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'Borne back ceaselessly into the past': *Glossa*, hypertext and the future of legal education[1]

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What is everywhere passes unnoticed. Nothing is more commonplace than the experience of reading, and nothing is less well known. Reading is taken for granted to such an extent that at first glance it seems nothing need be said about it.[2]

Abstract

In this article I shall argue that hypertext in most of its manifestations requires us to adopt reading habits we are unfamiliar with. As I shall show, many of these reading habits have striking parallels with glosses and with forms of reading attention evolved by medieval readers, forms which, since the rise of the printed book in the fifteenth century, have gradually died out. I shall suggest that knowledge of these reading habits could help us not only to understand the advantages and disadvantages of reading hypertext, particularly for academic lawyers and law students, but the means by which electronic text are gradually transforming the way we read text itself. First, we shall examine medieval ways of reading text. Then we shall analyse how one form, the gloss, embodied these reading methods. Next, we shall define hypertext and then compare it to medieval writing and reading. Finally we examine the effects that social software may have upon legal educational methods, and the analogies between social software and glossed literature.

[1] **Draft paper** presented to BILETA Conference, 2006. The paper forms a chapter of a larger argument concerning the jurisprudence and practice of legal education I very much welcome comments on this draft – paul.maharg@strath.ac.uk

[2] Tzvetan Todorov, *Les genres du discours*, Editions du Seuil, 1978, translated by Catherine Porter, *Genres in Discourse*, Cambridge, Cambridge University Press, 1990, p.39

Introduction

That technology has a profound effect upon society cannot be doubted.[3] That it is socially constituted, and mediated by culturally embedded practices is also widely accepted.[4] That information technologies in particular are having a profound effect upon the practice and theory of law, one need only look to this conference, and the conference proceedings of previous BILETA conferences. In legal education, while it is becoming more evidently there through the ubiquitous use of learning management systems, the use of ICT is still variable. We have yet to attain what Ernst Cassirer called 'mature constructivism', namely the self-reflexive view of the development of technology within the history and culture of of the domain.[5] In part this may be because of our focus upon learning, at the expense of other contextual factors such as learning ecologies, social economies, motivation and prior knowledge. It may also be because we do not investigate sufficiently the introduction and development of technology within legal education. As Twining pointed out some time ago, a knowledge of our discipline is essential to who we are; and we have forgotten our own story in this regard, which is filed away under a different directory called legal history, or history of legal education.[6] It is the purpose of this paper to uncover some aspects of that forgotten story, which are valuable not in a historical sense only, but

[3] Winston, B. (1998) *Media Technology and Society: A History: From the Telegraph to the Internet* NY, Routledge; Nardi, B.A. (1996) *Context and Consciousness: Activity Theory and Human-Computer Interaction*, Cambridge, MA: MIT Press; Slevin, J. (2000) *The Internet and Society*, Malden, MA: Polity Press; Einon, G *et al* (1995) eds, *Information Technology and Society: A Reader* London, Open University Press

[4] See for example Suchman, L. (1987). *Plans and Situated Actions. The Problem of Human Machine*. Cambridge, Cambridge University Press; MacKenzie, D. (1990). *Inventing Accuracy. A Historical Sociology of Nuclear Missile Guidance*. Cambridge Mass, MIT Press; McGrew, W. C. (1992). *Chimpanzee Material Culture. Implications for Human Evolution*. Cambridge, Cambridge University Press; Lemonnier, P., Ed. (1993). *Technological Choices. Transformation in Material Cultures since the Neolithic*. London, Routledge; Bijker, W. E. (2001). Social Construction of Technology. In N. J. Smelser & P. B. Baltes (Eds.), *International Encyclopedia of the Social & Behavioral Sciences* (Vol. 23, pp. 15522-15527). Bijker, W. E. (1995). *Of Bicycles, Bakelites and Bulbs. Toward a Theory of Sociotechnical Change*. Cambridge, MA: MIT Press; Bijker, Wiebe E. "The Oosterschelde Storm Surge Barrier. A Test Case for Dutch Water Technology, Management, and Politics." *Technology & Culture* 43 (2002): 569-84; Latour, B. Woolgar, S. 1979: Laboratory Life: the Social Construction of Scientific Facts, Sage, Los Angeles, London; Werner Rammert, New Rules of Sociological Method: Rethinking Technology Studies *British Journal of Sociology*, Vol. 48, No. 2 (Jun., 1997) , pp. 171-191

[5] Cassirer, E. (1946) *Language and Myth*, quoted in Sherwin, R.K. *et al* (2005) Law in the digital age: how visual communication technologies are transforming the practice, theory, and teaching of law, SSRN, http://ssrn.com/abstract=804424

[6] Twining W (1967). Pericles and the Plumber 83 MLR 396. See also Twining, W. (1997) *Law in Context: Enlarging a Discipline*, chapter four, Oxford: Oxford University Press

also because they help us understand some of the changes we are undergoing in our own technological revolution in the early twenty-first century.

Part 1. Medieval text and the glossed manuscript

Problems of interpretation

A number of commentators draw comparisons between the move from manuscripts to printed texts, and from printed texts to hypertexts. The comparison, frequently invoking the magic of Gutenburg (*pace* McLuhan) is a dangerous one, but it is illuminating for what we are about to discuss, mainly because it illustrates first the difficulties in comparing past and present, and second because it illustrates the dangers of making assumptions about forms of communication, whether past or present.

A good example of this is the relationship between manuscripts and books. It is axiomatic that the earliest books, that is, incunables, imitated the form of manuscripts. Printers copied the overall shape, letterforms (rubrics, incipits, large initials and illustrations), bindings and parchment sizes so that their books were sometimes mistaken for manuscripts. For this reason it was until recently assumed that printers simply imitated manuscripts either because they wanted to preserve the uniqueness of the manuscript (and also its high price), or else they imitated manuscripts simply because it was the only literate form available. But as Margaret Smith and others have pointed out, the concept of imitation does not do justice to the complexity of the relationship between late medieval manuscripts and incunables. By examining the ways in which printed texts appropriated the form and texture of manuscripts she came to the conclusion that printed books did not so much imitate as emulate manuscripts, and principally for economic reasons.[7]

The distinction between emulation and imitation is narrow, but it is important to the way in which printers perceived the legacy of the manuscript, and how they used this in order to articulate the concepts of information linkage and hierarchy within the text. Thus, rubrication was left to scribes to add by hand to printed texts not merely

[7] Margaret M. Smith, 'The Design Relationship between the Manuscript and the Incunable', *A Millenium of the Book: Production, Design and Illustration in Manuscript & Print, 900-1900,* edited by Robin Myers & Michael Harris, St Paul's Bibliographies, Winchester, Oak Knoll Press, Delaware, pp.23-43; p.25

because it was difficult to print red text, and the cost-effectiveness of the process did not justify the attempt; but because red text was an integral part of the reading schemata in late medieval texts. It was used in decoration, and for functions such as the initial strokes in capitals 'headings, text-, chapter- and sub-division beginnings, lemmata and references to authorities'.[8] If a genre which had hitherto appeared with rubrication as an integral part of its meaning structures suddenly appeared without red, it would have seemed highly odd to its readers. Printers thus were not so much following rubrication *per se* as the conventions by which meaning was created and ordered within the text. It took some time for printed books to develop a quite different set of conventions appropriate to its form which would be recognised by a book's readers: the evolution of the incipit into the title-page (almost entirely unknown in manuscripts) is a good instance of this.[9]

In a similar way, I would argue, generalisation regarding the relationship of one form of textual meaning to another (here, that of text to hypertext) is fraught with danger. Cognitive research into how we read text, and how we read hypertext is beginning to inform our understanding of the many complex processes involved in our relationships to printed and hypertext text. Such research is one method of gaining an understanding of how we make meaning from text. However texts and the means by which we understand them are not isolated epiphenomena: they are produced in a social, historical, cultural, often disciplinary nexus which serves to create the meaning we attribute to the text and its author. This nexus has been described in different ways: Bourdieu's 'field of cultural production', Kuhn's paradigm, Foucault's episteme and theory of the supplement, the Annales school's concept of *outillage mental*, to name but a few.

There are many contrasts between these approaches; but all emphasise the contextual complexity of a text, and how change of context involves change of textual meaning. For this reason, rather than describe comparisons between print and hypertext interfaces, I shall later in this paper attempt to consider how hypertext transforms or

[8] Smith, p.37. As Carruthers points out, scribes were sometimes described as the 'painters' of manuscripts, and she notes the etymology of the Latin verb *distinguere*: '"divide up," "mark", "punctuate", and "decorate", all activities pertaining to the fundamental task of *divisio*. (p.225)

[9] Smith, pp.35-6. See, for example, the first page of Alciati's *De Verborum Significatione*, reproduced at figs 4 & 6, pp.44 & 46 in Ian Maclean, *Interpretation and Meaning in the Renaissance: The Case of Law* (Cambridge UP, 1992, Ideas in Context, vol.21), discussed at 1.4.3, pp.37-8

skirts the underlying conventions which, almost unconsciously, we apply when we read texts. In effect it enacts a type of *clinamen* or swerve around print resources, which accounts for many of the difficulties we had with it as a technology in the early days of the internet. In doing so, it points in the direction of technologies that lie *behind* the print revolution of the fifteenth century and which have been generally eclipsed by that revolution – in particular the technology of the glossed manuscript.

If comparison of hypertext to text is difficult, then comparison of hypertext with medieval *glossa* would appear to be little short of presumptious. If we attempt to compare historical forms of writing with one form from our own period, it could be argued, as relativists do, that we cannot find anything in the past except what our own preconceptions and analyses of it supply us with. Or we could take the opposite view, that common, albeit evolving forms of disciplinary study exist through time (eg legislation, courts, cases, text books) and are capable of supporting sustained historical enquiry. I shall take the view here that it is possible to understand, in a limited way, aspects of the cultural production of textual meaning in past societies and that, in doing so, it is possible to achieve a measure of distanciation from our own practices sufficient for us to begin to understand social and technological processes that may hitherto have remained hidden. It may be argued that this use of the past is strongly teleological, and I would not deny this. But a teleological use of the past does not presuppose a Whiggish view of history and the relentless progress of cultural development which that view espouses. Far from it: in this article I want to argue that in a number of important respects, hypertext and the wireless web recovers a sense of the text which, since the rise of Ramist propaedeutics, Renaissance hermeneutics and above all the printed text, we have lost. The *locus classicus* for this sense of text is the *glossa*. Before we discuss this textual form in its context (a context which may help us to begin to appreciate the remarkable properties of this scholarly tool), there are a number of debates surrounding interpretation and reading which require to be outlined.

Commentators on communication have taken a variety of complex positions with regard to the effect that communicative media have had on historical cultures; and the debate has continued for the past forty years or so. On the one hand there are those who claim that the move to literacy from orality brought about profound changes not

only in the general culture of a society, but also in modes of cognition.[10] Amongst their claims, they argued that written forms separated text from context, made the concept of grammar possible, and (perhaps most interestingly for legal scholars) made possible the concept of context-free logic.[11]

Against the positions advocated by this more radical group are those of what might be regarded as less technologically-determinant commentators.[12] They argued that it was impossible usefully to distinguish the effects of literacy from those cultural forms mediated by educational processes; and that the evidence for wholesale cognitive transformation was weak if present at all in societies that had undergone transmission changes. This position has been confirmed in the work of Elizabeth Eisenstein, Michael Clanchy and Mary Carruthers; and it is the approach that is adopted, with some modification, in this paper. It should be noted that none of the above commentators deny the profound changes wrought in society by technology, whether by script or by book. They analyse in detail the introduction of technology, its use and effects, on particular societies..What is useful about Carruthers' research, for example, is that she shows how contemporary cognitive research can be applied to the activities and procedures involved in medieval reading, writing and memory. Her comparisons of the mnemonic techniques of Cicero and Quintilian, as these were embodied in the texts and practices of Hugh of St Victor and others, for instance, and the comparisons she draws between this and cognitive research into memory and writing serves to demonstrate the complexity of medieval textual practices.

Manuscript writing

If the more radical approach to literacy and cognition is not adopted in this paper, there are still many strands of the arguments that are valuable to our understanding of medieval manuscript culture. Ong, for example, points out the visual quality of much

[10] See for example Goody, J. & Watt, I. (1963). The consequences of literacy. In J. Goody, Ed., *Literacy in Traditional Societies*. Cambridge: Cambridge University Press; Havelock, E. (1963). *Preface to Plato*. Cambridge: Cambridge University Press; Havelock, E. (1976). *Origins of Western Literacy*. Toronto: OISE Press; Ong, W. (1976). *The Presence of the Word*. New Haven: Yale University Press; Ong, W. (1982). *Orality and Literacy*. London: Methuen; Olson, D.R, (1994) *The World on Paper*;

[11] Michael Heim aptly called this the 'transformation theory' – Heim, M. (1987) *Electric Language: A Philosophical Study of Word Processing* New Haven, Connecticut: Yale University Press

[12] Cole, M., Gay, J., Glick, J., & Sharp, D. (1971). *The Cultural Context Of Learning And Thinking*. New York: Basic Books; Scribner, S. & Cole, M. (1981). *The Psychology of Literacy*. Cambridge, MA: Harvard University Press; Greenfield, P. (1983). Review of *The Psychology of Literacy* by S. Scribner and M. Cole. Harvard Educational Review 53, 216-220.

medieval textuality.[13] As he says 'medieval logic is ... a logic with a very high visual component'. This 'visualist drive' is 'marked by an increased sensitivity to space and a growing sophistication in ways of dealing with quantity and extension, which comes to a climax not only in the neutral Copernican cosmic space that supplanted the less abstract, more crudely physical space of 'favoured directions' in Aristotelian cosmology, but also in even more subtle psychological shifts felt through the whole of society and affecting man's entire outlook on reality'. This sensitivity to space is apparent, says Ong, in medieval art and in the rules and procedures used by scribes to arrange words on pages – lines of research taken up by Carruthers and many others.

One example of this use of space Ong remarks upon is the spacing of words upon the page. It is impossible to be sure how medieval readers understood their texts, but what we do know about their textual practices reveals that their understanding of text, and their understanding of what they were doing when they read, wrote, remembered and used texts was radically different from our own.

We can appreciate this if we consider aspects of the writing systems developed in the early medieval period. Thus, medieval writers differed from modern writers in many respects, not least that they were closer to the final product which their readers would use. In this respect, medieval writers contradict Roger Stoddard's dictum regarding the separation of modern writers from the sphere of book production:

> Whatever they may do, authors do not write books. Books are not written at all. They are manufactured by scribes and other artisans, by mechanics and other engineers, and by printing presses and other machines.[14]

Being closer to the methods of production, they were able to make decisions regarding their physical materials. One of the first decisions, apart from which instrument to use for writing, was which material to write upon. After 1307, there were three available to writers.[15] Wax tablets inscribed with a stylus were used for

[13] Ong, W. (1986) Writing is a technology that restructures thought. In Baumann, Gerd, *The Written Word: Literacy in Transition*, Clarendon Press, Oxford, 226

[14] Roger E. Stoddard, 'Morphology and the Book from an American Perspective', *Printing History*, 17 (1990), pp.2-14, quoted in Roger Chartier, *The Order of Books: Readers, Authors, and Libraries in Europe between the Fourteenth and Eighteenth Centuries*, translated by Lydia G. Cochrane, Polity Press, London, 1994, p.9

[15] That is, if we discount tally-sticks, a very common medieval administrative tool. The introduction of paper made from rags was a late medieval and very much a local phenomenon. According to

brief writings, summaries, quick thoughts. The wax was re-usable, since the wax could be smoothed over and used again. Paper was relatively scarce before the advent of printed books, and was used for informal writings (perhaps one reason why so little of it has survived). Parchment or *membrana* was the commonest writing material. Parchment was commonly the skin of cattle, sheep or goat which was scraped, stretched and prepared for writing. It was used for a variety of writing purposes: for pocket-sized books, for administrative 'pipe rolls', records of fines and plea rolls, notatarial instruments, ecclesiastical documents such as Gratian's *Decretum*, or considerable literary productions such as Books of Hours or the Winchester Bible. It was a highly durable material, and writers were aware of this when they committed their words to the *membrana.* As a result they wrote with a different sense of the status of the text than a modern writer would have, writing on paper. In the first place, they would be aware that it was the unique text they were composing, by *ars dictaminis* or actually writing, which would be the reader's text. Secondly, this text was not transient or fragile like paper or wax, but long-lived: later medieval writers had proof of this because of the survival of previous manuscripts from much earlier periods.

If relationships to materials were different, the act of penning words onto the page also involved radically different procedures, conventions and cognitive processes to our own writing practices today. In late antiquity, from around 200AD onwards, the main form of writing was *scriptio continua*, that is, continuous writing without spaces between words or sentences. As M.B. Parkes has pointed out, word separation, was first used in the West by Irish scribes, whose first language would not have been a Romance language, and to whose readership Latin was an alien language:

> Since Irish was not a Romance language, its speakers tended to regard Latin primarily as a written or 'visible' language used for transmitting texts: they apprehended it as much by the eye as by the ear. (2)

As a result, Irish scribes developed new graphic conventions which, as Parkes points out, relied on the ancient grammarians Donatus and Priscus, who gave them a sense of

Clanchy, p.120, paper was scarcely known in England before 1307, when it is first mentioned in a register from King's Lynn

the word as 'an isolable linguistic phenomenon' (3). The scribes arrayed these isolated parts of speech on the page by separating them with spaces.[16]

This new relationship to representation of language on the page extended also to new forms of punctuation. These also followed grammatical units: the *punctus* or period, the system of marks placed at different heights in the line to indicate the importance of the pause (8), and the small '7'-shaped mark which indicated the end of sections. Also employed was the *diple* or arrowhead, an early form of quotation mark, used whenever scripture was quoted. In Anglo-Saxon mss, this is used in two forms: a large *diple* to indicate the start of a quotation, and a smaller one to indicate its continuation in subsequent lines. The beginning of the quotation was marked by a *hedera* or ivy leaf, a device common throughout Europe, and one of the oldest punctuation marks.[17] As Parkes points out, Bede introduced a 'system of letters placed in the margins to indicate the patristic sources for his commentaries', eg AM for Ambrose, HR for Jerome, with the first letter sited at the start of the quotation, and the second indicating the end (15). Parkes suggests that this 'may well be the ancestor of the modern footnote' (15); it is certainly one of the roots of the twelfth century gloss. What is interesting from the point of view of a modern reader is that the paratactic material appears not at the bottom of the page, or the end of a section or the end of the book, but in the margin beside the text. As paratactical material grows to commentary, the margins of texts grow to accommodate it. But the siting of the material in the margins has an interesting effect on the status of the commentary. It becomes much more a dialogue of (near) equals, or a debate between text and commentary. In our modern books we have no exact parallel. The footnote is clearly *parataxis*, not *taxis*, and even when the footnote is placed beside the margin, it is still subordinate to the main text on the page.

These methods of arranging text itself so as to give the reader a sense of the organisation of meaning on the page came to be further developed throughout the

[16] In contrast to their practice when transcribing their native language, which they did according to syllable. For further information, see M.B. Parkes, *Pause and Effect: An Introduction to the History of Punctuation in the West* (London), and Paul Saenger, 'The Separation of Words and the Physiology of Reading' in *Literacy and Orality*, edited by David R. Olsen and Nancy Torrance (Cambridge UP, 1991), pp.198-214, p.210

[17] Parkes cites an example of a text on pp.108-10 of *Scripts, Scribes and Readers*: Oxford, Bodleian Library, MS Bodley 819, fol. 16. On the *diple*, see P. McGurk, 'Citation Marks in Early Latin Manuscripts'.

twelfth and thirteenth centuries. Sometimes these devices were employed in order to aid memorisation of textual meaning. Mary Carruthers has highlighted the extent to which the layout of the page was powerfully governed by mnemonic concerns.[18]

Sometimes, the devices were alphabetic, and were designed as finding tools. The collection of canonical texts assembled by Cardinal Deusdedit in four books with a list of subjects dealt with by each book, is an early example of this.[19] As scholarship within the schools grew, there also grew the necessity to find material within a text. Some texts, such as Gratian's *Decretum*, were in effect finding tools themselves, consisting as they do of textual quotation for the most part. Other texts required special marks or layout design to facilitate searching. Rouse & Rouse, in their study of these techniques have summarised them: '[i]nnovations in layout of the manuscript page are surely the most highly visible of all the twelfth-century aids to study -- such techniques as running headlines, the size of initials, paragraph marks, cross-references, and citation of authors quoted'[20] Rouse & Rouse cite Bosham's edition of Peter of Lombard on Psalms as an example of the highly elaborated forms of these tools (p.199). Their conclusion gives a sense of how important these devices are, not only for medieval readers, or even modern readers, but for modern readers of medieval texts:

> The utility of the devices of layout worked out in the twelfth century is evident: we still use virtually all of them today, save that we have moved the marginalia to the foot of the page. And whenever one has occasion to turn directly from use of a well-laid-out twelfth- or thirteenth-century manuscript to look for something in the exceptional modern printed text that does *not* have, for example, running headlines or clear paragraph divisions, one has an annoying sense of lost ground. (pp.200-201)

The introduction of alphabetisation, as Rouse & Rouse point out, is similarly symptomatic of a 'manifestation of a different way of thinking' about both text and its

[18] See Carruthers, M. (1998) *The Craft of Thought: Meditation, Rhetoric and the Making of Images, 400-1200* Cambridge University Press, chapters 1 and 2.
[19] *Die Kanonessammlung des Kardinals Deusdedit*, ed by Victor Wolf von Glanvell (Paderborn, 1905; original text written c. 1083-87), cited in *Authentic Witnesses: Approaches to Medieval Texts and Manuscripts*, Mary A. Rouse & Richard H. Rouse, (University of Notre Dame Press, Illinois, 1991), p. 194
[20] *Ibid*, p.198

meaning (p.204). From early on, alphabetisation had been employed for simple lists; but its use within large and authoritative texts signalled a change in the way in which such texts were being read. It reveals on the part of the writer 'a tacit recognition of the fact that each user of a work will bring to it his own preconceived rational order, which may differ from those of other users and from that of the writer himself' (p.204). This is particularly evident in the *distinctio* collections of the twelfth and thirteenth centuries: Peter of Cornwall's *Pantheologus*, or the *Alphabetum* of Peter of Capua, for example (pp.211-14).

The thirteenth-century scholarly text

It is the thirteenth-century scholarly manuscript which demonstrates the sophisticated use of textual devices. At this time, there was an increase in the numbers of lay people who could read and write.[21] The variety and numbers of manuscript books, and legal and administrative documents increased substantially, as did their dissemination, giving rise to further literacy.[22] The growing universities stimulated demand for more copies of books (giving rise to the *pecia* system of book copying and dissemination), while the model of the university college library was quite different to that of the ecclesiastical library. The new Aristotelian learning and the requirements of the mendicant orders for texts which would support their work gave rise to new forms of scholarship and more complex forms of learning. The comparison between the attitude towards reading taken by the early Benedictine Rule, for example, in comparison to that of the Dominican, could not be more marked. As Petrucci remarks, the 'earliest Benedictine monasticism was not a monasticism of *scriptoria* and books': monks were not allowed to own writing materials, and 'the *lectio* of the earliest Benedictine monasteries was limited tothe *Regula*, liturgical books, the Bible, and a few other religious texts'.[23] Reading went hand in hand with

[21] In a famous passage Bonaventura defined four ways in which books could be written: by a scribe who 'scribit aliena, nihil addnedo, vel mutando', by a compiler who 'scribit aliena, addendo, sed non de suo', by the commentator who 'scribit et aliena et sua', and by the author who 'scribit et sua et aliena, sed sua tamquam principalia' (*Commentarium in I librum Sententiarum* in *Opera Omnia*, vol I (Ad claras aquas, 1882), pp.14-15. To this should be added the fact that many *auctores* did not write their texts, but dictated them to scribes. See also Mary Carruthers' discussion of Augustine account of Ambrose reading in *Confessions* VI, 3 (pp.170-74) and Eadmer's account of Anselm's compositional practices (pp. 211-14)

[22] This is one of the themes in the sophisticated argument of Michael Clanchy in *From Memory to Written Record: England 1066-1307* (Blackwell, Oxford, second edition, 1993), p.21

[23] Petrucci, p.34

prayer and *meditatio*.[24] By contrast, thirteenth-century scholarly reading involved textual comparison, searching and collation, and the application of textual scholarship and logic to the text by the reader. New reading purposes required new forms of text. Thus Dominican preachers were equipped with texts which they carried around with them as aids to preaching in the mission fields of town and country.[25] As Rouse and Rouse comment,

> Early thirteenth-century Bibles not infrequently contain, as well, brief indexes, in rational or alphabetical order, of biblical 'themes' for preachers -- for example, the index of texts useful for preaching against the Manichees (that is, the Cathars) that is found in early Dominican pocket Bibles.[26]

These indices were achieved by using alphabetisation, arabic numeration, division into chapters and *distinctiones*. Passages were further divided into sevenths using the first seven letters of the alphabet A-G, which then served as 'the smallest and most specific unit of reference'. This could then be used in conjunction with chapter-reference; or 'as the Bruges Cistercians did, with reference to a folio and column, to delimit the portion of the column intended'.[27] Other devices used included consideration of the best order of a work and communicating this to the reader (*ordinatio*); use of *rubricae, litterae notabiliores,* majuscules, paraph marks, running titles.

These devices were invaluable as guides to the more sophisticated forms of writing being developed by scholars in the thirteenth century. The *compilatio* was one of these. The *compilatio* was a compilation of extracts of works of authority or *auctoritates*, chosen by the compilator and re-arranged, often without commentary, so

[24] See J. Leclercq, *The Love of Learning and the Desire for God* (New York, 1961), pp.88-91
[25] Although as Rouse & Rouse point out (p.247), the 'need for preaching tools was not limited to, nor did it originate with, the mendicant orders' (p.247)
[26] Rouse & Rouse, p.215. As evidence, they quote BN lat 174 (saec. XIII) fols. 18iv-203, and University of California, Los Angeles, Research Library MS 170/348 fols. 383v-385v, in which the index ends 'Explicit summa breviata contra Manicheos et Paterinos, et contra Passaginos et circumcisos, et contra multos alios hereticos qui nituntur subvertere veritatem [...]'
[27] Rouse & Rouse, p.244

that its effectiveness as a genre lay in its juxtapositional strategies.[28] Parkes' comments on the interaction of *ordinatio* upon *compilationes* (indeed the necessity for a clear and precise *ordinatio* in order to guide readers through the bewildering mélange of extracts) are a valuable reminder of the instrumentality of reading within medieval culture, when so much authority attached to ancient and ecclesiastical *auctores*. In this respect the *compilatio* could be used on its own or as a bibliographical aid to another text.

The *compilatio* spawned a scholastic industry. 'the big compilers like Vincent of Beauvais and Hugh of St. Cher had smaller compilers to help them', while scribes learned the new forms of abbreviation and conventions, and applied them, in the manner of a journal's house style, to an author's text (Parkes, p.69). These changes in reading and writing affected the legal world as much as that of Church scholarship, and is evidenced not only by the forms of books produced but by the sheer numbers of them owned by private readers. As Petrucci points out,

> While in 1273 the library of the late Accursius (or what remained of it) counted only 73 volumes, all in law except for a lonely Vegetius, in about 1350 the library of Giovanni Calderini, another jurist and professor at Bologna, comprised 294 books. These were ordered by subject in twelve sections, showing that alongside the crushing presence of juristic texts (more than 50 works) and of works of philosophy and theology (81) there was also a broad representation of classics (27) and biblical and patristic literature (more than 50 works).[29]

Parkes usefully summarises the effect of all this:

> The late medieval book differs more from its early medieval predecessors than it does from the printed books of our own day. The scholarly apparatus which we take for granted -- analytical table of contents, text disposed into books, chapters, and paragraphs, and accompanied by

[28] See M.B. Parkes, 'The Influence of the Concepts of *Ordinatio* and *Compilatio* on the Development of the Book' in *Medieval Learning and Literature*:*Essays Presented to R.W. Hunt,* edited by J.J.G. Alexander and M.T. Gibson (Oxford University Press, 1976), pp.115-40; reprinted in M.B. Parkes, *Scribes, Scripts and Readers: Studies in the Communication, Presentation and Dissemination of Medieval Texts*, London, The Hambledon Press, 1991, pp.35-70, pp.62-64

[29] Armando Petrucci, *Writers and Readers in Medieval Italy: Studies in the History of Written Culture*, edited and translated by Charles M. Radding, Yale U.P. New Haven, 1995, p.210

> footnotes and index -- originated in the applications of the notions of *ordinatio* and *compilatio* by writers, scribes, and the rubricators of the thirteenth, fourteenth, and fifteenth centuries. (Parkes, p.66)

This is a key point, as we shall see when we consider hypertext. Medieval writers developed and used these research tools not as a result of the new technology of printing, but in response to the increasing demands of quantity and sophistication in the cognitive *materia* that they required to deal with.[30] They altered their own technology to deal with this.[31] But principally, there was a need in readers to order and search the greater quantities of complex materials with speed and precision; and writers responded to this.

Law, reading and writing

In the legal field, Clanchy gives evidence that the conventions of the form of medieval text was similar to that of other forms. He makes the point that Carruthers makes about the use to which medieval writers put signs in documents as ways to index and track the information in the document:

> The use of a sign, like [a] hand with outstretched index finger, to mark a particular item in a document was a simple way of facilitating the retrieval of information. Such signs are not essentially different from the rubrics, capital letters, running titles, introductory paragraph flourishes, and other aids to the reader which are usual in medieval manuscripts. The royal records, from Domesday Book and the pipe rolls onwards, are particularly notable for their clear and orderly layout. Marginal abbreviations and symbols were systematically used to extract payments due to the crown from a roll and distinguish the business of one county or jurisdiction from another. It is usually easy to identify a particular item on a membrane or page of a royal document. The medieval archivist's problem lay in not knowing which page or roll to search in the first place. (p.172)

[30] Contrary to the argument of Walter Ong, for whom the advent of printed books gave rise to indices and alphabetization of arrangement. See Rouse & Rouse, pp.254-55

[31] For example, parchment was scraped thinner so as to allow for more pages within the same size of book; pens were use with a central point instead of an oblique, allowing for a more cursive, flowing hand and smaller letters -- very useful when compiling a gloss to a main text

Clanchy effectively corroborates what Carruthers says about the importance of order on the page, and applies this generally to administrative documents and legal documents. Clanchy goes on to quote Hugh of St Victor, using Carruthers' translation and general approach:

> To fix something in the memory, it is of great value when we are reading to take pains to imprint (*imprimere*) on the memory through the imagination not only the number and order of the verses or sections in the books, but also at the same time the colour, shape, position and placement of the letters: where we saw this written down and where that; in what part (of the book) and in which place (on the page) we saw it positioned -- whether at the top, in the middle, or near the bottom; in what colour we discerned the shape of a particular letter or the ornament on the surface of the parchment. I think there is noting so effective for exciting the memory as meticulously paying attention to the surroundings of things (*circumstantias rerum*), to those features which can occur accidentally and externally.[32] (p.172-3)

Hugh of St Victor is here giving reasons as to why books should be ornamented. As Clanchy points out, '[e]ven the most business-like manuscripts required some embellishment, in the form of rubrics and enlarged initials, to enable the user to find his place in the book' (p.280). He cites the Domesday Book as an example, with its 'vermilion paint for three distinct types of rubrication -- capital letters for the names of shires and other headings; shading for the initial letter of each paragraph and certain abbreviations; underlining for the names of places and tenants' (p.280). He also cites more prosaic legal texts, namely parliamentary statutes in the Harvard Law Library collection, dating from 1290-1310. They contain a variety of devices, from illuminated initials, rubrics and figures which index contents (Clanchy cites 'a boar and a deer in a wood and a man shooting a deer with a longbow [which] accompany the text of the charter of the Forest' (p.281).

[32] Clanchy quotes thus: 'Liber Magistri Hugonis Sancti Victoris', ed W.M. Green, in *Speculum* xviii (1943), p.490, lines 19-27. Translation based on translations by Carruthers, *Memory*, p.264; G.A. Zinn, in *Viator*,v (1974), pp.211-34; C.P. McMahon, in *History of Education Quarterly* 111 part I (1963), pp. 33-7, as noted by J. Bowen, *A History of Western Education* (1975) II, pp.67-72

As Clanchy and many other commentators on medieval reading and writing point out, these devices had mnemonic purposes:

> Learning by heart according to Hugh's method did not mean the oral repetition of phrases until their sounds became a recording, but the visual scanning of a page until its images were imprinted in the mind's eye like a photograph. The medieval schoolmen 'printed' books, before the invention of the mechanical process of printing, by scanning texts and accessing 'through the imagination' the pages imprinted on their minds. (p.173)

As an example of the devices that twelfth-century writers and readers would adopt to aid them in their reading, either scanning or memorisation, Clanchy cites the system of Robert Grosseteste, chancellor of Oxford university and bishop of Lincoln. He devised a code of around 400 symbols, placed in margins, to identify and summarise topics: upturned V, crescent moons, dissecting lines and figures. As Clanchy puts it, 'Grosseteste located them on the pages he read in order to map his path through the thicket of scholastic texts' (p.179). These marginal annotations are similar in their indexing effects to the plea roll clerks' 'practice of making annotations in the margins and cross-referencing entries' (p.180). Clanchy raises the query as to why alphabetical indices were not constructed for these administrative texts as well as the philosophical and theological texts Grosseteste would have dealt with as a schoolman. Alphabetical indices did of course exist. As we have seen,the Dominican Friars had used them and compiled a concordance to the Bible in 1239, for instance, and a union catalogue of books in 180 ecclesiastical libraries (p.181). But Clanchy is right when he observes that '[m]edieval intellectuals were ambivalent towards alphabetical order because it militated against their sense of hierarchy' (p.181).

Perhaps most interesting of all, he points out how the use of documents changed the traditional ways of pleading. '[F]ormal speech began to be learned by studying books instead of hearing the words of others' (p.276). These books first appeared around the middle of the thirteenth century, and modelled the dialogues which would commonly occur in legal situations -- a witness's oath, a vassal's oath, and so on. Clanchy points out that the use of such dialogues by Grosseteste among others may well derive from the *ars dictaminis* of written culture. Certainly, the oral culture of courts is displayed

in the records of actual speech noted in the Year Books, and Clanchy notes the parallels between this form of recording cases and 'the use of dialogue in romances and with the earliest English drama in French', as well as 'the jongleurs' "stage scripts", in which the vernacular romances are thought to have been first recorded in writing.' (pp.277-8)[33]

Summa

The *summa* was a key form of scholarship in the thirteenth century. As the term suggests, its main aim was to synopsise the scholarship on particular subjects. It did so by juxtaposing quotations from authorities, and by providing commentaries which expounded the meaning and context of the quotation. It is exemplified by Abelard's *Sic et Non* (c.1130), which brought together authorities and placed them systematically in juxtaposition so as to compel the reader to use forms of dialectical reasoning in order to make sense of apparent contradiction.[34] As Clanchy puts it (p.108), compiling '*summae* was a reaction to the proliferation of documents and books in the twelfth and thirteenth centuries; they were intended as a guide through the maze, although sometimes they added to the confusion'. Defined in this broad way (as opposed to a definition of the term to those works which explicitly call themselves *summae*, such as the *Summa* of St Thomas Aquinas) the *summae* can include a wide variety of text types. The genre includes, as Clanchy exemplifies them, 'formularies and treatises which instruct by citing examples in how to conduct law courts, draft charters, cast financial accounts, manage estates, and so on'. He also adds to this list the 'collections of papal decretals and parliamentary statutes' which lawyers both canon and civil used. An example of this is Huguccio's *Summa* of Gratian's *Decretum*. Whether or not the *summa* can be stretched this far as a genre, it is clear that the main thrust is to reduce information, to condense meaning, and this required a clear knowledge of the audience for which the text was being written. To use the terms of reader-response criticism, the reader would be heavily implied and implicated in such a text.

[33] Clanchy cites here: E. Auerbach, *Literary Language and its Public in Late Antiquity and in the Middle Ages* (1965), p.288

[34] Peter Abelard, *Sic et Non*, ed. B. Bayer and R. McKeon (Chicago: University of Chicago Press, 1976)

The classic example of this, quoted in Clanchy p.107, is Bracton:

> I, Henry de Bracton, to instruct the lesser judges, if no one else, have turned my mind to the former judgments of just men, examining diligently their decisions ... and have compiled whatever I found therein worthy of note into one *summa*, organized by titles and paragraphs, without prejudice to any other opinion, and committed to memory forever by the aid of writing.[35]

Glossa

The *glossa* was in many respects the opposite of the *summa*, consisting of a main text written in a large hand (*textualis formata*) around which accreted comments or glosses, both marginal and interlinear. The method developed from the study of the Bible, and was used with texts which were designed to be authoritative, particularly within the context of university teaching.[36] In the thirteenth century in particular, this form of writing was one of the principal methods by which intellectual tradition and scholarship was altered *via* commentary and criticism. It is significant that the practice of the gloss dies with manuscript culture after the introduction of printed texts. It survives thereafter only in print form as a fossilised version: printed books were seldom laid out to be glossed.

The scholarly manuscript book in the thirteenth century and after was often laid out in a form which encouraged glossing: the main text was set in the middle of the page in a narrow column in large letters, with plenty of marginal space. The most sophisticated examples are glosses on the Bible, and on Canon and Roman law: the glossed Psalter of Eadwine is a highly elaborated example of the form. Gratian's *Decretum* is another, and it is worthwhile to spend some time examining the form of the *Decretum* (c.1140) as an example of *glossa*.

[35] Henry de Bracton, *De Legibus et Consuetudinibus Angliae*, ed G.E.Woodbine (1915), reissued with translation and revisions by S.E. Thorne (1968-77), vol. ii, p.19

[36] The existence of a gloss gave a text much more authority. As an instance of this, Carruthers cites the example of Boccacccio's romance epic *Teseid* (Firenze, Biblioteca Medicea Laurenziana MS. Acquisti e Doni 325) which Boccaccio wrote in *textualis formata*, then added a commentary in a smaller hand to his own text. As Carruthers remarks, 'Boccaccio is both the originator of his text, and its reader; his own commentary invites commentary from others' (p.218). By this, Boccaccio was claiming for his text 'the immediate institutional status of an "auctor"' (*ibid*)

Unlike the *Corpus Iuris Civilis*, whose sources are fairly uniform, canon law was the product of a variety of different source texts: sermons, patristic writings, letters, papal decretals, reported speeches, the Bible and many other writing forms. Many of these, particularly the older texts, were already embedded in other texts, often in variant readings. It would appear that Gratian worked from a comparatively small number of sources, many of them recent collections of canon law.[37] While the possibility of linking and cross-referencing these is almost infinite, the potential for textual corruption, variation and contradiction was everpresent. If Gratian's text were to live up to its name as the *Concordia Discordantium Canonum* it would have to harmonise the discordant texts.

Gratian did so by providing a commentary upon his authorities called a *dicta* whenever there was contradiction, or whenever he required to link the sources together. The commentary reveals how coherent meaning can be derived from the authorities and, where there is contradiction, how the contradiction can be solved. His text thus expands upon itself, unlike the *summa*, and especially unlike Abelard's *Sic et Non.*

His text is divided into 3,800 texts or *capitula*, which are futher gathered around *topoi* or *distinctiones*. Sometimes these *capitula* form sets of narrative, as with the 'fictional cases or *causae*'.[38] As Christensen puts it, they are:

> designed to pose an interlocking set of questions about a given legal situation. Some are elaborate to the point of striking the modern reader as far-fetched, a sort of ultimate story problem, but every twist and turn proves significant as each question is dealt with in a series of capitula.[39]

We can follow the logic and layout of Gratian's own text by mapping the key structure. An example of this is Distinction Eight.[40] Gratian begins with his

[37] *Gratian: The Treatise on Laws with the Ordinary Gloss*, translated by Augustine Thompson, OP and James Gordley, with an introduction by Katharine Christensen, Studies in Medieval and Early Modern Canon Law, (Washington DC: The Catholic University of America Press, 1993), p.xiii.
[38] *Gratian, p.xiv*
[39] *Gratian, p.xiv*. As Christensen points out on the same page, whether or not Gratian intended this structure is debatable, and we have no autograph text to adopt as a copy-text
[40] *Gratian*, pp.24-8

comment, which follows from previous Distinctions upon a comparison of customary law and natural law:

> Part 1
> Natural law differs from custom and enactment. By natural law all things are common to all people, a practice found not only among those of whom it was said "The multitude of believers were of one heart and one mind ...," but also found in earlier times in the teachings of philosophers. So Plato lays out the order for a very just commonwealth [...]

Gratian proceeds to comment on Augustine's commentary on John 1, then

> Also, in the same place, a little way down
> [quotation]
> Also, in the same place, after a few intervening passages:
> [quotation]

Part 2 of this Distinction begins with a similar passage of *dicta* which, as well as introducing the particular subject of Part 2, also acts as a bridge between the two parts:

> Now natural law similarly prevails by dignity over custom and enactments. So whatever has been either received in usages or set down in writing is to be held null and void if it is contrary to natural law
> So, Augustine says in *Confessions*, III, viii:
> [quotation ...]
> Also, Pope Nicholas wrote to Hincmar, archbishop of Rheims:
> [quotation]
> Also, Augustine, in *On One Baptism* [...]
> [quotation]
> Also, Gregory wrote to Guitmund, bishop of Aversa:
> [quotation]
> Also, Augustine in *On BaptismI* [...]
> [quotation]
> Also in *On Baptism* [...]
> [quotation]
> Also, Cyprian to Pompey in the letter against Stephen:

[quotation]

Also, to Caecilian, in *Letters*, II,iii:

[quotation]

Thus it is obvious that custom is subordinate to natural law.

Set out like this, we can see the structure of this particular Distinction. In essence what we have is a dialogue set up by Gratian between his *topoi* and his sources. The resultant text is dialogic in a Bakhtinian sense, in that the authorities Gratian quotes are embedded within his argument. The quotations are rarely restatements of Gratian's *topos*, and thus there is a tension between the two forms of writing: we must look in the passage from Augustine or Gregory or Cyprian for the parallel that Gratian wants us to see.

Gratian's own text, however, attracted other commentators, who added their gloss to his text. This collection of comments, known as the 'Standard Gloss' (*Glossa Ordinaria*), stabilised about three-quarters of a century after Gratian wrote the original text, and was incorporated into future versions of the text. The comments, some anonymous, some signed with initials, were added around Gratian's text which came to occupy the centre of the page. The glosses themselves underwent small-scale revisions, supplementing each other, sometimes one gloss replacing another. The initial compilation of these glosses was carried out by jurist Johannes Teutonicus canon of Halberstadt, around 1215, and this was further revised around the mid-century by Bartholomaeus of Brescia. Other additions were made in the fourteenth century.[41]

All the glosses are referenced using *signa* so that the texts can be directly applied. The glosses form a variety of comment upon Gratian's dialogic text, turning it from a dialogue between Gratian and his sources into a multi-vocal conversation. The glossators corrected Gratian, commented upon his sources, added other sources which agreed or disagreed with his own, and even argued with earlier commentators.[42] We can see this in practice if we turn again to Distinction Eight. There, even in one Distinction, the glosses take a bewildering variety of forms. There are simple

[41] *Gratian*, p.xvii. See also Charles Duggan, *Twelth-Century Decretal Collections* (Athlone Press, University of London, 1963), pp. 18-19

[42] *Gratian*, pp. xvii-xviii

clarifications[43]; advance organisers[44]; contradictions[45]; elaborations of argument[46], and many more. The glosses are distinguished from the main text not only by place on the page, but also by letterforms. The main text, written in large *textualis formata*, is surrounded by commentary in a smaller hand. This had considerable mnemonic potential, much more so than a printed page without rubrics or any other form of functional lemmata. As Carruthers puts it,

> the glossed format seems deliberately designed to present memorable variations of letters ... and colours, for each page is unique. These different hands became conventionally used for these different kinds of text; the large hand developed into fully-formed Gothic script; the small squatter hand was used for commentary, even in books that did not reproduce a source text. Clearly, they were used to form a visual cue to the sort of text with which one was dealing.[47]

It has been said that glosses are really a form of footnotes. Christensen, for instance, describes the *Glossa Ordinaria* as 'more like a series of footnotes than a continuous text' (p.xvii). The likeness is clearly there, but only in a limited sense. Modern footnotes are clearly *parataxis*. They support the main text in a variety of ways, but they seldom seek to replace or argue with *taxis*. Our expectations of footnotes and their functions are based upon this subordinate role; and their place on the page (in the

[43] Eg gloss to 'those' in the first *dicta* of Part 1: 'that is, the Apostles'

[44] That is to say, statements which synopsise what Gratian is about to expound in detail. The gloss on Part 2, for instance states 'He states that natural law differs from others in dignity, for an enactment or custom contrary to it is void. He proves this in the following capitula'

[45] Eg gloss on *capitulum* 2: 'It says in this capitulum that offences against human conventions are to be avoided so that the agreement of the people and the customs of the society be observed and no violated by anyone but enjoy perpetual validity. If, however, God commands something contrary to agreement or custom, then he should be obeyed. For if a king is to be obeyed in his kingdom or city, much more is the king of all creatures to be obeyed.'

[46] Eg the gloss on 'law' from Augustine, 'For according to divine law 'The earth is the Lord's and the fullness thereof [Ps.23:1]':
'So it appears that something is possessed not by divine law but by human law alone. To the contrary is C.23 q.7c.1, where it says that something is possessed by divine law. But this is not contrary because it says there that all heresy may be raised against a claim for restitution. Note that it is not licit for a heretic to possess anything. C.23 q 5 c.35; C.23 q.7 c.1; C.23 q.7 c.2. Also, it may be argued from this text that when there is a claim for restitution, we must ask by what law the claim is made: by an interdict or by the authority of the court. Also, a claimant is obliged to explain the basis of his claim and what action is brought under canon law. X 2.1.15; X 2.3.3, notwithstanding X 2.1.6. The solution, I believe, is that the basis and the kind of action must be given so that the judge can make a decision according to the kind of action. X 5.3.31. Nevertheless, one is not compelled to specify an action, for according to [civil] ordinance the basis alone is sufficient. Cod. 6.33.3. Bar.' The abbreviation 'Bar.' stands for 'Bartholomaeus Brixiensis'

[47] Carruthers, pp.215-6, referring to de Hamel, *A History*, pp.36-7

great majority of texts at the bottom of the page or relegated to a section at the end of a chapter or the end of the book) reflects this. The *glossae* which surround Gratian's text, however, are quite different. They use the first person at times, they many different forms, some of which we have seen. We can never be sure what attitude the next *glossa* will take towards Gratian's text. The result is not a footnote: more a critical commentary. But here again we must beware unhistorical readings of medieval attitudes towards scholarship. Gratian's glossators were highly respectful of his achievement. More often than not, they elaborate his original *dicta* or his authorities. This is one of the reasons why they surround his text on the page, and are written, as Carruthers observed generally of *glossae*, in a smaller hand. Christensen is right to say that the *Glossa Ordinaria* 'makes very little sense if read in isolation' from Gratian's text (p.xx): once again, we can see in medieval reading and writing the extent to which the text was authoritative to the extent that it generated ongoing commentary.[48] In this sense the *glossa* had no close parallel in forms of information presentation until the video age. Perhaps the closest comparison might be the voice-over video technique, which achieves for us a seamlessness with regard to the visual material that the gloss achieves with its *textura*.

The gloss, of course, was not a perfect tool of analysis and comment. The effort to squeeze more and more information onto the page could lead commentators or scribes to reduce the gloss to a series of obscure abbreviated comments. Furthermore, glossators were well aware of the form's limitations as a text of full authority. By the end of the twelfth century, in fact, scholars were beginning to appreciate the importance of the text in its context, and the greater authoritativeness this gave the glossed extracts. This is borne out by a situation described by Rouse & Rouse:

> Geoffre of Auxerre describes how Gilbert of Poitiers, in his defence at the consistory of Reims in 1148, arrived armed with the *codices integri*, to the consternation of Bernard and his other accusers who had brought with them only a sheet of extracts as their documentation; and the accusers returned, the next day, equipped with their own whole texts. (Rouse, p.216)

[48] As in the example of Boccaccio in footnote 21

As Carruthers and others point out, glossed texts were frequently institutional in nature, and used by students at university.[49] Carruthers, following de Hamel, points out the extent to which glossed texts were used as teaching texts: consequently those which were glossed tended to be institutional, highly authoritative texts, to which not only a *glossa ordinaria* would be attached, but which would have ruled margins in which readers could append their own marginalia and *notulae*.[50]

Quite apart from the difficulty of reading Latin, and the script with the many complex abbreviations so typical of glosses scattered throughout the texts, the visual effect is, for modern readers, bewildering at first, then enriching. It is so because there is a multiplicity of voices all speaking on the same page. This multivocality is typical of the experience of reading a gloss. The adjacency of gloss to text actually increases this experience. Usually a modern text will only include different voices in a critical edition of a work. There, the critical apparatus will be restricted to the bottom of the page or the end of the chapter or even a separate volume. The physical separation emphasises the critical distance, which is enforced by copyright law and culture. To have the glossators' comments cheek-by-jowl with Gratian's words emphasises, to a modern reader at least, the closeness of the community of scholarship and the engagement with Gratian's text. The glossator's comments talk to Gratian's text. In this sense Derrida's point about the closeness of speech and writing in medieval culture are apposite:

> There is much to say about the fact that the native unity of the voice and writing is *prescriptive*. Arche-speech is writing because it is a law. A natural law. The beginning word is understood, in the intimacy of self-presence, as the voice of the other and as commandment.[51]

[49] Carruthers, p.??? It is significant in this respect that Justinian's *Institutes* is termed by Justinian himself a *cunabula legum* or cradle of the law

[50] Carruthers, pp.214-18. Christopher F.R. de Hamel, *Glossed Books of the Bible and the Origins of the Paris Booktrade*, London, Boydell and Brewer, 1984; *A History of Illuminated Manuscripts*, Boston, David Godine, 1986

[51] J. Derrida, *Of Grammatology*, translated G.C. Spivak, Baltimore & London 1974, chapter 1, 'The End of the Book and the Beginning of Writing', p.17, quoted in Michael Camille, 'Seeing and Reading: Some Visual Implications of Medieval Literacy and Illiteracy', *Art History*, vol 8 No. 1 March 1985, 26-49;31. Derrida's own celebrated gloss, called *Glas*, is a good example of the form. It was printed on oversize pages using a column-structure (the English translation published by University of Nebraska Press, 1987, preserved this structure). The left-hand pages contain texts from and glosses on Hegel's conception of the family; while on the right-hand pages are Jean Genet's floral metaphors, and glosses on homosexual love. *Glas* even has a commentary: John P. Leavey, Jr, *Glassary*, Lincoln, University of Nebraska Press, 1987. I do not, of course, claim that Derrida's text is a modern equivalent of the medieval gloss. Rather, it is a postmodern text,

As a convention of reading, juxtaposition was a common device. Petrucci points to it when he traced from late antique Mediterranean culture the form of the early medieval 'miscellany in which several texts of different authors are more or less coherently juxtaposed in a single container'.[52] Petrucci dwells upon the extent to which the miscellaneous authors' texts are unitised within a single text, and the effect this has both on the authors' texts and the misellany itself. Carruthers highlights another aspect of the miscellany, the florilegium, which she defined as a 'compilation of extracts and maxims derived from the great writers of the past ... [which was] basically the contents of someone's memory, set forth as a kind of study-guide for the formation of others' memories.[53]

This concepts of adjacency and dialogue and of close contiguity in scholarship between text and reader is alien to our culture. Brian Stock, for example, demonstrates how, in Eadmer's description of Anselm's compositional practices, the central activity was that of dialogue between Anselm and his brethren, then between Anselm and his readers. Carruthers dwells upon this important point to illustrate the differences between medieval and modern reading habits. She quotes Eadmer at length, and it is worthwhile considering this passage for the view that it gives us of the medieval concept of the text:

> This work [the *Proslogion*] came into the hands of someone who found fault with one of the arguments in it, judging it to be unsound. In an attempt to refute it he wrote a treatise against it and attached this to the end of Anselm's work. A friend sent this to Anselm who read it with pleasure, expressed his thanks to his critic and wrote his reply to the criticism. He had this reply attached to the treatise which had been sent to him, and returned it to the friend from whom it had come, desiring him and others who might deign to have his little book to write out at the end of it the criticism of his argument and his own reply to the criticism.[54]

fragmented, evocative

[52] Petrucci, *op.cit.*, 'From the Unitary Book to the Miscellany', p.1

[53] Carruthers, p.174. She gives the example of *De universo* of Rhabanus Maurus, which she describes as 'a web of *interpretationes* of the various matters relevant to Scripture, arranged by key-words that are themselves organized not alphabetically but "logically" (starting with God and the angels)' (p.175).

[54] Carruthers, p.212, quoting Southern, *Life of Anselm*, p.31.

The idea of one copyrighted, integral work which cannot be copied or added to, the intellectual property of the text as a legal entity which can be bought and sold and litigated upon -- all this is very far from Anselm's view of his text and his readers. The critical work appended (by Gaunilo) is treated by Anselm henceforth as an integral part of his own text. It is so for two reasons: it is seen by Anselm as a rigorous examination of his argument, and therefore worthy to be included (and I think we can take his pleasure in this as unfeigned). Secondly, as Carruthers succinctly puts it, for a medieval writer, 'a text achieves full authority not by closing debate but by accumulating it' (213) In so doing, it achieves originality in the eyes of its readers. The concept is highly reader-centred, and strikingly different from a modern view of criticism and commentary. Now, had Anselm and Gaunilo been modern writers, Gaunilo would have written a separate article or book, which Anselm would have incorporated into the second edition of his own text, in a preface, in footnotes or in textual revisions. In the medieval manuscript, however, Gaunilo becomes Anselm's 'co-equal reader' (213) because what matters is not the writer, but the reader-centred text and its place in the community of readers.

Part 2. Hypertext and the wireless web

Hypertext: definition & experience

As Dillon has pointed out, ICT has emerged so swiftly from its cluster of related disciplines that it has not had time to develop 'a robust intellectual tradition'.[55] Nevertheless, If there is a common theme to the many texts on computers and writing it is that the space in which writing is done and which it occupies is important to its meaning. This is as true of medieval writings as it is of computerised text. Furthermore, medieval writers were as aware as word processor users of the concept of writing space and the arrangement of text within that space. As Carruthers puts it:

> from earliest times medieval educators had as visual and spatial an idea of *locus* as any Ramist had, which they inherited continuously from antiquity, and indeed that concern for the lay-out of memory governed

[55] P. Dillon, trajectories and tensions in the theory of information and communication technology in education. *British Journal of Educational Studies*, 2004, 52, 2, 138-150, 138

> much in medieval education designed to aid the mind in forming and maintaining heuristic formats that are both spatial and visualizable.

In this sense, Carruthers explores the theme of what Malcolm Parkes called the 'visual grammar' of the page in all its aspects -- letterform, page layout, and decoration – and these have occupied commentators on the web – not just those concerned with web layout and design, but at a deeper level those who are concerned with what the experience of hypertext actually does to our concepts and practices of reading and writing. There are of course many obvious differences between *glossa* and hypertexts. Volume of materials stored, speed and method of retrieval, presentation on-screen are three of the major changes to book-reading that change the context utterly. Hypertext takes over some of the functions of the glossatorial method, but not others; and that hypertext could be improved for informational purposes in law texts in the university if it took over some of the functions of a gloss. What sort of functions are we talking about? Principally the ones inherent in the theme of adjacency and interaction *via* annotation in the text by the reader. In this section of the paper we shall explore the concept of hypertext and explore its use in social software. Throughout, the analogies to glossed literature will be drawn.

Hypertext has been defined many times and the chief components of most definitions are the presence of nodes and links. The literary critic and early theorist of hypertext applications, George Landow defined it elegantly as 'an information technology consisting of individual blocks of text, or lexias, and the electronic links that join them'.[56] This duality of stasis and kinesis can be identified in most of the evolutionary literature of hypertext, even from the earliest texts.[57] It is a duality which is at the heart of all hypertextual activity. But if it seems rather elementary to

[56] George P. Landow, 'What's a Critic to Do?: Critical Theory in the Age of Hypertext', in George P. Landow, editor, *Hyper/Text/Theory*, The Johns Hopkins University Press, Baltimore, 1994, p.1. I take it as axiomatic that mainstream HCI accounts of action and intention have contributed hugely to our understanding of how technology has affected communication, and *vice versa*. However in general I have taken a rhetorical approach to the subject of HCI and internet theory, preferring activity theory and constructivism as forms of activity and analysis, rather than the instructional processing model of cognitive science. I believe that these approaches, in this field at least, have more to offer the analysis of web communications and the history of communicative forms.

[57] See Vannevar Bush, 'As We May Think', *Atlantic Monthly* 176 (July 1945), 101-8; T.H. Nelson, 'A File Structure for the Complex, the Changing, and the Indeterminate', *ACM Proceedings of the 20th National* Conference (New York: Association of Computing Machinery, 1965), 84-100; Douglas C. Engelbart, 'The Augmented Knowledge Workshop', *A History of Personal Workstations*, ed. A. Goldberg (Reading, Mass.: Addison-Wesley, 1988), 187-236

us now, more than a decade after the early browsers opened up the web for us, we still need to bear in mind Margaret Smith's comments above regarding the relationship of incunabula to manuscript culture. In many ways, the web's relationship with earlier forms of media is uneasy: as a new form of information presentation, it requires to develop upon the rhetorical structures and expectations set up by almost half a millennium of text production and usage by readerships. When it does not take account of this, or fails to create a coherent meta-text for itself, a hypertext loses coherence for a reader, or becomes difficult to learn and navigate.

Since the experience of hypertext starts with experience, it may be helpful to start with the experience of hypertext itself. Let us try to see what is for must of us an everyday experience with fresh eyes. Go to any hypertext page on the web – for example http://pantheon.yale.edu/~haw6/gratian.html.

First of all my language needs comment. I asked you to 'go to'. The language of hypertext 'travel' -- in part derived from that of programming -- is also deliberately, cautiously, neutral, because we are yet fumbling with the right terms to describe the experience of encountering text in this way. Clearly, we cannot turn, leaf, riffle, open at a certain page: our traditional performatives are incoherent in the environment of this new page. Second, I asked you to look at a 'page', a single page, not a book full of pages. But this is clearly unlike any real page: it is so only in a transferred or metaphorical sense. We cannot view its contents globally at once as we can on a printed page, no matter how large the page is, but the information is 'scrolled', as if on a *volumen*, not a *codex*. In this sense, we have reached back past the printed *and* the written book to ancient manuscripts.

Once we have 'arrived' there (note the paradoxical use of the travel metaphor), the 'page' appears odd. There is no title page, no publication details, no dedication and list of contents as we would expect to find in a book. Instead of this formal introductory *materia* (and stripping out the 'frame' of whatever browser you happen to be using) we are plunged into details straightaway, in much the same way as we are in a medieval manuscript. Where manuscripts are to this day still identified by their incipits, so web pages are located by their web addresses.

What type of page is this? If we examine the contents and try to define this publication according to print genres (and after all, we speak of web pages being 'published'), then we will discover that there are none which fit this publication. Is it monograph, archive of papers, is it -- in the academic domain -- the product of research or teaching, who is its intended audience, the research community or students or web users generally; how does the author regard this page: has it been written semi-seriously, in between the serious research pursuits to which he is presumably committed; does its copyright reside with a publisher or the University or with the author Anders Winroth? Is Anders the only author? Did he employ the services of a Web consultant or programmer, and is the relationship of these people to the author the same as text editors to the production of a book? The words of Bonaventura, quoted earlier, seem apt to this environment: who is a scribe, who is a compiler, who is a commentator, and who is the author of these pages?

When we look closer at the information on this page, we see links with other pages. When we go there, Anders' page vanishes, to be replace by the new page. We can go back or forward (travel again, not the page turning or flicking we are used to). The links are, to one used to book production, remarkable. Where we arrive at is similar to the page we started from: not a book (with its Germanic derivation associated with 'beechwood', the wood used to encase the text) but 'sites' or places of information. Denied the traditional language of text production, we reach for spatial metaphors that are only half-metaphoric: the information on Anders Winroth's page, after all, is stored on a server at Yale, and is not, except in a transferred epithet, in front of our eyes.

The more we consider these new qualities of the hypertext in front of us, the more it becomes clear that hypertext itself has created a new genre by blurring the boundaries between older genres and coalescing aspects of them. In fact, while there are many differences, the page does share many of the basic qualities of a gloss – going to another text, embedded links, text as adjacent commentary, compression of textual meaning, the proliferation of commentary, and both the dispersal and reconfiguration of meaning. This of course is in the nature of hypertext: it both divides and separates meanings, and brings them together again in new contexts. Landow's use of the term 'lexia' points to how this can be so. Landow derives it from Roland Barthe's *S/Z*,

from a passage in which Barthes describes a new way of reading text, one that breaks up hitherto accepted rhetorical structures within texts, and which therefore disturbs reading conventions: '[the text] will be cut up into a series of brief, contiguous fragments, which we shall call *lexias*, since they are units of reading'.[58] Landow's use of lexia is different from Barthes', of course, and possibly less radical; but he uses Barthes' concept to emphasise a similar transformation in terms of the dispersal and fragmentation that text undergoes when it becomes hypertext.

Landow uses Barthes and Foucault and concepts of intertextuality to present a view of hypertext as a a dispersal process, where the hierarchy of textual relationships are broken, and a text can be adjacent to another text which a reader would not normally associate with it. Hypertext thus breaks down the notion of a discipline based upon a recognisable community of texts. The links and paths by which it does so profoundly affects our sense of textual uniqueness (p.53), and according to Landow it is in the nature of hypertext to do this. Thus, where footnotes reference other texts, or at best provide extracts of them, hypertext links can be made directly from one text into another. Central and marginal texts thereby lose the status they have in printed books and can exist in a different relationship to each other, one defined by layout on screen and the intentionality of the hypertext designers.

Texts thus become more contextualised, more adjacent on the screen than they would ever be if they were books. Beginnings and endings lose some of their significances as fixed and intentional entry and exit points. It is, of course, easy enough to open a book at any page and begin to read, even to read unsequentially. But when one does this, one becomes aware that the text has not been constructed rhetorically for this activity -- reading back from one chapter to the previous is an example of this; while using an index to find all references to a name in a book is an example of a text supporting a particular reading activity.

These new qualities which a text accrues when it becomes a hypertext have implications for every type of legal text one might wish to embody as a hypertext, not only in terms of archiving and retrieval, but also for textual authority, and possibly even the way in which argument can be presented in hypertext. The extreme form of

[58] Roland Barthes, *S/Z* (Paris: Editions du Seuil, 1970), translated by Richard Miller (NY, Hil and Wang, 1974), p.13, cited George Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology*, (The Johns Hopkins University Press, Baltimore, 1992), pp.52-3.

this view is of course that of Walter Ong, for whom writing is a technology that restructures thought, and which changes social and noetic relationships in significant ways.[59] Whether the thesis of Ong, Havelock, Olson and others is viable, there is ample evidence to prove that technological contexts, if not the cause of change in the deep structures of disciplinary argument, certainly has a powerful effect on informational context, and on learning and teaching.[60] Indeed, technological context has already altered our view of what hypertext is and is capable of.

We can see this at work in theorists of hypertextual writing. One of the earliest attempts to define different types of hypertext use is that of Michael Joyce in his essay 'Siren Shapes: Exploratory and Constructive Hypertexts'.[61] Here, Joyce distinguishes between two types of hypertext. The 'exploratory' hypertext 'enable its audience to view and test alternative organizational structures of their own and perhaps compare their own structures of thought with hypertext and traditional ones'. The 'constructive' hypertext, on the other hand, requires 'a capability to act: to create, change, and recover particular encounters within the developing body of knowledge. These encounters, like those in exploratory hypertexts, are maintained as trails, paths, webs, or notebooks, but they are versions of what they are becoming, a structure for what does not yet exist' (pp.41-2).

One might be tempted to qualify the last phrase with 'on the page'; but apart from this, and over ten years after Joyce first proposed it, the distinction would appear to describe fundamental differences in hypertext design. Yet Joyce's distinction does not describe wholly the current direction of web applications. More and more, the distinction is breaking down, and under the very pressures of information and new

[59] Ong, Walter J., Writing is a Technology that Restructures Thought', in Gerd Baumann, *The Written Word: Literacy in Transition*, Clarendon Press, Oxford, 1986, p.29. See also Christina Haas, *Writing Technology: Studies on the Materiality of Literacy*, NJ: Lawrence Erlbaum Associates, 1996; Ong, Walter J. *Orality and Literacy: The Technologizing of the Word*. New York: Methuen, 1982; Olson, David R. and Nancy Torrance (ed.) (1991). *Literacy and Orality*. Cambridge: Cambridge University Press; Havelock, Eric (1982). *The Literate Revolution in Greece and its Cultural Consequences*. Princeton: Princeton University Press; Tannen, Deborah (1982). The oral/literate continuum in discourse. In *Spoken and Written Language: Exploring Orality and Literacy*, D. Tannen (ed.), 1–16. Norwood: Ablex.

[60] See for example Richard Rorty: 'the Internet provides a model for things in general – thinking about the World Wide Web helps us to get away from Platonic essentialism, the quest for underlying natures, by helping us to see everything as a constantly changing network of relations'. Foreword, Vattimo, G., (2004) *Nihilism and Emancipation: Ethics, Politics and Law*, New York: Columbia UP, xvii

[61] In *Of Two Minds: Hypertext Pedagogy and Poetics*, Ann Arbor: University of Michigan Press, 1995

genre types that now flood the web. Exploratory texts are merging with constructive texts -- we can see this happening in any university LMS class web page, which often contains links to texts, readings, an online handbook, and a space for student discussion. Some lecturers ask students to create HTML or XML projects, or use blogs. Indeed, it could be said that Joyce's own distinction bears the hallmarks of a print culture, in which the separation of exploratory reading of texts and production of textual meaning is enforced by print production. Hypertext, elusive, protean, diaphanous, cannot be so easily categorised: it enables a close working relationship between exploration of information, and the creation of meaning arising from that exploration. It thus mimics the form of a gloss in which, as we have seen, the reader/writer adds to the expanding docuverse of glossed meaning.

Early research on applications analysed the extent to which hypertext actually enabled learning and understanding of complex intellectual materials. Landow, for instance, made the claim that hypertext enables active learning.[62] He argued that connecting materials and constructing arguments for the linkages 'is a high-level intellectual skill' (136), and that hypertext helped students to develop one of the components of this skill, namely 'nonsequential reading' (126). Others, however, questioned whether hypertext can do this, and if it can, under what conditions it might do so. Jonathan Smith, for instance, observed that in using Landow's teaching and research tool, *The Dickens Web*, his students 'often struggled just to process the material a the two ends of a link, and hence they tended to see the abyss rather than the bridge'. He pointed out that 'the mere mechanical ability to cross the bridge almost instantaneously, did not guarantee that the more important conceptual crossing would occur', and went on to say that while hypertext makes it 'easier to ask our students to read and think in these more sophisticated ways, [it] also increases our responsibility to teach them how to do this'.[63] Smith did report that students' learning improved,

[62] Eg George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology*, Baltimore and London: Johns Hopkins University Press, 1992, p.121. Landow's work has been seminal in the development not only of hypertextual pedagogical applications, but in literary theory as well. For examples of his work, both theory and practice, see his collection of websites at www.landow.com.

[63] Jonathan Smith, 'What's All This Hype about Hypertext?: Teaching Literature with George P. Landow's *The Dickens Web*', *Computers and the Humanities*, vol 30, No 2 1996, 121-9, p.125. A similar but more detailed description of the use to which one class put the *Perseus* Project can be found in 'Tom Martin's Journal for his 'Perseus class' in the spring term of 1994 at Holy Cross', at http://perseus.holycross.edu/Courses/Seminar_with_Perseus/Journal-Spring_1994.html. Martin's conclusions are similar to Smith's: 'the greatest challenge for me as teacher remains, it seems, to

but from his own experience in the use of *The Dickens Web* he argues that 'students must be taught how to read hypertextually' (p.128) and, if they are expected to *write* in hypertext, this needs to be learned as well (126, my emphasis). His point about writing, is of course borne out by the culture of glossed manuscripts. The culture of this particular textual form had to be learned by writers: like all genres, there was nothing natural or innately comprehensible. Its symbols and structures were powerful learning tools; but they needed to be mastered before they could be used effectively.

Others have supported this point of view. In a trenchant article, Hammond *et al* point out that to draw analogies between the experience of hypertext connectedness and structures of the brain or the mind is to fall into a version of the homeopathic fallacy. As they point out, hypertext is an effective learning tool when it 'makes explicit the connections between chunks of information in the domain'. However, they make it clear that comprehension of these connections is 'contingent upon the learner processing the links in a meaningful way. ... merely moving from one screen to another is unlikely to give the learner any insight as to the implied connection between the two screens'.[64]

Underlying these criticisms of hypertext is the awareness that reading and writing in hypertext is fundamentally different from reading and writing books, and requires us to learn quite different skills from those we have developed in order to understand the products of our print culture. But those skills, as many volumes of research into teaching and learning with technology point out, can be the basis for much learning from e-learning and multimedia applications. Collaborative learning, for instance, finds considerable support in the research literature – Crook, for example, argued that induction into cultural practices and the construction of shared understanding through the use of language are important mechanisms of learning, and particularly so within

model for them the behavior in doing research as discovery and as expression of that discovery that I take for granted in my own life .... My conclusion ... is that Perseus gave them a chance to learn how to learn as researchers in texts. They still need lots more practice at it, to be sure. ... In reality, however, Perseus gave them the boost they needed to learn to learn by discovering and then making sense of what they discovered.'

[64] Jean McKendree, Will Reader, Nick Hammond, 'The "homeopathic fallacy" in learning from hypertext', *Interactions*, (1995) vol 2, No 3, pp.74-82, p.80. Reproduced at http://www.ioe.ac.uk/tescwwr/Homeopathy.html

computer-based learning; while Laurillard (1992) emphasised the need to integrate simulation software into a socially organised teaching context.[65]

Hypertext does not only link up pages of text. Hyperlinks can of course be used to link graphics and pictures, sound and video. In the realm of hypermedia, particularly on the web, it is rare for one author to be responsible for all aspects of the production and mounting of materials. Teams of authors and Web programmers frequently work together to produce the final product: 'the electronic environment is a rich context in which doing work and sharing work become virtually indistinguishable'.[66] These team productions frequently raise problems of authorship, as this is defined in the traditional, book-centred sense of the word. Landow describes this well when he narrates the process by which he and at least ten others created the graphic overviews of *The Dickens Web*.[67] As he concludes:

> Hypertext has no authors in the conventional sense. Just as hypertext as an educational medium transforms the teacher from a leader into a kind of coach or companion, hypertext as a writing medium metamorphoses the author into an editor or developer. Hypermedia, like cinema and video or opera, is a team production. (100)

Or, we might add, like a twelfth-century *glossa ordinaria*, with its multiple authors, its implicit indebtedness which makes the concept of quotation and the device of quotation marks almost irrelevant. The tools of the *glossa ordinaria*, whatever the subject-matter, compare well with the advice of our own contemporary cognitive science – they embody many of the guidelines to good reading practice and page layout, including the classic three or four column format so often used on web pages. What is interesting, though, is how much these tools are needed in the situation of the computer and the internet. In word processed documents viewed on-screen, for example, there is little or no sense of page, only a perpetually scrolling document.

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[65] Crook C (1994). Computers and the Collaborative Experience of Learning. Routledge, London; Laurillard D (1992). Learning through collaborative computer simulations. British Journal of Educational Technology. 23, 164-171; Laurillard D (2001). Rethinking University Teaching: A framework for the effective use of educational technology. RoutledgeFalmer, London.

[66] Tora K. Bikson and J.D. Eveland, 'The Interplay of Work Group Structures and Computer Support', in *Intellectual Teamwork* ed Jolene Galegher, Carmen Egido, and Robert Kraut, eds, Hillsdale, N.J.: Lawrence Erlbaum, 1990, p.286, quoted Landow, *Hypertext*, p.94

[67] George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology*, The Johns Hopkins University Press, Baltimore and London, 1992, pp.99-100

Page breaks are marked weakly, but do not contribute to the sense of a page in the traditional sense. The same could be said of a page on the Web, where pages exist without the contraints of books or book bindings and their parataxis such as title page, etc. In these situations, it is all the more important to use the type of mnemotechnic and placing devices to which medieval readers and writers were accustomed and which, as we shall see, we are beginning to recover through the revolution known as social software.

Hypertext, social software and communities

If hypertext can seem to exemplify many aspects of the glossed literature of the thirteenth century, the analogy between medieval page and wireless web must surely be a tenuous one. And yet I am not sure that this is the case. There are striking parallels between the way that we view can view connectionism in both contexts, and the ways in which we use media in order to achieve the same ends of community-readership, community-interpretation and the creation of professional knowledge tools.

Let me begin with a scene from a film – fast forward to 2053, to the world of *Minority Report* – Spielberg's film of the Philip K. Dick short story that focuses on the activities of the Precrime Unit in Washington DC. Crimes can be foretold, the visions of the gifted seers appearing upon a screen; police attend the scene of the future crime and arrest the putative criminal; the homicide and violent crime rate drops in the capital. While aspects of the film present interesting material for jurisprudential classes on the nature of free will and the power of the state, etc., let us focus on the scenes where Tom Cruise is trying to evade capture. He boards an underground train, hoping to hide amongst the commuters. A passenger is seated, reading a newspaper, and looks up quickly at Cruise who senses he has been recognised. Viewing from over the passenger's shoulder we see the digital print of his newspaper page dissolve and reform into a picture of and article about Cruise as the newspaper's information is updated instantly and wirelessly. The moment (it is over in a few seconds) is startling, but believable for an early twentieth-century audience. The film does not present us with radically new technologies we cannot understand – it remains linked to our understandings of present technology, but pushes it further. The context is

stretched, but remains intact.[68] It is of course an ancient narrative device – recognition of the hidden hero by others.[69] Culturally, too, the film merely stretches this narratological convention within the structure of the Hollywood sci-fi thriller – Spielberg is quoting the classic scene where a passenger recognises the main character from his picture in a newspaper (Hitchcock's *North by North-West* is one of many examples).

This cinematic moment exemplifies how technology can be accepted because it is on the verge of our understanding of present possibilities. The city of Bristol now has a wireless cloud, and there are plans to do the same for the City of London. If our computers can update wirelessly, why not newspapers and books? But it is the communicational and mobile applications that the web (and in particular the wireless web) enables which are the more interesting aspects of the phenomenon, and in particular the movement known generally as 'social software' or 'social bookmarking'.[70] These include applications based on file-sharing and peer-to-peer networks wherein users can share audio files (Napster, Kazaa, i-Tunes, podcasts), pictures (Picasa, Flikr), textual information (blogs and wikis) and hypertext links themselves (del.icio.us, Furl).[71] This networking phenomenon is not based on file applications, but on the concept of linkage itself. Ease of linkage according to one's communicational needs and the needs of one's audience are critical markers of success. The success of Friends Re-united and Genes Re-united are based upon this. Friendster, an early version of friendship networks, has recently been eclipsed by MySpace, which allows more personalised communication than Friendster. As a commentator in Business Week noted, quoting an early investor in MySpace, '"we just realized that to allow people more personalization and control would give people more attachment to their web pages."'[72]

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[68] Steven Johnson, (1999) *Interface Culture: How New Technology Transforms the Way we Create and Communicate*, Harper, San Francisco

[69] Ulysses' recognition by his nurse on his homecoming to Ithaca in the Odyssey, for instance

[70] There are numerous discussions of this on the web. See for example www.onewisdom.pbwiki.com/SocialSoftware

[71] http://www.napster.co.uk/; http://www.kazaa.com/us/index.htm; http://www.apple.com/uk/itunes/download/; http://audio.weblogs.com/; http://picasa.google.com/; http://www.flickr.com/; http://del.icio.us/; http://www.furl.net/;

[72] http://www.friendsreunited.co.uk/?li=f; http://www.genesreunited.co.uk/genesreunited.asp?wci=yourhome; http://www.friendster.com/; http://www.myspace.com/; The quotation derives from http://www.businessweek.com/ap/financialnews/D8FNN7JG0.htm?campaign_id=apn_home_down&chan=db

As expressed thus, the concept is very different from *glossa* at first glance, because while a user's MySpace home page may have mnemonic functions for any particular user, its primary aim is self-expression and sharing of personal data. And yet, at a deep level MySpace succeeds because it forms a space filled with intuitive tools for content-sharing and communications between user and audience.

Perhaps the most profound implication of the social software revolution in recent years is the implicit acknowledgement in these tools that the web is an immeasurably complex ecology, one composed of people, practices, values and technologies.[73] A number of qualities mark it out from previous use of the web. First, the system is not merely based upon code, but also upon inter-relationships and dependencies of those taking part. For this reason locality, not in a topographical sense alone, but more in Bourdieu's sense of *habitus,* is crucial.[74] Secondly, Diversity matters within dependencies – the more diversity is encouraged, the more successful an ecology will be. There are of course 'keystone species', whose presence is important to the health of an ecology; but monoculture – the dominance of one element of the system – rarely if ever is good for an ecology. Finally, in such an information ecology, the value of data as knowledge is increased when it is aggregated.

An application such as Squidoo is fairly typical of this ecology.[75] Users construct a 'lens' which can filter or aggregate content from other sources. Current content is measured crudely by a 'tag cloud', in which links with more data attached to them appear as larger text – they become a form of *textura.* Throughout the functionality of this tool, as with blogs, there is a concern to compress information, and to present it in as manageable a form as possible. Size of text is one device for doing so. In blogs, 'post continuation' is another, where extended posts can appear on the blog as their first couple of lines only, and if the user wishes to read on, he or she clicks a 'More' button.

[73] Nardi, B. and O'Day, V. *Information Ecologies: Using Technology with Heart*. MIT Press. 1999.
[74] The term is an important element of his theory of social and cultural reproduction, referring to socially acquired, and embodied systems of dispositions tendencies. See Pierre Bourdieu and Jean-Claude Passeron, *Reproduction in Education Society and Culture*, trans. Richard Nice (Beverly Hills, California: Sage, 1977).
[75] http://www.squidoo.com/browse/homepage

Some social software applications support a pictorial view of knowledge – see for example CmapTools which offers shareable concept maps – one might compare the thumbnail illustrations within initial letters and other uses of colour and diagrammatic techniques in medieval manuscripts.[76] Illustrations within glossed manuscripts and other medieval manuscripts of course related tightly to textual content, often with a mnemonic function. Illustrations used in concept maps have similar functions.

Wiki production, often carried out by a widespread team of authors working within a community context, in a number of important ways returns us to the knowledge community of the gloss.[77] But it is blogs which offer perhaps the closest parallels to *glossa* communities and forms of thought and action. Like *glossa*, they are dynamic, in that they link and comment, but of course the speed of information travel is exponentially faster than the *glossa* webs. Communicative devices between writers and audiences includes comments, trackbacks, RSS, permalinks, blog indices and such like. These link discussions all over the web and its 'blogosphere'.[78] The links can be syndicated and aggregated, using special software that allows users to track concepts and discussions without moving in and out of bookmarking software or different applications. As Butterfield points out, blogs and wikis express a number of fundamental qualities that distinguish them from other forms of communication on the web, namely direct forms of personal/professional identity; a high aware of the presence of others for whom writers write; relationships that can develop between

[76] See http://cmap.ihmc.us/. Event visualisation is another form of graphical information tool. See Chung, Wingyan, Chen, Hsinchun, Luis G. Chaboya, O'Toole, Christopher, D., Atabakhsh, Homa (2005) Evaluating event visualization: a usability study of COPLINK spatio-temporal visualizer. *International Journal of Human-Computer Studies* 62 127-57. The article includes a table of event visualisation tools and techniques. For two examples of event visualisation in courts, see the Bloody Sunday Tribunal at http://www.bloody-sunday-inquiry.org.uk, and the DVD compiled by the Prosecution for jurors in the Soham murder trial, at http://www.guardian.co.uk/soham/story/0,14010,1108312,00.html
For examples of initial letter foliation and interlinear illustration, see the Fitzwilliam Museum, http://www.fitzmuseum.cam.ac.uk/gallery/CambridgeIlluminations/images/works/LRG/FM_ms251_fol54v_LRG.htm. The image is zoomable – glossators would have loved this tool, but they may also have had reservations about its capacity to distort the mnemonic value of the page.

[77] Wikipedia is of course the classic example -- http://en.wikipedia.org/wiki/Main_Page. Wikis are of course the subject of vast commentary on the web. See for example http://www.willatworklearning.com/2005/12/are_wikis_inher.html

[78] And there are of course tools that index topics and themes – see http://www.bloglines.com/, a personal news aggregator, or Technorati, http://www.technorati.com/, which is a real-time search engine that tracks blogs in the blogosphere, can monitor the community and inform bloggers. According to a Pew Internet study carried out in spring 2003, about 11% of internet users were regular blog readers (http://www.pewinternet.org/PPF/r/113/report_display.asp). The figure now is much greater – according to Technorati data, there are around 700,00 postst daily – see http://www.technorati.com/about/ .

writers; and the coalescing of groups that emerge from these relationships.[79] The speed of information aggregation of courses changes the nature of the community, as do many other factors.[80] Nevertheless, there are many parallels, as we have already seen, between the links culture of glossed literature and hypertext.

Rip, mix & burn: the hermeneutic hypertext

This has been commented upon since hypertext was first noted by legal commentators. The study of law bears significant parallels to literary hermeneutics as these are practiced in literary criticism and biblical studies. In all three, the habit of cross-referencing texts is deeply embedded in the conceptual meta-skills of the discipline. In their own domain, lawyers collate statutes chronologically; they compare cases, contrast and debate judgments. Textual comparison is a key skill in all of this. Hypertext supports this type of cross-referencing. What one early researcher, David Johnson, said about hypertext in the practice of law applies even more so to academic law –

> Lawyers think naturally in hypertext. Their fondness for footnotes and cross references indicates their healthy awareness of the potential complexity of any real legal issue ... Hypertext systems will provide the tools with which - or rather in which - lawyers will embody their expertise so as to make it much more suitable for easy distribution to and use by others.[81]

But if lawyers think 'naturally' in hypertext, and while hypertext has been used to build extensive databases such as Westlaw and Lexis/Nexis, little has been done to

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[79] See http://www.sylloge.com/personal/2003_03_01_s.html#91273866

[80] For proof of this unprecedented information growth, see http://www.sims.berkeley.edu:8000/research/projects/how-much-info-2003/execsum.htm -- one quote: 'We estimate that the amount of new information stored on paper, film, magnetic, and optical media has about doubled in the last three years' (ie 2000-03). The nature of the experience of interactin with this information is changing, too – see Pilke, E.M. (2004) Flow experiences in information technology use. *International Journal of Human-Computer Studies* 61 347-57, which set out to discover whether Csikszentmihalyi's 'flow' experiential state could be detected in the performance of relatively ordinary IT tasks (as opposed to complex games):

> Results [from interviews] indicate that flow experience is quite frequent while performing a variety of tasks ranging from word processing to programming to visual design and information search on a desktop computer'.

[81] David Johnson, 'Building and Using Hypertext Systems in the Practice of Law' 3 (1980) (unpublished manuscript available in the IIT Chicago-Kent Law Library), quoted in Ronald W. Staudt, 'Legal Mindstorms: Lawyers, Computers and Powerful Ideas', *Jurimetrics Journal*, Winter 1991, 171-185, p.183

allow users to annotate web text with the intuitive fluency that glossators could add to a gloss. High-quality interpretive tools are needed if the hermeneutic potential of the web is to be realised. We need to create for our students the ability to create their own web gloss, add their own notes, share notes, and link to others' glosses. In the thirteenth century this created a sense of community, of discussion and debate around the text which stimulated further discussion and learning. The comment on a text which one launches out into a public electronic arena is very different from paper-based publication of commentary, and also from the private comments sent to an individual; and for these reasons, spaces for virtual comment rarely of themselves encourage comment. Vellum, by contrast, is a much more intimate medium for communication: there is privacy, individual contribution and, when the text is circulated, community discussion. The very slowness of communication can help to build a community of practice -- an 'interpretive community' in which the constant movement of discipline shifts and boundaries within the community helps to create and -- in a Foucaultian sense -- discipline the texts which are produced.[82]

There are also a number of valuable insights we can derive for the form of teaching resources and learning contexts. Glossed literature, as we have seen, sprang from a recognition of an emerging community of texts and of authors who wished to comment upon the texts. Balanced between the stasis of the *textura* and the kinetic energy of the *glossa*, they were powerful learning and teaching tools. But universities are only now coming to terms with the social software revolution and its consequences for learning theory and practice. As a number of researchers have noted, social software promotes connectivist models of learning and teaching, which are in direct opposition to transmissive modes of teaching.[83] It also promotes a learner-centred view of a curriculum, rather than a teacher- or administrator-centred view. Many of our current learning management systems (LMSs) in use in universities, for instanceare built around an institutional view of learning: web sites are organised in a drill-down structure into course or programme pages organised centrally, by Faculty or Department, which in turn sub-divide into class or module pages, with resources posted by academics who lead the module, with forums

[82] See also Brian Stock's concept of 'textual communities', which maintain collective memory and empower certain people within them and can, on occasion, help peopel to challenge authority. Brian Stock, *The Implications of Literacy: Written Language and Models of Interpretation in the Eleventh and Twelfth Centuries*, Princeton, Princeton University Press, 1983

[83] Quote Siemens, etc.

managed by the institution/academics; and where students have minimal or no ability to alter or interact with the online resources. To be sure, the ability to read and download such resources at a distance from campus contributes to flexibility of learning; but the structure of the LMS is still highly institutional. A learner-centred view of resources, knowledge, tasks and assessments would involve much more interaction and the ability of students to design their own learning environments, in much the same way as they can design MySpace, or Google's personalised home page, or their own blogs and wikis. Central to the process of engaging with complex legal texts in such an environment would be the ability to gloss a text online with both interlinear and marginal notes; for those notes to be shaeable with staff and other students, and to be set out in a number of different levels as well as different views. The creation of such software is still in its infancy – Internet Explorer's annotation functionality is hardly a promising start. When using this and similar tools, it is hard not to avoid the conclusion that, in this function at least, the internet has a lot to learn from the sophistication and streamlined simplicity of the *glossa ordinaria.*

That conclusion is drawn not just from the study of how graphics, layout and textual solutions were converged and adopted by glossators within the constraints of their technologies, culture and economy, but also driven by the potential of the contemporary web to converge data. The problem for us now is that so much needs to integrate in order to give us the seamless functionality we wish for. The social software revolution will take us so far; but we need to go further. I have a phone conversation with a colleague about virtual towns on the web – I may want to integrate that conversation with a blog or a research paper, or extract concepts and search for further scholarly information on the topic on the web. Any of these activities would currently involve different hardware, different file formats, the transfer of data across separate applications. The web is hardly seamless. The concept of rip, mix and burn, so influential in the contemporary music industry, and long since applied to the film industry (particularly in dvd formats) must be applied to legal education as well, and across data formats. Academic text publishers are only now learning that it can make economic sense to allow consumers to read the portion of the book that they need, rather than compel them to buy a conceptual structure that arose in Renaissance economies and served it and Ramist pedagogies well, but now is a stop against change and innovation. But 'read' is precisely the wrong term here:

reading is merely the start of what one might want to do with data. If learners are interested in information they almost inevitably will want to do something with it, pull it into their own webs and structures so that information can become useful knowledge. The concept of the 'mashup' and filters expresses this well: a remix of data formats, and a dynamic re-interpretation, for both personal and community purposes, of information and knowledge, which also uses filtering technologies to strain out irrelevant data and capture the key information required by a user – these are critical creative and data-handling tools that web users require to survive and thrive in the data-rich streams of the internet.[84]

Conclusion

The ability to reflect on changes in the technology of reading and writing is not limited to our own times. In his study of orality and literacy in early German texts D.H. Green points out that in 1471 Guillaume Fichet, reflecting on the technologies of reading and writing, divided them into three periods: that of the *calamus* or reed pen (classical antiquity), that of the *penna* or quill pen (medieval literacy) and that of the *aereae litterae*, the recently-developed 'movable type'. Green observes that Fichet's divisions parallel the divisions of Walter J. Ong's argument, developed more than half a millennia later, regarding the nature of communications shifts, and points out that both Fichet and Ong develop their arguments precisely because they write close to a nodal point in the communications shift.[85]

To many of us now it might appear as if we are undergoing a revolution in communications as we move from analogue to digital cultures, as computing becomes ever more intelligent, ambient and pervasive within our culture, and as the semantic web emerges as a practical reality.[86] But as I hope I have shown in this paper, the

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[85] D.H. Green, *Medieval Listening and Reading: The Primary Reception of German Literature 800-1300*, Cambridge UP, 1994, p.1

[86] See for example Ferscha, Alois, Mattern, Friedemann, eds, (2004) *Pervasive Computing*, Second International Conference, PERVASIVE 2004, Linz/Vienna, Austria, April 2004 Proceedings, Springer-Verlag, Berlin. The semantic web is one solution to the massive size of information on the web and the accessing and storage of that information. Currently, search engines syntactically match a user's query to web pages or services. Many of these, however, are semantically incorrect or irrelevant to the user's purposes. The semantic web adds semantic data to web content, such that software agents can recognise web resources with greater clarity (the term 'semantic web' was first coined by Berners-Lee, T., Hendler, J., Lassila, O. (2001) The semantic web, *Scientific American).*

astronomical eymology of that word also prevails: much of what we do today in web-based communications was brought about by other technologies and other methods throughout the last millennium. Indeed this study is yet more evidence that in ter

Glossed manuscripts developed over a long period of time, out of the need for a form that would facilitate information comprehension, collation, interpretation and dissemination given a huge corpus of primary and secondary materials. The internet has been with us for a little over a decade now, and the massive explosion of data that it has initiated still eclipses the tools we have available to us to navigate and use the environment effectively.[87] The words of Lisa Jardine regarding the spread of book publication apply even more to the internet:

> What scandalized the serious scholar Erasmus (as it fascinated Dürer) was the fact that, not much more than half a century after the first appearance of the printed book, demand had turned it into a product beyond the control of the scholars and specialists. The book had taken over as the transmitter of European written culture, before scholars and educators had had time to come to terms with its power and influence.[88]

We are writing, still, within that shift. The changeover period in the fifteenth century from manuscript to print, in which print establishes itself as a major communications

Applications will also be able to manipulate potentially huge quantities of data much faster. See for instance Glaser, H., Alani, H., Carr, L. Chapman, S., Ciravegna, F., Dingli, A., Gibbins, N., Harris, S., schraefel, m.c. Shadbolt, N. (2004) *The Semantic Web: Research and Applications*, Bussler, Christoph, Davies, John, Fensel, Dieter, Studer, Rudi, eds, First European Semantic Web Symposium, ESWS 2004 Heraklion, Crete, Greece, May 2004 Proceedings, 417-32

[87] The research being undertaken into such tools and their HCIs is substantial. For examples, see Cockburn, A., McKenzie, B. (2004) Evaluating spatial memory in two and three dimensions, *International Journal of Human-Computer Studies* 61 359-73, where results showed that the addition of a third-dimension to computer displays did not aid users' spatial memory; Padovani, Stephania, Lansdale, Mark (2003) Balancing search and retrieval in hypertext: context-specific trade-offs in navigational tool use. *Journal of Human-Computer Studies* 58 125-49, where the authors argue that navigation tools are mediating structures for activities, such as bookmarking and learning the structure of the site, which represent cognitive investment for future retrieval. In this view, user performance is optimized by the balance of two potentially antagonistic conditions. First, the usability of tools and metaphor must free cognitive resources for planning; but also, the difficulty of the task and the need for planning must remain visible to the user.
See also Watters, Carolyn, Duffy, Jack, Duffy, Kathryn (2003) Using large tables on small display devices. *Journal of Human-Computer Studies* 58 21-37. See also Pearson, Robert, van Schaik, Paul (2003) The effect of spatial layout of and link colour in web pages on performance in a visual search task and an interactive search task. *Journal of Human-Computer Studies* 59 327-53, which contains a helpful review of the research on web interactive design, and where the authors reported that evidence was found amongst users 'to support the conjecture that experienced Internet users might have formed automatic attention responses to specific web page designs'

[88] Jardine, L. (1996) *Wordly Goods: A New History of the Renaissance*, Macmillan, 228

channel, extended across two generations. If we date the rise of electronic communications *via* hypertext not from Vannevar Bush's prophetic article, but from the rise of the Internet, the growth of the PC and the development of hypertext applications in the late eighties and early nineties, we can see that we are still at the early years of development in the latest technology of literacy.

It would be bizarre to suggest that many of the internet's communicational problems can be solved by adopting glossatorial methods. Two illustrations will suffice, the first on the subject of archiving, and the second on mobile telephony.
The contrasting media of parchment & paper & computer screens affected the different archival strategies adopted for each medium . Clanchy makes the point usefully as follows:

> Medieval writing materials themselves made the scribe conscious of time. Because he was presented with the alternatives of wax or parchment as a medium, he made an initial choice between the ephemeral and the permanent. Notes writen on wax tablets were necessarily transitory, whereas the fair copy on parchment was obviously durable. To write on parchment was therefore to make a lasting memorial: to commit 'bare and transient words' to script with its 'tenacious letters', as Adam of Eynsham says in the prologue to his life of St Hugh of Linclolm.[89] Modern paper, on the other hand, which is used for both notes and fair copies and is constantly disposed of, does not make the writer feel that he is producing a permanent record. Even when printing gives a modern work a physical permanence comparable with that of parchment manuscripts, the modern writer is more concerned with printing's ability to reach a wide audience in the present than with the transmission of his work, in a unique copy like a medieval manuscript, to posterity[90]

With computers, by contrast, the permanence of the file is even more in question. Hard disks, with their fragile technology, are relatively untested in comparison to the proven longevity of vellum (or even better, the durability of cuneiform on baked clay

[89] Clanchy quotes thus: Edited D.L. Douie and H. Farmer (1961), p.1; M.T. Clanchy, 'Archives and memory', *Archivaria* xi (1981) pp.115-25
[90] M.T. Clanchy, *From Memory to Written Record: England 1066-1307,* second edition, Blackwell, Oxford, 1993, 145

tablets). In addition there is also the problem of short- and medium-term archiving and retrieval of data. How do we archive texts upon the Web, for example, so that they will be accessible not just tomorrow or next week, but for future generations? How can scholarly archives such as SSRN be stored and available most effectively for the community?[91] Our concept of an archive itself will have to undergo substantial change, given the radical linking technologies of the internet; and in planning for the future archives we must beware that we do not create mere re-configurations or imitations of present archives that would make inappropriate use of the technology.[92] It is another instance of the convergent power of the web, where single applications such as eBay or Amazon or Linkedin are only partial solutions to a much larger problem of data transfer and sharing.[93]

The second example involves mobile telephony, which presents information and hardware designers with particular problems of display, particularly of lengthy texts within a small display window. Gloss has little part to play in this mode of display. One solution to this has been the adoption of software originally designed for reading

[91] This problem is exercising Web journal editors today. The writings of Steven Harnad are a good introduction to the subject. See, eg, Harnad, S. (2000) "The Invisible Hand of Peer Review", *Exploit Interactive*, 5, http://www.exploit-lib.org/issue5/peer-review, and the Harnad e-print archives at http://www.ecs.soton.ac.uk/~harnad/. See also *Developing services for open eprint archives: globalisation, integration and the impact of links*, Proceedings of the 5th ACM Conference on Digital Libraries. San Antonio Texas June 2000, Hitchcock, S. Carr, L., Jiao, Z., Bergmark, D., Hall, W., Lagoze, C. & Harnad, S. (2000), http://www.cogsci.soton.ac.uk/~harnad/Papers/Harnad/harnad00.acm.htm For an experiment from the *British Medical Journal* in such online peer review, see *British Medical Journal*, web site, http://www.bmj.com/cgi/shtml/misc/peer/index.shtml. See also see Paul Ginsparg's work on a global preprint archive, on which the world high energy physics community relies, at http://arxiv.org/corr/home

[92] There are many examples of technologies imitating older technologies in this way. Here is an example of one technology mimicking an earlier one for prestige purposes. Early sixteenth-century humanists were interested in the interiors of classical libraries: how a scroll was store, how colour was used, how it was indexed, and so on. One of the ways of imitating the scroll on the shelf was to make the codex as much like a scroll as possible. In his intriguing article on the subject, T. Kimball Brooker points out that:

> Gold tooled spine titles first occurred on bindings executed for humanists in Rome during the 1520s and 1530s and also may have been inspired by classical models, that is, from the way these humanists may have imagined the appearance of ancient libraries based on their reading of classical texts which mentioned the presence of visible titles on volumes stored in bookcases.[92]

Brooker observes that 'the spine with its raised bands, a universal Venetian binding practice of the period for non-Greek texts, gave emphasis to the codex form of the book, a distinctly non-classical format'. For humanists such as Manutius, who wanted to recreate the physical as well as the intellectual legacy of the antique world, Brooker speculates that the 'form of fore-edge title represented a more sensitive approach to reviving the appearance of an antique library than the longitudinal spine titles in current use by some humanists in Rome' (195).

[93] See http://www.webdesignfromscratch.com/future-social-web-experience.cfm for an example of an essay that describes the tools and methods by which more social collaboration can be brought about.

experiments in the early 1970s, namely rapid sequential visual presentation, or RSVP. In this form of display, words appear as individual letters, appearing in quick succession on the screen.[94] Initially used with dyslexic readers, the display can be used to read quite lengthy texts of 500 words or more. In effect it is a form of *scriptio continuo*, or continuous text, used in ancient manuscripts and the early medieval period.[95]

Between the different writing and reading technologies of *volumen*, manuscript codex, printed book and electronic screen, then, it is axiomatic that we find it difficult to anticipate and cope with the problems and advantages of the new technology. One of the reasons for this could be that it is so difficult to understand the cognitive ground of our own technology. If the present is difficult to understand, with all the information about communication we have at our disposal, our understanding of the mentality of past readers and writers from the evidence of the technology available to us is even more difficult. Often as a result of this difficulty, we treat past reading and writing technologies less as technology and more as artistic curiosities: cuneiform, hieroglyphs, *scriptio continuo*, illuminated and glossed manuscripts. But as we have seen, each stage of reading and writing in the past represents attempts to come to grips with similar cognitive problems of conceptualisation of thought and communication, similar cultural and economic problems of coping with communicational volume and collaborative networks. The study of glosses, as with other forms of information capture, storage and retrieval, still holds valuable models for us in our own times.

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[94] For free download of this software, see http://www.freedownloadscenter.com/Authors/StepWare__Inc_.html. For experimental results on usability, see Russell, M.C., James, M., Cohlmia, A. (2002) Reading from a Palm Pilot Using RSVP, *Usability News*, 4.1.2002, http://psychology.wichita.edu/surl/usabilitynews/41/rsvp_palm.htm; Bernard, M., Chaparro, B. & Russell, M. (2000). Is RSVP a Solution for Reading from Small Displays? *Usability News 2.2.* For a useful review of the literature on presentation and navigation of literature on information presentation on small screens, see Christie, John, Klein, Raymond, M. Watters, C. (2004) A comparison of simple hierarchy and grid metaphors for option layouts on small-size screens. *International Journal of Human-Computer Studies* 60 564-84

[95] See Jesper Svenbro's comment on such forms of continuous text:

> Reading aloud is part of the text, it is inscribed in the text. At first this may seem a paradoxical proposition. How can an audible act be part of a silent fact? How can one be comprised by the other? ... the Greeks ... wrote in *scriptio continua*, that is, without intervals between words, which, as experience shows, makes reading aloud practically necessary. It is in this way that audible reading is part of the text which is incomplete, unfinished by itself. Therefore the text is more than the sum of the alphabetic signs of which it is made up: these signs are to guide the voice through which the text will take on a body -- an audible body

Jesper Svenbro, *Phrasikleia: Anthropologie de la lecture en Grèce ancienne*, Paris, Editions La Découverte, 1988, p. 54, translated by Johannes Fabian, 'Keep Listening: Ethnography and Reading', *The Ethnography of Reading*, edited by Jonathan Boyarin, (Berkeley, University of California Press, 1993), p.91