

THE INDEXER

Volume 32 Number 2, June 2014

ISSN 0019-4131 (Print)

ISSN 1756-0632 (Online)

The International Journal of Indexing

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Editorial

Why, you may ask, does D. L. May's animated alphabet grace 'my' page? Well, it's there as an appetizer for Alberto Cevolini's article which starts overleaf. It seems that such an alphabet was long used as a tool on which to hook knowledge worth remembering. I found captivating his argument that change begets reciprocal change, the index turns from memory tool to finding tool without us really noticing, and physical change affects the psycho-cognitive process which in turn affects the physical representation of that process.

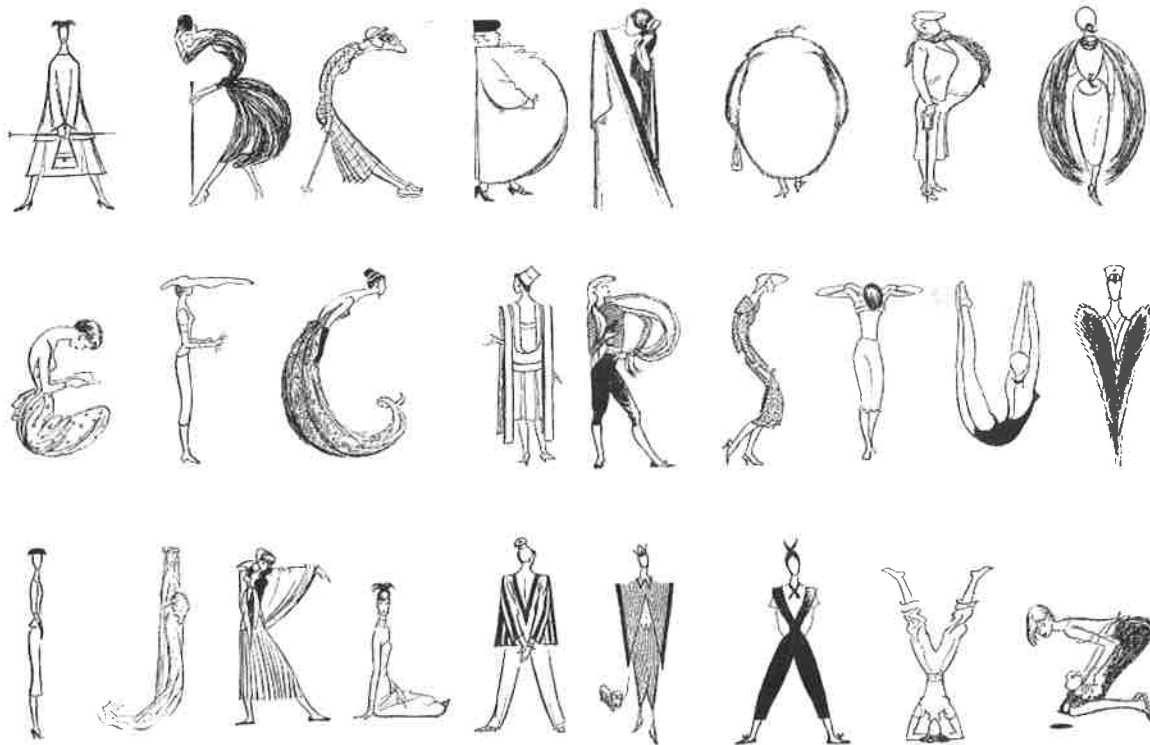
The purpose of 2005 Lille Colloque (which I reported on in the October 2006 *Indexer*) was to 'look at the developing role of indexing in the context of the tensions which exist between cultural, professional and economic factors which are themselves in a state of perpetual change in the light of social and technological developments'. Books exploring what Google and the Web are doing to our reading minds tumble our way, two of my favourites being Maryanne Wolf (*Proust and the squid: The story and science of the reading brain*) ('Human beings invented reading only a few thousand years ago. And with this invention, we changed the very organisation of our brain, which in turn expanded the ways we were able to think, which altered the intellectual evolution of our species') and Nicholas Carr (*The shallows: How the internet is changing the way we think, read and remember*) ('Not since Gutenberg invented printing has humanity been exposed to such a mind-altering technology').

So what will a future Dr Cevolini have to say on indexing

as preadaptive advance? Professional indexers tend to worry that this sort of development spells the death of the index in anything like the shape we have known it. Perhaps, or perhaps we shall see the indexer's unusual skills in coupling analysis with synthesis, separating out the bits in order to put them back together in a persuasive pattern, harnessed to the new media. Too many of us spend too much of our time telling one another about surveys showing that the ebook market has plateaued, that students prefer hard copy, that if we hold tight it will all go away. It won't. The ebook, in all its variety of meanings is here to stay. All major publishers now operate on a digital-first basis and that is the environment in which we need to learn to work, finding a way to give clients what they may not realize they want at a price they can afford. And that is really the rub, not whether analytical indexing has a role in the digital age, but whether we can afford it, and whether traditional indexers have the skills to do it.

Much of the news both for individual indexers and for indexing societies at the moment is not very cheerful. The China Society of Indexers has warned (see p. 84) that without its change of name (and focus) to 'China Society of Indexing and Database Management', 'the society would be eliminated by history'. What can the rest of us do to meet the challenge?

Maureen MacGlashan



'an animated alphabet, made of letters which are imagined as human figures' – see Alberto Cevolini's article on p. 50. This one is from *Punch*, by D. L. Mays, March 1955 (and is taken from Geraldine Beare's article 'Past, present and future': *Indexer* 25(4), 262).

Indexing as preadaptive advance: a socio-evolutionary perspective

Alberto Cevolini

The index is widely acknowledged to be one of the most important knowledge management tools of the typographic age but opinion remains divided over the relationship between indexing and the printing revolution. Did the index, in something like its modern sense, succeed or precede the introduction of the printing press? In this article, Alberto Cevolini, looking at it from a socio-evolutionary perspective, suggests that the answer is 'both': that the post-printing index is simply the pre-printing, encyclopaedic index with its functions adapted to the new possibilities. The index as memory tool became the index as finding tool. He emphasizes the reciprocal nature of any evolutionary process, with change begetting change to the point where the original function may be lost from sight: and he points to the way in which physical changes can affect the psycho-cognitive process, in turn affecting the physical representation of that process.

Introduction

The index is one of the most important knowledge management tools of the typographic age. It is also evidence of the way in which communication media shape both cognitive performance and social memory. But opinion remains divided over the relationship between indexing and the printing revolution. On the one hand, there are those (Eisenstein, 1983/1995: 70f; 168–9; Ong, 1982/1986: 177f) who consider alphabetical indexes as a 15th–16th century novelty made possible by the advent of printing, with its textual standardization and the production of books in their identical hundreds with stable page numbers apt for use as reference points or (to use today's terminology) locators. On the other hand, there are those who point to indexing as a practice first experimented with in the 13th century, long before the advent of the printing press, by enterprising medieval scholars attempting to manage an encyclopaedic culture (Parkes, 1976: 116f; Rouse and Rouse, 1990: 228; Zedelmaier, 2007: 236f). Both may be right. My aim in this article is to suggest, drawing on theories of evolution, how apparent contradictions between the two might be reconciled.

The socio-evolutionary perspective

Tackling the problem I have identified calls for a conceptual framework that is sufficiently abstract to overcome the limitations historical research can impose. One possibility, taking an interdisciplinary approach, is to explore the idea of society as an evolving communication system. I argue that differences of view about the origins and development of indexing methods could be reconciled if we start from the assumption that any evolutionary advance is the unfolding of the paradox of the probability of the improbable (Luhmann, 1997: 413), making normal what has previously been unnatural or implausible. Knowledge management evolution may be seen as a field research in this respect.

Indexing can be presented as an evolutionary novelty in the classic, Darwinian, sense; the question is whether the novelty is deemed to arise gradually or by sudden saltation. The neo-Darwinian approach squares the gradual versus sudden change circle by arguing that any new structure is simply an old structure that has taken on a new function. Biologists speak of preadaptive advances (Bock, 1959; Mayr, 1960),¹ an approach which fits in with the principle of functional change formulated by Anton Dohrn (1875: 60) according to which a structure may have a primary and a secondary function. Evolutionary advance normally occurs when the secondary function becomes primary and the primary function becomes subsidiary or even disappears, causing the whole structure to change. Thus, every evolutionary novelty can be said to arise both gradually and by sudden saltation. It is normally fostered by preadvances (Luhmann, 1997: 505, 512). Approaching it in this way, the development of indexing may be framed within a sociology of knowledge perspective.

Indexing as preadaptive advance

The alphabetical index only takes off definitively a full century after the invention of the printing press, but it draws on a heritage (or 'latent training'²) going back to the 13th or 14th century. The main stages of this preparatory phase have been described by Anna-Dorothee von den Brincken (1972: 905f) in her discussion of Vincent de Beauvais's encyclopaedic work, *Speculum historiale* (c. 1240–60). Von den Brincken explains how, to complete his work, de Beauvais attached a list of topics in alphabetical order (*tabula*) to each of the four parts of the *Speculum*, justifying the unusual nature of this operation on the grounds that the *tabulae* made it possible to track down topics simply by following the references they provided to the book and chapter in which they were to be found.

The need for this justification lay in the habits of the medieval reader – a century was yet to pass before the

facilitas inveniendi developed into a tool that readers naturally looked to. This experimental phase saw the achievement of a remarkable level of abstraction, with the move to a cross-referencing system contingent not on page numbering (in any case a rarity in medieval manuscripts), but instead on the more common division into books and chapters. As de Beauvais admitted, this did not eliminate the inconvenience of having to trawl through a whole chapter for the desired information, but he urged the reader not to give up on the search (*'non ob hoc desistat lector a querendo'*). An index of this sort was also an early way of offering two entry points to the subject matter, one determined by the layout of the handwritten text, the other an alphabetical alternative, thus getting readers used to finding their way through the former with the help of the latter (Parkes, 1976: 131). However, until the end of the 13th century a good layout coupled with a well-trained memory remained the best way for the medieval scholar to find what he was looking for (Rouse and Rouse, 1990: 219).

The evolutionary novelty

The 14th century was full of subject indexes drawn up in a more or less stringent manner, but it took the printing press to speed up their production. The evolutionary novelty can be properly understood if we take into account the fact that it was the circulation of printed texts which led to a differentiation between psychic systems (consciousness) and communication systems (society), while making it clear that communication is a self-reproducing self-referential operation. Those who wrote to be printed did so to contribute to *social* memory, not to produce an aid to their personal memory. The transition from manuscript to printed texts triggered a functional change that worked as a selective force on indexing procedures, turning a mnemotechnical aid into a search engine of virtual memories. As Elizabeth Eisenstein (1983/1995: 73) argues, the alphabetical index is not only a by-product of typographic culture, but more radically the consequence of new opportunities available to learned readers to achieve old targets.³ How did this change come about?

Indexing as mnemotechnical device

From the outset, the alphabetical index was seen as a way to save the reader from a long and painstaking search in an encyclopaedic work such as a *summa*, florilegium or commonplace book. The index offered the possibility of substituting linear reading with a transversal, cutting across the thread, approach, at the same time making up for the natural limits of the reader's psychic memory. To achieve this, the amanuensis had to comply with the rules of the *ordinatio* and the *compilatio*.

Writing in the Middle Ages was largely a matter of putting the works of others into good order, not only in terms of subject matter, breaking down the content hierarchically into *quaestiones* and *distinctiones*, but also in terms of layout, using visual cues such as rubrics and *litterae notabiliores*, or insertion of the ¶ sign to mark divisions. The handwritten

book became a sort of physical mirror of its thematic structure (Parkes, 1976: 121 f).

This editing process was fundamental to the *compilatio*: that is, to the making of a subject index or table, often in a separate booklet. The *compilator* worked on the manuscript, adding marks in the margins, such as symbols or stenographic notes, in order to highlight the topics to be inserted as *lemmata* (or subject headings) in the register, with a view to the possible compilation of a florilegium for personal use. The outcome was a sort of running index (Blair, 2000: 72): readers should acquaint themselves with the *signa* in order to enact them without too much effort, but this implied a long training and was not always successful, as the brilliant yet never completed indexing work undertaken by Grossatesta and his team shows.

Be that as it may, the main function of the index was to support the reader's natural memory. The *lemmata* of which it was made up constituted a 'mental filing system' (Carruthers, 1990: 99f), and acted as mnemonic hooks by means of which a 'mental grid of texts' was always to hand for use as need be in speeches or sermons. The quick retrieval of topics remained a secondary function.

This also explains why medieval indexes are normally judged by academics to be somewhat rough and ready, not to say incoherent. This is a view distorted by the perspective of modern indexing. The supposed incoherence is such only for those who are used to the cognitive standards of typographic civilization. In fact, the difference is not so much between coherence and incoherence, but rather between two different kinds of coherence. Apart from rarely being exhaustive, medieval and pre-modern indexes did not always adhere strictly to alphabetical order as we know it (Witty, 1965; Rabnett, 1982: 100 f; Hasenohr, 1990: 277f). The reason is that the topical criterion interferes with the alphabetic:⁴ Adam comes before Abel, probably by virtue of having been the first man, rather than Abel before Adam as alphabetic order would decree. The competition between these two ordering principles shows a clash between two functions – the *ordo rerum* and the *facilitas inveniendi*. For the medieval man, alphabetic retrieval remained too abstract a practice, too detached from the topical content, better suited to forgetting than remembering. For this reason, it was normal practice in knowledge management before the advent of the printing press not to stick consistently to alphabetical order (Meyer, 1991: 333, 337).

Ambivalent attitudes towards alphabetical order

The attitude of medieval scholars towards alphabetical order was ambivalent. Alphabetical order was sometimes rejected as being against the hierarchical order of Creation, its artificiality not respecting natural differences.⁵ When classifying animals, for instance, Albertus Magnus admitted that the alphabetical order was not a philosophical way (*modus non philosophicus*) of learning, but he argued that it had the advantage at least of supporting the *facilitatem doctrinae*, or rapid information retrieval (cf Meyer, 1991: 322). The resistance of medieval scholars to alphabetical

order hid a pedagogical concern for mnemotechnical performance, hierarchical order being '*plus apte à la mémorisation*' than mechanical alphabetical order (Weijers, 1995: 13).

Medieval notebooks and commonplace books were organized in the same, non-alphabetical, way, knowledge deemed to be worth remembering usually being arranged in accordance with topical criteria such as the seven days of Creation or the seven liberal arts, and within the hierarchical order of beings, from God to angels, from heavens to the earth, and from beings with a soul (men and animals) to beings without one. The two orders, topical and alphabetical, were sometimes combined, as for example in a number of florilegia⁶ which were described as *alphabetata* as an alternative to other metaphorical terms, such as 'garden', 'theatre', 'treasure' and so on, normally used to designate this literary genre. But this was merely following advice dating back to Aristotle (350 BCE: 2, 452a17f) and repeated in rhetoric handbooks right up until the Renaissance, according to which the alphabet – sometimes in the sense of an animated alphabet, made of letters which are imagined as human figures – might be used as a keyword system on which to hook knowledge worth remembering. But for indexing purposes, alphabetical order was employed preferably to classify inferior beings, such as animals, plants and minerals: that is, all those that play secondary roles in the view of medieval scholars, and for that reason are easy to forget.

Virtual memories

The medieval *alphabetata* remained curiously faithful to the mnemotechnical principle that knowledge should be ordered so as to coincide with the order of memory. Of course, life does not present itself in alphabetical order, but once scholars decided to arrange a book's topics alphabetically, memory training soon followed suit. The mind, in other words, came to see itself mirrored in the handwritten text.

The advent of print slowly broke down these habits, separating the order in which knowledge was presented from the order of the procedures that provided access to that knowledge. This is the memory model of the archive (Esposito, 2002: 239f): the way in which the items are set out within it is relatively unimportant, as long as there is an order that can be conjured up according to the user's changing needs. An archive looks like a well-ordered chaos: memories are built up by activating the network of relationships that underpins the order of the archive.

Indexing, in the modern sense of the term, implies just this searching by relationships: anything that is not linked (such as an uncatalogued book in a library or an unnumbered entry in a filing system) is lost, and will be found again only by chance (Krippendorf, 1975: 17). The forefathers of the modern library understood this very well, summing up the issue in the fundamental principle that '*nulla sine ordine Bibliotheca est, aut esse debet*' (Morhof, 1747: 34: 'without order there is no library').

The evolutionary advantage of this strange duplication is that it fosters forgetting, thus paradoxically increasing what can be remembered. There is no need to memorize all the entries in a filing cabinet or the contents of an archive; it

is much more important that the catalogue which enables the user to construct the past he needs in the present for a future-referred purpose be kept up to date. In this sense, according to Conrad Gessner, *catalogus* and *memoria* are synonyms, and the activation of catalogue references really means *commemorare* (cf Müller, 1998: 293f).

This functional change from memory tool to finding tool is further demonstrated by the fact that while in the Middle Ages the task of indexing usually concerned multiple works, with printing, an index was provided only for single works. The reciprocal relationship between the production and use of knowledge through handwritten texts or printed texts was also transformed. As discussed above, indexing was at one time a technique for the production of a particular literary genre: the florilegium, in which a scholar brought together the best of their own readings, just as bees gathered the best from flowers, and arranged the selected material in a work which in turn might be indexed with a view to the production of other encyclopaedic collections, such as *tabulae*, *specula* or *alphabetata*. By the late Middle Ages, indexes composed for this purpose had reached a remarkable level of complexity thanks to the *compiler's* addition, alongside the lemmata, of '*quere in...*' ('see ...') references. These indexes were usually the product of an organized team of *excerptores*.

In contrast, the printing press, while standardizing the layout of the text, personalized the reading process through indexes put together in a standardized, non-idiosyncratic manner. The possibility of original individual use derived from the anonymous nature of the procedures that made this use possible. The index offered readers a selection from the author's personal filing cabinet and they might in turn index the books they read with a view to further publication. In this sense, according to Johann Friedrich Bertram (1727: 11), '*Excerpta sind gleichsam ein Register über eine ganze Bibliothek*' ('The *excerpta* are, so to speak, the register of a whole library') and finally academic work takes on the form of a relationship between two filing systems (*Kartothek-systeme*): that of the researcher and that of the scholar, who assimilates the work of the former in a private manner and for personal purposes (Benjamin, 1981: 103).

The function of subject headings itself also changed. The commonplace book was no longer '*a place for storing arguments, but rather a place for storing dilations and expansions of a theme*' (Lechner, 1962: 178), thus turning into an information machine and making the function of the index as a retrieval tool the primary one. For this reason, indexing became something of an obsession for the inventors of the modern methods of note-taking and early filing systems.

For example, Just Christoph Udenius (1687: 62–73) suggests compiling a name and subject index in a booklet kept separate from the commonplace book, leaving sufficient space under each letter of the alphabet for additional entries to be inserted later. Jeremias Drexel (1638: 122f, 135) calls for great prudence and reflection before deciding on the entry term to avoid the risk of searching for the entry to no avail under the wrong letter. Hence, when indexing *Incrementum incredibile divinae gratiae* and *Divinae gratiae incredibile incrementum*, the indexer should opt for the heading *Gratiae divinae incredibile incrementum* and place it under the letter G. 'Grace' is the topic and the first word

which will come to mind, so it is under 'G' that the user will naturally search.⁷

This almost obsessive attention to the alphabetic index is explained by its function. In early modern Europe the index became a device that served to 'irritate' (in the cybernetic sense, according to the combination of irritation and reaction) what was increasingly perceived as a virtual memory, potentially expandable *ad infinitum*, but also ever less transparent and thus also ever less memorizable by the user,⁸ who interacted with it rather as with a secondary memory, which in turn reacted as a communication partner. The difference between natural memory and artificial memory also took on new meaning: artificiality no longer referred to the technique used to support the psychic memory of the scholar, but was the result of a technologization of the communicative memory (Cevolini, 2006: 39f).

The outcome was the establishment of libraries, archives and card indexes. They all worked like black boxes, and as such were no longer aids to the personal memory of the user but rather substitutes for it, and could be seen as a form of objectification and exteriorization of memory (Lévy, 1995/1997: 28; Pomian, 1997: 4008). But even more to the point, these two processes coincided with the virtualization of memory. In fact, the evolutionary advance lies not in the creation of a virtual reality – the Aristotelian art of reminiscence is no more than a technique by which to make actual that which otherwise would remain potential, in other words the memory of something – but rather in the way latency is made operative.

The book as a system

Users who interact with black boxes (archives, filing cabinets) have to develop very new knowledge management skills. They no longer have to deal with the rhetoric problem that the arguments which still are latent must be extracted from the topic while avoiding relying upon the extremes of chance or nature, in other words luck or talent in finding the best arguments the orator may bring for discussion (Partenio, 1560: 39f). And nor is it, as Augustine would have it (397–8: X, VIII), that the images of things to remember, stored in the *thesaurus*⁹ of the imagination, remain hidden in the memory and are hard to recover. Activating what is latent in the archive calls for more 'abstract' procedures, free of context-bound criteria.

Orators who wandered about their own 'storehouses' found their way using spatial criteria: the order of places (rooms, corridors, gardens) reflected the order of the discourse; they could move on or go back without fear of confusion, for what was in one place could not be elsewhere; consequently, intellectual activity was a kind of movement from one place to another (Lechner, 1962: 151). Print, by contrast, while freeing the reader from the burden of memory training, gave the impression that the book or library was a box which could not be explored from within. The only solution was to establish a form of interaction that made it possible to reactivate the structure of the secondary memory in a selective and hence different way to suit each occasion. This was exactly what the index was for.

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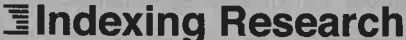


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referential way, observing how the box reacted to their own 'irritations'. The art of semantic association as practised by orators was now replaced by the somewhat mechanical procedure of the alphabetical register, leaving users to take their bearings from the terms from which the index was constructed through semantic paths. Information retrieval took place in a 'methodical' manner, through clear and simple rules that allowed for a progressive increase in knowledge without weighing down the mind (according to Descartes' classic formulation in *Regulae* (1626–8), IV).

The book itself was conceived and laid out as a 'system', a term known to Greek culture but then almost entirely forgotten over the course of the Middle Ages, revived only in the early modern age (Stein, 1969). Writing was no longer perceived as the recording of a spoken conversation. Those who managed knowledge were now urged to philosophize not in a textual manner as in the classical commentary style, but starting out from *precognita* and moving forward by way of connections of a logical-analytical type: in other words, systematically.¹⁰ When even theology, starting with Philipp Melancthon, exploits this cognitive potential, the change has become irreversible.

The transitional stage

It took a century or so following the invention of the printing press for the index to establish its position definitively as a knowledge management tool. Not by chance, this period coincided with the transition from the handwritten to the printed text, during which there were many overlaps and contradictions (McKitterick, 2003). This is a fairly normal part of the evolutionary process. So for many years printed texts were transcribed and texts printed as if they were handwritten. Early print publications were also left deliberately incomplete, leaving the reader not only to add page numbers, but also to compile the index. Aldo Manuzio, for example, in his *Dictionarium graecum* (1497), urged readers to insert the page and line number beside the lemmata they might wish to retrieve quickly (*'quo facilius quod quaeris invenire possis'*) (Vecce, 1998: 109f, 124f).

The subject index, along with page numbering, began to emerge as a normal feature only at the start of the 16th century, but by the middle of the century it had become one of the most successful of the technological novelties associated with printed books, its presence announced prominently on the frontispiece, not just because this satisfied the expectations of scholarly readers, but also in the hope that it might act as a 'banner' to promote sales of the book (Ong, 1976/1989: 174; Vecce, 1998: 118; Zedelmaier, 2007: 238).

Involitional reactions

Like all evolutionary novelties, indexing practice also engendered involitional reactions. Against the background of medieval habits of knowledge management, the use of indexing procedures was seen as something that fostered pedantry and laziness. While it was true, as Conrad Gessner (1551: β 1v– β 2r) maintained, that the alphabetic organization of the material meant that the reader was not

obliged to read everything from start to finish – something which would be more of a chore than a useful exercise – but might skip from one point to another (*'non ut a principio ad finem perlegeat, quod operosius quam utilius fieret, sed ut consulat ea per intervalla'*), it was also true that this very possibility enabled the reader to learn with little effort. Furthermore, alphabetical registers made it possible to collect and arrange a huge quantity of words in common-places for the satisfaction of one's own vainglory, yet without any real knowledge assimilation; in this way, readers ended up like those who fill their rooms with weaponry but never go to war.¹¹

The result, as described by Helmut Zedelmaier (2007: 239), was a sort of 'scholarly barbarism' which *honnêtes hommes* of the 17th and 18th century set themselves against. Yet at the same time the management of the early filing cabinets based on loose entries ordered alphabetically was gaining ground as a successful form of 'scholarly book-keeping' (*gelehrte Buchhaltung*).¹² Indexing practice began to coincide with the possibility of breaking up knowledge into discrete chunks, to be combined at will via the register and so achieving a previously unthinkable level of complexity. But for this same reason, there was also opposition to this involitional resistance.

For example, Juan Caramuel (1664/1988, §3223: 31f, 34f) defended the usefulness of alphabetic indexes, particularly against those who looked upon Biblical concordances as one of the reasons for ignorance and laziness among contemporary theologians, and to be a bit more convincing, he added a short explanation of his own indexing method. The reader should insert symbols (a cross, an asterisk) in the margin of the text to highlight noteworthy topics; on the recto of a page divided into columns, a collaborator must then copy down all the marginal annotations marked by the reader. The lemmata should then be cut out with scissors, placed in a basket, and laid out on a board in alphabetical order (Ab, Ac, Ad ...). Caramuel expressed doubts as to the best form of reference: if indexers opted for the page numbering, the danger was that the index might become useless for editions of the same book in a different format; if on the other hand, they opted for the classic book/chapter subdivision, the reader was obliged to trawl through the whole section in search of the precise passage. A third solution was to number all the paragraphs of the text: the numbers would never change, regardless of the edition used.

The evolutionary advantage

Anyway, why bother learning such a form of information technology? Evolutionary advances are selected and stabilized only if they offer a clear advantage. For the neo-Darwinian theory the relevant advantage lies in producing and organizing more complexity through restriction – just as a road network, by selecting the best routes, facilitates an increase in traffic (Luhmann, 1997: 506). Increasing complexity coincides with an increase in combination possibilities.

This also holds true with respect to the social production and administration of knowledge. The printing press relieved scholars of the need to engage in time-consuming

memory training, thus freeing up cognitive resources which had been otherwise unavailable. Furthermore, by ultimately differentiating communication systems from psychic systems, the printing press created an autonomous and self-referential universe of publications, the standardization of which allows for univocal and networked references.

This was a consequence also of page numbering, since this not only made it possible to give the references a greater degree of precision (lacking in the indexes of the Middle Ages), but it also promoted the hitherto unusual habit of letting the writer be observed as observer before an anonymous audience of readers. Authorities which must be commented on were replaced by sources which might be cited. Through the use of footnotes – another paratextual tool made possible by the printing press – writers made the selectiveness of their own readings visible (what they had read as well as – and mostly – what they had not read) and in this way signalled the relevance of their own work. The compiler thus became an author.¹³

Those most familiar with this universe of publications might – as Ann Blair (2000: 73) says – come up with sophisticated thematic indexes and use cross-references to draw comparisons and highlight contradictions or interconnections which would have otherwise remained latent. In other words, the emancipation from the topical order encouraged knowledge management that moves away from repeating well-known topics and turns increasingly to producing information.

Evolution and evolvability

Evolution ultimately increases evolvability. It is a self-reinforcing process through positive feedback: deviance becomes normal and fosters further evolution. Typographic culture, as seen above, changes the intellectual attitudes of scholars and turns indexes into an irritation device by which to explore a book as if it were a virtual memory. Yet the printed text binds the reader to the given layout, and even though it makes skipping and breaking-up of the text possible, it forces the reader to proceed in a linear fashion, sticking to the structure of the book.

Typographic culture itself, however, supports layout-independent techniques for loosening and recombining knowledge: for instance, the construction of filing cabinets. In this case the index performs the same function, but the advantage is that the cabinet structure sets the reader free from the straitjacket of the printed text and from the differentiation of scientific subjects, thus paving the way for a network research that makes use of the machine's self-referentiality by triggering neighbourhood relationships (every entry may refer to further entries and every reference may potentially refer to further references) in order to produce surprises, or in other words information. Users can 'surf' the virtual memory by combining their own queries with the machine's self-produced constraints. Knowledge thus becomes a form of construction, texts take on the form of a hypertext, and that 'cosmopedic' ideal (Lévy, 1994/2002: 209–11; 1995/1997: 34f) is finally achieved, which has been made truly operative only recently by computers.

Notes

- 1 Strictly speaking, since adaptation is not a plan but an evolutionary invariant, it would be more correct to speak of 'exaptation' (the same structure is *a posteriori* apt to perform a function different from that which it was made for) (Gould and Vrba, 1982; Gould, 2002, ch. XI).
- 2 Evolutionary theory speaks of 'transitional stage' (cf Mayr, 1960: 362).
- 3 Zedelmaier (2007: 239) also maintains that the index should be understood as a 'forerunner' to knowledge management techniques which became established only after the invention of the printing press.
- 4 Academic literature usually distinguishes between systematic and alphabetical order. In this context however, the concept of 'systematic' really means 'thematic', or 'topical'. The concept of 'system' arises only later in typographic culture and has a semantic connotation which also concerns the practice of indexing. See below.
- 5 See Martin and Vezin (1990: 463); Clanchy (1993: 181). Rouse and Rouse (1982: 80) speak of 'abdication' from the intellectual duty of mirroring the order of nature in the order of knowledge.
- 6 The 'essential book of memory' of every medieval scholar, according to Carruthers (1990: 176).
- 7 Last but not least, Vincent Placcius (1689: 103f) suggested compiling the register in strictly alphabetical order, but onto loose cards that can be numbered.
- 8 Francis Bacon himself (1778: 81) admits that indexing, meant as a work of filing, has two defects: retardation of reading and relaxation of memory. According to Johannes Friedrich Hodannus (1702: A3r, A5v) those who take notes (*excerpta*) should learn by heart the headings of the entries (*titulos*), but if they do not trust their own memory, it is best for them to keep an alphabetical index.
- 9 Here used in its original sense of a 'treasure' or place, such as a box or casket, for 'storing' treasure.
- 10 See Gilbert (1960: 216–18) referring to the philosophical works of Bartholomäus Keckermann. Johann Heinrich Alsted (1649: 47) thinks of the encyclopaedia as the *systema omnium systematum*.
- 11 Cf Charles Sorel (1673: 15): 'Il n'y a que les Pedans & les Sophistes qui se chargent de Lieux communes pour avoir un magazin de belles paroles dont il font parade en tous lieux sans en tirer autre profit que la vaine-gloire. Ils ressemblent à ces Curieux oisifs qui ont des cabinets remplis de toute sorte d'Armes, & ne vont jamais à la Guerre.'
- 12 See the title page of the handbook on the art of note-taking by Vincent Placcius (1689). For discussion of the metaphor of 'scholarly bookkeeping' and its spread during the 17th and 18th centuries, especially in Germany, see Blair (2003: 22); Cevolini (2004: 233f; 2006: 49f).
- 13 Cf Grafton (1999). Niklas Luhmann (1981: 50) speaks of 'quoting habits' (*Zitiergepflogenheiten*): the question is whether the compilers' own thinking determines the authors to be quoted, or if the authors they quote determine their own thinking (and the answer, obviously, is both!).

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Text editing across cultures in a multilingual society: South African English as a case study

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John Linnegar explores the opportunities and challenges that present themselves to text editors in South Africa as a multilingual and multicultural society where SAE (South African English) is a rich mix of UK Standard English and several dialects; Dutch and Afrikaans; Malay; Indian English; French, Portuguese, and all nine indigenous official languages of South Africa (11 official languages in all).

Constitution; koeksister; bunny chow; tsotsi; vuvuzela; just now; sharp, sharp; eish!

I did buy me a jean, but I'm thinking I nogal made a mistake.

After the indaba, he send me the document he promise me.

Don't drive through the red robots without stopping; the traffic cops is monitoring you.

I'll be with you now-now, né.

If any or all of these expressions sound foreign to you, then you have just been exposed to South African English (SAE) in all its diversity! These are all examples of the influence of local languages on SAE. Pronunciation by non-native speakers, words adopted from their native tongues, the application of native-tongue rules of morphology and syntax, spelling, punctuation, and South Africa-specific lexicon are all illustrated here. In this paper, I attempt to illustrate the factors that exert an influence on the form and shape of English as an important lingua franca between speakers who do not share a first language in South Africa (Crystal, 2003).

SAE is a rich *banket* of many linguistic influences dating back to British occupation from the early 19th century: UK Standard English and several dialects; Dutch and Afrikaans; Malay; Indian English; French, Portuguese, and all nine indigenous official languages of South Africa (11 official languages in all). The 11 different official languages represent five different language families with limited mutual intelligibility, so the need for a widely used lingua franca is clear (Onraët, 2011).

Lexicographer Jean Branford describes SAE as 'a mixed bag ... a lingua franca among those to whom English is, and many to whom English is not, their mother tongue' (Branford and Branford, 1997). This makes SAE a diverse, rich, colourful and vibrant language, even discounting modern external ('foreign') influences.

In this linguistic microcosm, SAE is the lingua franca (though a minority language and only the fifth most spoken countrywide) (Crystal, 2007). It's the language of education, business and government. As a result, despite the fact that SAE is the world English closest to British Standard English, it is nevertheless heavily influenced (and at times altered beyond recognition) by its non-native users.

Because of our linguistic diversity and complexity, for English native speakers in South Africa 'editing across (blurred) borders' is second nature: while we model SAE on UK (as opposed to US) English (crossing other 'borders' by standardizing on reference works from elsewhere in the English-speaking world), we editors have to understand the several Englishes written and spoken by non-native-speaking authors as well as their cultural origins. Some examples are Afrikaans speakers, speakers of the unique dialect that is SA Indian English, and black Africans who speak isiZulu, isiXhosa (Nguni languages), Sesotho and Setswana (Sotho languages). They are all required to produce documentation in English, as are users of SAE who are heavily influenced by the idiom, syntax and morphology of the other official languages. And from time to time we also have to ask the question, 'Is this word "foreign" to SAE or not?' because this will determine our editorial treatment of such words.