique de Port-Royal*, see Antoine Arnaud and Pierre Nicole, *La logique ou l'art de penser* [orig. ed. 1662] (Paris: Vrin, 1981), Avant-propos.

53   Building on a statement by Cicero, early modern rhetoric was meant to instil *fides*, faith or trust, in the listener. A distinction was made between the trust in the orator and the trust in that which the orator has said. Both were considered necessary for a convincing speech. See Serjeantson, "Proof and persuasion", pp. 147–149.

54   John Locke, *An essay concerning human understanding* (2 vols., New York: Dover, 1959[2]), I, pp. 365–368. See Daston and Park, *Wonders*, p. 251.

55   Daston and Park, *Wonders*, pp. 252–253. Cf. Locke, *An essay*, I, pp. 366–367.

that the content of the testimony should be inspected before assenting; reports of marvels and miracles were particularly suspect.[56]

In line with this development, Albrecht von Haller assessed the observations of others decidedly critically when they pertained to contested questions. He was the more critical if the observed phenomenon belonged to the by now contentious categories of the praeter- or supernatural. His predecessors in the Renaissance were typically less critical. For instance, they often indiscriminately reproduced and thus further circulated factoids about monsters. They tended to do so even in cases where the reliability and epistemic status of their source on a given monster left some space for doubt. To give but one example, despite the fact that the Bolognese professor of natural history Ulisse Aldrovandi (1522–1605) or his editor Bartolomeo Ambrosini (1588–1657) had some reservations vis-à-vis some of the cases of monstrosity reported on and visualised in Conrad Lycosthenes' *Prodigiorum ac ostentorum chronicon* (1557), the *Monstrorum historia* (1642), which was published under Aldrovandi's name posthumously in 1642 frequently references Lycosthenes and even reproduces factoids from his *Chronicon* that were considered dubious.[57]

Circa one hundred years later von Haller acted differently. For him, the trustworthiness of a witness was an important, but not the only criterion for assessing the trustworthiness of an observation. Like Pierre Bayle, he took also the internal plausibility of the observation into consideration. Both these aspects play an important role, for instance, in what he made of a case of a headless child reported upon by the Flemish naturalist and polymath Johannes Baptista van Helmont (1579–1644). Von Haller comments upon it in his *Lectures on forensic medicine* (*Vorlesungen über die gerichtliche Arzneiwissenschaft*), which he gave in at the University of Göttingen in the summer term of 1751.[58]

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56   Daston and Park, *Wonders*, p. 252. Cf. Pierre Bayle, *Pensées diverses sur le comète* [orig. ed. 1681] (2 vols., Paris: Droz, 1939), I, p. 38.

57   For an expression of scepticism with regard to the reliability of Lycosthenes directly followed by a repetition of one of the events related by him, see Ulisse Aldrovandi, *Monstrorum historia. Cum paralipomenis historiae omnium animalium …* [orig. ed. 1642] (Paris and Turin: Les Belles Lettres, 2002), p. 8, where the author says that Lycosthenes "multa vana scripsit". On Aldrovandi's approach to observation and reading and on the vexed question of authorship of the *Monstrorum historia*, see Krämer, *Ein Zentaur in London*, Ch. 2.

58   On the complex publication history of the *Vorlesungen über die gerichtliche Arzneywissenschaft*, see Fabian Krämer, "Why there was no centaur in eighteenth-century London. The vulgar as a cognitive category in Enlightenment Europe", in K. von Greyerz et al. (eds.), *Wissenschaftsgeschichte und Geschichte des Wissens im Dialog – Connecting science and knowledge* (Göttingen: V&R Unipress, 2013), pp. 317–345, at pp. 333–334.

According to van Helmont, von Haller argues, "a child was born headless because his/her mother had been terrified upon seeing the beheading of the Swedish Duke Horn".[59] For two reasons von Haller could not let this pass. First, he considered the *witness* in this case untrustworthy. The narrative has, he argues, "the more the aspect of a fable for not only did Helmont not see the event for himself but he trusted his great-grandmother on it".[60] Van Helmont retold an observation that went back to his great-grandmother, which for von Haller further reduced its credibility. As von Haller's use of the collective subject 'the Ancients' (*die Alten*) suggests, he typically put more trust in an observation made by a contemporary, 'enlightened' naturalists than in that by a scholar who lived in former, 'unenlightened' times, not to mention a woman.

Second, von Haller strictly rejected the theory of the influence of maternal imagination on the unborn child. This rendered the *content* of the observation untrustworthy. For von Haller, the belief in the influence of maternal imagination on the conformation of a child was a "phantasm of the physicians and naturalists of the past"[61] (*Hirngespinst älterer Aerzte und Naturforscher*). Hence, he devoted a lengthy part of his *Lectures on forensic medicine* to refuting it.[62] Van Helmont's report figures among several examples of the alleged influence of the imagination. It is well chosen as the female testimony rendered it a particularly easy target for criticism.

To conclude, Albrecht von Haller, one of the most famed scientific observers of the enlightenment, was arguably no less diligent a reader than he was an observer. He was an 'enlightened' reader in the sense that his approach to the literature, and to assessing the observations of others in particular, was meant to be, in the contemporary sense, 'critical'. What is more, reading and observation were closely intertwined in his research practice. If historians of science still remember him almost exclusively for his observational practice, and not for its learned counterpart, this may be due less to his actual practice as a naturalist than to our own tendency to pay more attention to the 'empirical' aspects of the sciences as we study their histories.

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59   Haller, *Vorlesungen*, I, pp. 87–88: "… es sei ein Kind ohne Kopf zur Welt gekommen, weil die Mutter beim Anblik der Enthauptung des in der Geschichte bekannten schwedischen Grafen Horn erschroken sei".

60   Haller, *Vorlesungen*, I, p. 88: "… um so mehr das Gepräge der Fabel, weil Helmont nicht allein selbst kein Zeuge der Begebenheit war, sondern sie noch dazu auf Treu und Glauben seiner Altmutter nachschrieb".

61   Haller, *Vorlesungen*, I, p. 86.

62   Haller, *Vorlesungen*, I, pp. 86–93.

Albrecht on Haller is too salient an example to exhaust his reading practices in a single article. I have but begun to show that von Haller took pride in particular in three aspects of his *Bibliotheca medica*, his major contribution to *Historia literaria*: in the order he developed for this work, in his scrupulous scouring of even seemingly minor texts, and in his critical judgment about them. I suggest we consider the *Bibliotheca* as one corner of a triangle of sources embodying von Haller's reading practices, the other two being the extant *Iudicia librorum* and his book reviews in the *Göttingischer Gelehrter Anzeiger*. The *Bibliotheca medica* is a compilation based upon von Haller's critical reading. Despite belonging to a different genre, the *Göttingischer Gelehrter Anzeiger* may to a considerable extent turn out to be based in a similar fashion upon the same materials. After all, it was common in the eighteenth century to consider journals as compilations based on their editors' excerpts.[63]

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63   For a characterization of the *Miscellanea curiosa*, the journal of the *Academia Naturae Curiosorum*, as a collection of excerpts, for instance, see Fridericus Sidelius and Paulus Sigismundus Schubart, *Positiones XXXIV de studio excerpendi* (Ienae: Fickelscher, 1713), pp. 8–9. I am grateful to Helmut Zedelmaier for this reference.

Medical Note-Taking in the Sixteenth and Seventeenth Centuries

Michael Stolberg

10.1 Introduction

Note-taking in the early modern period has attracted considerable attention in recent historical writing.[1] Scholars have examined, in particular, contemporary advice books on note-taking, like those of Sacchini and Drexel,[2] and they have studied encyclopedic collections of knowledge like those of Gessner, Bodin or Zwinger[3] which were presumably based, in turn, on their authors' personal notes. Much less attention has so far been devoted to the

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1   See, in particular, Ann Blair, "Note taking as an art of transmission", *Critical Inquiry*, 31: 1 (2004), pp. 85–107; Ann Blair, "The rise of note-taking in early modern Europe", *Intellectual History Review*, 20 (2010), pp. 303–316; Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010); Richard Yeo, *Notebooks, English virtuosi, and early modern science* (Chicago and London: The University of Chicago Press, 2014).

2   Francesco Sacchini, *De ratione libros cum profectu legendi libellus* (Ingolstadt: Apud E. Angermariam, 1614); Jeremias Drexel, *Aurifodina artium et scientiarum omnium. Excerpendi sollertia, omnibus litterarum amantibus monstrata* (Munich: Leysserius, 1638). Cf. Florian Neumann, "Jeremias Drexels *Aurifodina* und die *Ars excerpendi* bei den Jesuiten", in H. Zedelmaier and M. Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen: Max Niemeyer, 2001), pp. 51–63.

3   Conrad Gessner, *Pandectarum sive partitionum universalium ... libri XXI* (Tiguri: Apud Christophorum Froschoverum, 1548); Theodor Zwinger, *Theatrum vitae humanae* (Basel: per Eusebium Episcopium, 1586); Jean Bodin, *Universae naturae theatrum: in quo rerum omnium effectrices causae et fines contemplantur et continuae series quinque libris discutiuntur* (Lyon: Roussin, 1596). Cf. Ann Blair, *The theater of nature. Jean Bodin and Renaissance science* (Princeton: Princeton University Press, 1997); Helmut Zedelmaier, "Navigieren im Textuniversum. Theodor Zwingers *Theatrum vitae humanae*", *metaphorik.de*, 14 (2008), pp. 113–135; Paul Nelles, "Reading and memory in the universal library: Conrad Gessner and the Renaissance book", in D. Beecher and G. Williams (eds.), *Ars reminiscendi. Mind and memory in Renaissance culture* (Toronto: Toronto Centre for Reformation and Renaissance Studies, 2009), pp. 147–169.

actual practice of note-taking itself. With very few exceptions,[4] the manuscript notes which have come down to us among the papers of early modern scholars have not been studied in depth in this respect. Those historians who examined them at all usually were primarily interested in what they might learn from these notes about the genesis and background of the printed works of these authors and their ideas in general. As a result, we are, somewhat paradoxically, much more familiar with early modern ideas about scholarly note-taking and with its printed products than with the ways in which early modern scholars actually went about it, sitting at their desks, quill in hand and paper before them.

In this contribution, I will attempt to help fill this gap. I will focus entirely on personal, unpublished, manuscript notes – almost all of them in Latin – and on what they reveal about scholarly note-taking practices and paper tools in the post-Gutenberg era. I will examine, more precisely, the note-taking practices of one specific – and quite sizeable and influential – group within the early modern republic of letters: academically trained physicians and those who aspired to join that profession. Medical note-taking practices are particularly rich and varied because medical students and practicing physicians, more than most other scholars at the time, participated in and moved between different social and cultural spheres. Before they embarked on a medical career, they usually received a thorough training in the liberal arts, first in a Latin school and later in an arts faculty. Many of them self-fashioned themselves as learned humanist scholars throughout their lives and cultivated non-medical interests from history and numismatics to music and poetry.[5] As *physici*, they also had a particular interest in medicinal plants, anatomy and in the natural world, in general, however, areas in which empirical knowledge gained increasing importance in the early modern period, in addition to a thorough familiarity with the works of ancient and more recent authorities. Finally, most physicians made their

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4   Christoph Meinel, "Enzyklopädie der Welt und Verzettelung des Wissens: Aporien der Empirie bei Joachim Jungius", in F.M. Eybl et al. (eds.), *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung* (Tübingen: Max Niemeyer, 1995), pp. 162–187; Guy G. Meynell, "John Locke's method of common-placing, as seen in his drafts and his medical notebooks, Bodleian MSS Locke d. 9, f. 21 and f. 23", *Seventeenth Century*, 8 (1993), pp. 245–267; for a detailed analysis of the more specific genre of medical practice journals and casebooks see Volker Hess and Sabine Schlegelmilch, "Cornucopia officinae medicae: medical practice records and their origin", in M. Dinges et al. (eds.), *Medical practice 1600–1900. Physicians and their patients* (Leiden: Brill, 2016), pp. 11–38.

5   Cf. Michael Stolberg, "Zwischen Identitätsbildung und Selbstinszenierung. Ärztliches Self-Fashioning in der Frühen Neuzeit", in D. Freist (ed.), *Diskurse – Körper – Artefakte. Historische Praxeologie in der Frühneuzeitforschung* (Bielefeld: Transcript, 2015), pp. 33–55.

living as medical practitioners. Their daily business was to treat patients and their success on the early modern medical market-place as well as their economic survival depended to a considerable degree on their (perceived) capacity to perform successful cures. They therefore had a keen interest in keeping track of important diagnostic or therapeutic signs, of successful treatments as well as of the fees they received.

Since so far very little systematic work has been done on medical note-taking[6] my approach will be largely explorative and descriptive. My principal aim is to provide an overview of different types of medical note-taking and of the paper tools that were used for this purpose and to assess their respective uses, advantages and limitations. My analysis will draw on a fair range of sources which I have identified over the last two decades, in the course of a more general search for medical manuscripts, in libraries and archives across the world, but with a geographical focus on central and western Europe. Though I believe that my sample is, to this date, the largest and most varied that has been analyzed for the note-taking practices of any professional group in the early modern era, I would like to underline that my evidence is nevertheless fragmentary and selective. After all, for all we know, virtually every early modern scholar – and certainly every learned physician – took notes. Yet, if the note-taker was not a very famous man, his personal records almost inevitably got lost after his death.

Physicians' notes have come down to us in a variety of formats. Sometimes individual notes on little slips of paper can be found, usually between the pages of a manuscript or book. A typical example among physicians are recipes for different kinds of remedies.[7] Most medical notes have survived in notebooks, however, and my following analysis will focus on them. Occasionally notebooks originated from notes on loose sheets of paper or small fascicles which the writer (or a later owner) eventually had bound together into a volume. We can often recognize this at first sight since, in this case, we are likely to find sheets of paper (or fascicles) of different sizes and quality and/or a chaotic page numbering which reflects a previous separate pagination of individual parts or fascicles. For example, a notebook which a student of Jodocus Willich, professor in Frankfurt an der Oder, wrote around 1550

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6   Even Ann Blair, who has spent many years studying early modern information management, limits her comments on this matter to a brief footnote: "Medical note taking would also be worth studying" (Blair, 'Note taking', p. 91).

7   In my personal copy of Daniel Sennert's *Opera* of 1676, for example, several slips of paper with recipes were inserted, which were, by all appearances, written in the late seventeenth century.

contains amongst others single sheets of paper with an index and a list of the works of Giovanni Battista da Monte, extensive notes on different diseases, presumably based on Willich's teachings, as well as a series of recipes written in German.[8] More commonly, however, medical note-takers seem to have started with an *album*, a stack of empty white leaves, which had been bound together and could be filled with notes.

Even bound notebooks were very likely to get lost after their author's death. As a result, in most cases, in which the notes of an early modern physician have survived at all, we are usually faced only with one out of – presumably – a whole series of notebooks which that physician wrote, or at best with several volumes of the same kind of notebook. It is only under very unusual circumstances that we can assess the note-taking of one specific physician in its full extent. For the sixteenth century, the only medical doctor, whom I have found so far, whose notebooks have, by all appearances, survived completely – and whose name will therefore recur in this paper – is the little known sixteenth-century Bohemian physician Georg Handsch (1529–1578?).[9] From the seventeenth century, extensive sets of medical notes by an individual writer have survived more frequently. In what follows, I will draw, in particular on the notes and notebooks of Cornelis Booth, physician in Utrecht, of the physician-philosopher John Locke, of Johannes Magirus (1615–1697), physician in Berlin and Zerbst and later professor in Marburg, of Johann Heinrich Meibom (1590–1655) and his son Heinrich Meibom in Helmstedt and of Johann Jakob Wepfer (1620–1695), a very successful physician from Schaffhausen.

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8   Yale University, Historical Medical Library, no shelfmark. The notebook carries the initials 'IMD'; the author has not yet been identified.

9   Handsch's notebooks – which are at the center of my current research – have been preserved in the Österreichische Nationalbibliothek, Vienna (henceforth: ÖNB). For a detailed analysis of his medical notebooks, see Michael Stolberg, "Empiricism in sixteenth-century medical practice: the notebooks of Georg Handsch", *Early Science and Medicine*, 18 (2013), pp. 487–516. For biographical details, see also Josef Smolka and Marta Vaculínová, "Renesanční lékař Georg Handsch (1529–1578)", *DVT – Dějiny věd a techniky*, 43 (2010), pp. 1–26, and Stolberg, "Empiricism in sixteenth-century medical practice". Tellingly, the survival of these notebooks is due to rather unusual circumstances: shortly before his death, Handsch, who had obtained the position of a personal physician to Archduke Ferdinand in Innsbruck/Ambras, seems to have left or sold his complete library to the Archduke. This library included his personal notebooks, although giving these away as well may not have been Handsch's intention, since the notebooks were clearly not meant to be read by others. Here, Handsch revealed amongst others that he had cheated in order to gain his doctoral degree in Padua – he had never obtained the necessary master's degree –, he confessed that it found it difficult to see blood, and he even mentioned his sexual encounters with other men.

Since the terminology is somewhat fluid in this area, I would like to clarify that my paper will deal with physicians' 'notes' and 'notebooks' in what I take to be the more specific sense of these terms. The terms 'notes' and 'notebooks', I believe, imply two important characteristics which the manuscripts that I will refer to have in common: firstly, the individual 'notes' or entries are fairly short – usually stretching, at most, over a couple of pages and more commonly only occupying a few lines. Secondly, 'notes' in the sense that I will understand the term reflect a process of selection. They record only specific pieces of knowledge or information from a larger body to which the writer has access. For this reason I will not deal with two fairly familiar kinds of manuscripts which we not only find among medical writers: manuscript copies of whole books or treatises and handwritten transcripts of university lectures. Especially the latter must have been very common at the time. Probably every student filled several notebooks with what he learnt in the course of his studies. Historians and library catalogues have frequently referred to these manuscripts as 'students' notes'. In many cases, the term 'notes' does not do justice to early modern teaching practices, however, since it was common practice that students wrote down what their professor dictated to them.[10] Sometimes such transcripts of lectures were even produced in collaboration, with several students taking turns, in order to arrive at a truly complete version of the lecture. The result resembled copies of complete printed books. They might be copied, in turn, by others and some eventually made it into print. In what follows I will limit my analysis, in this respect, to what I consider student 'notes' in the proper sense of the word: brief records of individual pieces of information taken from a larger body of knowledge which the young physician acquired from his professors and to which he attributed enough importance to write them down.

Like the notebooks of other early modern scholars, those of physicians could be devoted to a wide range of topics. In his little *Schreibbuch*, for example, Johannes Magirus took notes, amongst others, on the history of the tartars and the story of Helena as well as on religious topics.[11] Georg Handsch filled several hundreds of pages just with notes on and quotations from Roman poets.[12] Sometimes note-takers also used remaining empty pages in scholarly manuscripts for notes on more mundane topics. In one of Handsch's notebooks, for example, we find a list of his expenses for clothes and tailor's work.[13]

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10   See, e.g., Universiteitsbibliotheek, Utrecht, Hs VII E 29, "Henr. Florentii dictata de morbis capitis" and Hs VII E 30, "Ewald Schrevelii dictata de morbis pectoris" (Cornelis Booth).

11   Universitätsbibliothek Marburg, Ms. 97.

12   ÖNB, Cod. 9607.

13   ÖNB, Cod. 9671, fol. 225v and fols. 227r-229r.

The bulk of physicians' surviving notes reflects their more immediate professional interests. Sometimes they assembled numerous references to and quotations and excerpts from ancient and more recent authors. The notebooks of Salomon Hottinger (1649–1713), for example, offer countless excerpts from major and minor medical works.[14] In addition to excerpts from authoritative works, however, and this is a very characteristic feature of medical notes in that period, empirical findings had a prominent place. Students already carefully took note of the personal experiences their professors communicated to them and/or which they made themselves, for example when they visited patients together with their professors: important diagnostic signs, the effects of certain drugs on different patients, what they had seen in anatomical dissections and post-mortems or the 'experiments' which the professor reported. Occasionally such students' notes offer the earliest surviving evidence of famous experiments and new discoveries. For example, in Handsch's notes on a private anatomy which Gabriele Falloppia performed in 1550 or 1551, we find the earliest known description of the lacteal vessels – a discovery which is widely ascribed to Gaspare Aselli some 70 years later.[15]

Practicing physicians took notes, in particular, on what they observed and learned from seeing and treating patients. Handsch filled several thousand pages with notes of that kind. Johann Jakob Wepfer's collection of – largely medical – notebooks comprises altogether 46 volumes, which combined notes with letters by colleagues on certain patients or letters written by the patients themselves or their relatives.[16] Such records of empirical observations on certain diseases, diagnostic or prognostic signs, drug effects and the like could serve as an important repository of personal, private knowledge that could usefully be applied on future patients. Later, Handsch frequently added notes on other, similar cases to his entries on certain patients, recording, for example, that a certain drug had also worked on other patients with the same disease or complaint, whose names he might even list in the margins. His handwritten notes on different patients he saw, mostly together with other physicians, in Prague in the 1550s, also include explicit entries on 'errors' he or other physicians had made in the treatment of certain patients as well as practical conclusions on how to deal with patients in order to secure a successful practice. Thus he admonished himself repeatedly to be more cautious in

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14   Zentralbibliothek Zürich, Ms. Car X 202–208 and 210–228.

15   ÖNB, Cod. 11210, fol. 207v.

16   Universiteitsbibliotheek Leiden, BPL 249, Nr. 1-Nr. 46. On Wepfer's papers in general see the medical dissertation by Pietro Eichenberger, *Johann Jakob Wepfer (1620–1695) als klinischer Praktiker* (Basel: Schwabe, 1969).

his prognostic judgments and not to accept patients with incurable diseases, because in both cases he risked damaging his reputation.[17]

A particularly elaborate type of notes on individual patients which was to develop into one of the most important genres in published medical writings of the time were case histories or medical *observationes*, as they came to be most commonly called.[18] Handsch's handwritten notes on various patients he saw with his professor, as a student in Padua, is at the present the earliest known example of such case histories which were recorded under the explicit title *observationes*.[19] But in other contemporary medical notebooks, too, we find more or less detailed accounts of individual cases, and some physicians even produced fairly sizeable collections of cases from their own practice. A manuscript collection of cases which Johann Frank of Ulm compiled in the seventeenth century is even adorned with a series of beautiful colored images.[20]

10.2 Medical Notebooks: A Typology

Physicians' notes did not only vary in content. Physicians – like other early modern scholars – also used different approaches to managing and sorting their notes. In general terms, we can distinguish three fundamental types of medical notebooks: the plain notebook, the common-place book and the journal or casebook.

10.2.1 *Plain Notebooks*
In plain notebooks – some contemporaries called them *adversaria* but that term also has other meanings[21] – the note-taker filled one page after the other

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17 ÖNB, Cod. 11240, fol. 423.

18 Other, related terms were *curationes* and *casus*. On printed early modern medical case histories and *observationes*, see Gianna Pomata, "A word of the empirics: the ancient concept of observation and its recovery in early modern medicine", *Annals of Science*, 65 (2011), pp. 1–25; Michael Stolberg, "Formen und Funktionen ärztlicher Fallbeobachtungen in der Frühen Neuzeit (1500–1800)", in J. Süßmann et al. (eds.), *Fallstudien: Theorie – Geschichte – Methode* (Berlin: trafo, 2007), pp. 81–95.

19 ÖNB, Cod. 11238, fol. 95v, "Observationes ex praxi doctorum patavinorum".

20 Stadtbibliothek Ulm, Mss. Franc 8a and 8b.

21 In general, to this day, *adversaria* refers to unsystematic notes. The term may quite simply have been derived from the Latin term *animum adverto* or *animadverto*, for 'to take notice', but the precise meaning and the origins of the term were already a matter of debate at the time. A common point of reference was Cicero's oration for Roscius Comoedus, in which Cicero attacked Fannius for claiming an alleged huge debt based only on his

with notes on everything noteworthy that he encountered, in his reading, in his scholarly work, in his oral exchanges with others or even in his private life. Plain notebooks typically involved no deliberate attempt at sorting or organizing knowledge. Except for the fact that note-takers were likely to read one book at a time from which they took notes or to be particularly interested in a certain issue or disease at a certain point of time, they followed no given structure. Entries were quite simply made in the temporal order in which the note-taker read or learnt about certain things until the notebook was full. While taking notes in this manner was simple and straightforward – one only had to look for the last entry and start writing – retrieving notes on a certain topic or patient could become a serious challenge. The writer might remember roughly at what time he had read a certain work or treated a certain patient but in the worst case he would have to browse through the whole volume – or indeed through several notebooks – looking for the respective entry or entries.

Early modern physicians were well aware of this challenge. Some sought to remedy that deficit by means of secondary note-taking. They copied their miscellaneous notes from loose paper or from a working notebook into another, orderly and well-structured notebook. In this sense Georg Handsch described how he put the various notes together which he had taken on different topics, tried to estimate how much space he would need for each topic and copied the notes accordingly into a notebook.[22] The price for this kind of second-order

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adversaria rather than on the *codex* that he used to keep track of the money received and spent. *Adversaria*, thus Cicero, were only for short time memory ("parvi temporis memoriam"); lasting, trustworthy entries could only be found in an orderly account book, and in those of Fannius the name of the debtor – presumably that of Roscius – did not figure. Cf. Marcus Tullius Cicero, *Orationes duae, pro Q. Roscio Comoedo* (Cologne: Mylius, 1592), fols. A2v-A3r. Quoting Cicero, early modern writers like Andrea Alciati and Heinrich Salmuth characterized *adversaria* as notes (Alciati: "vulgo dicimus notas") which were sloppily and hastily ("negligenter", "tumultuarie") written, so things would not be forgotten ("ne res memoria excidant"). Cf. Andrea Alciati, *Paradoxorum ad Pratum libri sex, dispunctionum libri quatuor* (Lyon: Gryphius, 1532), p. 137. See also Salmuth's commentary on Guido Panciroli, *Rerum memorabilium sive deperditarum pars prior commentariis illustrata ... ab Henrico Salmuth* (Frankfurt: Schonwetter, 1660), fol. 3r. The etymology was controversial, however. Salmuth assumed that they were called *adversaria*, because they "advert the mind and our memory" ("Adversaria dicta videntur, quod animum et memoriam nostram advertant"). Jean de Coras rejected this view. In his eyes, the term *opisthographa*, the Greek synonym for *adversaria* (derived from the Greek work for 'rear' or 'back') which Alciati had already mentioned, suggested that the term referred to the use of both sides of the paper, the *adversa* and the *aversa*. Cf. Jean de Coras, *Miscellaneorum iuris civilis libri sex* (Lyon: Rouillius, 1559), pp. 54–55.

22   ÖNB, Cod. 11239, fol. 100v.

note-taking was obvious: the notes had to be written twice with a corresponding expense of time and paper. But some writers clearly felt that this was worth the trouble.

As these attempts already indicate, retrieving information on a specific topic could be made considerably easier, if notes were written in such a way that notes on the same topic or on a set of related topics were somehow grouped together. A first, major step into this direction, was the use of separate notebooks for different areas of knowledge or for different purposes. Thomas Bartholinus recommended to those who were studying medicine to keep a separate notebook for every discipline in which they could briefly record memorable information.[23] The rare cases in which various notebooks by the same physicians have survived, suggest that physicians made use of this possibility above all in response to the demands of medical practice. Handsch, for example, not only filled several notebooks with all kinds of notes on medical topics but also had an extra notebook devoted specifically to *experimenta*, i.e. to different remedies and recipes that he or other physicians had heard of or indeed used; in his general notebooks he sometimes even explicitly cross-referenced to these books of remedies. Other physicians, too, seem to have kept separate books of recipes which served as a virtual treasure trove for the treatment of future patients. Cornelis Booth concomitantly used seven separate recipe books to record medicines which could be used for diseases of the various parts of the body respectively: of the head, the chest, the belly and so forth.[24] Among Johann Jakob Wepfer's papers there are about two dozen volumes filled primarily with extensive notes on different cases, each devoted to a different area of the body and/or certain types of disease that typically occurred in them.[25]

10.2.2   *Commonplace-books*

In addition – or as an alternative – to keeping separate notebooks for different kinds of topics or fields of knowledge, early modern physicians relied above all on the quintessential humanist tool for knowledge management and adapted it to their needs: commmonplacing. The characteristic feature of common-placing was that different notes on a certain topic were assigned to a common

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23   Thomas Bartholinus, *De libris legendis dissertationes* (Frankfurt: Wildt, 1711), p. 149 (posthumous edition by J.G. Meuschen, with a preface by Bartholinus from 1672). A similar advice can be found in Sacchini's and Drexel's instructions for efficient scholarly note-taking.

24   Universiteitsbibliotheek Utrecht, Hs VII E42-48.

25   Universiteitsbibliotheek Leiden, BPL 249, Nr. 1-Nr. 46.

heading and thus assembled in a 'common place' or *locus communis*.[26] In Latin schools students were already taught to collect commonplaces or *loci communes* and it would have been familiar to any early modern scholar.[27]

Humanist commonplacing served primarily to collect quotations and references to certain topics in the works of the ancient writers. Contemporary scholars valued such collections as a paramount source of *copia*. With the help of well-sorted commonplaces, one could spice one's speeches and writings with learned quotations. Occasionally, we find commonplace books of this general, scholarly, rhetorical kind also among the papers of early modern physicians.[28] For good reasons, however, the medical authors of advice books for medical students and fledgling physicians advised especially their young medical readers to write *loci communes*.[29] Commonplacing could easily adapted to the ordered, structured collection of medical knowledge, from learned medical treatises to empirical observations, and in this respect was suitable for primary note-taking as well as for turning plain notebooks into more useful paper tools.[30]

As I have shown in greater detail elsewhere,[31] we can distinguish three basic types of commonplacing in early modern medical notebooks (as in those of

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26   The modern term 'topic' is derived from the Greek word for place, *topos*, which, tellingly, today is used largely synonymously with 'commonplace'. Library catalogues sometimes use the term 'commonplace-book' in a wider sense for all kinds of personal notebooks.

27   For overviews, based almost exclusively on printed sources, see Blair, *Too much to know*; Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996); David Cowling and Mette B. Bruun (eds.), *Commonplace culture in Western Europe in the early modern period* (Leuven et al.: Peeters, 2011).

28   Staatsbibliothek zu Berlin, Preußischer Kulturbesitz (Ms. Lat. Qu. 41), *Loci communes* of the later physician and professor of medicine Salomon Alberti, ÖNB, Cod. 9607, fols. 1r-97v and fols. 107v-125v, poetic commonplaces by Georg Handsch.

29   Albert Kijper, *Medicinam rite discendi et exercendi methodus* (Leiden: de Vogel, 1643); Friedrich Hoffmann, *Medicus politicus sive regulae prudentiae secundum quas medicus juvenis studia sua & vitae rationem dirigere debet, si famam sibi felicemque praxin & cito acquirere & conservare cupit* (Leiden: Bonk, 1738), p. 35f.; Martin Kerger, "Methodus excerpendi, Drexeliana succinctior", appended to Drexel, *Aurifodina*, no pagination; Kerger was a physician himself.

30   In one of Cornelis Booth's notebooks, for example, we find the remark that he still had to copy certain entries into his commonplace-book (Universiteitsbibliotheek, Utrecht, Hs VII E25, Cornelis Booth, "Empiricae observationes tum medicorum tum chirurgorum tum etiam vulgi"; an empty page at the beginning lists a few terms as "restant referenda ad locos communes").

31   Michael Stolberg, "Medizinische *Loci communes*. Formen und Funktionen einer ärztlichen Aufzeichnungspraxis im 16. und 17. Jahrhundert", NTM – *Zeitschrift für Geschichte der*

other early modern scholars): the sequential approach, the systematic or text-book approach and the alphabetical approach.

The *sequential approach* resembled in many ways that of the plain note-book. Notes were entered in temporal order, one after the other, as the writer encountered the different pieces of knowledge he deemed noteworthy. The note-taker added a crucial feature, however, often quite prominently, in larger writing or in a separate column in the margin: he gave a heading to each entry – and the same heading to later entries on the same topic.[32] This made it possible, just by browsing through the manuscript, to identify quite quickly all entries on a given topic. In addition, as we will see in a moment, these headings could be used to build an index which further facilitated the retrieval of notes on a specific topic.

In the *textbook approach* to commonplacing, the notes were structured according to a given system or thematic order. Much more than sequential note-taking it reflected the contemporary ideal of method. The writer reserved the individual pages of an *album* beforehand for notes on a set of pre-established topics, usually with the corresponding headings written on the top of the empty pages. The sequence of these headings frequently resembled the chapter headings of a textbook. Some note-takers quite simply used the table of contents, in fact, which they found in a major, well-established work of reference. The English physician-philosopher John Locke, for example, organized the notes in one of his earliest notebooks based on the chapter headings of Daniel Sennert's well-known *Institutiones medicinae.* He started with excerpts from Sennert himself and then added excerpts from other authors, such as Thomas Sydenham, Johann Baptist van Helmont and Grunlingius.[33] The textbook approach was, in fact, particularly useful for recording excerpts. It allowed the note-taker to see at one glance what different writers had said on a certain well-establish topic, such as the division of medicine or a common disease. For example, the unknown physician who, around 1600, conceived a

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Wissenschaften, Technik und Medizin, 21 (2013), pp. 37–60; for a shorter account in English, see also Michael Stolberg, "John Locke's 'New Method of Making Common-Place-Books': tradition, innovation and epistemic effects", *Early Science and Medicine*, 19 (2014), pp. 448–470.

32   See, e.g., the medical notebooks of Handsch, ÖNB, Cod. 11006, Cod. 11200 and Cod. 11205, with a corresponding index in Cod. 11206, Cod. 11207, and the commonplace-book of Johannes Magirus, Universitätsbibliothek Marburg, Ms. 97.

33   Biblioteca Marciana, Venice, Mss. Lat. 23. The notebook has been largely overlooked by Locke scholars; it is absent, for example, in the fairly recent list of Locke's medical and natural-philosophical notebooks which Peter Anstey compiled in his *John Locke and natural philosophy* (Oxford: Oxford University Press, 2011).

volume of *loci communes*, which has survived in Sankt Gallen, accumulated about 20 notes on fevers taken from the works Galen, Hippocrates, Avicenna, Emanuel Stupanus, Leonhard Fuchs, Jean Fernel und Girolamo Mercuriale as well as from an oral communication which Caspar Bauhin made in an exam.[34]

The *alphabetical approach* to commonplacing, finally, sorted headings based on their initial letters.[35] This could be done in different ways. Sometimes the note-taker pre-assigned already individual pages of the empty notebook to different topics, starting with 'A' like *abdomen* or *actio*. This approach made it impossible to add new topics, as the writer might encounter them, without inserting additional sheets or subdividing existent ones. It was therefore useful above all for notebooks which were devoted to a limited set of topics belonging to the same category, for example on well-known poetic topics or different types of drugs.[36] To make the alphabetical approach more flexible, the note-taker could pre-assign empty pages only to the different letters of the alphabet, in alphabetical order. For instance, the first four pages might be reserved for entries on all topics that started with an A, the following four to headings starting with a B and so forth. Finally, the note-taker could leave the pages entirely empty and try to guess, as he proceeded, on which page entries on a new heading should find their place, if the alphabetical order was to be maintained. In the last two cases, each page could be devoted to a single topic or different topics starting with the same letter could be mixed on the same page.

Some surviving notebooks were organized consistently, based on one of these three approaches to commonplacing but this is not always the case. For example, the notebook which a physician in Southern France – probably Pierre Baux – wrote around the turn of the eighteenth century, starts with notes – probably copied from other notes – devoted, in alphabetical order, to topics from *aliment* to *carnosité*. But then that neat order is interrupted and various random notes of the plain notebook type and a series of empty pages follow, which give way, in turn, to sequential commonplacing with headings prominently placed in the margins.[37] We are particularly likely to find such mixed forms, when notebooks resulted from a subsequent binding of previous loose sets of notes.

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34   Kantonsbibliothek St. Gallen, Ms. 408, coll. 600–602.

35   See, e.g., Universitätsbibliothek Erlangen, Ms. 1206, medical commonplaces by Georg Prechtl, town physician in Straubing, started in 1557.

36   Cf. ÖNB, Cod. 9607, fols. 48r-97v (poetical commonplaces, with headings from A to V by Georg Handsch) and Universitätsbibliothek, Marburg, Ms. 935, a notebook by Laurenz Blumentrost with notes on different kinds of medicines sorted in alphabetical order (started around 1650). My thanks to Sabine Schlegelmilch, who pointed out this manuscript to me.

37   Bibliothèque Municipale Nîmes, Ms. 430.

The three basic approaches to commonplacing, which I have outlined, all had their respective advantages and disadvantages. The textbook approach offered little flexibility. It did not allow for the addition of new headings or topics. It also tended to be extremely wasteful of paper. Once the page/s allotted to only one specific topic was/were full the writer basically had to start a new notebook – or use other, still empty ones, which would lead to considerable chaos. On the positive side, the textbook approach resulted in a thoroughly structured notebook. It offered an excellent means for collecting excerpts from different authors on the same topic.

In theory, the textbook approach had the best potential to serve as a convenient tool for prospective authors who had conceived an outline of a book they wanted to publish. It would have allowed them to collect, in a structured fashion, the different excerpts, quotations or pieces of knowledge they would need when they went about writing the individual chapters. So far, I have not been able to find a single example of this use, however. Instead, the medical commonplace books of the textbook kind which I have seen were all written by medical students or by physicians at an early stage of their career. Presumably they were following the advice of their teachers. For the beginner, commonplacing based on the pre-structured, textbook approach made it possible to assemble in an orderly fashion what he was learning on different, well-established medical topics and the very act of writing the notes was expected to help students learn and remember. Since those, at least, who had access to or owned some basic textbooks could find the same information easily retrievable in *institutiones* and other introductory works, the resulting notes were not particularly valuable for their future use, however. This certainly seems to have been the conclusion at which many young note-takers arrived. Sooner or later they gave up, leaving many or indeed most pages empty. The above-mentioned page on fevers in the medical commonplace book from Sankt Gallen, for example, is far from representative of the whole manuscript: most pages of this impressive folio volume remained empty.[38] Likewise the *Memoriale practicum* of Erasmus Reinhold contains some pages covered with notes on different kinds of medicines such as *syrupi humores digerentes* while others remained without a single note.[39] The same goes for a massive and expensively bound volume of commonplaces in the University Library in Leipzig. Occasionally a page is filled with notes, for example, on *pulsus*. But others only contain a heading like *praegnantium morbi* – and many pages following such pages remained entirely

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38 Kantonsbibliothek Sankt Gallen, Ms. 408.

39 Staatsbibliothek Bamberg, Bamberger Sammlung, Msc. misc. 385.

empty.[40] In the *Mnemoneutikon* on medical practice which Joachim Camerarius the Younger wrote in his early years, we likewise find numerous pages with nothing else then the heading or, at most, one brief note, for example on a specific remedy.[41] Some commonplace books of this type probably survived only because the owner eventually decided to use the empty pages for miscellaneous notes which bore no relation whatsoever to the heading the writer had initially written on the top of the page.[42]

Commonplace books of the alphabetical type, offered a more flexible tool, provided the note-taker refrained from allotting each page to a given topic beforehand. Later retrieval of notes on a certain topic was relatively easy, if one knew which term to look for. One only had to open the notebook at the right page and would find all relevant entries assembled on a single page or a short series of pages. In contrast to the textbook approach, the sequence of headings followed no logical structure, however, and it was almost as wasteful of paper. Sooner or later a page would be full, with the following page already reserved for a different topic or a new letter, and the note-taker would have to either start a new notebook or forget about maintaining the alphabetical order. In my sample of medical commonplace books, alphabetical commonplacing is the least common type.

Commonplacing of the sequential type offered no structure whatsoever. Notes on very different topics might end up on the same page. In recompense, it made maximum use of paper and space: no page was left empty. And, above all, it offered a very flexible tool because new headings could be introduced as needed. This approach was therefore particularly attractive for advanced note-takers who – like many early modern physicians – were dealing with a wide and to some degree unpredictable range of topics rather than with the familiar themes of humanist rhetoric, such as *honor* or *patria* or the standard topics of medical *institutiones*. Whenever the writer heard, for example, of a new plant or another new remedy or about some other natural particular he could take note of it and assign an appropriate new heading.

The great challenge, in this type of commonplacing, was the later retrieval of notes. The relevant entries on a given topic were likely to be scattered throughout the notebook. In order to find them, the note-taker would have to browse through the whole volume, page by page. The marginal headings made

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40   Universitätsbibliothek Leipzig, Ms. 2494, medical commonplace-book of an unidentified writer, around 1600.

41   Universitätsbibliothek Erlangen, Ms. 935. Another example is Bodleian Library, Oxford, Ms. Lister 8, with most pages carrying nothing than the heading or entirely empty.

42   Universitätsbibliothek Marburg, Ms. 118.

it possible to do so far more quickly than in a plain notebook which lacked such headings. However, there was an even much more convenient solution to this problem: creating an index. Indexes had already been used in medieval manuscripts but early modern physician did not have to look that far. By the mid-sixteenth century, many printed books offered indexes as a convenient finding tool which physicians and other scholars adapted to their note-taking purposes.[43] They used, in particular, a new feature of many book indexes. While medieval indexes typically only referred to the respective chapters,[44] printed book indexes came to be based on page numbers. On this model, physicians and other early modern note-takers commonly paginated their notebooks and could then use the page number in the index for easy retrieval. Indexes can also be found in commonplace books of the alphabetical type, making it easier for the note-taker to assess rapidly which topics were covered in that note-book. The success of John Locke's new method of commonplacing – he combined elements of the alphabetical and the sequential approach – even rested primarily on the special kind of index he devised.[45]

10.2.3 *Practice Journals and Casebooks*

The third basic type of notebook which has come down to us among the papers of early modern physicians are practice journals and casebooks. Practice journals served to record, usually on a daily basis, the patients seen and treated, adding various amounts of other information on the individual case, from age and profession to diagnosis and therapy. The practice journal thus shares a fundamental characteristic with plain note-taking and sequential commonplacing: notes are entered in chronological order. In journals, however, the temporal order is not just a reflection of the temporal sequence in which the writer encountered different bits of knowledge or pieces of information. It is an essential feature of the very content of these notes. They record things that

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43   In principle, an index could also be made for plain notebooks. In fact, the lines between plain notebooks and commonplace books of the sequential type are somewhat blurred in this respect. In plain notebooks, the note-taker might underline or otherwise highlight key terms in his notes, in the process of taking notes or at a later stage. Like the headings in a commonplace book, these highlighted terms could then serve as the basis for an index.

44   Alberto Cevolini, "Indexing as preadaptive advance: a socio-evolutionary perspective", *The Indexer*, 32: 2 (2014), pp. 50–57.

45   John Locke, "A Letter from Mr. Locke to Mr. Toignard, containing a New and Easie Method of a Common-Place-Book, to which an Index of two pages is sufficient", in P. King and A. Collins (eds.), *Posthumous works of Mr. John Locke* (London: A. and J. Churchill, 1706), pp. 314–336 (French orig. 1686). Cf. Stolberg, "John Locke's 'New Method'".

happened or were observed – excerpts had no place in this – in the chronologi-
cal temporal order in which they occurred.

Early modern physicians seem to have kept practice journals quite com-
monly.[46] Unfortunately, they have rarely survived, however, and those that are
extant, tend to cover only a few years in the physician's practice.[47] The only
major exception, in the sixteenth century, that I have so far identified are three
folio volumes with about 12,000 individual entries which Job Fincel – author a
well-known book on portents – wrote as a town physician in central Germany,
from the mid-1560s to the late 1580s.[48]

Practice journals could serve different purposes, some of which pointed
beyond the realm of professional, scholarly information management. To
start with, they helped the physicians keep track of received and outstanding
fees.[49] The three volumes of Job Fincel' practice journal even carried the title
Rationes practicae medicae – *rationes* was commonly used at the time as an-
other word for bookkeeping. Account books were of course a very familiar tool
among merchants and physicians could easily adapt them to their own needs.
By all appearances, keeping track of patients and their fees became more and
more important over the sixteenth century and it is probably no coincidence
that surviving manuscripts of this kind tend to reflect the practice of town

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46   Balthasar Timaeus von Güldenklee, e.g., claims to have filled 36 volumes with notes from
      his daily practice, from which he took the 260 or so cases he published in his *Casus et
      observationes*. Cf. Balthasar Timaeus von Güldenklee, *Casus et observationes practicae
      triginta sex annorum* (Leipzig: Klosius 1691), "lectori bono ad candido".

47   Biblioteca Apostolica Vaticana, Cod. pal. 1269 and Cod. pal. 1895–1, fols. 1r-137v (J. Ma-
      genbuch); Stadtbibliothek Nürnberg, Ms. Cent V 10b (G. Palma); Universitätsbibliothek
      Marburg, Ms. 96, "Diarium medicum s[ive] catalogus aegrotorum in quo ipsorum morbi
      referuntur et cura et successus medicamentorum medicinalium", around 1550.

48   Cf. Michael Stolberg, "A sixteenth-century physician and his patients" [submitted]. For
      an analysis of the seventeenth-century casebooks of Turquet de Mayerne (1573–1655),
      which I have not yet been able to examine myself, see Brian Nance, *Turquet de Mayerne
      as Baroque physician. The art of medical portraiture* (Amsterdam and New York: Rodopi,
      2001); on physicians' casebooks in general see Brian Nance, "Medical casebooks in early
      modern Europe: a survey of recent research and strategies for teaching", in C.R. Burns et
      al. (eds.), *Proceedings of the 37th International Congress on the History of Medicine* (Galves-
      ton: University of Texas Medical Branch, 2002), pp. 214–217; Lauren Kassell, "Casebooks in
      early modern England: medicine, astrology, and written records", *Bulletin of the History of
      Medicine*, 88 (2014), pp. 595–625; Martin Dinges et al. (eds.), *Medical practice 1600–1900.
      Physicians and their patients* (Leiden: Brill, 2016) which presents the major results of a
      cooperative research project involving seven research groups in Germany, Austria and
      Switzerland.

49   Cf. Hess and Schlegelmilch, 'Cornucopia'.

physicians. In the sixteenth century, town physicians became increasingly important figures in the healthcare of the wider population. Rather than treating a few affluent patients they came to be consulted more and more also by ordinary citizens, by artisans and, as Fincel's journal shows, even many *rustici*, people from the countryside, sought a learned physician's advice.

Practice journals with more detailed entries on individual patients, such as those of Job Fincel, were much more than simple bookkeeping tools, however. Firstly, they were an important aid to – or indeed a substitute for – memory. With hundreds of patients every year, it would have been difficult if not impossible to remember the complaints of every single one and, even more importantly, the treatment that the physician had recommended. Thanks to his practice journal, however, the physician could recall what his diagnosis had been and what kind of treatment, which medicines he had ordered, when the patient returned, days, weeks or possibly even years after a previous consultation. In order to further facilitate the retrieval of the necessary information, the physician could add an index of patients' names. An early example is the patient index, which the Nuremberg town physician Magenbuch started making for the medical diary he wrote from 1526 to 1528.[50]

Secondly, practice journals were repositories of empirical knowledge. From his practice journal the physician could not only learn how correct he had been in his diagnosis of individual illness episodes and how successful his treatment had been. He could also learn how to diagnose and treat future patients with the same disease. It is telling in this respect that some patient journals not only had an index of patients' names but also one of their diseases. Cornelis Booth of Utrecht who filled, in a chronological order at least seven volumes with *adversaria in modum diarii*, i.e., mostly with notes on different patients he had seen, even used an extra volume for his index and structured it according to the major subdivisions of contemporary medicine, such as *physica*, *diaetetica*, *pharmaceutica*, *empirica* and *pathologica*.[51]

As Fincel's journal makes clear, a major disadvantage of the practice journal was that entries on one and the same patient could appear on dozens of different pages. Especially when a patient was treated for some time, putting

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50   Biblioteca Apostolica Vaticana, Rome, Cod. pal. 1269, fols. 8v-88v, with an (incomplete) index at the beginning. Cf. Peter Assion and Joachim Telle, "Der Nürnberger Stadtarzt Johannes Magenbuch. Zu Leben und Werk eines Mediziners der Reformationszeit", *Sudhoffs Archiv*, 56 (1972), pp. 353–421, esp. p. 397; another sixteenth-century example can be found in Germanisches Nationalmuseum Nürnberg, Hs 100.822, prescription diary of Georg Palma 1568–1570.

51   Universiteitsbibliotheek, Utrecht, Hs VII E36–40 and Hs VII 41 (index); two further volumes from the series are missing.

the entries to practical use could be greatly facilitated if the writer modified or indeed abandoned the strictly chronological approach of the journal to create a casebook on different types of diseases.[52] A good example is the *diarium medicum* of Johannes Magirus (1615–1697), which I found some years ago in Marburg. It covers about five years of Magirus' practice, from 1651 to 1656, first in Berlin and then in Zerbst. Magirus entered new patients in chronological order but – and that is the crucial difference – he left space for further entries which could be added when Magirus saw the patient again. In this manner, the whole case history could be assessed at one glance on a single page (or, in protracted cases, a few pages). Obviously, this case-centered approach also made it much easier to use this material as the basis for published *casus* or *observationes* or, in Magirus' case, for teaching students.[53]

10.3   Conclusion

My analysis of extant notebooks written by medical students and physicians in the sixteenth and seventeenth centuries suggests that they devoted considerable attention and effort to taking notes and that they used different approaches to note-taking depending on their respective needs and, to some degree, the stage of their career. In this respect we can roughly distinguish plain notebooks, i.e., collections of miscellaneous notes without associated headings; commonplace books, in which notes were given or associated with a heading and, depending on the subtype, entered consecutively, alphabetically or in a systematic order; and practice journals and casebooks.[54]

These various approaches to medical note-taking, this overview has shown, differed considerably in their advantages and drawbacks regarding the five principal demands on efficient note-taking, namely structure, flexibility, economy of space and paper, speedy writing and easy retrieval. They also varied considerably, I would like to add at this point, in their epistemic potential,

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52   Hess and Schlegelmilch, 'Cornucopia', similarly distinguish journals and casebooks.

53   Universitätsbibliothek Marburg, Ms. 96. With funding from the Deutsche Forschungsgemeinschaft, Magirus' *Diarium* has now been submitted to a detailed analysis by Sabine Schlegelmilch; see Sabine Schlegelmilch, "'What a magnificent work a good physician is'. The medical practice of Johannes Magirus (1615–1697)", in M. Dinges et al. (eds.), *Medical practice 1600–1900. Physicians and their patients* (Leiden: Brill, 2016), pp. 149–168.

54   Other approaches to note-taking, such as writing notes on individual slips of paper and keeping them sorted in a drawer and the use of tables, beyond the rough outline of a patient journal, or branching diagrams seem to have been used rarely and I have no sound evidence for any consistent use of these practices in the sample that I have examined. See, however, Meinel, 'Enzyklopädie der Welt'.

i.e., in their ability to help draw general conclusions from individual notes, to question established knowledge claims and to arrive at new knowledge.

Plain notebooks offered a very flexible and straightforward means of recording excerpts and information but were in many ways endowed with the lowest epistemic potential. In order to turn the notes into more than an indiscriminate heap of information, they had be processed.

Commonplacing was endowed with a much greater intrinsic epistemic potential. Though the surviving evidence suggests that it was used primarily by beginners (and likely to be given up fairly soon) this goes even for the textbook approach. After all, assembling the ideas, claims and findings of different authorities on a given topic under one heading on the same page or pages made it easier to identify at one glance where they disagreed or contradicted each other or where indeed passages taken from the same author were at odds with each other. This promoted questioning the value of authority *per se* and encouraged note-takers to draw their own conclusions and to establish their own point of view.

Commonplacing of the sequential type, by contrast, was best suited for collecting and organizing empirical findings of all sorts. Providing entries with a common heading made it possible to arrive at more general conclusions, for example about the validity of certain diagnostic signs or the efficacy of certain drugs in a given disease. Moreover, the very act of assigning a certain, very common type of heading – disease names – to observations on different patients had a profound effect in itself. It promoted an 'ontological' understanding of diseases as distinct entities, similar to plants, rather than just as individual events. It thus helped create and stabilize individual diseases as separate objects of inquiry which might have to be diagnosed and treated in a specific manner.

This latter feature is shared by casebooks and practice journals which, like those of Fincel's, used disease names to record their diagnosis. More generally practice journals and casebooks offered their author a unique chance to arrive at general diagnostic, prognostic and therapeutic conclusions, based on their observations on all patients with similar or identical complaints.

Much recent research on early modern practices of note-taking and knowledge-management has treated them as strategies for coping with the 'early modern information overload'.[55] My analysis of early modern physicians' notebooks conveys a distinctly different picture. To start with, a major

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55   See the special issue of the *Journal of the History of Ideas*, 64 (2003) devoted to this topic and, in particular, Ann Blair, "Reading strategies for coping with information overload, ca. 1550–1700", *Journal of the History of Ideas*, 64 (2003), pp. 11–28. See also Blair, *Too much to know*.

part of physicians' notes, certainly in the surviving notebooks that I have been able to examine, was not devoted to excerpting or, more generally, to the management of the knowledge from an ever growing number of books. Personal observations predominate, of natural particulars, such as plants, but above all observations which they made in diagnosing and treating patients. This reflects the principal use of these notes and the whole rationale behind the effort of writing them. Most of the physicians' notebooks I have seen clearly were not designed to serve, like humanist commonplace books, as paper tools for future publications or speeches. They served very concrete, practical and professional purposes. With their help the physicians hoped above all to arrive at valid generalizations from individual observations and to improve, by consequence, their diagnostic and prognostic acumen and their therapeutic outcomes. This, in turn, would assure their professional and economic success in the highly competitive early modern medical marketplace.

The claim that 'early modern information overload' was a crucial driving force behind the development of early modern note-taking even raises great doubts, however, when we look at notebooks devoted to excerpts. True, some early modern writers expressed their feelings of being overwhelmed by the sheer number of books that left the printing press every year[56] and, of course, the concept of 'information overload' is attractive for scholars today who face similar and, due to the internet, further growing challenges in this respect. But the idea that early modern note-taking should be seen as a response to 'information overload' may well reflect above all a massive bias of extant research on early modern note-taking and knowledge management. Much of this work has focused on the very impressive but also highly exceptional encyclopaedic endeavours of Zwinger, Bodin and their likes to come to terms with the whole of available knowledge or to assemble the countless new empirical observations of natural particulars in a certain field such as zoology and botany.[57] Most early modern scholars and surely most physicians are not likely to have shared this ambition, however. As medical students' and young physicians' commonplace books of the textbook variety show, scholars at an early stage of their career may have hoped to assemble at least the available knowledge on the whole range of topics belonging to their particular discipline. As we have seen, they sooner or later relinquished even this more modest aim, however, and for good reasons, too.

56   Daniel Rosenberg, "Early modern information overload", *Journal of the History of Ideas*, 64 (2003), pp. 1–9.

57   Brian W. Ogilvie, "The many books of nature: Renaissance naturalists and information overload", *Journal of the History of Ideas*, 64 (2003), pp. 29–40.

In a clearly defined field of knowledge such as medicine – and the same may well be true for law – the very printed books which confronted the early modern scholar with a flood of new knowledge and not the personal notebooks were, in fact, the much more suitable 'machines for forgetting', substitutes for memory. After all books were, in general, a lot easier to procure than manuscripts, even with relatively modest financial means. As we know from their letters, early modern medical students and young physicians usually already possessed a number of medical books.[58] With their clear structure, introductory works and general textbooks offered much more rapid and complete access to information on a particular topic – and without the trouble of filling page after page with handwritten notes. What is more, printed books usually left ample space in the margins and thus provided a much more convenient means for adding further information on the same topic which the reader/writer obtained from other sources. Notes in the margins of printed books can be found very commonly in the early modern era. Together with other traces of readers' responses such as underlining and an 'NB' for *nota bene* annotations have attracted considerable interest in recent years as an important source for the ways in which texts, published in print or disseminated in manuscript, were used and appropriated.[59] For those who owned and read the books or manuscripts, however, notes in the margins were above all a very convenient tool for information management.

Certain types of physicians' notebooks were truly 'forgetting machines', devices that made it unnecessary to burden the memory or indeed indispensable to cope with an otherwise overwhelming mass of information. Modelled on merchants' account books, practice journals and casebooks are paradigmatic in this respect. For a busy physician it would have been virtually impossible to remember, over years of medical practice, all the patients, their complaints, their treatment and, not to forget, their unpaid fees. "To remember everything is divine rather than human", Balthasar Timaeus von Güldenklee commented on his painful realization that after a few years of practice he already forgotten much of what had proven beneficial to his patients, because, in the beginning, he did not keep a journal.[60] An even stronger case can be made, in this respect, for notebooks which served amongst others or primarily for recording countless

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58   Cf. the database on 'Early modern physicians' letters' which has been established since 2009 at the University of Würzburg under the auspices of the Bayerische Akademie der Wissenschaften (www.aerztebriefe.de).

59   William H. Sherman, *Used books. Marking readers in Renaissance England* (Philadelphia: University of Pennsylvania Press, 2008).

60   Timaeus von Güldenklee, *Casus et observationes*, "Lectori bono et candido".

experimenta, recipes for different kinds of medicines with their various ingredients and their dosage.

Other notebooks, by contrast, and in particular those devoted to excerpts from medical works, were above all convenient learning devices, tools for memorization. An entry in one of Handsch's student notebooks outlines how he and his fellow students used them for this purpose: "Annotate headings in the margins" he reminded himself "and often reread them". And: "This is my habit in my studies which I feel has been useful for me. To read and to sort and write down what I have read in brief commonplaces" and then "to often re-read it at repeated times so that they do not escape from memory as Adam and Iulius [the sons of his teachers Ulrich Lehner and Andrea Gallus] did in Prague, every day, repeating every Saturday the pensum of preceding week and every three months the pensum of the last trimester".[61]

However, the bulk of surviving early modern medical notebooks, those, that is, which served primarily to record empirical personal observations rather than excerpts form the works of others, were above all working tools. As the use of different ink or a different quill on the same page suggests, some writers, like Handsch, frequently returned to older notes and worked with them. They added further notes in the margins or between the lines, such as similar observations on the same drug or diseases or cross-references to later or previous patients with similar complaints. Their notebooks were devices for the production of new knowledge rather than tools for memorization or substitutes for personal memory. They were far more than a mere accumulation of countless bits of information. They provided the basis for inductive reasoning and general conclusions which could then be brought to bear on the diagnosis and treatment of future patients and ultimately helped shape the physicians' understanding of different kinds of diseases.

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61   ÖNB, Cod. 11240, fol. 2r. Handsch was in his early twenties at that time and a student of medicine in Padua.

Early Modern Attitudes toward the Delegation of Copying and Note-Taking

Ann Blair

11.1 Introduction[1]

Autograph writing was valued in a number of ways in the early modern period: by writers as a mental and physical discipline that sharpened attention and retention, by readers as a privileged point of access to the person writing, and by both as a warrant of authenticity or a sign of affection or of special personal attention. At the same time handwriting was also often considered a chore best delegated to helpers – including secretaries in long-term employ, scriveners hired for a particular task, other servants, family members, friends, or students. In practice some scholars did a lot of writing themselves, while others dictated and delegated copying or note-taking, whether because of ill health, failing eyesight, poor handwriting, or a desire to get more work done faster.[2]

Generally I have found only a few explicit discussions of the decisions concerning delegating writing – in advice about working methods, or brief allusions to special circumstances in printed prefaces or in letters – while a vast expanse of surviving manuscripts bears witness to practices not always in line with the attitudes articulated explicitly. From these two kinds of sources (for the latter of which I often rely on existing case studies and editorial notes), I'd like to ask both what early modern scholars delegated and what they admitted to delegating. From these questions I hope we can learn more about working methods, about the value associated with handwriting after the introduction of printing, and about the role of 'invisible helpers' who were likely much more present in early modern scholarship than is apparent from the printed record.[3]

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2 A further motivation less relevant to scholars was embarrassment about poor writing skills.

3 I borrow the term from the inspiring piece by Steven Shapin, "The invisible technician", *The American Scientist*, 77 (1989), pp. 554–563.

Most portraits we have of early modern scholars at work depict a man alone in his study with books and instruments of writing. But humanists worked with others of varying social and intellectual status. They shared information and sources with peers in person (in social gatherings seen as proto-academies) and in their correspondence, and often acknowledged these interactions in which rivalry was intermixed with collaboration, e.g., by citing, criticizing, praising, or thanking their interlocutors in print. Humanists portrayed themselves as participants in a Republic of Letters that extended across time and space, comprising social and intellectual peers engaged in a collective scholarly endeavour. These forms of collaboration invite comparisons with other contexts of collaborative work in this period, including play-writing in England, novel-writing in the French salons, and collaborative work in more or less formalized academies, from the Accademia dei Lincei to the Royal Society.[4]

Other humanists are the most visible, but were not the only kinds of people with whom scholars worked. A spate of recent work on the early modern France has emphasized the interactions of authors with their printers for example.[5] But the production of manuscripts through reading, note-taking, writing, and copying also often involved helpers, typically social or intellectual inferiors (e.g., due to age or gender), ranging from copyists to trusted amanuenses, paid in wages or in kind, or who contributed more or less voluntarily as students or as family members who stood to gain in personal experience and/or from the success of their professor or relative.

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4   As an entry into the world of English play-writing see Brian Vickers, *Shakespeare, co-author. A historical study of five collaborative plays* (Oxford: Oxford University Press, 2003). On French novel-writing in the salons, see Joan De Jean, *Tender geographies. Women and the origins of the novels in France* (New York: Columbia University Press, 1991). On specific examples of collaborative work in the early modern period, see Adam Nicolson, *God's secretaries: the making of the King James Bible* (New York: HarperCollins, 2003); Anthony Grafton, "Where was Salomon's house? Ecclesiastical history and the intellectual origins of Bacon's *New Atlantis*", in *Worlds made by words. Scholarship and community in the modern west* (Cambridge, MA: Harvard University Press, 2009), pp. 98–113; John Considine, *Academy dictionaries 1600–1800* (Cambridge: Cambridge University Press, 2014).

5   See Martine Furno (ed.), *Qui écrit? Figures de l'auteur et des co-élaborateurs du texte XVe-XVIIIe siècle* (Lyon: ENS Éditions and Institut d'Histoire du Livre, 2009); Edwige Keller-Rahbé (ed.), *Les arrière-boutiques de la littérature: auteurs et imprimeurs-libraires aux XVIe et XVIIe siècles* (Toulouse: Presses Universitaires du Mirail, 2010); Raphaële Mouren (ed.), *Quid novi? Sébastien Gryphe à l'occasion du 450e anniversaire de sa mort* (Villeurbanne: Presses de l'ENSSIB, 2008); Brigitte Ouvry-Vial and Anne Réach-Ngô (eds.), *L'acte éditorial: publier à la Renaissance et aujourd'hui* (Paris: Classiques Garnier, 2010); Alain Riffaud (ed.), *L'écrivain et l'imprimeur* (Rennes: Presses Universitaires de Rennes, 2010).

Focusing on late humanist scholarship presents the distinct advantage that the working papers of scholars survive in greater numbers than they do for literary figures from the same period.[6]

11.2 The New Status of Handwriting in the Early Modern Period

A larger historical perspective suggests that decisions about delegating writing became more complex in the early modern period, when writing in one's own hand was no longer exceptional and relying on the hand of another to write was not yet unusual – there were two real options to choose from. The norm in antiquity and much of the middle ages was to compose by dictation, so that authorial composition was a mental process rather than a physical one and *scribere* often meant having someone else do the writing.[7] Similarly in ancient usage the term 'autograph' could designate a manuscript vetted by the author or a respected grammarian and thus considered a reliable expression of the author's intention, even if it was written in a hand other than the author's.[8]

Nonetheless, even in antiquity dictation had its critics. Quintilian warned that dictated texts required more revision. Jerome worried that someone composing by dictation would be incited to speak whatever occurred to him for fear of falling silent while the secretary was waiting – a sentiment seconded with a different emphasis by Ambrose who praised the extra time for reflection afforded by composing in one's own hand. And Augustine noted that some matters were too delicate to be dictated to another.[9] Autography held some

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6 See Michel Espagne, *De l'archive au texte. Recherches d'histoire génétique* (Paris: Presses Universitaires de France, 1998), p. 217; and most recently Roger Chartier, *The author's hand and the printer's mind* (Cambridge: Polity Press, 2014), Ch. 5.

7 Mary Carruthers, *The book of memory. A study of memory in medieval culture* (Cambridge: Cambridge University Press, 1990). On *scribere*, see Colette Sirat, *Writing as handwork. A history of handwriting in Mediterranean and Western culture* (Turnhout: Brepols, 2006), p. 442.

8 David Ganz, "Mind in character: ancient and medieval ideas about the status of the autograph as an expression of personality", in P.R. Robinson and R. Zim (eds.), *Of the making of books: medieval manuscripts, their scribes and readers. Essays presented to M.B. Parkes* (Aldershot: Scolar Press, 1997), pp. 280–299, at p. 298.

9 See Myles McDonnell, "Writing, copying, and autograph manuscripts in ancient Rome", *The Classical Quarterly*, 46: 2 (1996), pp. 469–491. On Jerome, see Évaristo Arns, *La technique du livre d'après Saint Jérôme* (Paris: E. De Boccard, 1953), pp. 47–48, quoting the *Patrologia Latina*, vol. 25, col. 1118A. On Augustine, see Pierre Hadot, *The inner citadel: the meditations of Marcus Aurelius* (Cambridge, MA: Harvard University Press, 1998), p. 33. On Ambrose, see Jacqueline Hamesse, "Les autographes à l'époque scolastique. Approche terminologique

significance in antiquity too, as evidenced by autograph subscriptions added to scribally produced letters and by occasional references to the autographs of important people.[10] Suetonius for example spoke of having held compositions of Nero's written in his own hand; an early biography of Augustine reports that his church in Hippo preserved a quire which Augustine had written in his own hand.[11] The key values of writing *sua manu* were thus already articulated in antiquity: privacy, control of and more time for composition, and a sense of direct access to the person writing.

In the middle ages, scribing was generally considered a craft and a form of manual labour. In addition to the physical work of writing, the process also involved preparing ink, quill, and writing surface, which was time-consuming and messy too. Writing was not in itself the purview of the scholar. Albert the Great for example described copying in his own hand as an act of humility.[12] In medieval Paris, university students were barred from spending too much time copying. Although they attended sermons at least once daily, they were warned against "wasting time in writing out sermons other than their own; only one day a week might be spent in sermon writing".[13] We can deduce that the rules against dictating at the University of Paris were observed in the breach given their regular repetition, and they were finally lifted in the sixteenth century. They likely stemmed in part from a similar sense that mere scribing was a waste of time for university students (though acceptable for younger ones). One master caught dictating justified himself by invoking the poverty of those students who could not afford a scribe and thus needed to make their own copy of the texts. Hiring a scribe was evidently considered the normal solution; at the University of Paris a scribe might be hired to copy from the assigned text deposited by the professor at the stationers' and available

et méthodologique", in P. Chiesa and L. Pinelli (eds.), *Gli autografi medievali: problemi paleografici e filologici* (Spoleto: Centro Italiano di Studi sull'Alto Medioevo, 1994), pp. 179–205, at p. 188.

10   See examples from the Vindolanda letters as discussed in Sirat, *Writing as handwork*, p. 448.

11   "I have had in my possession notebooks (*pugillares*) and papers (*libelli*) with some well-known verses of his [Nero's], written with his own hand and in such wise that it was perfectly evident that they were not copied or taken down from dictation, but worked out exactly as one writes when thinking and creating; so many instances were there of words erased or struck through and written above the lines". Cf. Suetonius, *Life of Nero*, trans. J.C. Rolfe, 52, 3. Re Augustine, see Sirat, *Writing as handwork*, pp. 476–479.

12   Hamesse, "Les autographes à l'époque scolastique", p. 191.

13   David L. d'Avray, *Medieval marriage sermons. Mass communication in a culture without print* (Oxford: Oxford University Press, 2001), p. 26.

for rent in pieces (or *pecia*), thus allowing many copies to be made simultaneously from the same vetted original.[14] The rare medieval autographs that survive before the thirteenth century did not seem to carry special weight in their day. For example, a few autograph drafts by Maimonides survive because they were discarded in the Cairo Geniza.[15] Aquinas autographs only survive from his early years, before he composed by dictating, and his prestige among Dominicans was no doubt crucial to their having been saved.[16] In the middle ages the significant copy of a work was not the authorial autograph but rather the authoritative exemplar provided for *peciation*.

Armando Petrucci notes a variety of factors that favoured the production and survival of autographs in Italy starting in the thirteenth century, among them the use of paper and practices of notarial recordkeeping, but also in specific cases the "momentary or prolonged absence of helpers" which motivated writers to write in their own hand.[17] Petrarch was one of the first to articulate a preference for the autograph and made multiple autograph copies of his work to circulate to avoid the risk of introducing scribal errors (or at least errors made by someone other than himself); but he also employed scribes.[18] In the first century of humanist recovery of manuscripts, the humanists generally did the copying themselves, whether because the originals were too precious to entrust to others or because of a broader distrust of scribes whose errors and crabbed scripts humanists were on a mission to purge. The humanists famously introduced new scripts modelled on ancient inscriptions and on Carolingian manuscripts which they took to be reproducing ancient forms. Colette Sirat also argues that competition from printing drove professional scribes to promote handwriting as a skill worthy of princes and scholars and

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14   István Hajnal, *L'enseignement de l'écriture aux universités médiévales* (Budapest: Maison d'Edition de l'Académie des Sciences de Hongrie, 1959), pp. 121–125. On the *pecia* system, see Richard Rouse and Mary Rouse, *Authentic witnesses. Approaches to medieval texts and manuscripts* (Notre Dame: University of Notre Dame Press, 1991), Ch. 8. In Eastern and Central Europe where there was no *pecia* system, dictation by a *bidellus* was a common way for students to get copies of their texts; see Hamesse, "Les autographes à l'époque scolastique", p. 197.

15   Sirat, *Writing as handwork*, p. 478. For a very early autograph, see Elias Avery Lowe, "An autograph of the Venerable Bede", *Revue Bénédictine*, 68: 3–4 (1958), pp. 199–202.

16   Pierre-Marie Gils, "S. Thomas écrivain", in *S. Thomae de Aquino Opera omnia iussu Leonis XIII P.M. edita* (50 vols., Rome and Paris: Commissio Leonina and Editions du Cerf, 1992), L, pp. 173–209.

17   Armando Petrucci, *Writers and readers in medieval Italy. Studies in the history of written culture* (New Haven: Yale University Press, 1995), p. 148.

18   For an entry into this topic, see Chartier, *The author's hand*, p. 77.

successfully used printed manuals to enhance the prestige and visibility of their services.[19] They were helped in this agenda by humanist pedagogues like Erasmus and Juan Luis Vives who portrayed handwriting as an essential personal skill and a valuable intellectual exercise, citing Quintilian in support.

Erasmus' *De recta Graeci et Latini sermonis pronunciatione* (1528) offered advice for the teaching of spelling, punctuation and pronunciation, and included a few pages on handwriting. Erasmus blamed the decline of proper handwriting among scholars on printing and highlighted the virtues of writing in one's own hand – privacy, control, evidence of authenticity and personal investment.

> Leo: Nowadays the art of printing has led to the situation that some scholars do not write down anything at all! For, if they decide to commit any of their lucubrations to paper, they write so beautifully [ironic] that they themselves cannot read what they have written and require a secretary to read it and decipher what they cannot decipher themselves. …
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> To be brief: a letter that is a product of someone else's fingers hardly deserves the name. For secretaries import a great deal of their own. If you dictate verbatim, then it is goodbye to your privacy; and so you disguise some things and suppress others in order to avoid having an unwanted confidant. Hence, quite apart from the problem of the genuineness of the text, no open conversation with a friend is possible here. It is very easy to forge a signature but very difficult to forge a complete letter. A man's handwriting, like his voice, has a special, individual quality.[20]

But Erasmus was wary of too much writing, which could lead to bad habits, like developing abbreviations and writing less well. "Leo: … In former times pupils at school had to take down so much long-hand that boys wrote rapidly but

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19   Sirat, *Writing as handwork*, p. 479.

20   Desiderius Erasmus, *De recta Graeci et Latini sermonis pronunciatione* (1528), as excerpted and translated in Arthur Sidney Osley, *Scribes and sources. Handbook of the Chancery hand in the sixteenth Century* (Boston: David Godine, 1980), pp. 29–30. Cf. Quintilian, *Institutio oratoria*, English trans. by H. Edgeworth Butler (Cambridge, MA: Harvard University Press, 1958), 1, 1, 28–29: "Writing is of the utmost importance in the study which we have under consideration and by its means alone can true and deeply rooted proficiency be obtained. But a sluggish pen delays our thoughts, while an unformed and illiterate hand cannot be deciphered, a circumstance which necessitates another wearisome task, namely the dictation of what we have written to a copyist. We shall therefore at all times and in all places, and above all when we are writing private letters to our friends, find a gratification in the thought that we have not neglected even this accomplishment".

with difficulty, constantly on the look-out for symbols and for abbreviations to save time. … Ursus: And both these sayings are very true, namely that correct writing leads us to rapid writing, and that it isn't by writing a lot that we come to write well".[21] In other words, the goal was good elegant writing, and trying to write too much or too fast was a hindrance; the unstated corollary might be that when bulk or speed was required, a helper might offer the best solution.

Juan Luis Vives also promoted learning to write in a dialogue in simple Latin designed for the instruction of boys (1538) in which the master tells his well-born charges that the nobility err in spurning "knowing how to do something". Instead "you will attain true nobility if you train your minds with those accomplishments which are particularly appropriate to your noble lineage" – among them handwriting. As the pupils are convinced and the writing lesson begins, a servant is summoned to bring the ink-well.[22] Writing *sua manu* would typically take place with the help of a servant.

Writing masters used their skills and the new medium of printing to raise writing up from its status as a mechanical activity. Osley has identified some twenty handwriting manuals printed in the sixteenth century, most of which went through multiple editions, offering not just models of writing to imitate but a full treatise on handwriting (e.g., on preparing and holding the quill, forming the letters in different scripts, the joins, the slope, etc.) which frequently opened with a justification for learning these skills.[23] Some masters emphasized that bad handwriting would make a reader ill disposed to the arguments contained in the letter; conversely a good hand would predispose the reader favourably.[24] In the most ambitious such statement, the Basque Pedro de Madariaga who dedicated his *Libro subtilissimo* to Philip II in 1565, called handwriting a liberal art, because it opened the way to higher

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21   Osley, *Scribes and sources,* pp. 29–30.

22   *Linguae latinae exercitatio* (1538), excerpted in Osley, *Scribes and sources*, pp. 41–42. Interestingly, the mention of the servant is omitted in the edition of Edinburgh (1657).

23   Forty such manuals from the sixteenth century, in addition to others in the seventeenth are listed in David Becker, *The practice of letters. The Hofer collection of writing manuals 1514–1800* (Cambridge, MA: the Harvard College Library, 1997). For a focus on English writing manuals, see Ambrose Heal, *The English writing-masters and their copy-books 1570–1800. A biographical dictionary & a bibliography* (London: First Edition Club, 1931); and Simran Thadani, "'For the better atteyning to faire writing': an analysis of two competing writing-books, London, 1591", *Papers of the Bibliographical Society of America*, 107: 4 (2013), pp. 422–466.

24   Giovan Francesco Cresci, *Il perfetto scrittore* (1570), in A.S. Osley, *Scribes and sources. Handbook of the Chancery hand in the sixteenth Century* (Boston: David Godine, 1980), p. 118.

disciplines and was an appropriate pursuit for a gentleman along with fencing, swimming, and dancing. Penmanship should even, he went further, "be given a place among the supreme accomplishments and inspired sciences close to holy Theology" since it was a divine gift and God himself was a scribe, since he wrote in his own hand the tablets of the law that he gave to Moses.[25]

In another line of argumentation, the Spaniard Andreas Brun proposed to correct Plato by emphasizing that writing, not speech was the most distinctive human skill.[26] This notion coincided with the Spanish imperial project too. A recent study of Yciar's *Recopilación subtilissima* (1548) has emphasized that handwriting was essential to the conduct of imperial administration and information-gathering with its vast accumulation of manuscripts, most of which were never printed. But for Brun and others, writing was also taken as a clear sign of European superiority over the inhabitants of the Americas. Even José de Acosta who was among the most favourably curious about them ("there are no people so barbaric that they do not have something worthy of praise") noted that the Indians did not have the use of letters, only of signs that signify things.[27] If writing was a uniquely human skill, then the absence of writing was an argument for the less than human standing of the natives of the Americas (though that argument required ignoring the successful instruction of natives in Latin in the early days of the College of Santa Cruz).[28]

While writing masters generally addressed their works to the highest social ranks in search of the best possible patronage and visibility, some of them also noted the value of their art for the less well born: through writing men "of lowly birth can ... improve themselves and not envy [those above them in society]; they can walk with their heads high, proud to realise that, without this accomplishment, even men of superior quality cannot ennoble themselves or appear in the ranks of the noble". Secretarial skills no doubt proved a means of

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25   Osley, *Scribes and sources*, p. 155.

26   Osley, *Scribes and sources*, p. 180; cf. Sirat, *Writing as handwork*, p. 106.

27   José de Acosta, *Natural and moral history of the Indies*, ed. by J. Mangan (Durham and London: Duke University Press, 2002), Book 7, p. 379; re Yciar and imperialism, see Jessica Berenbeim, "Script after print: Juan de Yciar and the art of writing", *Word and Image*, 26: 3 (2010), pp. 231–243.

28   For an entry into this topic, see Walter Mignolo, "On the colonization of Amerindian languages and memories: Renaissance theories of writing and the discontinuity of the classical tradition", *Comparative Studies in Society and History*, 34 (1992), pp. 301–330. On the Mexican colleges, see Andrew Laird, "Latin in Cuauhtemoc's shadow: humanism and the politics of Lang in Mexico after the conquest", in Y. Haskell and J. Feros Ruys (eds.), *Latinity and alterity in the early modern period* (Tempe, AZ: ACMRS and Brepols, 2010), pp. 169–200.

upward mobility for many, though these trajectories can be hard to document, because few who rose in the social hierarchy cared to call attention to their low birth. Osley points to one exceptional trajectory, in Thomas Wolsey's rise from butcher's son to Lord Chancellor, fuelled by his secretarial skills. Of the writing masters Osley discusses most were born to families of means or even noble standing. But a few whose origins are unknown, like Juan de la Cuesta of Alcalá described as coming from a tiny village in Guadalajara, might themselves represent cases of upward mobility.[29]

Of course the writing masters were engaged in a campaign to sell their books and their services as teachers, in more or less direct competition with one another, and to raise the status of their activity. It is hard to document their impact independently of other factors such as the spread of humanist education, the rise of bureaucracies and of literacy. The genre of printed book that the masters developed, which used woodblock then copper engraving to reproduce all kinds of handwriting, continued to grow in the seventeenth century (including many shorthand manuals in England especially). Although it would be hard to quantify, it seems clear that the increased production and survival of manuscripts in the early modern period also involved greater percentages of autography, in part as a result of the impact of writing masters and their publications.

11.3 Delegation in Letter-Writing

The genre in which attitudes toward autograph versus scribal writing have best been studied is correspondence. In his analysis of over 10,000 English letters from 1512–1635, James Daybell notes a growing expectation during this period of writing in one's own hand letters to family, friends, and associates, detectable from practice and from apologies for failing to do so. Letters written by scribes were preferred for more formal letters relating to government, law, or business. Letters to the monarch were scribal, for example, because autographs would be too familiar, except from those writing from special positions of favour or intimacy. Daybell notes that it is unclear how far down the social scale this convention extended, beneath the rank of monarch. It was common also to write to social inferiors using a secretary. Additional gender conventions likely

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29 Agostino da Siena, *Opera nella quale si insegna a scrivere* (c. 1565), in A.S. Osley, *Scribes and sources. Handbook of the Chancery hand in the sixteenth Century* (Boston: David Godine, 1980), p. 103. Re Wolsey and Juan de la Cuesta, see Osley, *Scribes and sources*, p. 103 and p. 173.

existed; for example, it may have been deemed inappropriate to write personally to a woman to whom one was unrelated or unknown, and vice versa.[30] Autograph subscriptions to scribal letters enabled writers to add a personal message, as a sign of affection or to preserve confidentiality. These reasons for autography are all familiar from antiquity.

New in the sixteenth century was the interest in collecting autographs: first in the *album amicorum* tradition, then in occasional collections of correspondence that seem focused on gathering autograph letters by prominent people (notably, a volume formed by the antiquarian and Parliamentarian Sir Simonds d'Ewes, 1602–50). Munby concludes that for most antiquarians the autograph status of manuscripts was incidental, but Samuel Pepys had one of his secretaries (probably Paul Lorrain) make careful facsimiles of signatures copied from the State Papers in a *Repertorium chiro-typicum* which could then be used to test whether papers in his collection were originals or transcripts.[31] The rise of the signature as a mark of authentication was a gradual one from the middle ages when signatures were accompanied by seals and personal appearances to the eighteenth when an author's signature was sometimes added to the title page of a book to authenticate the copy (as in *Tristram Shandy*, or Hoyle's *Book of games*).

Despite the rise of autography, early modern letter-writing more often than not involved the work of another: family members could write for one another; friends could be consulted or involved, but most commonly professionals were engaged, at the highest levels even in complex hierarchies of secretaries with different specialties. Daybell concludes nonetheless that it is hard to establish exactly what happened in each case: "Letters might be dictated, either verbatim or partially, leaving the scribe to provide opening and closing modes of address; they might be written from notes, penned from oral instructions or derived from epistolary models and templates; their invention might also be entirely ghosted by a secretary".[32] Scribes were also tasked with copying outgoing letters for the sender to keep as a record, or in order to circulate them to

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30 James Daybell, *The material letter in early modern England. Manuscript letters and the culture and practices of letter-writing 1512–1635* (Houndmills: Palgrave Macmillan, 2012), pp. 86–88; James Daybell, "The social conventions of women's letter-writing in England 1540–1603", in J. Daybell (ed.), *Early modern women's letter-writing in England 1450–1700* (Houndmills: Palgrave Macmillan, 2001) pp. 59–76.

31 Alan Noel Latimer Munby, *The cult of the autograph letter in England* (London: Athlone Press, 1962), pp. 1–3.

32 Daybell, *The material letter*, p. 79; see also James Daybell, "Women's letters and letter-writing in England, 1540–1603. An introduction to the issues of authorship and construction", *Shakespeare Studies*, 27 (1999), pp. 161–186.

additional readers in manuscript.[33] Social conventions and practical consider-ations fed a constant interaction between writer and helper in the production of the vast quantity of manuscript comprised by early modern letters.

11.4   Delegation in Note-Taking

In turning to note-taking, we face many of the same interpretive problems as we do for letter-writing, and without as much existing synthetic work. Note-taking could serve different purposes: as a method and record of one's reading, as material to share with others, or from which to compose a new publication. Helpers could be involved at every stage in multiple ways, though explicit men-tion of scribal help was typically limited to just a few activities, such as making clean copies and taking dictation.

It is not easy to tell who did what amid surviving papers. Daybell empha-sizes that masters and their amanuenses, and even women, long thought to have generally learned just one script, might move between two (or more) scripts depending on the language, the genre and the circumstances of their writing. So it is not easy to identify the same person writing in two different scripts. Conversely, secretaries were also encouraged to mimic their master's hand – and this was not considered duplicitous.[34] But presumably secretar-ies tended to have clear, neat hands. Paul Nelles suggests that Gabriel Naudé in the employ of various French grandees was given the task of forming and organizing libraries rather than copying because of his poor handwriting – a failing that Naudé was perhaps not displeased with given his likely preference for work in libraries.[35] Whereas as Vives mocked as being uncultured nobles whose signatures were illegible, might a messy hand have also served as a sign of social standing, of not having to conform to the needs of legibility? A dif-ficult hand might thus safely be identified as the master's hand and histori-ans encounter plenty of those – Ulisse Aldrovandi, Nicolas Fabri de Peiresc,

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33   Daybell notes that the letter should not be considered a single text, given the number of different versions that may have existed and that survive: "Drafts were later reworked; secretarial copies kept as records, as separates or in formal letter-books; neat copies were produced for presentation; and transcripts made for wider circulation in manuscript". Cf. Daybell, *The material letter*, p. 74.

34   Henry R. Woudhuysen, *Sir Philip Sidney and the circulation of manuscripts 1558–1640* (Oxford: Clarendon Press, 1996), p. 388.

35   Paul Nelles, *The public library and late humanist scholarship in early modern Europe. Anti-quarianism and encyclopaedism* (Ph.D. Diss., Baltimore: Johns Hopkins University, 1994), p. 219.

and Theodor Zwinger among them. In a printed index marked up by Erasmus and his amanuensis Nicolaus Cannius, the latter's hand is predictably the neater hand.[36] But no doubt masters occasionally used neat hands too. Conrad Lycosthenes for example gave his notes to his stepson Theodor Zwinger as a seed from which the latter grew his *Theatrum humanae vitae* (1565). The surviving slips that match Lycosthenes' *ex-libris* inscription are neat and sorted by headings, unlike other slips in the Zwinger papers (which I have presumed to be Zwinger's own). Perhaps Lycosthenes took these notes neatly himself or perhaps he had them copied before passing them on to Zwinger.[37] After all, proficient writers surely varied their level of neatness. We can observe that Conrad Gessner wrote very neatly when inscribing gift copies of his books, and much less so when annotating his books for his own use. So conclusions about who wrote what in surviving collections of papers must often remain somewhat speculative.[38]

The theorists of note-taking, humanist then Jesuit pedagogues, generally emphasized the importance of taking notes in one's own hand, as an exercise in retaining the best bits of one's reading. Petrarch was one of the first to articulate the notion that one should not read without writing at the same time: "I do not read without writing. ... Because writing is slower than reading, the more deeply it is impressed and the more tenaciously it sticks [in the mind]".[39] Note-taking was thought to aid the memory in two different ways: not only by creating a written record to return to, but also by forcing the mind to dwell on the material and to retain better what was read or heard by writing it down. Francesco Sacchini and Jeremias Drexel, the Jesuit authors of the two most reprinted manuals on note-taking, made this point repeatedly.[40]

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36   Luigi Michelini Tocci, *In officina Erasmi: l'apparato autografo di Erasmo per l'edizione 1528 degli Adagia e un nuovo manoscritto del Compendium Vitae* (Rome: Edizioni di Storia e Letteratura, 1989), pp. 39–49.

37   For some illustrations, see Ann Blair, *Too much to know. Managing scholarly information before the modern age* (New Haven and London: Yale University Press, 2010), pp. 215–216.

38   Compare for example the inscription by Gessner to Heinrich Bullinger in the copy of *Evonymi thesaurus* (1552), Zentralbibliothek Zurich, call number Md E 377, digitized on E-rara, with the notes in Gessner's own copy of his *Bibliotheca universalis* (1545), Zentralbibliothek Zurich, call number DrM3, digitized on E-rara.

39   "Nihil legi nisi dum scriberem ... Quod enim tardior est scriptura quam lectio, eo altius imprimitur haeretque tenacius". Francesco Petrarca, *Epistolae de rebus familiaribus* (Florence: Le Monnier, 1862), XVIII, 12, pp. 498–499, as discussed in Hamesse, "Les autographes à l'époque scolastique", p. 204.

40   E.g., "Deinde ipsa quoque scriptio et intelligentiam iuvat". Francesco Sacchini, *De ratione libros cum profectu legendi libellus* (Ingolstadt: Ex Typographo Ederiano, 1614), p. 74.

In support of the pedagogical virtues of writing Sacchini cited the model of ancients who copied texts not in order to have copies of them, but in order to retain them better. He reports (with what veracity I do not know) that Demosthenes copied Thucydides eight times, and Saint Jerome wrote many volumes in his own hand, "not due to the weakness of his library but out of desire to profit from the exercise".[41] The sentiment was widely shared by other pedagogues, from Juan Luis Vives who also praised the act of copying for keeping light or scabrous thoughts at bay[42] to New England preacher Richard Steele who wrote in 1682: "The very writing of any thing fixes it deeper in the mind".[43]

In this spirit students were expected to do a lot of writing, not just while reading material for the first time (when it would increase attentiveness to the text), but also by copying notes a second time. Sacchini called for students to copy out each excerpted passage twice, first in a notebook kept in the order in which items were read, then in a notebook sorted by commonplace headings. Delegation would deprive the student of the additional opportunity for retention through writing and Sacchini did not even discuss the possibility. In various contexts teachers also assigned their students to copy out the notes or a text composed by another. Anthony Grafton and Urs Leu

Or "Excerpendum esse diversis rationibus docetur. ... Prima est: lectoris intentio scribendi et annotandi cura multum acuitur. ... Altera ratio est: quod exscribitur, intelligentiam profundius subit, menti altius imprimitur. ... Cum gnaviter excerpit et annotat, crebrius subsistere cogitur et pedem figere: etiam dum lectis immoratur, dum relegit et retractat, longe melius, quae retinenda penetrat". Jeremias Drexel, *Aurifodina artium et scientiarum omnium. Excerpendi sollertia, omnibus litterarum amantibus monstrata* (Antuerpiae: Apud Viduam Ioannis Cnobbari, 1638), Ch. 9, pp. 55–56. For more on Sacchini and Drexel, see Blair, *Too much to know*, Ch. 2.

41   "Itaque Demosthenes sua manu si Dionysio Halicarnasseo credimus, octies totum exscripsit Thucididem. Multa etiam manu sua exscripsit volumina S. Hieronymus: multa alij sapientissimi viri, non tam librarij inopia, quam cupiditate profectus ex opere". Sacchini, *De ratione*, p. 74.

42   Ann Moss, *Printed commonplace-books and the structuring of Renaissance thought* (Oxford: Clarendon Press, 1996), p. 300.

43   Richard Steele, "What are the hindrances and helps to a good memory in spiritual things?" in S. Annesley (ed.), *A continuation of morning-exercise questions ... resolved in 1682* (London: J.A. Dunton, 1683), p. 428, as quoted in Thomas Knoles and Lucia Zaucha Knoles, "In usum pupillorum: student-transcribed texts at Harvard College before 1740", in T. Knoles et al. (eds.), *Student notebooks at colonial Harvard: manuscripts and educational practice 1650–1740* (Worcester: American Antiquarian Society, 2003), p. 57. I also discuss this in Ann Blair, "Textbooks and methods of note-taking in early modern Europe", in E. Campi et al. (eds.), *Scholarly knowledge: textbooks in early modern Europe* (Geneva: Droz, 2008), pp. 39–73.

have recently documented how the Swiss humanist Heinrich Glarean taught chronology by having his students copy out the marginal notes in his copy of an assigned work. This practice of copying marginal annotations would also explain the multiple copies of technical works like Copernicus' *De revolutionibus* containing near identical annotations.[44] At Harvard College, in the late seventeenth century students were assigned to copy out manuscript textbooks brought from England; they did so in instalments throughout the semester. There were insufficient numbers of students to warrant printing the text, and the pedagogical virtues of copying were assumed. But in these cases one of the purposes was also to create a new copy of the notes or the text. I am not aware of rules forbidding hiring someone to do this work in one's stead. One could take this as a sign that this copying was supervised by a master and could not be evaded or delegated; but perhaps delegation was allowed or did happen in some circumstances. Outside a pedagogical context, making a copy of a text not otherwise available, whether a manuscript or a printed book, was certainly something likely to have been requested of secretaries in various circumstances.[45]

Beyond these conservative pedagogical circles, another line of advice assumed that scholars and even students would rely on the work of others to some extent. The principal point in these recommendations was to establish what work could usefully be delegated, by distinguishing the tasks requiring judgment which should redound to the master, from more mechanical activities of taking dictation or copying which could safely be delegated. Taking as a model Pliny who was read to and dictated large numbers of notes (according to the account of his nephew), Guarino da Verona (1374–1460) suggested that in studying, a young nobleman might hire a servant to copy out excerpts into his notebook, but the master would select the excerpt and dictate it.[46] Similarly, a 1599 letter to Fulke Greville (possibly by Francis Bacon) advises the new Cambridge student to hire "two or three ... to gather for you" (including

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44 Anthony Grafton and Urs Leu, "Chronologia est unica historiae lux: how Henricus Glareanus studied and taught the chronology of the ancient world", in I. Fenlon and I. Mai Groote (eds.), *Heinrich Glarean's books: the intellectual world of a sixteenth-century musical humanist* (Cambridge: Cambridge University Press, 2013), pp. 248–279. On Copernicus, see Owen Gingerich, *An annotated census of Copernicus'* De revolutionibus (*Nuremberg, 1543 and Basel, 1566*) (Leiden: Brill, 2002), pp. xix–xxi, concerning the notes copied by the students of Jofrancus Offusius.

45 On copying textbooks at Harvard see Knoles and Zaucha Knoles, "In usum pupillorum". On manuscript copies of printed books, see Ann Blair, "Reflections on technological continuities: manuscripts copied from printed books", *Bulletin of the John Rylands Library*, 91: 1 (2015), pp. 7–33.

46 Moss, *Printed commonplace-books*, p. 54.

possibly a friend), but they should be told to gather examples and arguments relevant to a position or question of the master's selection.[47] The letter warns that "one Man's Notes will little profit another, because one man's Conceit doth so much differ from another's; and also because the bare Note itself is nothing so much worth, as the suggestion it gives the Reader". A note taken by another could not trigger a personal recollection of reading and therefore required establishing ahead of time strong criteria for the note-taking and maintaining regular interaction between the note-taker and the person for whom the notes were taken. "For [your Collectors] should like labourers bring Stone, Timber, Mortar and other Necessaries to your Building: But you should put them together, and be the Master-workman yourself".[48] In this conception the master could impart precise instructions for others to follow, with proper supervision.

Francis Bacon was sceptical that judgment could be delegated successfully so recommended limiting the practice to unimportant material: "Some books also may be read by deputy and extracts made of them by others, but that would be only in the less important arguments and the meaner sort of books".[49] Drexel the Jesuit was also dubious about delegating judgment. "Notae propriae, notae optimae": "your own notes are the best notes", he explained, with one page of the former being worth "10, 20, 100 pages" of the latter. Hence his displeasure too in the reliance on reference books which presented in print the reading notes of others.[50] But some fifty years later Daniel Georg Morhof took a frankly positive attitude toward delegation: "If you can afford it, you should employ learned amanuenses, to whom to assign the task [of taking

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47   On the contested authorship of this letter which echoes themes found elsewhere in Bacon's writings, see Francis Bacon, *Early writings to 1596*, in *The Oxford Francis Bacon*, ed. by A. Stewart (15 vols., Oxford: Oxford University Press, 2012), I, at pp. 200–205. Concerning the status of friends, care was taken to treat their help differently from that of secretaries; see Paul Hammer, "The Earl of Essex, Fulke Greville, and the employment of scholars", *Studies in Philology*, 91 (1994), pp. 167–180 concerning the treatment of Bacon.

48   Vernon Snow, "Francis Bacon's advice to Fulke Greville on research techniques", *Huntington Library Quarterly*, 23 (1960), pp. 369–378, at p. 374 (p. 370 re friendship); and Hammer, "The Earl of Essex".

49   Francis Bacon, "Of studies", in B. Vickers (ed.), *Francis Bacon: the major works* (Oxford: Oxford University Press, 2002), p. 439.

50   Drexel, *Aurifodina*, p. 58: "Hic ego cum cochlea velut oraculum proloquor: Domus propria, domus optima: Notae propriae, Notae optimae. Unica Excerptorum pagina tuo labore scripta, magis tibi erit usui quam decem, quam aliae viginti, quam aliae centum, quas diligentia obtulerint aliena". Cf. also Drexel, *Aurifodina*, p. 59: "Quam multa sunt, quae scriptores alii, aut studio praetermittunt, aut incuriosi transeunt, aut ad alia festinantes negligunt, aut reperta mutilant et frangunt? Quae attentus lector, hinc illinc ingenti suo commodo decerpet".

notes *lemmatice*]; but who use your judgment in collecting, as Saumaise and other very eminent men have done".[51] Morhof gives no further advice on how to lead an amanuensis to replicate his employer's judgment. Kevin Sharpe argues that the papers of Sir William Drake offer an example of that kind of success: the fifteen commonplace books in Drake's own hand (composed from 1627 to the mid-1640s) are followed by twenty-two volumes of notes mostly in another hand, but using similar headings, authors, and judgments, which suggests that Drake successfully conveyed to his amanuensis his methods of working and selecting, presumably by interacting closely with him during the process.[52] For this strand of advice-givers delegation was acceptable only on points of lesser importance (Bacon) or if the judgment involved was exercised by the master himself or in close consultation with him.

The case of Gabriel Harvey shows that extensive note-taking was delegated to professional readers in elite political circles in early seventeenth-century England. Harvey not only summarized but also reflected on the lessons to be drawn from the histories of Livy in his copy of the book annotated for the use of his employer, the Earl of Leicester.[53] We can wonder how closely directed his reading was by preliminary instructions or regular discussions during the process of reading. But more likely Harvey's role resembled that of the scholars hired by Robert Devereux, second Earl of Essex, studied by Paul Hammer, who sought to hire the best university graduates precisely in order to delegate to them the task of expert judgment.[54] In these cases, a high-ranking employer sought the help of men who were his social inferiors but offered exceptional intellectual skills and background. He hired them not for mechanical tasks like copying but in order to benefit from their well-trained judgment and university education. In this context, an elite family could be mocked on the contrary for hiring only "base pen clerks that can do nothing but write as they were bidden", a charge that was levelled after his death against Elizabeth's chief minister Burghley and his son.[55]

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51   Daniel Georg Morhof, *Polyhistor, literarius, philosophicus et practicus* (Lubecae: Sumptibus Petri Boeckmanni, 1747[4]), Book I, Ch. 21, § 12, p. 239: "Vel si opibus non destituaris, amanuenses alas non ineruditos, quibus rem illam [taking notes *lemmatice*] committas; sed qui tuo judicio in colligendo utantur. Id Salmasius aliique viri praestantissimi fecerunt".

52   Kevin Sharpe, *Reading revolutions. The politics of reading in early modern England* (New Haven: Yale University Press, 2000), pp. 273–274.

53   Lisa Jardine and Anthony Grafton, "Studied for action: how Gabriel Harvey read his Livy", *Past and Present*, 129 (1990), pp. 30–78.

54   See Hammer, "The Earl of Essex".

55   Woudhuysen, *Sir Philip Sidney*, p. 83.

A final model of reliance on the notes of others occurred in the context of collaborative note-taking among peers. Bartholomaeus Keckermann is credited by Vincent Placcius with first devising methods of group study. Keckermann advised that three students of similar age, ability, and interests, would work together to master texts, by taking turns reading aloud while the other two took notes or by pooling notes they each took on different themes if they hired a reader to read for them.[56] Placcius invoked this model in praising the virtues of the note closet he described from the 1640s manuscript of Thomas Harrison: the closet was the ideal tool for a group of scholars to share their notes with one another. Placcius also described what could be delegated to a 'third party' in the use of the closet – a servant could file note slips to their proper place after use (and presumably fetch them too).[57] These forms of collaboration among peers who shared a same purpose resembles the dispersed sharing of notes that can be tracked through correspondence networks in the Republic of Letters, when scholars circulated to one another results of their reading, observations, and thinking in response to queries or in exchange for similar gifts. Gessner's accumulation of notes in the *Thesaurus practicae medicae* shows, for example,

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56   "*Socialium Excerptorum primus mentionem*, quod sciam, *fecit* KECKERM. *Cons. Log de adornandis Locis Communibus c.1. p. 3. columna 2. circa finem*: exponens, quomodo *plures conjungere possent operam* suam *in excerpendo*". Vincent Placcius, *De arte excerpendi. Vom gelehrten Buchhalten liber singularis* (Holmiae et Hamburgi: Apud Gottfried Liebezeit, 1689), p. 161. This is likely the passage Placcius had in mind: "Socius modus est, quando coniunguntur opere, tum in legendo tum in colligendo id quod hac ratione maxima cum utilitate fiet; 1. si coniungerent se tres studiosi similium ingeniorum et parium profectuum. 2. si isti tres eundem scopum haberent propositum, et essent vel studiosi Theologiae omnes, vel Politicae et Iuris, vel aliarum etiam facultatum. 3. si sint aeque diligentes et industrij. 4. si sint sibi invicem addicti et amici; ita, ut alter sine invidia alteri suam sententiam velit communicare. 5. si alant aliquem anagnosten, sive lectorem, aut si non possint alere lectorem, ipsi per vices hanc operam praestent. 6. Habeant volumina iam parata, in quibus ea, quae notatu digna sunt, notent. 7. Notare autem poterit unus e numero per vices, sed ita, ut in dubiis aut obscuris, quando non ita statim liquidum est, ad quem titulum referri aliqud debeat, sententias inter se conferant. 8. volumina illa communia deinde a singulis describi poterunt, vel etiam poterit hic modus commodior observari, ut duo qui non legunt, suis distinctis voluminibus sibi notent, tertius qui legit, postea sibi notet, aut si anagnosten alunt singuli singulis voluminibus possunt notare, breviter, si opus sit, collatis sententiis". Bartholomaeus Keckermann, *Operum omnium quae extant* (2 vols., Geneva: Petrum Aubertus, 1614), II, coll. 222–223 (misnumbered 220–221).

57   Placcius, *De arte excerpendi*, p. 156: "Quo casu etiam per tertium quemque postea poterunt suis locis in scrinio appendi". On the origins of the text, see Noel Malcolm, "Thomas Harrison and his *Ark of Studies*: an episode in the history of the organization of knowledge", *The Seventeenth Century*, 19: 2 (2004), pp. 196–232.

how he integrated the contributions of others, by cutting and pasting from their letters, into categories of his choosing. The manuscript survives because though it was prepared for publication, it was never published – presumably the next step would have been to commission a clean scribal copy. In its absence we have three folio volumes comprising slips cut and pasted from letters, manuscripts, and printed books in an innumerable number of hands.[58]

In letter-writing autography was valued for the control, the privacy, and the personal gesture involved. In note-taking autography was valued by some for the intellectual mastery it fostered and by all for the personal control of judgment that notes represented. Unlike autograph letters designed to be read by others, autograph notes were more likely to be taken in haste and bad writing for personal use, so notes to be shared with others might be taken with special care or be copied out by a helper in a neat hand.

11.5   Acknowledgments of Delegation

The work of helpers becomes visible occasionally, in private correspondence, or in print to apologize for their errors or other failings. The invisibility of intellectual helpers is not surprising given the broader cultural system in which households functioned thanks to the labour of servants of many kinds who were treated as invisible. In addition, I suspect, the notion of an author's talent was sufficiently developed that there was something to be lost in acknowledging the contributions of helpers of lower status. Conrad Gessner offered explicit thanks far more often than most contemporaries, acknowledging and thus also encouraging the contributions of specimens, images, or information to his natural histories and other projects. But Conrad Gessner only thanked peers (typically scholars, physicians or pharmacists) or patrons in the Republic of Letters, not the amanuenses whom we know he also employed.[59] Gessner has left fleeting evidence of these helpers in his *Bibliotheca universalis* and his correspondence: in the first work he apologized for excessive prolixity caused by his amanuenses (in the plural) and in a late letter he solicited suggestions of a

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58   Blair, *Too much to know*, pp. 216–219.

59   On Gessner's thanking practices, see Ann Blair, "The Dedication strategies of Conrad Gessner", in C. Klestinec and G. Manning (eds.), *Professors, physicians and practices in the history of medicine: essays in honor of Nancy Siraisi* (New York et al.: Springer, forthcoming) and Ann Blair, "Conrad Gessner: publicité et gestion des savoirs", in A. Charon et al. (eds.), *L'Annonce faite au lecteur* (Louvain: Presses universitaires de Louvain, forthcoming).

studious young man who could work for him.[60] When even a Gessner, who was exceptionally generous in his expressions of thanks, never acknowledged his amanuenses, it is not surprising that other contemporaries did not do so either.

Despite the general silence about the role of helpers in scholarly work, a few tasks were mentioned explicitly in public contexts as being appropriate to delegate. Presumably, these tasks seemed good to delegate because they were both mechanical and tedious – in particular alphabetizing and indexing, taking dictation and making a clean copy for the printer. Alphabetizing was explicitly called mechanical work in Juan Caramuel's 1664 description of how to cut up and distribute slips alphabetically to create an index: "Have someone cut up [the sheets containing the index entries] with scissors into slips (*lemmata*): have someone do this, I say, do not do it yourself: indeed this work is mechanical. ... Call four or six servants or friends and have them distribute the slips by letter and classes".[61] Sorting according to explicit criteria like the alphabet (or the headings noted on slips for the note closet, as mentioned above) could be delegated to friends or servants without special training. Similarly, but only in manuscript, Ulisse Aldrovandi thanked his wife for gluing slips into place in his multi-volume encyclopaedia left in manuscript, the *Pandechion epistemicon*.[62]

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60 "Caeterum non diffiteor argumenta vel capita librorum aliquot, verbosius quam vellem explicata mihi displicere: sed illud maxime in primo elemento commisi amanuensium opera usus, in caeteris nolim brevior fuisse". Conrad Gessner, *Bibliotheca universalis, sive catalogus omnium scriptorum locupletissimus* (Tiguri: Excudebat Christophorus Froschoverus, 1545), sig. *4r. "Postremo scire a te cupio, an invenire possem apud vos aliquem iuvenem aut adolescentem mediocriter instructum literis, medicinae studiosum, pauperem, modestum et bonum: qui mihi scribendo ac describendo navaret operam: posset interim lectionem unam aut alteram publicam audire: et domi apud me obiter in mensa et alias proficere". Gessner to Zwinger, April 8, 1565 in Conrad Gessner, *Epistolae medicinales* (Tiguri: Excudebat Christophorus Froschoverus, 1577), fol. 111v–112r. I am grateful to Candice Delisle for this lead.

61 Juan Caramuel y Lobkowitz, *Theologia praeterintentionalis ... est theologiae fundamentalis tomus IV* (Lugduni: Sumptibus Philippi Borde et al., 1664); reprint in v. Romani, *Il "Syntagma de arte typographica" di Juan Caramuel ed altri testi secenteschi sulla tipografia e l'edizione* (Rome: Vecchiarelli, 1988), pp. 1–73, at p. 30: "Tertio, singula lemmata forficibus secari jube. *Jube* dico, non *Fac*: nam labor iste est mechanicus, nec te indiget: sufficiet enim, ut alios dirigas. ... Quinto, quatuor aut sex famulos aut amicos advoca, et lemmata jube per literas et classes distribui".

62 See Paula Findlen, "Masculine prerogatives: gender, space, and knowledge in the early modern museum", in P. Galison and E. Thompson (eds.), *The architecture of science* (Cambridge, MA: The MIT Press, 1999), pp. 29–57, at p. 44 and fn. 62. Aldrovandi's wife was also very well educated, as can be judged by her signing a Latin dedication to her husband's posthumously published *De reliquis animalibus exanguibus* (Bologna: Baptista Bellagamba, 1606). I am grateful to Caroline Duroselle-Melish for pointing this out to me.

Alphabetizing was a key component of indexing, which was also mentioned in print as work performed by an amanuensis, notably in poems praising Gilbert Cousin's work for Erasmus.[63] Erasmus was also sometimes personally involved in indexing too, as is clear from surviving manuscripts bearing some annotations by Erasmus alongside the more numerous additions by his amanuensis to prepare the index for a new edition of the *Adages*.[64] Unlike alphabetizing *tout court* indexing certainly involved judgment in selecting what to index and under what heading.

In the few relevant images we have from the sixteenth and seventeenth centuries, secretaries are typically shown taking dictation. For example, in a 1553 pamphlet celebrating his relationship with Erasmus among other highlights of his career, Gilbert Cousin depicted himself working with Erasmus as a young man some 20 years earlier, taking dictation; in 1668 Jacob van Oost's portrait of a theologian includes a secretary taking dictation. But few early modern scholars or authors discussed composing by dictation. On the contrary some may have hidden that method of working. George Hoffman suspects that Montaigne composed parts of his *Essais* by dictation, but Montaigne never made mention of it, though he discusses introspection, reading, and writing aplenty.[65] Montaigne emphasized instead the solitude of his study and reflection, although many servants attended him, including likely when he was writing. It is likely that the growing value associated with autography in the early modern period made dictation no longer seem an ideal method of composition, so that even if he dictated parts of his *Essais*, Montaigne preferred not to mention it. Authors who mentioned composing by dictation typically explained that a physical disability necessitated it, as Robert Boyle did, invoking an eye ailment.[66]

Even while autography was increasingly valued during this period, one kind of delegated copying was considered virtuous – having a clean copy of a manuscript made for the printer. For example, we know from letters and the multiple hands in surviving papers that the famous Florentine humanist

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63   For the image, see Blair, *Too much to know*, p. 107. See "Iodocus Sabutus Caesaris consiliarius, in Gilberti Cognati Nozereni librum Flosculorum ex omnibus Eras. Rot. operibus summo labore selectorum" and "Idem de indicibus Gilbert Cognati in omnia opera D. Erasmi". Gilbert Cousin, *Effigies Des. Erasmi Roterodami et Gilberti Cognati Nozereni, eius amanuensis. Accesserunt et doctorum aliquot virorum in D. Erasmi et Gilberti Cognati laudem carmina* (Basel: Oporinus, 1553), p. 29.

64   See note 36.

65   See George Hoffmann, *Montaigne's career* (Oxford: Clarendon Press, 1998), p. 48ff. The image and pamphlet by Cousin are cited in note 63. The painting by Jacob I van Oost is in the Groeninge Museum in Bruges; warm thanks to John Pollock for bringing it to my attention.

66   Robert Boyle, *New experiments physico-mechanical, touching the spring of the air, and its effects* (London: Miles Flesher, 1660), sig. [A4]v.

Piero Vettori (1499–1585) worked with a group of helpers, including some of his students, his son Jacopo, and in due course his grandson Francesco. And yet in his éloge of Piero after the latter's death Francesco boasted that his grandfather, unlike most humanists, worked alone, relying only on a single copyist occasionally to make a clean copy for the printer.[67] The one best placed to know Piero's working methods obscured them. Just as a modern editor might deny playing a substantive role in part in order to preserve his relationship with the author, here the helper preferred to elevate his grandfather to the status of an exceptional humanist instead of calling attention to his own bit part in his scholarship.[68] But even given his concern to efface his own help and that of others, Francesco mentioned the hiring of a scribe to make a clean copy. Francesco turns this act of delegation into a further point of praise of the deceased scholar. Indeed, printed errata lists often cast blame on the author for providing a messy manuscript from which to set type, thus incurring errors for which the printer denied responsibility. To pay an amanuensis to make a clean copy for the press was by contrast the responsible way to ensure an error-free publication. In Francesco Vettori's portrayal, to rely on that help but no other help was to be the best kind of humanist author.

11.6   Conclusion

Many factors affected the decisions involved in when and what to delegate and to whom, and the specifics are rarely recorded in writing that survives. Many questions will therefore perforce remain unanswered. Nonetheless, we can argue that the availability of mechanized copying in the form of printing was one factor that contributed to the rise in status of handwriting and the growing attention to autography in the fifteenth to seventeenth centuries. Authors and scholars continued to rely on helpers for many tasks, from those which were considered to require judgment, such as note-taking, to those considered mechanical such as alphabetizing. Copying, especially to produce a clean manuscript for the printer, and taking dictation were the activities of amanuenses most likely to be acknowledged in print or iconography.

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67   Raphaële Mouren, "Sébastien Gryphe et Piero Vettori: de la querelle des *Lettres familières* aux agronomes latins", in R. Mouren (ed.), *Quid novi? Sébastien Gryphe à l'occasion du 450e anniversaire de sa mort* (Villeurbanne: Presses de l'ENSSIB, 2008), pp. 287–339, at p. 321.

68   See the observation, based on modern examples, that "the myth of the author's prominence is strongly cherished by the people who most know about the author's failings". Jack Stillinger, *Multiple authorship and the myth of the solitary genius* (Oxford: Oxford University Press, 1991), p. 155.

Appendix: Current Issues in Note-Taking and Card-Indexing Systems

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Niklas Luhmann's Card Index: Thinking Tool, Communication Partner, Publication Machine

Johannes F.K. Schmidt

12.1 The Sociology of Niklas Luhmann

Niklas Luhmann (1927–1998) taught at the Faculty of Sociology at the Bielefeld University (Germany) from 1969 until his retirement in 1993. He was one of the outstanding sociologists of the twentieth century, and one of the last advocates of a 'grand theory'. Over the course of his forty years of academic work, he developed a universal social theory that raised claims of being applicable to and capable of describing social phenomena of any kind: specific types of social systems such as face-to-face interactions, organizations, or society, social communication media such as trust, power, or love, or also matters of contemporary contents such as environmental issues, social movements, or processes of social exclusion. Since the beginning of his academic career in the early 1960s, Luhmann published a bewildering wealth of articles and books year after year. At the time of his death, his list of publications comprised more than 500 titles.[1]

Since then, a number of more recent monographs and articles have been published posthumously that had largely been completed at the time of his death, and there still are other manuscripts in his literary estate that he completed or are at an advanced stage but have not yet been published.[2] All in all, this amounts to about 50 books and 550 articles that have emerged from Luhmann's theory lab. This sheer number of publications is unprecedented in contemporary sociology. This amazing quantity is even topped by the range of subjects addressed in these publications that cover nearly the entire spectrum of social phenomena, which in itself is a unique achievement and in line with the goal that he set himself of developing a 'supertheory'.

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1 See "Niklas Luhmann – Schriftenverzeichnis" in the sociological journal *Soziale Systeme*, 4 (1998), pp. 233–263.

2 In total, there exist more than 150 unpublished manuscripts. The Bielefeld University acquired Luhmann's literary estate in 2011. Since 2015, it is being prepared to make it accessible for research.

A remarkable aspect in this respect is that the large number of publications and the great diversity of subjects covered therein are not the product of utilizing a plurality of different theoretical approaches depending on the research topic in question. Rather, all of this work was part and parcel of a comprehensive, coherent, and ongoing program of theory building by which Luhmann, who began his career in the field of jurisprudence, sought to radically expand the potential of sociology. In so doing, he placed great emphasis on conceptual and terminological consistency and, for this reason in particular, was receptive to theoretical developments in other academic disciplines such as philosophy, law, theology, biology, or cybernetics. Whereas his initial publication activities were more strongly focused on the fields of administrative and organizational studies, he turned to developing the key elements of his sociological work in the period from 1962 to 1997, which involved considerations on the methodological and theoretical foundations of a theory of social systems, a comprehensive theory of society, as well as studies on the link between the structures and self-description of modern society.

At a remarkably early point in his career – namely in the 1950s, before Luhmann had any institutional affiliation with academia but was still employed as a senior civil servant in public administration (*höherer Verwaltungsdienst*)[3] – he was conscious of the fact that the notes he took from his readings at the time, primarily in political science, public administration, and philosophy, would not be collected for a limited publication project but for a far more extensive endeavour. The shortcomings of some of the common methods of organizing notes by inserting them between the pages of books or collecting them in folders motivated him early on to start a card-based filing system.[4] Apart from Luhmann's exceptional intellectual abilities, there can be no doubt that this specific filing technique, by which he systematically organized the results of his extensive readings across a broad range of disciplines, provided the foundation for his universal theory and vast number of publications. In Luhmann's own assessment, the large number and great diversity of publications would

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3   At this time, he was working on his doctoral thesis in law, which he had largely completed in 1955 but did not submit.

4   "I started the index card file for the simple reason that I have a poor memory. Initially, I had started to insert slips of paper with the notes that I had taken into books. This led to damaging the bindings of the books. Then, I tried folders. As they became thicker, I couldn't find anything in them anymore. From 1952 or 1953 on, I started the index card file because it was obvious to me that I would have to plan for a lifetime not for a book". Cf. Niklas Luhmann, "Biographie, Attitüden, Zettelkasten", in N. Luhmann, *Archimedes und wir. Interviews*, ed. by D. Baecker and G. Stanitzek (Berlin: Merve Verlag, 1987), pp. 125–155, at p. 149 (all following citations of Luhmann's works are the author's translations from the German).

have been inconceivable without this filing system. "Of course, I do not think of all this on my own; it mostly happens in my file. ... In essence, the filing system explains my productivity. ... Filing takes more of my time than writing the books".[5]

In organizing his research in this way, Luhmann adopted a system of organizing knowledge that had emerged in the wake of early modern scholarship along with the rapidly growing number of available publications since the sixteenth century and the practice of excerpting that followed.[6] He went on to develop to perfection the potential for systematic knowledge production[7] inherent in this filing technique by devising a very specific system of organization and referencing that is unique in the history of the card-based filing systems that have been used in the social sciences and humanities in recent times – those of Claude Lévi-Strauss, Roland Barthes, and Hans Blumenberg come to mind here.

12.2   Niklas Luhmann's Card Index

The outer appearance of Luhmann's card index is far from spectacular, perhaps even rather disappointing on first glance considering the myth that surrounds it: it consists of only six small filing cabinets made of beech wood with four drawers each, no larger than a dresser in its entirety.[8]

The true magnitude of the file becomes apparent only when opening the drawers: each drawer contains between 3,000 and 3,500 handwritten cards in A-6 format. As Luhmann sought to limit the size of the file so that he could work with it from his desk, he used simple paper, as thin as possible, instead of regular index cards. In many cases, he had cut sheets of paper to size himself that were initially A-4 size and had already been used on one side (often

5   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 142f.

6   See Alberto Cevolini, "Verzetteln lernen. Gelehrsamkeit als Medium des Wissens in der frühen Neuzeit", *Soziale Systeme*, 10: 2 (2004), pp. 233–256; Helmut Zedelmaier, *Bibliotheca universalis und Bibliotheca selecta. Das Problem der Ordnung des gelehrten Wissens in der frühen Neuzeit* (Weimar et al.: Böhlau, 1992), p. 22ff., p. 36ff., p. 99ff.; Christoph Meinel, "Enzyklopädie der Welt und Verzettelung des Wissens: Aporien der Empirie bei Joachim Jungius", in F.M. Eybl et al. (eds.), *Enzyklopädien der frühen Neuzeit. Beiträge zu ihrer Erforschung* (Tübingen: Max Niemeyer, 1995), pp. 162–187.

7   Cf. Markus Krajewski, *Paper machines. About cards & catalogs, 1548–1929* (Cambridge, MA: The MIT Press, 2011).

8   At the time of his death, there were an additional four freestanding cardboard card boxes filled with cards containing bibliographical information.

the backsides of hectographed copies, private notes, or old invoices from his father's brewery). Luhmann used these slips of paper to note the results of his reading, his own theses and concepts, as well as questions and bibliographical references. All in all, the file consists of approximately 90,000 index cards organized in two collections.

(a) The early collection (approximately 1951–1962), based primarily on his readings in political science, administrative studies, organization theory, philosophy, and sociology, was compiled mostly during his time as a legal trainee (*Rechtsreferendar*) in Lüneburg and as a senior civil servant (*Oberregierungsrat*) at the Ministry of Education and Cultural Affairs in Lower Saxony. The collection consists of seven drawers with approximately 23,000 cards, which are divided into 108 sections by subjects and numbered consecutively, two bibliographies comprising about 2,000 titles, and a keyword index with roughly 1,250 entries.

(b) The later collection (c. 1963–1996) covers the major part of Luhmann's publication activity and, from the beginning, clearly reflects a sociological approach. This collection is divided into eleven top-level sections that are numbered consecutively (with a total of about 100 subsections). It fills 21 drawers with approximately 67,000 cards. In addition to the notes proper, there is a sizable but obviously incomplete bibliographical apparatus with roughly 15,000 references, a keyword index with 3,200 entries, as well as a short (and incomplete) index of persons containing 300 names.[9]

Luhmann never explained why he started a second collection in the early 1960s that was largely intended to replace the first one – which can be assumed from the fact that the numbering of the cards started with number one again. One can suspect that this had to do with his turn toward sociology in the early 1960s[10] and his first drafts of a universalistic theory of the social, which required re-conceptualizing the structure of the collection. Accordingly, the two collections are only loosely connected, i.e., there are relatively few references between the collections where even the same (key) concepts are involved (such as role, informal organization, institution).

The bulk of the collections (approximately 75,000 cards) consists of notes documenting the results of Luhmann's readings, his own thoughts, and ideas for publication projects. To facilitate use, he generally took notes only on one side of the card. Whereas the early notes from the 1950s and 1960s frequently tended to be more of the running-text kind and more closely reflected the

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9   Below, *Zettelkasten I* stands for the first, *Zettelkasten II* stands for the second file.

10   In 1960–1961, Luhmann spent a year at the Harvard School of Public Administration in Cambridge, MA, where he attended lectures by Talcott Parsons, the leading sociologist in the field of systems theory at the time.

original readings, they increasingly became more compact and thesis-like in the 1970s. Particularly, these later notes were not simply excerpts. Rather, Luhmann jotted down only a few keywords in the course of his reading along with the respective page numbers, some of which he also wrote on the back of the cards containing bibliographical information in the second collection. These notes are extremely brief and are not really excerpts in the strict sense – for instance, the notes from reading an entire book frequently fit onto one of these cards, as the following ones from his reading of Friedrich Schlegel's novel *Lucinde* illustrate, found on the back of the card listing the book's bibliographical information (see Fig. 12.1).

Instead of giving an exact account of what he had read, Luhmann made notes on what came to his mind in the process of reading, with an eye to the notes already contained in his file.[11] What mattered to him was "what could be utilized in which way for the cards that had already been written. Hence, when reading, I always have the question in mind of how the books can be integrated into the filing system".[12] Moreover, he never put his notes directly into the file, nor did he file them in exactly the same way that he had taken them. In a second step soon after he had completed his reading, he would prepare the notes that he had taken by organizing them according to his filing technique (see below). At this point, his main concern was not to develop an idea to maximum sophistication; rather, he operated on the assumption that a decision on the usefulness of a note could only be made in relating it to the other notes – and therefore would (in many cases) be a matter to be decided in the future. In this vein, Luhmann, in one of his notes, called his file a 'ruminant'. "All the random ideas, all the coincidental readings can be incorporated. It is then a matter of internal fit [*Anschlußfähigkeit*]".[13] This being the case, it was not clear right from the beginning where the note to be added would be inserted into the collection – this was a decision that was made in the course of preparing the respective note for filing.

However, the collection does not reveal on first glance how the filing system functioned and how Luhmann used it in his work. What then makes this

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11   Perhaps, this circumstance also explains the phenomenon familiar to many Luhmann readers that it is often difficult to find the argument in the publications by other authors that Luhmann cited them for.

12   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 150. In the process, Luhmann frequently read the text from multiple perspectives, i.e., with several different questions or publication projects in mind.

13   Niklas Luhmann, *Zettelkasten II*, index card no. 9/8i. In the second file collection, there is a section where Luhmann filed notes about the function of his filing system. The following quotes are taken from there.

FIGURE 12.1   *Niklas Luhmann's excerpt of Friedrich Schlegel's* Lucinde (1799)
© THIS IMAGE IS REPRODUCED BY PERMISSION OF THE BIELEFELD
UNIVERSITY.

notation system so special that Luhmann[14] called it his 'secondary memory'? The most important aspect of this external memory device was not that these written notes were supposed to support Luhmann's own memory. The main issue was rather that the file could enter into an exchange with Luhmann's 'primary memory' – this is at least how Luhmann described his relationship to his file. He perceived it as being a partner in a communication process in which the participants remain black boxes for one another.[15] The index card file and its user could enter a productive relationship because the internal structure of the file collection turned it into an innovative mechanism that, although requiring the user to ask questions, gave responses that surprised the asking person, even if that person was the author of cards. "Without those cards, just by contemplating, these ideas would have never occurred to me. Of course, my mind is needed to note down the ideas, but they cannot be attributed to it alone", said Luhmann.[16] The file is thus a surprise generator. But how is it possible that the filing system could develop a creativity of its own; that is to say, how could it systematically lead to ideas that do *not* lie at hand?

Luhmann's answer was that one must teach one's communication partner to achieve autonomy: to develop its own mode of creating and reducing complexity. This is accomplished by combining a specific system of organization and method of card integration with specific rules of numbering, an internal system of references, and a comprehensive keyword index.

12.2.1   *System of Organization and Method of Card Integration*
In talking about his index card file, Luhmann repeatedly highlighted its unique structure, which he claimed to explain its productivity as a 'text generator'. According to him, the file was a 'cybernetic system', a "combination of disorder and order, of clustering and unpredictable combinations emerging from ad hoc selection".[17]

Yet, even though the file does not feature a systematic classification system and order of contents, it is not simply a chaotic compilation of notes but an aggregation of a vast number of cards on specific concepts and topics. Both collections are characterized, accordingly, by providing a rough structure by subject areas, which is also reflected in the first number assigned to the card

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14   Niklas Luhmann, "Kommunikation mit Zettelkästen. Ein Erfahrungsbericht", in H. Baier et al. (eds.), *Öffentliche Meinung und sozialer Wandel: Für Elisabeth Noelle-Neumann* (Opladen: Westdeutscher Verlag, 1981), pp. 222–228, at p. 225.

15   Luhmann, "Kommunikation mit Zettelkästen", p. 222f.

16   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 144.

17   Luhmann, *Zettelkasten II*, index card no. 9/8.

per this system of organization followed by a comma (first collection) or slash (second collection) that separates it from the rest of the number given each card. However, both collections clearly differ in terms of their primary sorting by subject areas and, consequently, in terms of their internal organization.

The first collection, dating back to the 1950s, features a fairly large number of sections differentiated by subject areas – 108, specifically. The pattern that we see here is very much one of exploring and reflecting on largely predetermined, fairly detailed fields of knowledge such as state, equality, planning, power, constitution, revolution, hierarchy, science, role, concept of world, information, and so on. The categories are still itemized in a way that more resembles a list (albeit already largely of an unsystematic nature), which was then worked through in detail, item by item. If one were to classify this collection by disciplines, it would fall into the fields of jurisprudence, political science, administrative studies, and philosophy, whereas sociology still plays an only marginal role, even though the collection already contains a fairly large section on functionalism.

The second collection, by design, is more problem-oriented and clearly more centred on sociology. It also differs considerably from the first collection in terms of its structure. There remain only eleven top-level subject areas: organizational theory, functionalism, decision theory, office, formal/informal order, sovereignty/state, individual concepts/individual problems, economy, ad hoc notes, archaic societies, advanced civilizations. What this compilation immediately illustrates is that it is not simply a list or a system of order in the sense of a taxonomy or a book's table of contents. Rather, the collection's first level of organization is clearly the historical product of Luhmann's reading and research interests. His work during the 1960s was characterized by his interest in the concept of function as well as in issues of organizational sociology arising in the context of his preoccupation with administrative organization. He began with an assessment of previous approaches to understanding organizations, which led him to the model of functional analysis and to the concept of decision-making as an alternative to these approaches. In light of empirical studies on administrative organization, the concept of office played an important role, and the distinction between formal and informal order, among others, provided a means of getting a genuinely sociological grip on the subject matter.[18]

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18   This is not to say that the sections mentioned above were filled in linear fashion, one after another. In accordance with his specific mode of integrating cards into the file (see below), he would continuously add new cards in an ongoing process. For the sections that he added later, there is no discernible systematic connection to the conceptual design of the first sections. Whereas the section on economy originated in the process of preparing

Following the subject areas defined at the top level by the eleven sections mentioned above are other subsections that revolve around a variety of topics and are at least loosely connected with the main topic. Each of these subsections was assigned a numerical prefix of up to four digits. The relation between top-level subject area and the lower-level subjects cannot be described in terms of a strictly hierarchical relationship, as the following list from the third section illustrates:

Zettelkasten II – Structural Outline: 3 General Decision Theory[19]

3 General decision theory
   31 Concept of action
   32 Models of decision-making
   33 Types of decision-making model designs
      331 Utilitarian models
      332 Optimizing model
      333 Satisfying model (theory of acceptable decisions)
   34 Simplification of decision-making
      341 Anticipatory simplification
         3411 Ideology
         3412 Authority (organization)
         3413 Rules
         3414 Legal system
         3415 Unplanned structures in the field of decision-making
      342 Techniques of decision-making
   35 Organization of decision-making
...

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the manuscript for his book on the economic system in the 1980s – cf. Niklas Luhmann, *Die Wirtschaft der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1988) – and, in this respect, broke with his usual method, the sections devoted to individual concepts/individual problems and ad hoc notes appear to be organized according to principles reflecting the garbage-can model, according to which notes on seemingly random, unrelated topics of various kinds were filed consecutively. Section 7, for instance, on individual concepts/individual problems features 120 subsections with contents that have no inherent relation to one another and which often contain only a few cards but in some cases also extensive notes as in the category of truth/science (which he probably compiled while preparing the book on the system of science). Cf. Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt am Main: Suhrkamp, 1990).

19   All terms are the author's translations from the German.

A specific system of organization applied within these sections on a particular subject matter ensured that the initial decision for a specific topic did not lead to a sequence of cards confined to that one topic. Whenever Luhmann came across an interesting idea about a secondary aspect on one of his cards, he pursued this idea by adding additional notes and inserted the respective card at that place in the existing sequence of cards. This method could be applied again to the card that had been inserted, the result being a sequence of cards leading farther and farther away from the initial subject, which enabled the collection to grow 'inwardly'. For instance, when we look up the keyword 'functionalism', we find the following sequence of terms: concept of function – unit of reference of functional analysis – concept of conditions for continued existence – concept of functional problem – concept of expectations – social identity – sincerity – secret.[20]

The positioning of larger subject areas as well as individual cards in the collection was not simply the historical product of Luhmann's reading interests and note-taking activities. It also owed to the difficulty of assigning an issue to one and only one single (top-level) subject. Luhmann solved this problem by seizing it as an opportunity: instead of subscribing to the idea of a systematic classification system, he opted for organizing entries based on the principle that they must have only some relation to the previous entry without also having to keep some overarching system in mind. To illustrate this, we find, for instance, extensive notes on economic issues such as money and property not only in the aforementioned larger section on economy but also in Section 3 ('decision theory'), subsection 352 ('communication theory'), whereas we encounter the notes on the functional subsystem of 'law' that are the equivalent to those on economy not in a top-level section of their own but in Section 3 ('decision theory'), subsection 34 ('concept of decision-making'), and the notes on 'science' mostly in Section 7/25 ('truth'), which are part of Section 7 ('individual concepts/individual problems').[21]

This indicates, accordingly, that the positioning of a subject within this system of organization reveals nothing about its theoretical importance – for there exist no privileged positions in this web of notes.[22] Consider, for instance, the cards on autopoiesis, which is one of the key concepts in Luhmann's more recent social theory. Most of these cards in the second collection are filed under what seems to be a subordinate position in this system bearing

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20   All terms are the author's translations from the German.

21   All terms are the author's translations from the German.

22   Luhmann, "Kommunikation mit Zettelkästen", p. 225.

the number 21/3d26g1i. The same is true for his notes on his major project of a theory of society, which are located in the same subsection under the number 21/3d27fB.

Positioning of Subjects and Theoretical Importance[23]

21 Concept of function
    21/3 Unit of reference in functional analysis
    21/3d Concept of system (clarification of the concept of system)
        21/3d1 Concept of system – concept of continued existence (relative invariance)
        21/3d5 Parsons' systems theory
        21/3d7 Systems/environment theory (system – environment relations)
        21/3d18 System/world
            21/3d18d Meaning
        21/3d19 System boundaries
        21/3d20 Simple/complex systems
        21/3d26 Function of system formation
            21/3d26g1 Systems-theoretical concept of reflection
                21/3d26g1i Autopoiesis
        21/3d27f Application areas of the theory of social systems
            21/3d27fA Theory of organized social systems
            21/3d27fB Theory of society
    21/4 Functional/dysfunctional
...

The decision inherent in this filing technique to do without a fixed system of order is an essential prerequisite of the creativity of Luhmann's filing system. In explaining his approach, he not only underlined the fact that he saw no problems in handling his file in this way but, with computer technology in mind, also emphasized the benefits of the principle of 'multiple storage'.[24] Applied to the filing system, the latter serves to provide different avenues of accessing a topic or concept since the respective notes may be filed in different places and different contexts. Conversely, embedding a topic in various contexts gives rise to different lines of information by means of opening up different realms of comparison in each case.

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23   All terms are the author's translations from the German.
24   Luhmann, *Zettelkasten II*, index card no. 9/8b2.

At first glance, Luhmann's organization of his collection appears to lack any clear order; it even seems chaotic. However, this was a deliberate choice. It was Luhmann's intention to "avoid premature systematization and closure and maintain openness toward the future".[25] A prerequisite for a creative filing system, Luhmann noted, is "avoiding a fixed system of order".[26] He pinpoints the disadvantages that come with one of the common systems of organizing content in the following words: "Defining a system of contents (resembling a book's table of contents) would imply committing to a specific sequence once and for all (for decades to come!)".[27] His way of organizing the collection, by contrast, allows for it to continuously adapt to the evolution of his thinking.

However, the history of choices made as the collection evolved is also clearly reflected in the significant differences in the density of the notes added at later points in time. Whereas a steady stream of added notes resulted in an unfettered inward growth of some areas over time, one repeatedly encounters entire sets of cards – particularly from the 1960s in the context of his reflections on issues in administrative and organizational sociology – that were not only written as running text in a more linear fashion but were also only rarely added onto by inserting new cards later on. In these cases, we might even speak of 'black holes', that is, of parts of the file that seem to have sunk into oblivion as he did not add onto them anymore. In Luhmann's own words: "Some things fade away; some notes are never seen again. On the other hand, there are preferred foci, clusters, and regions where you work more frequently than in other areas. There are sets of ideas that were anticipated to become major complexes and are never elaborated; and there are secondary ideas that came to mind that gradually become more enriched and inflated; that are initially positioned so as to play a minor role in a text and then increasingly come to dominate the system".[28]

12.2.2 *System of Numbering*

Getting the filing system 'to speak', if you will, requires an additional prerequisite: the possibility of addressing each card individually and hence also of finding it again. Thus, the filing technique outlined above does not build on the idea of a order of contents but of a fixed order of positioning. This idea is at the root of Luhmann's specific notational system. Each card is assigned a

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25   Luhmann, *Zettelkasten II*, index card no. 9/8h.
26   Luhmann, *Zettelkasten II*, index card no. 9/8.
27   Luhmann, "Kommunikation mit Zettelkästen", p. 224.
28   Luhmann, "Kommunikation mit Zettelkästen", p. 225.

number[29] and, thus, a fixed position in the file that does not change over time: card 1,1 (or 1/1, as the case may be) is followed by 1,2 (or 1/2), and so on; a card that was created later and pursues an aspect further that is noted on card 1,1 was given the number 1,1a and inserted between card 1,1 and 1,2; at that point, either a card 1,1b on that very same topic could be added or another card 1,1a1 breaking things down further or pursuing other aspects, which would then be inserted between 1,1a and 1,1b, and so forth.

Illustration of the Method of Card Integration and Numbering[30]

1/1 Card with notes
   1/1a Card containing notes referring to a concept/idea from card 1/1
   1/1b Continuation of notes from card 1/1a
      1/1b1 Card containing notes referring to a concept/idea from card 1/1b
      1/1b2 Continuation of notes from card 1/1b1
1/2 Continuation of notes from card 1/1

In conjunction with the method of card integration outlined above, this numbering system results in cards that bear a combination of numbers and letters with up to 13 digits (e.g., 21/3a1p5c4fB1a Confidentiality); in some cases, we also find several 100 cards that were later inserted between what had initially been two consecutive cards created at the same time on a related subject. The file collection thus features a unique depth in its mode of organization that Luhmann referred to as a "capacity for internal ramifications" (*innere Verzweigungsfähigkeit*).[31]

12.2.3   *System of References*
In addition to Luhmann's notation and numbering system, there is another key feature of the collections that accounts for the creativity of this filing system, namely, a system of referencing in which Luhmann noted a card number on one or several other cards. An estimate based on a sample count suggests that

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29   Although they bear a number, the card entries are not dated. The only way to determine their approximate time of creation in retrospect is via the literature cited and changes in Luhmann's handwriting over the years.

30   For reasons of clarity, the principle of numbering that Luhmann applied will be illustrated in simplified fashion. In addition to the sequence outlined below, there are also cards that are numbered using two consecutive numbers or letters (e.g., 1/1aa or 1/2,1). This pattern is a consequence of applying the described method of adding cards and inserting a card in an already existing sequence at a later point in time.

31   Luhmann, "Kommunikation mit Zettelkästen", p. 224.
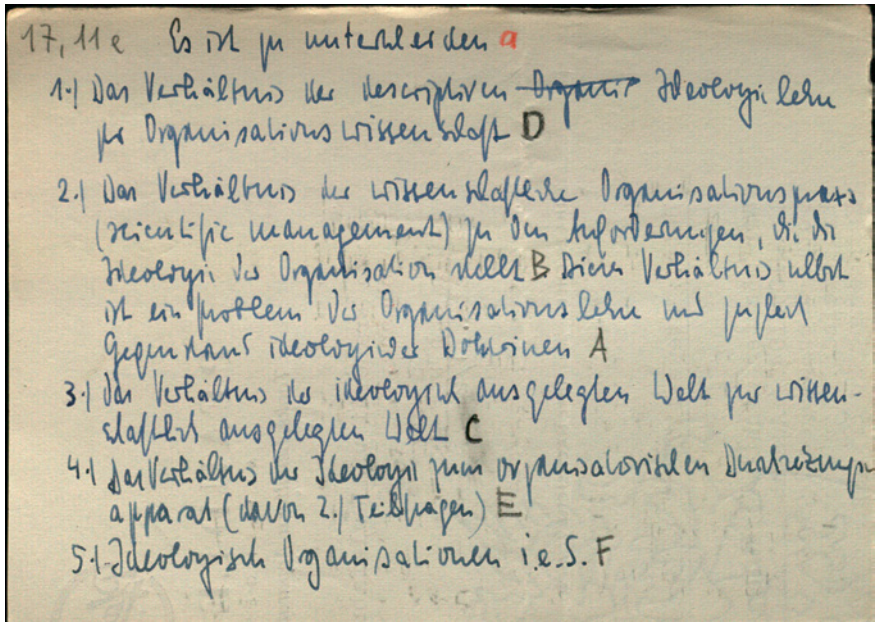
FIGURE 12.2   *Niklas Luhmann,* Zettelkasten I, *index card no. 17,11e*

the first collection contains approximately 20,000 references and the second about 25,000–30,000 references of this kind, with remarkably few references between the two collections.

We can distinguish three types of references:

(a) references in the context of a larger structural outline. Here, Luhmann, when beginning a major line of thought, noted on a card several of the aspects to be addressed and marked them by a capital letter that referred to a card (or set of consecutive cards) that was numbered accordingly and placed at least in relative proximity to the card containing the outline. This structure comes closest to resembling the outline of an article or the table of contents of a book (see Fig. 12.2).

(b) Collective references. At the beginning of a section devoted to a specific subject area, we often find a card that refers to a number of other cards in the collection that have some connection with the subject or concept addressed in that section. A card of this kind can list up to 25 references and will typically specify the respective subject or concept in addition to the number. These references can indicate cards that are related by subject matter and in close proximity or to cards that are far apart in other sections of the collection (see Fig. 12.3).
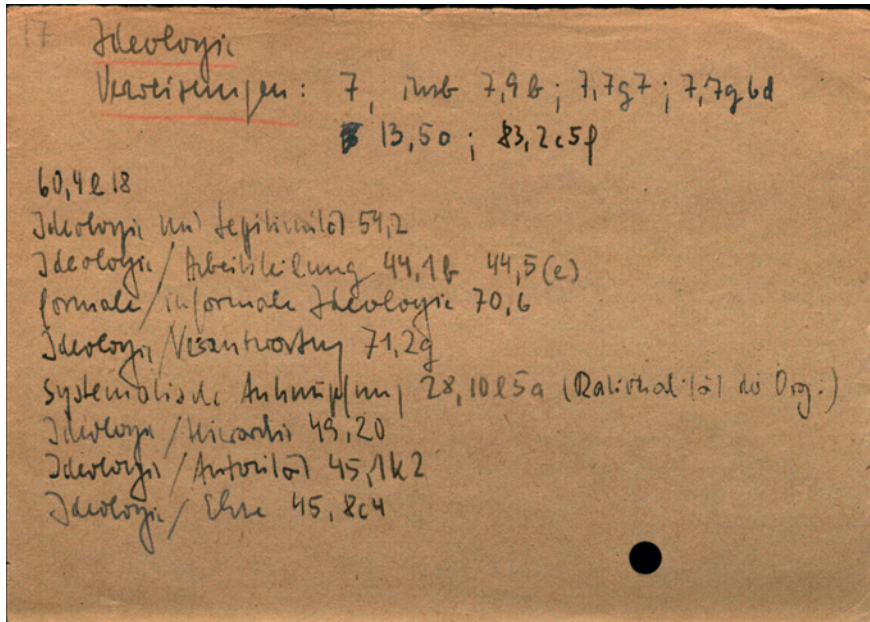
FIGURE 12.3   *Niklas Luhmann,* Zettelkasten I, *index card no. 17*
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(c) Single references. In his notes, Luhmann often made a reference to another card in the collection that was also relevant to the subject. He did this in two ways:

(c1) by adding notes containing references to a secondary aspect or idea (or several such aspects or ideas) according to the method described above; these cards were usually inserted in immediate proximity to the reference card. Contrary to his usual method, this reference does not consist of the actual card number but rather of a number written in red (beginning with 1 and ascending if the card contains several references to subsequent cards) or of a lowercase letter (starting with a), which would also be added to the actual card number on the card referred to (see Fig. 12.4 and Fig. 12.5).

(c2) By adding references relating to another index card of interest to the subject/concept in question that could be located at an entirely different place in the file, frequently in the context of a completely different discussion. This reference would involve noting the respective card number.

Luhmann noted the references directly as he created the card but also regularly updated already existing cards by adding references whenever the integration of new cards in other parts of the collection made it necessary.

FIGURE 12.4   *Niklas Luhmann,* Zettelkasten I, *index card no. 17,1b9*

FIGURE 12.5   *Niklas Luhmann,* Zettelkasten I, *index card no. 17,1b9,2*
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In this way, he engaged in an ongoing process of tending to his file, which explains why the file, according to him, preoccupied so much of his time and also illustrates how well he really knew it.[32]

Luhmann himself called his system of references a "web-like system" (*spinnenartiges System*).[33] This metaphor suggests interpreting it along network-theoretical lines.[34] A key feature explaining the productivity of this filing system is its potential for enabling 'short cuts', i.e., the fact that a reference may lead to a completely different (both in terms of subject and location), distant region in the network (file). Luhmann himself considered this feature, which counteracted the collection's primary system of organization, to be of crucial significance: "The references must not capture collective concepts that aggregate key aspects but must selectively lead away from the material subsumed under them"[35] so that they facilitate interpretations and contextualizations of his notes that differed from those intended when creating and initially integrating the notes in the file system.

The cards containing a collection of references are furthermore of interest because they represent so-called 'hubs', i.e., cards that function as nodes that feature an above-average number of links to other cards so that these few cards provide access points to extensive parts of the file.

Generally speaking, Luhmann's mode of referencing outlined above made use of what would later become the common technology of 'hyperlinks' (or 'hypertext') in the computer age, although the file's analog design limited the possibilities of realizing this for technical reasons since it required the more time-consuming process of physically looking up and taking the respective card instead of a simple mouse click.[36]

The significance of his system of referencing cannot be overestimated in light of the described method of integrating new notes into the file and the absence of order or, put positively, openness toward the future that this mode of organizing the collection involves. "The decision where to place what in the file can involve a great deal of randomness as long as I add references linking the other options".[37] Yet, this method is also fraught with certain risks,

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32   Accordingly, Luhmann never created a detailed table of contents for the two collections. Only for the first collection did he make a list of its 108 sections, yet without further differentiating it. A preliminary subject overview in the context of the aforementioned project of making Luhmann's work accessible for research comprises a total of roughly 100 pages.

33   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 143.

34   For a network model of this kind, see Duncan Watts, "The 'new' science of networks", *Annual Review of Sociology*, 30 (2004), pp. 243–270.

35   Luhmann, *Zettelkasten II*, index card no. 9/8b1.

36   See also Markus Krajewski's essay in this volume.

37   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 143.

as Luhmann himself pointed out: "Each note is only an element that derives its quality from the web of references and cross references within the system. A note that is not linked to this web becomes lost in the file; the file forgets it".[38] This applies to individual cards as well as smaller sections since the references, although usually addressing individual cards, frequently only mark the beginning of a series of notes on a certain subject and, thus, the point of entry into a subject area. Accordingly, we repeatedly find sets of cards that have not, or rarely, been revisited since the time they had been created, which can be inferred from their condition and the fact that no later notes were added and no other cards refer to them. Here, too, the inherent momentum of black holes applies: parts of the file that are poorly linked, or not linked at all, with other parts tend to remain isolated later on. Of course, in many cases this quasi-institutionalized oblivion was founded on reasons relating to Luhmann's research, as they represented conceptual lines of thought that Luhmann no longer pursued for theoretical reasons.

12.2.4   *Keyword Index*

The structure of the file described so far ultimately provides the backdrop to understanding the function of the keyword index. The absence of a fixed system of order and, in consequence, a table of contents turned the index into the key tool for using the file – how else should one be able to find certain notes again and thus gain access to the system of references? Not wanting to rely on pure chance requires being able to identify at least one point from which the respective web of references can be accessed. This is the purpose of the keyword index.[39]

Whereas the index to the first collection was still of fairly manageable size with its 1,250 entries, the continuous updates of the index to the second collection[40] ultimately resulted in 3,200 entries. Contrary to the subject index of

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38   Luhmann, "Kommunikation mit Zettelkästen", p. 225.

39   The collection also features an index of persons – although of a very rudimentary nature – consisting of 300 entries. The idea behind this index presumably was to be able to access the collection via names as well. In the bibliography – which is also incomplete and contains approximately 2,000 titles in the first and some 15,000 titles in the second collection – we also occasionally find the numbers of the cards on which Luhmann documented the results of his readings, so that the collections could be accessed via persons as well as works (see Luhmann, "Kommunikation mit Zettelkästen", p. 225). However, Luhmann did not systematically pursue this strategy.

40   The second collection contains four versions of the keyword index. Each time the process of continuously adding onto the index resulted in its alphabetical order becoming messy, Luhmann created an entirely new version of the index.

a book, the file's keyword index makes no claim to providing a complete list of all entries in the collection that refer to a specific term. Rather, Luhmann typically listed only one to three places where the term could be found in the file, the idea being that all other relevant entries in the collection could be quickly identified via the internal system of references. By contrast, the large number of keywords listed in the keyword index indicates that this index was at least intended to meet the standard of completeness.

The principles according to which the collections are organized have as a consequence that accessing the file via the keyword index exactly does not limit the search to that term only. Quite to the contrary, the specific method of integrating cards and his system of referencing ensure that any search soon opens up a vast web of notes. This can be illustrated by looking at a selection of cards on the concept of risk as an example. In the keyword index, we find a total of five entries with six references to the conceptual complex of 'risk' (see Fig. 12.6).

For the general concept of risk (*Risiko, Riskanz allg.*), there is a reference to a section starting with the number 21/3d18c6o09 ('transformation of risk'), which is part of a larger section on the concept of system in the second collection
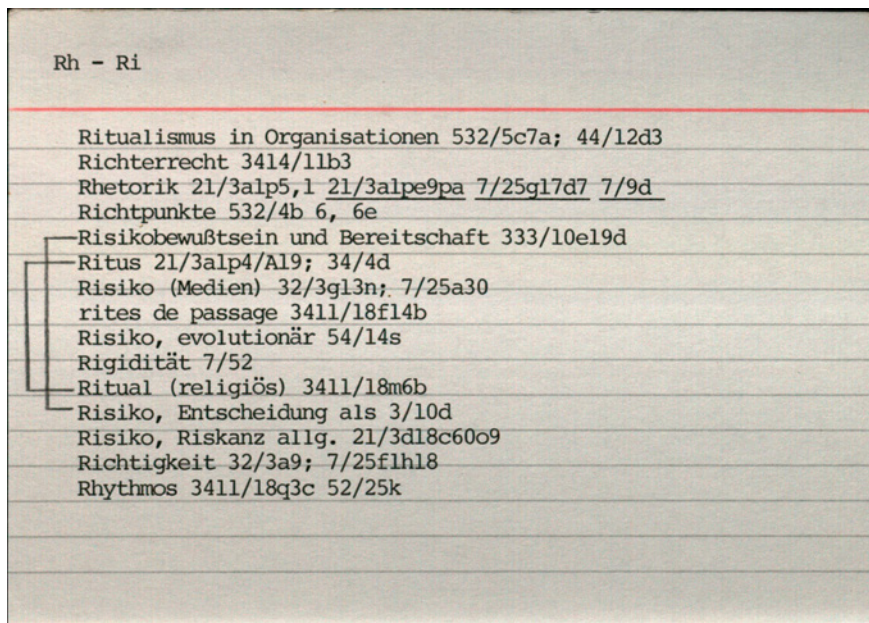
FIGURE 12.6   *Niklas Luhmann,* Zettelkasten ii, *Keyword index card Rh–Ri*

and, more specifically, part of the section on the theorem of the reduction of complexity. There, we encounter another set of references to subjects along various other lines and in very different parts of the file (e.g., on security, decision, evolution, media, uncertainty, legislation/science, participation, economy, death). When we follow the first reference to section 'security' (7/28), the first card (7/28,1) immediately refers us to cards on related topics, among them the subjects 'absorption of risk' (34/4), 'safety/work atmosphere' (532/5d3j2b), 'legal certainty' (3414/27), and 'certainty/truth/science' (7/25b30k). The very first reference on the card 7/28,1 leads to Section 21/802 on structural issues concerning the significance of security for the reduction of uncertainty in the context of information theory. Here, again, we quickly (21/802,2) encounter another reference to, among other things, an entire section on the 'absorption of uncertainty' (34/4) – where there immediately are references to other sections such as 'responsibility' (333/10e), 'uncertainty as an information variable' (44/2d5), 'money/power as absorption of uncertainty' (352/16a6), 'liquidity' (532/4a5fa13a), as well as the 'process of education' (7/25g58).

Paths of References Using the Example of 'Risk, riskiness, general' (21/3d18c6009)[41]

21/3d18c6009 Transformation of risk, riskiness
    -> Safety/security 7/28
        -> Absorption of uncertainty 34/4
        -> Responsibility 333/10e
    -> Uncertainty as an information variable 44/2d5
        -> Money/power as absorption of uncertainty 352/16a6
    -> Liquidity 532/4a5fa13a
        -> Process of education 7/25g58
    -> Safety/work atmosphere 532/5d3j2b
        -> Legal certainty 3414/27
    -> Certainty/truth/science 7/25b30k
        -> Uncertainty 21/3d25
        -> Legislation/science 3414/14p
        -> Economy 8/40
        -> Death as a risk 7/8l

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41   The path illustrated here is only the first one resulting from the *first* reference on each card. Moreover, I have not listed all references but only those that lead to more distant parts of the collection (author's translation from the German).

This example demonstrates how quickly this technique of referencing leads away from the original topic to a variety of other subjects that the user initially would not have associated with the first one; it also shows how potential relationships between these topics may not have come to mind in the absence of such a chain of references. Thus, a query via the keyword index in combination with this system of references systematically brings chance into play and creates connections among a variety of heterogeneous aspects – although in a theoretically and conceptually controlled manner.[42]

12.2.5   *Summary*

It is specifically not (only) the paths that Luhmann tread in his initial readings and note-taking that are constitutive of his filing system but rather the special filing technique and the (selective) relations established between his notes by means of his referencing technique that make it possible to retrieve more in a later query via the pivotal keyword index than what was intended when the notes were initially taken. As early as in the 1950s–1960s, Luhmann simulated a modern computer-based database system by applying the multiple-storage principle in filing subjects and utilizing his referencing technique, by which he anticipated what would become the common technology of hyperlinking in the era of the World Wide Web. The file's analog design, however, limited the realization of its potential for technical reasons since it required the more time-consuming process of physically looking up and taking out the respective card instead of a simple mouse click.

We must also not lose sight of the fact that Luhmann's filing system, apart from its surprise-generating function, rooted in its structure of organization, also – and above all – served him as a thinking tool. This is not only true in terms of the proposition that the file acted as a communication partner in the research process but also in regard to the fact that in Luhmann's mind the process of writing things down enables disciplined thinking in the first place: "Underlying the filing technique is the experience that *without writing, there is no thinking*".[43] Accordingly, the file also documents the evolution of important theoretical constructs in Luhmann's thinking: for instance, the concepts of communication media, evolution, or observation. It contains not only validated knowledge but also reflects the thought process, including potential mistakes and blind alleys that were later revised but not removed from the file as the original cards always remained in Luhmann's file and perhaps a new card with revisions was added if needed. In this sense, the file is more than

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42   See Luhmann, "Kommunikation mit Zettelkästen", p. 226.

43   Luhmann, *Zettelkasten II*, index card no. 9/8g.

just an analog database of Luhmann's theory: it can be seen as – drawing on the words of Erving Goffman[44] – the backstage of his theory and therefore as Niklas Luhmann's intellectual autobiography.

12.3   The Relation between Filing System and Publications

How must we conceive of the relation between Luhmann's index card and his publications against this backdrop? Using the example of his presentation on *How can modern society adapt to ecological endangerment*?[45] Luhmann described the process of drawing on his file to compose texts as a kind of collaging technique in which he combined the various sections on issues that are relevant to a topic.[46] He explained that producing this text required (no more than) combining the entries on the concept of functional differentiation, self-referential systems, and binarity (leaving the question open, however, of whether this idea of relating parts to one another in this way might be a product of the interaction between file and author to begin with). However, comparing the pertinent sections of the file, some of which are quite extensive, with the article in question quickly reveals that the 14-page presentation – as could be expected – comes nowhere near to reflecting the complexity that the file weaves around these issues. The presentation makes only a few brief remarks on functional differentiation; and even in this case, the section in the file contains several cards that were obviously produced only at the time of preparing the presentation.[47]

This interaction between publications and filing system not only suggests that it is not the latter alone that constitutes the cybernetic system but first and foremost the relation between the filing system and the publications to which it gave rise since the file, at least in the more mature stage of Luhmann's theory-building since the 1970s, did not serve as a pure archive that he would develop independent of specific publication projects (of which there were always some ongoing). Rather, the file would be filled as he responded to publication

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44   Erving Goffman, *The presentation of self in everyday life* (Garden City, NY: Doubleday, 1959).

45   Niklas Luhmann, *Wie kann die moderne Gesellschaft sich auf ökologische Gefährdungen einstellen?* (Opladen: Vorträge G 278 der Rheinisch-Westfälischen Akademie der Wissenschaften, 1985).

46   Luhmann, "Biographie, Attitüden, Zettelkasten", p. 144.

47   This is similar to the section containing his thoughts on his filing system, which was probably created in the course of preparing the article about his card index, which was published in 1981. Cf. Luhmann, "Kommunikation mit Zettelkästen".

requests and, in this way, would affect the (then emerging) publications. In the process, he would also document the evolution of his thought process and theory developments over the course of producing these publications. One can identify sets of entries that were added to the file that can be associated with a number of his publication projects since the mid-1970s without these publications representing simple copies of these sections of the file, as the system of references contained therein always pointed to other parts beyond the section in question: "On given occasions, the file provides combinatory options that were never planned, anticipated, or conceived in this way".[48]

To draw on the above-mentioned example of 'ecological communication' once again, the process of relating the subject areas to one another that were touched upon in the presentation (and others besides, such as resonance, observation, evolution) occurred only in the context of the book publication based on that presentation and which was (fairly quickly) completed three months later.[49] What this example clearly demonstrates is that the choice of *which* subject areas were ultimately related to one another was, apart from Luhmann's preference for relating heterogeneous issues, the particular outcome of the internal complexity of his filing system, generated by his system of referencing. However, the approximately 190-page book considerably reduces that complexity again compared to the complexity of what is found in the filing cabinet. Among other things, this owes to limited space and the inevitably linear mode of presentation. To put it in positive terms, we might say that it requires the book form to make the complexity that is present in the file accessible – via reducing it by means of ultimately only being able to trace a select number out of all of the references available, whereas by its very nature there are no stops to this process of referencing in the file itself. Quite to the contrary, if we follow the web of references in detail that are laid down in the file, we constantly encounter new paths leading to new subjects, while the decision to pursue or ignore them presupposes that there is a specific question to be answered within a certain time; otherwise, one risks getting lost in the depths of the file. This, however, was not the intention of its creator, to whom the file was not a maze but a thinking tool, a communication partner, and a publication machine.

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48   Luhmann, "Kommunikation mit Zettelkästen", p. 226.

49   Niklas Luhmann, *Ökologische Kommunikation. Kann die moderne Gesellschaft sich auf ökologische Gefährdungen einstellen?* (Opladen: Westdeutscher Verlag, 1986).

Note-Keeping: History, Theory, Practice of a Counter-Measurement against Forgetting

Markus Krajewski

> Let no thought pass incognito, and keep your notebook as strictly as the authorities keep their register of aliens.
>
> WALTER BENJAMIN, *Einbahnstraße,* 1928

∴

> It is basically infinite.
>
> NIKLAS LUHMANN on his slip box, 1997

∵

13.1   History – Notable Order

Not many people have the advantage of photographic memory. Instead, the vast majority have to rely on external memory aids if they hope to continue to work with information gleaned from reading. Admittedly, this problem is an old one. For the history of textual processing, many point to the ancient Greeks as progenitors.[1] However, in this case, one need not go back so far; with the onset of the Gutenberg age and its ever-expanding volume of books, the problem of retaining what has been read became virulent. One of the earliest and most influential tracts on the subject appeared in 1638 as part of the estate of the baroque Jesuit preacher Jeremias Drexel. Beginning with the insight that one cannot memorize anything without writing it down,[2] in *Aurifodina artium et scientiarum omnium* Drexel firmly rejects the lazy mode of reading without

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1   Matthias Bickenbach views Aristotle as the initial inspiration toward excerpting. See Matthias Bickenbach, *Von den Möglichkeiten einer 'inneren' Geschichte des Lesens* (Tübingen: Max Niemeyer, 1999), p. 66.

2   See Ann Blair, "Note taking as an art of transmission", *Critical Inquiry*, 31: 1 (2004), pp. 85–107, at p. 98.

a quill, while at the same time elevating to the status of law his directive to make notes during reading and provide relevant excerpts. A few years later, before the fourteenth and last edition of Drexel's recommendations appeared in 1695, Vincent Placcius not only provided further directions, but also images of containers and devices to manage one's notes in his 1689 book *De arte excerpendi*.[3] We know of at least one individual, already relatively prominent in his time, who had a contraption built which was apparently modelled after the cabinet put forth by Placcius.[4]

> Whatever occurred to him while reading his many books, while meditating, travelling, going on walks, etc., he wrote on notes, which he did not simply allow to lie in disarray (especially the notes with excerpts), but rather which he attempted to organize from time to time. In fact, he subsequently acquired a special cabinet to store his excerpts. In 1689, Vincent Paccius published *De arte excerpendi. Vom gelehrten Buchhalten* [on scholarly bookkeeping] in Hamburg in octavo format, in which he teaches all manner of methods of excerpting. On page 152, his cabinet is presented in a copperplate etching [see Fig. 13.1]. Hannover Secretary Clacius had a replica cabinet produced based on this invention. After his death, Herr von Leibniz purchased it. This is the so-called Leibniz Excerpt Cabinet, now kept in the royal library.[5]

Nietzsche was not the first to realize that good ideas are born in the open, on journeys or hikes. To that end, Gottfried Wilhelm Leibniz also always carried a few pieces of paper with him in order to keep with the practice mentioned above, because as a cameralist, he knew that the note was an indispensable storage medium for managing the ephemeral. Leibniz does not simply transfer his thoughts, excerpts and notes to long-term memory on pieces of paper in order to look at them and rearrange them from time to time. Rather, he places then into an array that allows both fixation and flexibility, in order to provide a mobile foundation. These devices of order and storage are the subject of what

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3 For more on these excerpt cabinets and the broader history of slip boxes, see Markus Krajewski, *Paper machines. About cards & catalogs, 1548–1929* (Cambridge, MA: The MIT Press, 2011), esp. pp. 26–31.

4 Noel Malcolm has shown that the inventor of this filing cabinet was an English scholar, Thomas Harrison, who designed it around 1640. See Noel Malcolm, "Thomas Harrison and his *Ark of Studies*: an episode in the history of the organization of knowledge", *The Seventeenth Century*, 19: 2 (2004), pp. 196–232.

5 Christoph Gottlieb von Murr, "Von Leibnitzens Exzerpirschrank", *Journal zur Kunstgeschichte und allgemeinen Litteratur*, 7 (1779), pp. 210–212, at pp. 210–211.
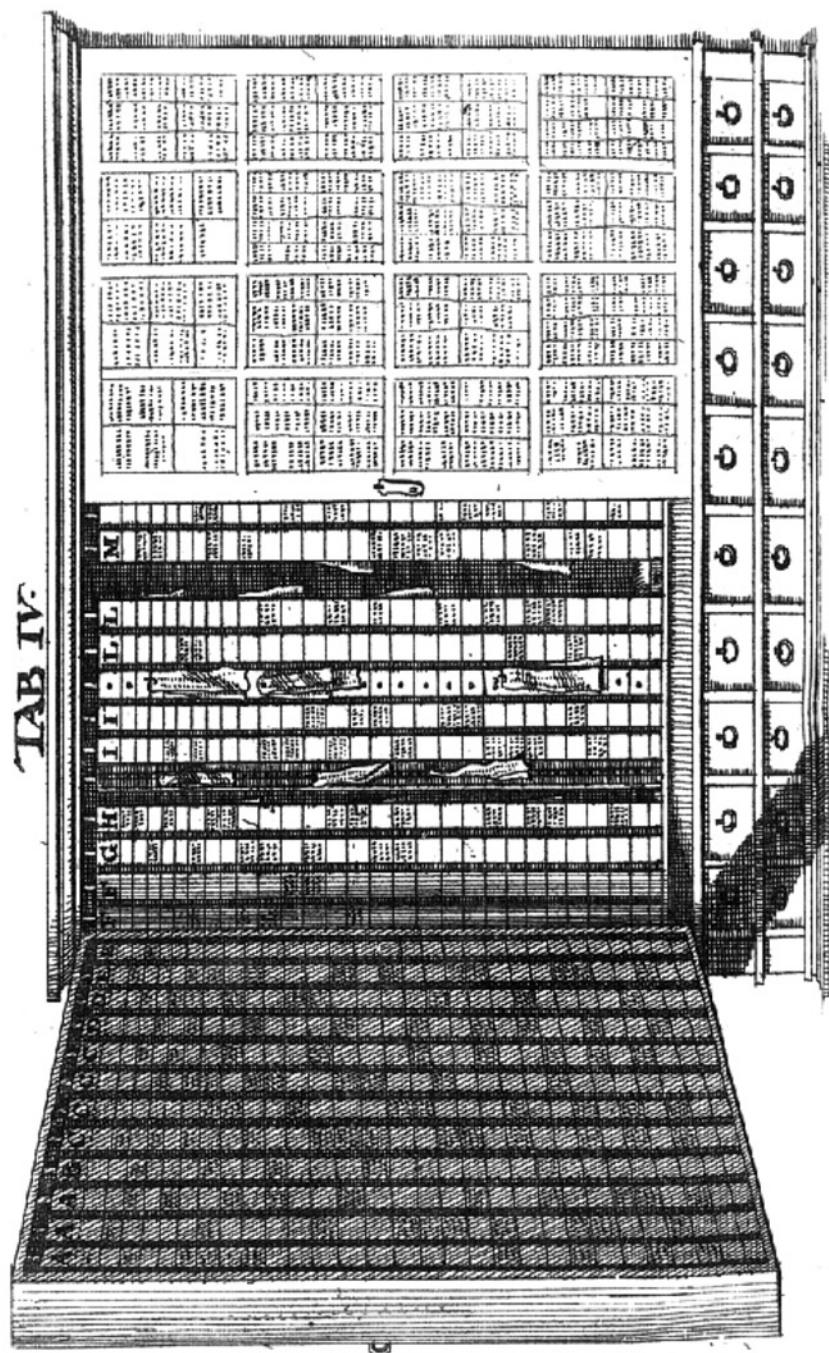
FIGURE 13.1   *Early storage media: Thomas Harrison's Ark of Studies, emended and improved by Vincent Placcius, De arte excerpendi.*
Vom gelehrten Buchhalten liber singularis (Hobniae et Hamburgi: Apud Gottfried Liebezeit, 1689), p. 152

is to follow. For it is with the help of such equipment, tools, boxes and books, databases *avant la lettre*, that enduring and effective access to the individual building blocks is guaranteed. They serve to always reliably retrieve any input, to recall notes without an inconvenient search or tedious remembering.

A media-historical view of these acts of managing knowledge should elucidate three moments. First, we will briefly analyze the cataloguing of a library, that is to say, the process of making the richness of collected knowledge accessible. Particular attention in this regard will be paid to the emergence of the card catalog, which redefined the relationship between notes as representations of books and the totality of the library. In a second step, this library-oriented figurative relationship will be inverted and scholarly access will be interrogated. From the surplus of information within a library, how can the relevant data be transformed into units appropriate for scholarly use? Here, it is less a typology of the process of excerpting, that is, not a question of reading. Rather, at the centre is the slip box as database, which holds the entirety of the prepared material at one's disposal and thus becomes the starting point of a new writing process.

13.1.1   *Note/Catalog*

"The library is the treasury of all wealth of the human mind in which one takes refuge", Leibniz wrote in a letter to Friedrich von Steinberg in October 1696.[6] Although around 1700 it became increasingly difficult to gain access to this wealth – the inventories of the primarily aristocratic libraries had begun to swell rapidly, thanks to the Baroque passion for collecting – in 1699 Leibniz could await the flood of books as calmly as any reader's request.[7] "Not every visitor asks: Do you have Montaigne, or Rösel? From time to time, someone says: What liturgical or economic works do you have? This necessitates a logical or scientific catalog".[8] In response to this, and to the question of how one might find even a specific passage amid the masses of collected writings, in the large book collections of that time, for instance in the royal library of Duke Augustus the Younger in Wolfenbüttel, one received a brief and reliable answer: with the aid of an ensemble of alphabetical catalogs and *indices materiarum* that obey as their highest principle "that one find the popular books

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6   Gerda Utermöhlen (ed.), *Gottfried Wilhelm Leibniz. Allgemeiner politischer und historischer Briefwechsel* (23 vols., Berlin: Akademie Verlag, 1950–2013), XIII, p. 71.

7   See Uwe Jochum, *Kleine Bibliotheksgeschichte* (Stuttgart: Reclam, 1993), Ch. 8.

8   Michael Denis, *Einführung in die Bücherkunde* (Vienna: Bey Johann Thomas Edlen von Trattnern, 1777), p. 277.

easily".[9] Nevertheless, at the beginning of the eighteenth century it was certainly not self-evident that a library should own a directory of its holdings. To find a book on a certain subject, one usually followed the classified shelving of books. At the outset of his library activity in Wolfenbüttel, Leibniz sketched a plan detailing how (and by means of which catalogs) he could tackle the pitiful mess this famous collection was in. For a library without a catalog, as Leibniz put it in his *Consilium*, resembles the warehouse of a businessman who cannot keep stock.[10] If the purpose of a businessman is generating profits from his products, deploying certain technologies such as double-entry accounting, the comparison concedes that a library full of books remains worthless so long as it does not maintain a single book about these books. Only a catalog allows specific access to the stored knowledge that can produce profit by way of reading. As will be shown, this insight would later be taken up anew and implemented by a certain Weimar privy councillor.

Relatively complete catalogs were not only rare in Baroque libraries – where they did appear, they usually resembled the form of what they recorded: bound books, bound catalogs. Besides a list of the directories to be compiled (inventories of books, paintings, 'curiosities', "index nominalis, ... index materiarum ... index librorum historicorum ... conspectus materiarum ..."), Leibniz's proposals for an indispensable library guide that marked the beginning of his activity in Wolfenbüttel in December 1690 included ideas on the form of cataloging: "Paper slips of all books, sorted *pro materia et autoribus*".[11] The plan anticipated registering every book only once, precisely on a slip of paper, so that the slip only had to be placed in the right order for any catalog organized alphabetically, by subject, or in any other way, and copied down into bound books as appropriate. The economy of this process is obvious: it is only in this way that numerous catalogs can be made with the same data set. However, the plan was just a plan. In fact, the librarians supervised by Leibniz only managed to assemble the long-awaited alphabetical catalog; all the other plans failed for lack of employees and funding.[12]

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9   Citation of Gottfried Wilhelm Leibniz, "Notwendige bibliothekarische Maßnahmen in der Bibliotheca Augusta' printed in Günter Scheel, 'Leibniz' Beziehungen zur Bibliotheca Augusta in Wolfenbüttel (1978–1716)", *Braunschweigisches Jahrbuch*, 54 (1973), pp. 172–199, at p. 195. See also Klemens Löffler, "Leibniz als Bibliothekar. Ein Nachtrag zum Leibnizjubiläum", *Zeitschrift für Bücherfreunde*, 9: 4 (1917–1918), pp. 95–100.

10   Gottfried Wilhelm Leibniz, "Consilium de Encyclopaedia nova conscribenda method inventoria", in L. Couturat (ed.), *Opuscules et fragment inédits* (Paris: Félix Alcan, 1903), pp. 30–41, at pp. 30–31.

11   See Scheel, "Leibniz' Beziehungen", p. 195.

12   See Scheel, "Leibniz' Beziehungen", p. 189.

In practice, the procedure turned out to be fairly easy. Walking past the shelves, the librarian made copies of titles. "I will subsequently call them paper slips for short".[13] With meticulous exactitude, the librarian recorded extensive details of the work on the paper slip, as with the Josephinian card catalog of the Vienna court library: "1. Case number, ... 2. Author's name, 3. Format of the book, 4. Commentators, translator and editor, 5. Year and place of printing, 6. ... Shelf number, 7. Format and number of volumes".[14] Moreover, "the title of the book must be copied neither too briefly, nor too extensively. It must be just so you can get a hint of the content of the book from it".[15] Thanks to internal mobility, or the permanent potential for reordering, the index catalog emancipates the order of the library from its physical shelving locations. From then on, the scholarly catalog prevails: "The place where a book resides is irrelevant".[16] In Leibniz's time, its paper slip form in Wolfenbüttel nevertheless remained only one temporary aid, again gathered and bound into the printed catalogs that librarians valued more highly than fleeting slips of paper. Only happenstance, the simple lack of staff to copy would unexpectedly turn this procedure into a permanent order: the great alphabetical catalog of the Vienna imperial library averted its own elimination in 1780 due to the sheer abundance of its material, and thereby became the first proper card catalog in library history.[17]

What remains pivotal, however, is the relation between index and book, which implies both temporary and permanent cataloging in the form of slips. For in contrast to the fixed entries of a continuous list on sequentially linear pages, paper slips can be reconfigured as freely mobile units in ever-new arrangements. A slip of paper serves as an initial pointer, which refers with the help of a call number to an address, the place the text occupies on a shelf. However, it not only points to the location where a text is found – it also embodies a highly compressed data set that characterizes the book to be found. Ideally, the slip of paper contains not only complete bibliographical specifications (with detailed title, subtitle, authors, etc.), but also a short

13   Albrecht Christoph Kayser, *Über die Manipulation bey der Einrichtung einer Bibliothek und der Verfertigung der Bücherverzeichnisse nebst einem alphabetischen Kataloge aller von Johann Jakob Moser einzeln herausgekommener Werke – mit Ausschluß seiner theologischen – und einem Register* (Bayreuth: Im Verlag der Zeitungsdruckerei, 1790), p. 22.

14   Gottfried van Swieten, *Vorschrift worauf die Abschreibung aller Bücher der k.k. Hofbibliothek gemacht warden solle* (Vienna: Österreichische Nationalbibliothek, 1780).

15   Adam Bartsch, "Einige Bemerkungen die Verfertigung eines neuen Catalogs der gedruckten Bücher in der k.k. Bibliothek betreffend", in E. Strouhal et al., *Der Zettelkatalog. Ein historisches System geistiger Ordnung* (Vienna and New York: Springer, 1999), pp. 125–138.

16   Kayser, *Über die Manipulation*, p. 10.

17   See Krajewski, *Paper machines*, Ch. 2.

content key. Thus, it delivers a derivative of the text it represents. More than a mere administrator of access, the 'title copy' becomes a representation of the text – which now needs no longer be read every time. The representational function deflects from what it refers to; reading the table of contents – or even more briefly, just the title – protects against having to read further. Thus, it should come as no surprise – amid a flood of books around 1800 – that this form of representation on mobile paper slips experiences an initial boom. Analogous to this is another reduction to (noble) titles, by which the signified becomes superfluous: "One arrives at one of our famous spas, a couple of hours after arriving one sends out a few hundred visiting cards, and the same day one is introduced to the whole society of the resort, and acquainted with two to three hundred people as if one had already lived with them for many years".[18]

Moving from the salon back to the library, we can say for the time being that its 'wealth' can be found only if it is also registered in the catalog. It is hardly accidental that a Weimar councillor, entrusted with supervising the Jena and Weimar book collections, described his impression of the Göttingen library, one of the most comprehensive of its time, in economic terms: "One feels as if one is in the presence of capital that silently yields unpredictable interest".[19] But what does this wealth consist of? "The capital is the mass of writing accumulated in text processing, and the yield is texts that originate from the loops of the bureaucratic-literary processing".[20] At the very beginning of this paper machine that eventually produces novels and learned texts stand the anonymous catalogs without which the material is inaccessible. The slips of paper in the catalogs become a derivative of the registered writings, the interest rate of amassed capital. The higher the magnitude of indexing, the greater the later yields, in the form of ever new texts resulting from texts thereby made accessible. The library becomes a bearer of capital, a data bank, lending out information like credit. The latter is reliably paid back in the indexing of new writings, whose contents in turn feed on the old ones. The question, then, is how the authors (i.e., the borrowers) deal with the data lent to them. Thus, the next section is dedicated to the slip box.

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18 Anonymous, "Neueste Moden in Visiten-Karten", *Journal des Luxus und der Moden*, 10 (1795), pp. 147–150, at p. 148. The reading of titles on small cards mirrors the access to books that one does not read but is nevertheless familiar with – at least their names and titles.

19 Johann Wolfgang Goethe, *Werke*, ed. by E. Trunz (14 vols., Hamburg: dtv 1994), X, p. 454.

20 Uwe Jochum, "Goethes Bibliotheksökonomie", in B. Siegert and J. Vogl (eds.), *Europa. Kultur der Sekretäre* (Zurich and Berlin: Diaphanes, 2003), pp. 111–123, at p. 111.

13.1.2 *Thought/Slip/Box*

One direction of the relationship between book and note provides the card catalog as a search engine kept current by the librarian, in order to grant access to the material. On the other side of the stream of data is the scholarly reader, a 'compulsive reader',[21] who produces his own personal excerpts from the writings before him: he builds a slip box, for internal use only. The units of this personal collection are the *Denk-Zettel*, loose slips of paper, free-floating staging posts of thought, which record all manner of remarkable things, excerpts and quotes in the permanence of script. In order to prevent the worst-case scenario of such a collection, the loss of unbound notes so feared by librarians, the data sets are arranged in a box-shaped (systematic) order, somewhat like Leibniz's Excerpt Cabinet.[22] The historical genealogy of this form of note-based thought in boxes, perhaps first mentioned in 1548 by Conrad Gessner, finding its way with Georg Philipp Harsdörffer, Joachim Jungius and Leibniz, from Goethe Age slip boxes to their non-electronic completion with Niklas Luhmann, will not be traced further here.[23] Rather, we will look briefly at the fundamental differences between the note-keeping of scholars and of librarians, whereby both tactics pursue the same goal, and each *enriches the material* in their own way.

What does a slip box accomplish? It is by no means a simple memory aid that allows one to reread and remember written material at a given moment. A slip box is also a sorting aid through its mobile units in a well-defined (i.e., standardized and unified) format. What is important is not the individual entry, but rather the arrangement of a multitude of notes according to a refined set of rules that combines and interconnects the modular textual building blocks in keeping with a nuanced scheme of classification. Furthermore, a slip box serves as a search engine with the help of its finely structured systematic or alphabetical order and index. Finally, one may use it as a computer (*Rechenmaschine*), in the strict etymological sense of *rechnen* as 'to organize', 'to guide' and 'to prepare', as with potential lines of reasoning through links and cross-references which the box offers up to the user browsing through it.

Without question, the task of the library catalog consists of always accounting for the current addresses of the available books in a consistent and complete order. This function is reflected in the etymology of *κατάλογος* as an

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21 According to Bernhard Fabian, "Der Gelehrte als Leser", in H.G. Göpfert (ed.), *Buch und Leser* (Hamburg: Dr. Ernst Hauswedell & Co. Verlag, 1977), pp. 48–88, in contrast to the leisure reader, the scholar is always possessed by the compulsion to read.

22 Murr, "Von Leibnitzens Exzerpirschrank". See also Fig. 13.1.

23 For a thorough history, see Krajewski, *Paper machines*.

enumeration of the fund of knowledge. This general and schematized form is usually sufficient for the queries posed to a catalog as to which texts are maintained where in the stacks. Consequently, one may expect that, if this schema is simply followed, that answers can be given, regardless of the characteristics of the inquirer. The library catalog is a collective search engine. Data entry takes place by way of countless different nameless people according to strict and consistent instructions, so that it may be consulted by as many people as possible. By contrast, the scholar's slip box has the contingency of choice. Whereas a catalog has the aim of indiscriminately recording *everything*, the scholar's machine makes the decision of whether or not to include information. Only select texts are carefully transferred from the wealth of the library onto excerpt slips in order to obtain their systematic position in the scholar's box. This power of selection defines the idiosyncrasy of the scholar's machine. It only answers pointed questions on the part of the operator in his own peculiar formulation. The materials accumulated over time organize themselves in divergent, outwardly incomprehensible structures.

The slip box utilizes a storage technology to counter scholarly forgetfulness.[24] Or, one could even argue that it allows the scholar to directly forget what he has read once it is noted in the slip box. True to an adage from Hans Magnus Enzensberger that storing already means forgetting,[25] it offers a structure against the irrevocable loss of the addresses pointing to its content. Collected gradually, the data contain the library in miniature, with reduced complexity. Their structure shows addresses, so as to address thoughts. What's more, the scholarly machine moves into the position of textual production itself, as it does not simply faithfully reproduce that which the scholar has invested in it step-by-step. Rather, to the extent that the scholar was able to link the material with the existing fund of knowledge during the input process, that is to say, marked connections with similar texts and themes, the scholarly machine, as a preliminary text generator, delivers precisely these connections with all of their branches as new, forgotten or unrecognized lines of reasoning. Thus, a simple but consistent cross-reference produces fertile excesses, in that the re-combinatorial power of connections enhances the utility of excerpts through interwoven chains of reference.[26]

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24   See Friedrich Kittler, "Vergessen", in U. Nassen (ed.), *Texthermeneutik, Aktualität, Geschichte, Kritik* (Paderborn: Ferdinand Schöningh Verlag, 1979), pp. 195–221.

25   Hans Magnus Enzensberger, *Kiosk. Neue Gedichte* (Frankfurt am Main: Suhrkamp, 1995), p. 31: "Something shredded in the mine-field / next to it, a shoe, intact / floats in the Caribbean / everything comes via satellite / stored, i.e., forgotten".

26   For more on this purely paper-based referential technique, see Niklas Luhmann, "Kommunikation mit Zettelkästen. Ein Erfahrungsbericht", in H. Baier et al. (eds.), *Öffentliche*

Finally, there is one more fundamental quality of the slip box to mention; namely, the efficiency of the system. The economy of entering a note a single time allows one to feed off of it continually. To be sure, the maintenance of the slip box demands its own time. However, in the final analysis, this work ultimately saves time. "The slip box costs me more time than writing books",[27] as Niklas Luhmann, perhaps the last analog slip-box theorist, once remarked. Astonishing, given Luhmann's extensive publication history,[28] unless the slip box is always already the prototype of the text to be written. If this were so, Luhmann's writing would be nothing but recombined excerpts from his slip box, tied together with filler – database reports, to use a contemporary term from *Informatics of Society*, never written by Luhmann. This assertion – fed by Luhmann himself in an interview[29] – , could doubtless be verified by way of the redundant passages in systems theory – and thus in keeping with hermeneutic procedure, the work could be retranslated into its point of departure as notes and quotes.

By contrast, the method of writing or already having written numerous books simultaneous to the relentless work on a slip box has concrete historical forerunners and model applications. One need only mention here Johann Jacob Moser (1701–1785), one of the most productive legal scholars of the eighteenth century as measured by his more than 500 publications, who simply selected the appropriate notes for each new publication, bound them up into bundles and sent the newly assembled packets to the typesetter without any further additions, to then place the notes back in the shelf and the box, next to the new book. Jean Paul describes this process of rereading his excerpts very much in Moser's tradition:

> The main thing is that I make excerpts from my excerpts, and distil the spirit once again. I may read them, for instance, only because of the article on dancing, or on flowers, removing this in two words into smaller notebooks or registers, and thus I fill bottles from the barrel's content.[30]

Meinung und sozialer Wandel: Für Elisabeth Noelle-Neumann (Opladen: Westdeutscher Verlag, 1981), pp. 222–228; and for an attempt at a critical analysis, see Markus Krajewski, "Paper as passion. Niklas Luhmann and his card index", in L. Gitelman (ed.), *"Raw data" is an oxymoron* (Cambridge, MA: The MIT Press, 2013), pp. 103–120.

27   Niklas Luhmann, *Archimedes und wir. Interviews*, ed. by D. Baecker and G. Stanitzek (Berlin: Merve Verlag, 1987), p. 143.

28   65 monographs, 420 essays, one social theory.

29   See Luhmann, *Archimedes und wir*, p. 144.

30   Jean Paul, *Sämtliche Werke*, ed. by N. Miller (10 vols., Frankfurt am Main: Zweitausendeins, 1996), II/3, p. 772.

The texts distilled in this way from *adversarii*, *loci communes*, *promptuaria*, commonplace books and slip boxes, florilegia in the best and most literal sense, form the repertory of quotes, albeit not (only) in an intellectually edifying manner. Above all, in keeping with an economy of individual work, they serve as a method of streamlining and increasing textual production through recycling.

13.2   Theory – Knowledge Production with Machines

In light of this (literally) rich tradition, one would be well-advised to mind the recommendations of the scholars, and set about the construction of such an apparatus as soon as possible. After all, from the first academic meeting onward, there arose the considerable problem of not only comprehending and processing what is heard and read, but also retaining it in a convenient way so that it can be retrieved and processed further without difficulty. To be sure, technical progress since the seventeenth century allowed one to rely on media other than simply paper and wood. Regardless of whether one prefers to take notes on paper, in a notebook or with a smartphone, a comparatively simple rule still applies: on the one hand, one should capture the text's train of thought, the structure of its argument as well as worthwhile details or references to secondary literature. On the other hand, one should also record one's own comments or annotations on individual textual passages as well as summaries and points of criticism. In contrast to the Baroque, with its exclusively paper-based form of management, today's computer programs promise a more comfortable means of dealing with this problem of achieving a sensible order from these writings and maintaining them in the long-term. A critical advantage lies in the fact that software-based literary databases are not simply able to remember, but can also be employed as productive assistants in the production of arguments. Ultimately, it is a question of how one interacts with such a database that manages to channelize the texts and the casually recorded pointers, while also serving in its own right as a supplier of ideas in the drafting of texts.

Particularly in the crucial phase of development when one has long-since moved from reading to writing as the primary activity, a certain problem inevitably rears its head, if one has not taken the necessary precautions: one remembers a certain idea or thematic connection, wants to look it up, and is faced with the question: "Where was that?" Who isn't familiar with this situation, which reminds us of our own forgetfulness and brings to mind a certain phrasing, a thought or a passage without being able to envision the

source, i.e., where this passage may be found? It is precisely this difficulty which a carefully maintained literary database promises to remedy, as slip boxes or electronic literary management systems reliably retrieve all texts, references and thoughts, even the smallest note, that have ever been input into them. However, this kind of literary database can do more than simply remind one of the forgotten locations of specific passages.

In the case of the inverse situation, if one finds oneself searching for ideas or thoughts on a specific subject and can remember neither relevant locations nor specific phrasing, but can only remember at best vaguely that a certain text might contain something interesting, access to the (electronic) slip box can allow one to confidently forget about forgetting. In a database that is regularly supplied with everything that one reads, hears or notices over the course of time, one can certainly find an appropriate passage, a quote, an excerpt, a stimulus or simply a reference that can help in the current context.

Thus, such a personal literary database must not only be able to remind others, but ideally itself as well. However, memory is an active operation. Can this even be accomplished by machines? Without attempting to enter into the usual philosophical debates about artificial intelligence, just allow me to say that a storage device constructed for this purpose is certainly equal to this task and many others. If one's own literary database can actually remember independently (that is to say, can retrieve long-forgotten thoughts in response to a stimulus – a mouse click, for instance), that would already be a significant, though occasionally boring and predictable matter. Would it not be much more stimulating if the database were equipped with certain characteristics that resembled the functions of human memory? Why should a literary database not be able to offer surprises and unforeseen connections? Why should one not be able to build in the contingency of the play of quotes, to bring together terms and lines of reasoning through its own associations, which the user would likely never have seen together before? To the extent that a literary database possesses such abilities, one could actually regard it to some degree as an outsourced textual memory, a sort of memory machine, or indeed as a 'communication partner'.[31] Regardless of whether one prefers to work on paper and wood or silicon, so long as one works with a literary database, be it analog or digital, one uses a medium that likewise has a long history.

Indeed, software also has a history, sometimes one that reaches considerably further back than simply the beginning of electronic computers, inasmuch as the methods that software employs on a functional level have a long tradition of their own. Since the early modern period, the basic equipment of the

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31   Luhmann, "Kommunikation mit Zettelkästen", p. 222.

scholar – apart from the customary stationary and paper – has included that tool (already described above) which has been seldom mentioned, still more rarely discussed, and yet without which hardly any extensive academic works have been written. It is known that Georg Philipp Harsdörffer, Georg Wilhelm Friedrich Hegel, Jacob and Wilhelm Grimm, Walter Benjamin, Siegfried Kracauer, Aby Warburg, Roland Barthes, Hans Blumenberg, Niklas Luhmann, Reinhart Koselleck, Friedrich Kittler and many other used slip boxes as an aid in the production of their academic texts. Numerous other authors such as Jean Paul, Heinrich Heine, Jules Verne, Arno Schmidt, Walter Kempowski, Ernst Jünger, Michael Ende and Vladimir Nabokov could be named as examples of those who employed slip boxes and card catalogs as a literary instrument and poetological tool for the production of poetry and fiction. In both cases, for academic as well as literary authors, the management of knowledge, the organization of thoughts and insights, the systematic arrangement of tableaus, motifs, thoughts, literary references, close readings, and excerpts stands at the centre of what a slip box can accomplish. It is the central point at which all reflections and insights gained from reading can be gathered.

Over time, thousands upon thousands of entries accumulate in these wooden or (by now) electronic systems of order, to be consulted more or less discretely by authors for their textual production. For many of those navigating the flood of information, these arrays of paper constitute an indispensable prerequisite for their literary productivity. Consequently, every epoch has had its authority on the technology of the slip box. What would Arno Schmidt or Niklas Luhmann (the eager reader of Jean Paul) be in the twentieth century, what would Hegel or Nietzsche's friend Franz Overbeck be in the nineteenth century, or Johann Jacob Moser and Gottfried Wilhelm Leibniz in the eighteenth century, or Georg Philipp Harsdörffer and Joachim Jungius in the seventeenth century, or Conrad Gessner in the sixteenth century, without their collections of notes, carefully and continually compiled? The loose slips of paper serve as free-floating staging posts of thought, which record all manner of remarkable things, excerpts, quotes and one's own reflections in the permanence of script. A box or cabinet with individual shelves or drawers maintains order and averts the danger of scattering: neither thematic confusion nor an unwelcome wind can threaten the order, once established.

In the interplay of man and machine, be it analog on the basis of wood and paper or digital with a database in the background, how can one really talk about a process of communication that sometimes entails surprising moments on the part of the equipment? Insofar as the slip box contains a critical mass of entries as well as a certain number of cross-references, it provides the foundation for a particular form of communication, that is to say, for its own

poetological process of knowledge production that can help lead its user to entirely unforeseen insights. Though users of analog slip boxes such as Niklas Luhmann assume that the wood-and-paper apparatus can in fact be an equal and stimulating partner in communication, this idea actually dates back to a situation already described in 1805 by Heinrich von Kleist in his impressive analysis of the 'midwifery of thought'. "If there is something you wish to know and by meditation you cannot find it, my advice to you, my ingenious old friend, is: speak about it with the first acquaintance you encounter".[32] The productive tension brought about by the interlocutor's expectations immediately spurs new thoughts; the idea develops during speech. The mere presence of the interlocutor is sufficient; he or she does not need to do anything, nor offer witty responses as additional stimulation. "It is a strangely inspiring thing to have a human face before us as we speak; and often a look announcing that a half-expressed thought is already grasped gives us its other half's expression".[33]

Kleist's idea is that communication partners need a catalyst to attain clarity about the knowledge to be expressed. What does the mere presence of an interlocutor achieve? "The midwifery of thought"[34] – a term Kleist borrowed from Kant. Without an interlocutor, a kind of 'intellectual bankruptcy' looms, but with a partner, a wealth of thought beckons. It is no coincidence that analogies are often drawn between early collections of analects and excerpts from all readings and the so-called paper banks of the seventeenth century.[35]

According to Kleist, the human face serves as a sufficient source for inspiration; "a look that conveys comprehension of a half-expressed thought" is sufficient, as such a look "gives us its other half's expression". One could assume that looking at wooden drawers would offer few moments of inspiration. However, substitute 'human face' with 'interface' in this decisive quote, the point of intersection between man and software – and substitute the simple word 'look' with the word 'click' (and, of course, the analog wood-and-paper slip box with appropriate software). It is precisely the nimble clicking of buttons on the screen that makes the silent interlocutor speak in interaction with this interface – even more so than Kleist claimed. The slip box offers an interface

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32 Heinrich von Kleist, *Sämtliche Werke und Briefe*, ed. by H. Sembdner (2 vols., Munich: dtv, 2001), II, p. 319.

33 Kleist, *Sämtliche Werke*, II, p. 320.

34 Immanuel Kant, *Die Metaphysik der Sitten*, in *Werke in zehn Bänden*, ed. by W. Weischedel (10 vols., Darmstadt: Wissenschaftliche Buchgesellschaft, 1983), VII, Part II, Sect. 50: "He is the midwife of his thoughts", on the teacher-student relationship.

35 See Markus Krajewski, "Zitatzuträger. Aus der Geschichte der Zettel/Daten/Bank", in V. Pantenburg and N. Plath (eds.), *Anführen – Vorführen – Aufführen. Texte zum Zitieren* (Bielefeld: Aisthesis Verlag, 2002), pp. 177–195.

that is more than just a stimulating sight, as the apparatus, with a simple click, delivers keywords that stimulate the protagonist to further production of thought. Thus, a silent counterpart can grow into an actual interlocutor. The fact that the keywords offered seem by no means arbitrary is guaranteed by a widespread net of cross-references. Bit by bit, during the course of their interaction, connections made by the software itself accumulate in the apparatus as a "kind of secondary memory".[36] And this secondary memory gains a certain amount of independence if it intervenes in the thought process of its thoughtful user more thoroughly than Kleist suggested.

Yet, compared with a mere silent human face that stimulates thought by means of its wonderful gaze, the box of index cards offers another advantage as an interface. The advantage of the slip box in its virtualized form consists not only in its ability to deliver precise answers to specific inquiries, but above all in its infallible ability to remember, to say nothing of the value added that is offered by the automatic associative linking of the data continually being fed into it. Every element is preserved and retrievable, either as an isolated piece of information or as a building block for a larger line of argument. Whoever sets about ongoing work (or communication) with such a secondary memory can not only count on the fact that the apparatus will faithfully reproduce everything which has been shared with it, they can also trust that, with the information successively provided over time, future knowledge will be enriched.

Since the advent of the printed word, the cultural technique of the slip box has experienced numerous high points. In keeping with the Olympic motto of "faster, higher, stronger", the top spot has been claimed and reclaimed continually. Among the leading group in this category are Franz Maria Feldhaus, whose collection on the world history of technology, begun in 1904, contains 160,000 cards, as well as Paul Otlet and Karl Wilhelm Bührer, who sought to establish an external brain for the collected knowledge of the world on index cards, committed to the insane notion of completeness (*Restlosigkeit*).

To begin with, the basis of everyday note keeping consists of copying or excerpting external thoughts. Inasmuch as such an excerpt only ever offers a selection of the original text, it points to a context that is not included as such, but which is nevertheless carried over as an address, in the form of the bibliographical information of the original text. In other words, the excerpt is a pointer that always refers to something else, though not, one might suppose, to itself. However, an excerpt by itself, much less in its referential form as a proxy, does not constitute a collection with a specific productive force. Of what use is the most careful note if one is unable to find productive connections to other entries? What good are page-long excerpts if they cannot be

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36   Luhmann, "Kommunikation mit Zettelkästen", p. 225.

incorporated into a network of cross-references? The written items are frozen in isolation it they cannot take up contact with the remaining contents. What must be added to the individual notes are connections, as it is only with these cross-references between the individual entries consciously entered by the user or unconsciously provided by the apparatus that the disparate material takes on a structure with evident relations, and which becomes at the same time something distinctly different.

13.3   Practice – *Synapsen*: A Digital Slip Box

It is precisely this principle of massive cross-referencing on which my software *Synapsen: A Hypertextual Slip Box* relies, using a method of compressing text blocks and collected materials that is partly automated and partly drawn from the conventional slip box. Nevertheless, the concept of *Synapsen* allows for the classical slip box to be elevated to the electronic level, to be understood as a 'communication partner' (in Niklas Luhmann's sense), with whom an on-going dialog of reading, writing and clicking can produce new insights. Then, as now, the fundamental difficulty in textual production lies in transforming the abundance of collected knowledge into structures that are not subject to ephemerality and forgetfulness. How, then, can the assembled data be stored in electronic form in such a way that they remain easily retrievable at a later time? Furthermore, how is it possible to assemble the knowledge to be stored in an arrangement that not only allows one to receive the desired answer upon request, but that also offers up associations and lines of argument of its own?

Answering precisely these questions is the goal of *Synapsen*. Finding, saving and processing literary data still serve as the basic operations of those fields that work with texts. Consequently, in addition to the programmatic struggle against the forgetting of passages and texts, new associations between entries must be made possible, indeed generated automatically, in order to create new connections between the readings recorded over time. Just how such connections (automatically created by the software by means of keywords) can be understood as their own lines of argument is demonstrated by the following example.

We may take as a starting point Peter Krezschmer's text *Economic proposals to increase timber, plant fruit trees, bring streets into straight lines, consequently make fields more fruitful, link the mulberry plantations and exterminate the sparrows and moles*, printed in Leipzig in 1744, which includes among its connections automatically generated by *Synapsen* references to timber or fruit trees in Georg Heinrich Zincke's preface, but also a passage about 'fantasy', which then opens up a connection to another book, Gustav

René Hocke's study on mannerism (*The world as a labyrinth*), which itself is tagged under the term 'espionage'. This leads in short order to a certain H. Russ, who wrote an essay in 1931 about *The customer file and its interpretation*, in which he describes the index as a system of spying on customers, to then add a few passages about *advertising*. Among the first entries for this keyword is a 1901 text by AEG (*Allgemeine Elektricitäts-Gesellschaft*) about 'electric advertising lights', which then refers by way of the term 'street lamp' or 'lighting' to an entry from Vilém Flusser's book *Dinge und Undinge*, in which he waxes philosophical not just about street lights, but also chess, glasses, rugs, wheels, atlases and a cane. In this way, the software leads the user in a dialog, as it were, from timber to canes.

Since its release in October of 1999, the *Synapsen* program has relied on software standards, both in its internal data organization (accomplished with an SQL database), as well as in its input and output, where standard formats such as PDF, LaTeX, BibTeX, RTF and UTF8 are useful. Furthermore, *Synapsen* is written in the Java programming language, which assures that it can run identically on all current systems, and that the user's data can continue to be used seamlessly even after changing to a new system. However, at this point, it is not necessary to list the individual functionality that has been added over the years, especially as these features are taken for granted in an electronic literary management system, including expression in index-card mode, output of bibliographies in PDF, RTF and BibTeX format, communication with current word processors (i.e., exporting footnotes to Word or OpenOffice by mouse click), loading bibliographic data via a z39.50 interface, as well as incorporating large union databases such as the Common Union Catalog's OPAC, the Library of Congress, the Bibliothèque National and others, and the support of collaborative work processes (*Synapsen* is also available in a network version for multiple users).

Of primary concern is illustrating the conceptual advantages that a program like *Synapsen* offers for the production of scholarly texts relative to other literature management software, as a personal dialog partner. The first difference is simply the greater ease of researching within the fundus offered by a digital rather than a conventional index: each combination of letters allows one to search both within specific categories (author's name, keyword, etc.) as well as the entire collection of data within seconds. The second, more obvious difference is the program's use of windows, which (in contrast to the typical appearance) consciously avoids a large main window, instead utilizing one small control unit to coordinate the management of the individual notes, which are modelled after traditional index cards even in their electronic form (see Fig. 13.2).
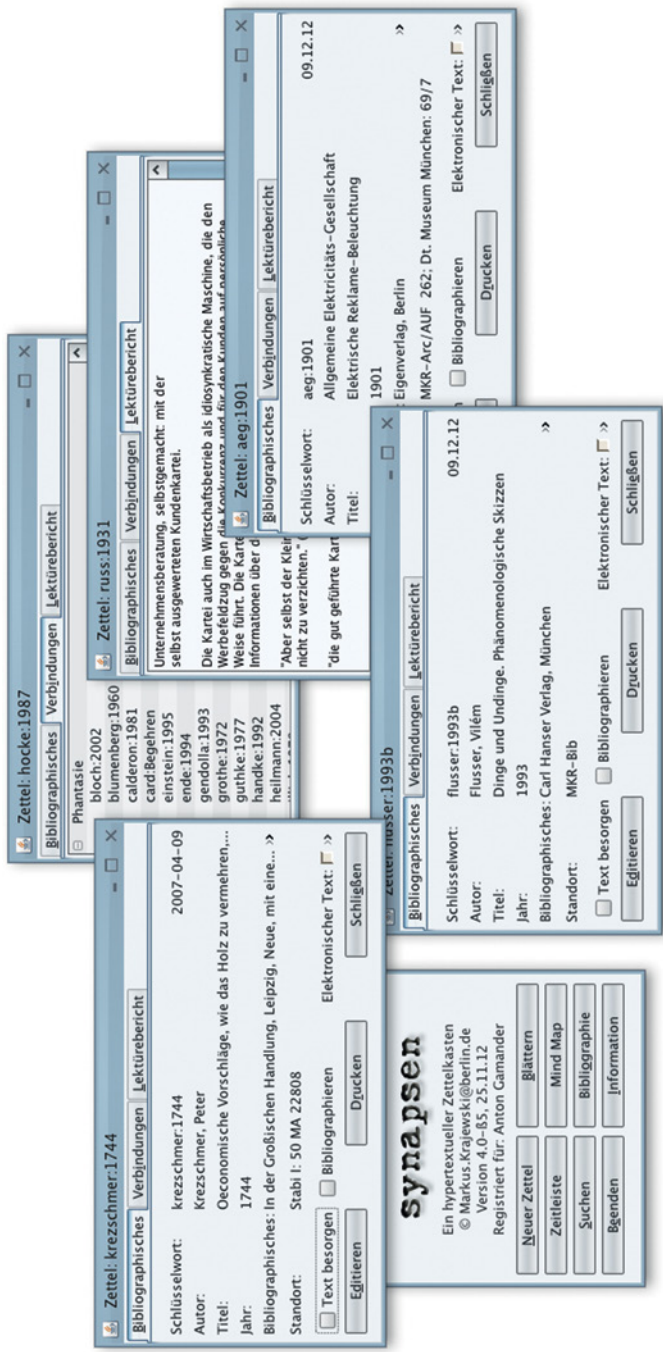
FIGURE 13.2   *Notes in relation: from timber to canes*

Though this may seem unusual to many users at first glance, there is a good reason for it: it is not by coincidence that the home screen is also called the desktop, in that it allows *Synapsen*'s user to arrange the individual notes and distribute them across the surface. Just as is suggested by the metaphor of the desk, the cards can be spread out and brought into relation with one another, and in the visual arrangement of the individual cards, in their diagrammatic relationships, there exists a first, significant possibility of order. The shifting and rearrangement of various notes allows far-flung things to be brought together in a homogenized form (the cards are identical, despite their differing contents), such that their relation in space may already serve as an aid in argumentation. Initial arcs in the line of reasoning of the text yet to be created may be probed and tested by way of the arrangement of the notes on the desktop. However, in contrast to the wooden predecessors of the electronic slip box, the most important function of the electronic version lies in the real ability of the software to engage in dialog with the user, which proves quite successful in the practice of knowledge production.

"The text knows more than the author", as one of the basic assumptions of philology reads. One could easily apply this adage to the relationship between the slip box and its user. In their potential for linkage, the text fragments held at the ready by the apparatus offer far more points of connection than the user is aware of at any given moment. The interface offers a whole array of possible connections, thereby providing the action potential for new arguments. The slip box software knows more than the author, in that *Synapsen* harbours the conditions of knowledge and aids in catalyzing future thought through contact with its interface. To cite Kleist once again, "it is not we who know things, but first and foremost a certain condition of ours which knows".[37] It is precisely these possible conditions to which the *Synapsen* software clings. Through its preformed elements designed to enhance connectivity, it always offers a configuration of possible conditions of knowledge that are only realized (that is to say, recalled) by the user at a given time through certain combinations.

Following the referential structure of the entries, there are two effects that contribute to the production of new contexts, i.e., paths other than the one intended: the *surprise* of stumbling across a previously unconsidered aspect thanks to a reference, and the *coincidence* with which the reference appeared here and not elsewhere. More decisive, however, is the ability of the partner to surprise the inquirer. By way of tags and keywords, one can point precisely from any spot in the slip box to another. In contrast to books, with their rigid binding and ineluctable standards of format, every note represents a self-contained,

37   Kleist, *Sämtliche Werke*, ii, p. 323.

expandable unit of information, an upgradable, elementary piece of data that can easily be referenced. Every note bears an unmistakable address due to its position in the order, or in the form of an abbreviation to which other notes can refer. "Every note is an element that gains its qualities only by virtue of the network of references and cross-references in the system".[38] By means of these cross-references, the user is able to tease out new associations and un-intended courses of reading while following the referential structure of the entries. "From a given stimulus, the slip box produces combinatorial possibilities that were never planned or thought of in advance".[39] This brings about the surprise of stumbling across an aspect not yet considered due to an unexpected reference.

How precisely does one succeed in endowing a slip box with this capacity for surprise? With appropriate software, and naturally with time itself, over the course of which complex structures will form without any further assistance. These will come about to the extent that the user continues to input information in the form of text blocks, facts, fragments of thoughts, longer excerpts or even fully determined lines of argument with sufficient regularity, and also always ties these into the existing referential structure. In a sense, then, the slip box owes its potential for surprise to a certain reading effect. Inasmuch as the assembled notes are able to remind one of their own previous thoughts through the permanence of script, and the writing itself points not only to the train of thought being documented but also to references (and connections) regarding the other complex contents, the reader is not only reading his own memory, but rather also his shifting frame of reference over time. It is not simply the difference in understanding over time that is surprising. Rather, what is more surprising are the references listed, the paths of which were much less complex at the time of entry than they are upon subsequent review. The system of notes continues to develop undetected. Consequently, *Synapsen* no longer simply lays the groundwork for a text to be written, but rather provides an early form of the text itself. The cross-reference creates the argumentative added value of the slip box, in that it ceaselessly fixes the associations of its reader into firm connections.

It is only with this proficiency at automated cross-referencing that the digital slip box moved from the position of a simple filing instrument to the status of an assistant (nearly) equal to the user, even to the status of a proper communication partner during the production of texts. The apparatus does not simply reliably reproduce everything which the user has gradually invested in

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38   Luhmann, "Kommunikation mit Zettelkästen", p. 225.

39   Luhmann, "Kommunikation mit Zettelkästen", p. 226.

it. It is always more than the sum of its parts. To the extent that it is able to link the input with the existing materials, to mark links to similar texts and themes, the slip box delivers numerous branching connections which represent new, forgotten or unforeseen lines of reasoning. Thus, a simple but consistent cross-reference produces fertile excesses, in that the re-combinatorial power of connections enhances the utility of excerpts through interwoven chains of reference.

Is a logic of connection that merely sets out to link keywords together not overly unsophisticated? Are incoherent connections not produced in this way? The slip box is not only able to refute this argument, but to make it something productive. For instance, in his *Encyclopédie*, Denis Diderot had intentionally 'false' references recorded in order to stimulate thought, as with the famous cross-reference from 'cannibalism' to the 'Eucharist'. In the age of the internet, it is hardly worth mentioning that cross-references are the fundamental element of a network – even if they produce connections that may resemble dead-ends – so long as they produce a link that may perhaps offer interesting constellations in another context, at another time with a later search. Ultimately, the connection made by the slip box functions as a productive method of disruption, as cross-references promote creative thinking.

One could argue that these cross-references, partly determined by software, partly manually entered, are able to accomplish a great deal, but are not without a certain randomness. However, this claim is only partially valid, inasmuch as every cross-reference can naturally be confronted with the argument of its contingency. In other words, one could just as easily refer to something else. But it is precisely this possibility of contingency that is the actual strength of software, as it provides an algorithmic structure to counter the fundamental problem of the historian; namely, that history could just as easily be told in a much different way. Through the standardization of the most heterogeneous information, through the management of relevant as well as marginal information, *Synapsen* allows one to combine scattered facts, to make them retrievable in a central location, to classify them and convert them into other new and different orders. This ability correlates precisely with the fundamental demands of historiography, of answering the question of how the contingency of historical narrative can be represented, modelled and made productive, both in textual form as well as with an eye toward pictures and other visualizations in the form of diagrammatic arrangements such as timelines, knowledge trees, etc., not to mention other sources such as paintings, sound recordings, films, etc. Before the user decides upon a narrative path for his story in dialog with the software, he must consider the alternatives; he must be able to see what other potential paths his material offers. *Synapsen* provides this form of
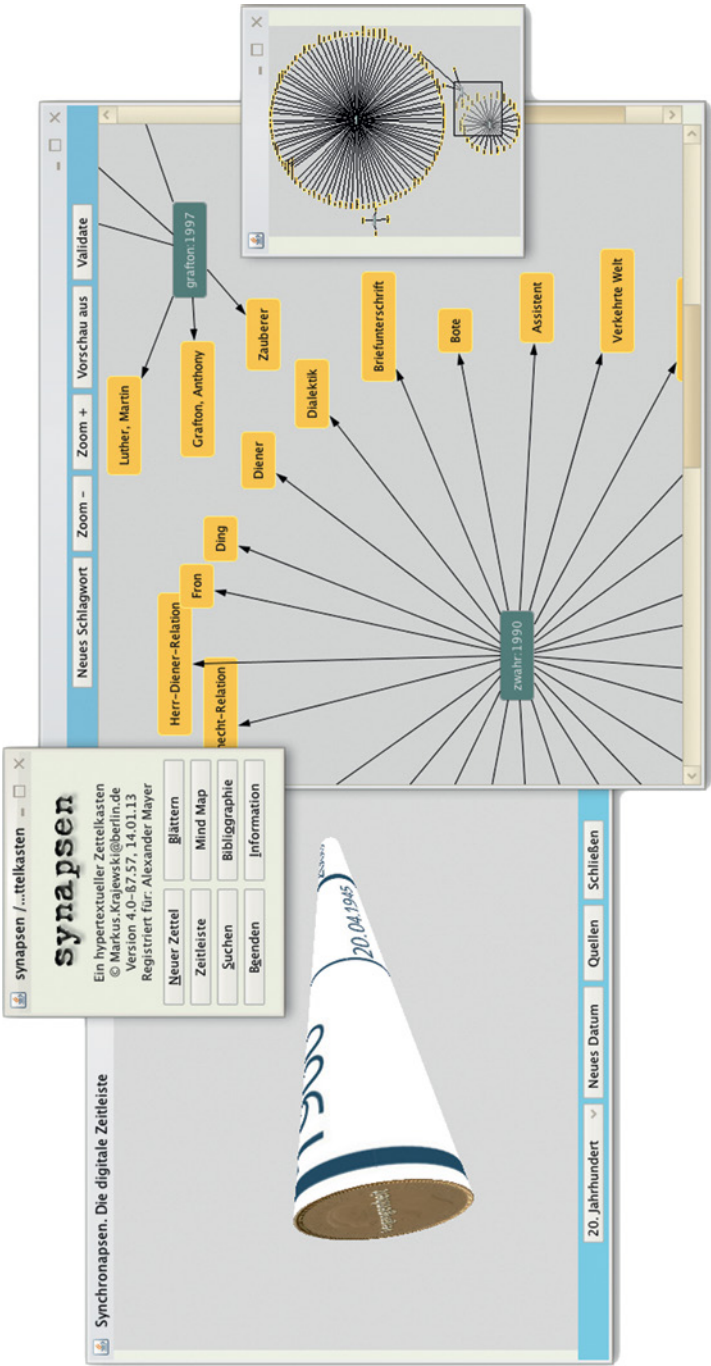
FIGURE 13.3   *Various visualizations in Synapsen: time arrows and structure trees*

overview, this synopsis of the individual fragments, images and text blocks, with its multi-window mode of presentation and particularly through the loose arrangement of the individual notes on the electronic desktop. The virtual relocation, resorting and (occasional) fixation presents the possibility of altering the course of the story with a few clicks, of modelling it differently for testing purposes. This form of visualization is supplemented by additional modes of presentation for the data managed by *Synapsen*: timelines (in two- or three-dimensional representations), figures similar to mind maps, and diagrammatic visualizations that produce epistemic images from statistical information, i.e., the 'big data' of a well-stocked slip box (see Fig. 13.3).

Typically, (physiological) synapses are networked within a single head, and if they extend beyond it, they are primarily in textual form, captured on paper as publications. The area of responsibility for *Synapsen* can be understood similarly: it is an instrument for scholarly textual production, primarily serving as a reservoir of personal knowledge that manages, organizes and renders productive over the long-term all information that seems important to a researcher, freed from the threat of being forgotten.

Tools to Remember an Ever-Changing Past

Elena Esposito

14.1   From Preservation of the Past to Preparation for the Future

The texts in this volume concern a very interesting transition that occurred during early modern time, a period that is often the subject of sociological research. In particular, the spread of printing was notoriously related to *ars excerpendi*. In this regard, many contributions in this volume explore the relationship between *ars excerpendi* and the traditional system of *loci*, which can be observed as the symbol (or one of the symbols) of the on-going transition.

The title of this book, *Forgetting Machines*, appropriately refers to the mnemonic component of the study. In the period under consideration, we observe a use of memory and a configuration of social memory that differed from those of previous times, with an unprecedented active role of forgetting. However, the emphasis on forgetting must be interpreted flexibly. We cannot assume that simply shifting from a focus on remembering (in *ars memoriae* and the related system of *loci*) led to an opposite focus on forgetting (with forgetting machines). *Ars excerpendi* is not a version of *ars oblivionalis*, which is always problematic. Rather, it signals a much more complex transformation of memory as a whole, involving both of its components, remembering and forgetting, and modifying their relationships to each other. This book contributes valuable insights for the study of this transition.

As Iveta Nakládalová observes, the basic issue concerns the "gnoseological apprehension of the world",[1] or, as sociologists say, the semantics of society, which underwent a decisive transformation during that time. Society shifted to a different form of order, becoming less cosmological and general but much more flexible, contingent and compatible with elements of disorder.

The traditional system of *loci* presupposes a unique order of the universe that is true, given, fixed and the same for everyone. For a long time, this undisputed order was the basis for many uses of *ars excerpendi*, which its proponents intended to help explore and confirm. However, as in many other cases, this technique operates as a preadaptive advance and goes in a direction that differs from their intentions and the awareness of those who are using it, favouring

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1   See Iveta Nakládalová's essay in this volume.

a critical approach[2] and shifting the emphasis from preservation of the past to preparation for the future. The future appears to be an increasingly open and unpredictable horizon located in the realm of novelty and surprise.[3]

The continuity between the past and the future, which is implicit in the idea of *historia magistra vitae* and is indirectly related to the assumption of an ultimate general order that rules the universe (past, present and future), is now broken. Although researchers know the past continues to be useful for preparing for the future, the past is now viewed with a sense of discontinuity rather than continuity. As a result, the order has become much more articulated and complex. One realizes that the future tends to be increasingly different from the past, and that now one can only learn from the past that the future will be different.[4] How do filing techniques relate to this transformation, and how do they affect the use and organization of memory?

As a tentative answer to these questions, my argument is divided into two parts. Modern society has shifted from valorising remembering (conceiving of memory as only the ability to remember) to valorising both remembering and forgetting, although this transition has rarely been made explicitly. First, I discuss the concept of memory, emphasizing the role of forgetting, which is distinguished from remembering but not opposed to it. To strengthen memory, one must be able to not only remember more but also forget more.

From a sociological perspective, this transformation does not concern primarily individual memorization. Rather, it concerns how the past and future are managed socially, i.e., it concerns the forms of social memory, which are the object of the second part of the argument. Filing techniques, which were developed after the spread of printing, in addition to the rapid increase in the amount of written materials, are a key component of social memory because they enable a much more flexible and contingent relationship with the past, especially because the past can no longer be changed.

14.2 The Mnemonic Function of Forgetting

Including the texts in this volume, a significant body of research indicates that in early modern times a rapid decline in the prestige and spread of mnemotechniques occurred; this decline involved the system of *loci* and ultimately the entire apparatus of rhetoric. Although the spatial organization

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2   See Fabian Krämer's essay in this volume.

3   See Alberto Cevolini's essay in this volume.

4   Cf. Reinhart Koselleck, *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten* (Frankfurt am Main: Suhrkamp, 1979).

of *ars memoriae* apparently continues to be the basis of the new management and use of texts,[5] *ars excerpendi* actually undermines the techniques, with people gradually remembering and forgetting differently. How do they remember and forget?

As Plato rightly feared in his attack on writing, it is true that a 'chirographic' culture forgets much more, but it also remembers much more. Societies that are equipped with the ability to write produce incomparably more materials than those that do not, resulting in the use of social supports that enable and require people to record increasingly less information in their individual memories. But in the modern age, the amount of information has become overwhelming and difficult to manage. The apparent enigma that we face today in the context of the Web has already been discussed at that time,[6] referring to the simultaneous increases in the ability to remember and the ability to forget. Before the spread of the Web, however, the primary concern was preserving the ability to remember. Today the prevalent concern is apparently the loss of the ability to forget. Yet, in reality, the two abilities to remember and to forget always increase together and at the same time. The Web remembers and forgets much more than the culture of books and mass media, which remembers much more than rhetoric culture because it has a greater ability to forget.

To understand and adequately describe the on-going transformations, we require a more flexible and powerful concept of memory than the one that we still tend to take for granted, which, as revealed by the study of *ars excerpendi*, still reflects the concerns and needs of a semantics that not only is different from that of today's society but already exhibited limitations in the early modern age. With regard to memory, everyday speech, in addition to a large part of scientific inquiry, still refers primarily to the management of remembering. Increasing memory is understood as increasing memories or strengthening the ability to remember. From this perspective, forgetting appears to be only the negation of memory: if forgetting increases, remembering decreases, and vice versa.[7]

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5   Most clearly by Giulio Camilllo's much-studied memory theater. Cf. Frances A. Yates, *The art of memory* (London: Routledge and Kegan Paul, 1966); Lina Bolzoni, *La stanza della memoria. Modelli letterari e iconografici nell'età della stampa* (Turin: Einaudi, 1995).

6   Cf. Jean-Francois Blanchette and Deborah G. Johnson, "Data retention and the panoptic society: the social benefits of forgetting", *The Information Society*, 18 (2002), pp. 33–45; Viktor Mayer-Schönberger, *Delete. The virtue of forgetting in the digital age* (Princeton, NJ: Princeton University Press, 2009).

7   Cf. Paul Ricoeur, *Memory, history, forgetting* (Chicago: The University of Chicago Press, 2004), p. 412.

The opposite idea, which understands forgetting is a key component of memory required for abstraction and reflection, is not new, but it has always remained in the shadows. From Themistocles to Nietzsche,[8] claims that the ability to forget is even more important than the ability to remember have always existed.[9] If you are unable to forget, you cannot develop general concepts which require you to neglect many features of the individual cases, nor can you focus your attention by excluding irrelevant details and distractions. Only those who are able to forget have a future that is open to novelty and surprises[10] and is not simply the forward projection of the past. The more relevant the future becomes, the more the role of forgetting increases.

Much more then remembering, forgetting is elusive and difficult to define because it is impossible to observe directly.[11] Therefore, we have for thousands of years elaborate techniques to remember (*ars memoriae*),[12] yet we have no effective technique to forget (*ars oblivionalis*).[13] Forgetting occurs inevitably and by itself, without a technique which would create the ability to control forgetting, eliminate memories in a selective and focused way, and decide what memories to eliminate and when. This was actually Themistocles' problem: "I remember even what I do not want to remember, and I cannot forget what I wish to forget".[14]

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8   Cicero, *De orat.*, II, 74, 299; Friedrich Nietzsche, *Unzeitgemässe Betrachtungen. Zweites Stück: Vom Nutzen und Nachteil der Historie für das Leben*, in F. Nietzsche, *Werke in drei Bänden*, ed. by K. Schlechta (3 vols., Munich and Vienna: Carl Hanser, 1999), I, pp. 209–287.

9   Cf. Harald Weinrich, *Gibt es eine Kunst des Vergessens?* (Basel: Schwabe & Co., 1996).

10   Cf. Marc Augé, *Les formes de l'oubli* (Paris: Éditions Payot & Rivage, 2001), p. 78.

11   Like a blind spot. See Heinz von Foerster, *Observing Systems* (Seaside, CA: Intersystems Publications, 1981).

12   Cf. Yates, *The art of memory*.

13   Cf. Umberto Eco, "*Ars oblivionalis*. Sulle difficoltà di costruire un'*ars oblivionalis*", *Kos*, 30 (1987), pp. 40–53; English transl. "An *ars oblivionalis*? Forget it!", *Modern Language Association*, 103: 3 (1988), pp. 254–261; Renate Lachmann, "Die Unlöschbarkeit der Zeichen: Das semiotische Unglück des Memoristen", in A. Haverkamp and R. Lachmann (eds.), *Gedächtniskunst: Raum-Bild-Schrift* (Frankfurt am Main: Suhrkamp, 1991), pp. 111–141; Harald Weinrich, *Lethe. Kunst und Kritik des Vergessens* (München: C.H. Beck, 1997), p. 9ff.

14   "Nam memini etiam quae nolo, oblivisci non possum quae volo". Cf. Cicero, *De finibus*, II, 34, 104. See also Baltasar Gracián, *Oráculo manual y arte de prudencia* (Huesca: Juan Nogués, 1647); Italian transl. *Oracolo manuale e arte di prudenza* (Milan: TEA, 1991), § 262, p. 153: "Not only is memory fallacious because it fails when you need it most, it is also silly because it is vigilant when least required". For Nietzsche, centuries later, the main problem of memory was that one cannot 'learn to forget'. Cf. Nietzsche, *Unzeitgemässe Betrachtungen*.

These difficulties, however, are at least partly related to a reductive notion of forgetting and therefore also of memory. As long as forgetting is understood in negative terms – as the denial (loss, corruption, or deletion) of remembering – attempts to refer to it inevitably produce a paradoxical situation in which one attempts to see what is invisible or refers to a content to deny its presence: first you remember, then you try to forget the recalled content.[15] From this perspective, forgetting is a passive effect of memorization, and memory is understood as a kind of data storage in a warehouse with limited capacity. With the passage of time or accumulation of data (interference), content is lost. However, the relationship between remembering and forgetting can also be understood differently. Rather than as an opposition, it can be viewed as the combined result of two independent abilities. Remembering and forgetting are the two sides of memory, and both are essential for it to function.[16]

Recent studies regarding memory have followed this trend, assuming a more complex and realistic idea of forgetting. Forgetting is understood as an active mechanism that inhibits memorization of certain stimuli, thereby enabling to focus attention and autonomously organize one's own processes.[17] Inhibition is required to avoid being controlled automatically by usual actions, reducing the level of activation of some responses and neutralizing some retrieval cues. In practice, forgetting is needed to focus on something and use past experience to act in a flexible, context-appropriate manner, not starting from scratch each time while also not always doing the same whenever the same situation occurs. One must be able to distinguish the present moment from an eternal presence of the past. Therefore, forgetting is also necessary to be able to remember properly, building an internal horizon of references and recursions to face the present. The act of remembering produces and requires a parallel act of forgetting.[18]

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15   This is also referred to as the 'Streisand effect': to enforce cancellation of content in the media, one must refer to it, and the media remember it.

16   Cf. Elena Esposito, *Soziales Vergessen. Formen und Medien des Gedächtnisses der Gesellschaft* (Frankfurt am Main: Suhrkamp, 2002).

17   Cf. Michael C. Anderson, "Rethinking interference theory: executive control and the mechanisms of forgetting", *Journal of Memory and Language*, 49 (2003), pp. 415–445; Justin C. Hulbert and Michael C. Anderson, "The role of inhibition in learning", in A.S. Benjamin et al. (eds.), *Human learning. Biology, brain, and neuroscience* (Oxford et al.: Elsevier, 2008), pp. 7–20.

18   Cf. Hulbert and Anderson, "The role of inhibition in learning", p. 8.

The result is a more complex and articulated idea of memory, which is close to Plato's ancient notion,[19] admitting the possibility that memories increase over time rather than diminish (reminiscence).[20] Available memory is distinguished from accessible memory. *Available* memory, as the experience of memorists show,[21] can include all data and experiences. However, in physiological cases, the actually *accessible* memory is limited and depends on the combined abilities to remember and forget. When time elapses, we do not only forget. In many cases, experiments indicate that subjects recall more memories after a few days compared with what they remembered after only a few hours. Experience and learning can lead to recall something that had not been noticed at an earlier time, which is similar to Meno's slave, who learns to 'remember' ideas he previously did not know.[22]

At any time, the actually accessible memory is the result of the combined action of two distinct processes, which are both active and necessary: 'oblivescence', which cancels content, and 'reminiscence', which makes content available. The two processes are independent. Reminiscence can be more powerful, causing information that is accessible to memory to increase over time. However, even in the familiar condition in which the amount of accessible information decreases, one does not necessarily face 'less remembering'. Oblivescence may have become stronger, causing information to be selectively stored. The action of forgetting is not a passive deterioration of content that is 'accumulated' by remembering but rather a component of the process that, at any time, leads to restructure memory in reference to new situations. Memory is not lost but rather is always shaped differently, remembering and forgetting in a different way.

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19   Before the introduction of any communication medium, i.e., of social forms of memory management. Cf. Plato, *Phaedrus*; Plato, *Meno*.

20   Cf. Mattew Hugh Erdelyi, *The recovery of unconscious memories. Hypermnesia and reminiscence* (Chicago: The University of Chicago Press, 1996).

21   Individuals with exceptional memories, who recall every detail of every moment of their experience. Cf. John Wilding and Elizabeth Valentine, *Superior memories* (Hove, East Sussex: Psychology Press, 1997); Elizabeth S. Parker et al., "A case of unusual autobiographical remembering", *Neurocase*, 12 (2006), pp. 35–49. For example, there is the famous case of Shereshevskij, who was studied in 1920 by Aleksandr Romanovich Luria, *The mind of a mnemonist. A little book about a vast memory* (Cambridge: Harvard University Press, 1987). These people, however, do not have better memory but rather suffer from a disease. They remember everything not because they have a better ability to remember (or not only) but rather because they are not able to forget. They experience an inefficient condition of overload by the past and an inability to abstract, plan and adapt to circumstances.

22   Plato, *Meno*, 81c–84b.

14.3 Memory Tools in Modern Society

The complex structure of memory is particularly relevant at social level, as initially evidenced during the period that is analysed in this volume. The transformation we are observing can be described as a profound change in the available memory of society, in its accessible memory and in the relationship between the two. The result is the open future of modern society, which is related to a past that has become the object of systematic and controlled study for the first time and therefore can be re-interpreted differently in each present. Modern society remembers differently because in every present, it remembers the past in a different manner, uncoupling itself from what was previously remembered (i.e., forgetting it). Social memory is the result of the joint actions of remembering and forgetting.

In more concrete terms, the structure of social memory, which was traditionally entrusted to rhetoric, mnemotechnique and memorization by individuals (conservation as faithful as possible in people's minds), changed deeply when the ability to record and store the content that is relevant to semantics on external supports became technically possible. When texts could be printed in large quantities and then stored in libraries and archives, the human mind was relieved of the task of warranting (via direct storage) the preservation of culture, while, at the same time, the content could be transmitted in a fixed, standardized and controlled form.[23]

Printing techniques allow the past to be fixed in an immutable form, which remains the same when time and readers change, unlike oral narratives, which adapt 'homeostatically' to the context of the on-going communication; a book becomes a proper text when it does not change and people know it.[24] This critical step was taken in early modern time, leading people to consider collections of texts to provide powerful and reliable support for memory. However, the fixed nature of a text also allows for diversity of readings: people can read a text from the end, from the beginning, or with a philological, artistic, or legal interest, but they still read the same book with incomparably great variety.

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23   Cf. Elizabeth L. Eisenstein, *The printing press as an agent of change. Communications and cultural transformations in early-modern Europe* (2 vols., Cambridge: Cambridge University Press, 1979).

24   Cf. Jan Assmann and Burkhard Gladigow (eds.), *Text und Kommentar. Archäologie der Literarischen Kommunikation IV* (München: Wilhelm Fink, 1995); Jack Goody and Jan Watt, "The consequences of literacy", in P. Giglioli (ed.), *Language and social context* (London: Penguin, 1972), pp. 311–357.

In a manner that was difficult to predict at the time, the meaning and scope of conservation of materials has subtly changed, with the focus shifting from simple preservation of content to a much more complex and flexible manner of dealing with them. The issue is no longer to simply remember the past but rather to be able to utilize it within a constantly changing present. We must not only reproduce the data (the past) as faithfully as possible, but rather each time we also must remember a different past, which requires a powerful and articulate ability to forget. As today's neurophysiological research shows, the task of memory is not simply to store past data, but rather to ensure the ability to use the past without being suffocated by it. It is not enough to remember reliably; one must also know how to forget efficiently. This creates the apparent contradiction that the more you know the past and develop historical analysis (as was the case in Western society during the modern age),[25] the greater the possibility of an open, unknown and unpredictable future to arise. In effect, "[t]he meaning of an archive … is a promise to the future".[26]

Herein lies the central role of filing cabinets, in addition to the cataloguing and indexing techniques that were developed during early modern times. Social memory is made not only of books, magazines and libraries, although it certainly needs them. As in all cases of memory, we must distinguish available memory, including all stored data, from accessible memory, which includes the contents actually circulating thanks to the combined contribution of the mechanisms of remembering and forgetting.

In modern society, the main repository of available social memory are archives and libraries, which preserve and retain contents for possible actualization, beginning with written texts and later incorporating audio and video recordings. Printed texts are fixed, standardized and stored, and remain available for communication, even when no one reads them. A library of books that have never been read, however, can hardly be considered actual memory. Accessible memory, as a result of the joint actions of remembering and forgetting, includes only the content that actually circulates in communication and the issues about which people are talking or to which they can refer. A simple collection of texts without any auxiliary tool would be as unusable for communication as the inaccessible recording of memories in an individual's mind.

In addition to the ability to produce and store significant amounts of texts, our society has also produced new mechanisms to manage and treat them, which are tools of accessible memory that allow the actual use of specific

25   Cf. Koselleck, *Vergangene Zukunft*.

26   Wendy Hui Kyong Chun, *Programmed visions. Software and memory* (Cambridge, MA: The MIT Press, 2011), p. 99.

communication content. In a sense, these tools occupy the place previously held by the organization of *loci* and mnemotechnique. One must be able to find the desired text in the collection of volumes. Therefore, complex and elaborate techniques of cataloguing, which we can identify as mechanisms of reminiscence, have been devised.[27] Already in the mid-sixteenth century, Conrad Gessner wrote that *catalogus* and *memoria* are the same, and cataloguing is synonymous with *commemorare*.[28] Without a catalog, every library would be completely useless. The collected books become actual memory content only when they are made available through some form of internal organization. The catalogue allows social memory to be activated, and it actually allows to remember.

However, the content found in books and other preserved materials become new and different with every reading. One is not required to start from the beginning of a book; a person can begin from a different point, whether it is from a later chapter or at a given concept, and follow different paths. One can compare different books and obtain new information or interpret a given text differently. As claimed by the theory of reminiscence, with the passage of time, an individual can also retrieve information from the past that was not previously recalled. Therefore, for management of texts, additional tools, which are precisely the object of the analysis in this volume, are available: indexes, tables of contents and page numbering, in addition to the complex techniques of 'dissolution and recombination', which are elaborated by the art of excerpting. The more sophisticated the tools that are available, the more current communication can 'forget' the past and reconfigure a text in ever new ways, remaining independent from the intention and expectations of the author.[29]

As we observed above based on the results of neurophysiological research, in this case and all others, forgetting is necessary to use the past in a flexible manner that is appropriate in the ever-changing present context. This enables to avoid repeating the past in the same manner each time, even if one does not always start from scratch (one remembers). In this sense, Alberto Cevolini is correct when he labels early modern techniques for treating texts as 'forgetting

27 Cf. Alberto Cevolini, "Indexing as preadaptive advance: a socio-evolutionary perspective", *The Indexer*, 32: 2 (2014), pp. 50–57; Ann Blair, "Annotating and indexing natural philosophy", in M. Frasca-Spada and N. Jardine (eds.), *Books and the sciences in history* (Cambridge: Cambridge University Press, 2000), pp. 69–89.

28 Cf. Conrad Gessner, *Bibliotheca universalis, sive catalogus omnium scriptorum locupletissimus* (Tiguri: Excudebat Christophorus Froschoverus, 1545), Epistola nuncupatoria, p. 3v. I thank Alberto Cevolini for this reference.

29 Cf. Umberto Eco, *Opera aperta* (Milan: Bompiani, 1962).

machines'. In modern society, they are the mechanism for forgetting of accessible memory and are combined with the corresponding mechanisms of remembering.

The tools of classification and management of materials allow "a working version of the past" to be created;[30] this is the past that is required by the actual present. With the combined contribution of cataloging systems and of indexing and cataloging techniques, the past that has been recorded in libraries and archives can be retrieved in new and surprising forms, making it the content of different communications. As a result, the past is remembered and forgotten at the same time.

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30   Geoffrey C. Bowker, *Memory practices in the sciences* (Cambridge, MA: The MIT Press, 2005), p. 18.

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