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Issues in Electronic Scholarly Editions: Has Hypertext Made An Honest Woman of Us at Last?

Chris Tiffin, Graham Barwell, Phill Berrie, and Paul Eggert

There have been at least three significant attempts in the last fifty years to comprehend what exactly is this text thing that we scholarly editors and textual critics work with. The initial wave was the Greg-Bowers New Bibliography which tried conscientiously to use all surviving witnesses as forensic evidence to reconstruct the author's intention. The text according to this view was ultimately a product of volition, and the task of the textual critic was a recuperative psycho-historico-linguistic one. The second attempt was marked by Continental inclusiveness and semiotic despair at identifying a single stable authoritative version. This despair produced the view that text was constituted by all recoverable manifestations of it.¹ The third attempt came with the wide accessibility of digital recording of texts and has had two branches. The first, spawned by poststructuralist literary theory (and perhaps partly by childhood Lego-deprivation) has seen electronic text as a field of liberationist politics in which readers of the interactive documents emerge at last from their slavery to author(itarianism)², while the second (which, paradoxically, is disciplinarian rather than liberationist) has seen text as a conceptual structure, an "ordered hierarchy of content objects" or OHCO³ What these two apparently disparate views have in common is an approach to the nature of text which focuses on the potential of the expressive medium. The views are driven not by what an author might have tried to say (New Bibliography), nor what all the witnesses record (*théorie de texte*), but rather what the medium makes it possible to say.⁴

Scholarly editors of the Greg-Bowers tradition had a seemingly coherent position from which to proceed, but it was progressively shown to be inadequate or flawed in a number of ways. Intention was neither simple nor stable and the attempt to establish an authorial intention which had never fully got into print meant subordinating the documentary versions that had.⁵ As the sense grew that a text must be comprised of all its manifestations even if they could not be reproduced and indexed in a printed book at

¹ Louis Hay, "Does Text Exist?" *Studies in Bibliography* 41 (1988): 64-76.

² See for instance, George Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins University Press, 1992); Richard A. Lanham, *The Electronic Word, Democracy, Technology and the Arts* (Chicago: Chicago University Press, 1993), Jay David. Bolter, *Writing Space: The Computer, Hypertext, and the History of Writing* (Hillsday, NJ: Lawrence Erlbaum Associates, 1991).

³ Steven DeRose et al, "What is Text Really?" *Journal of Computing in Higher Education* 1.2 (1990) 3-26; Alan Renear, "Out of Praxis: Three (Meta)Theories of Textuality." *Electronic Text: Investigations in Method and Theory*. Ed. Kathryn Sutherland (Oxford: Clarendon, 1997). 107-26.

⁴ Recent surveys of theories of text include: Peter L. Shillingsburg, "Text as Matter, Concept and Action." *Resisting Texts: Authority and Submission in Constructions of Meaning*. (Ann Arbor: University of Michigan Press, 1997) 49-103; and D.C. Greetham, *Theories of the Text* (Oxford: Oxford University Press, 1999).

⁵ Michael Hancher, "Three Kinds of Intention" *Modern Language Notes* 87 (1972) 827-51, G. Thomas Tanselle, "The Editorial Problem of Final Authorial Intention" *Studies in Bibliography* 29 (1976) 167-211, Jerome McGann, *A Critique of Modern Textual Criticism* (Chicago, Chicago University Press, 1983).

reasonable cost, the postulation of a single intentional ur-text came to seem less and less legitimate.

Electronic editions looked like the answer. A CD can deliver a collation of the 58 witnesses of the Prologue to the "Wife of Bath's Tale" with an ease and at a price which a printed book could never match. But the superiority of the electronic word is less clear-cut in other ways. It does not resolve the platonic-material dualism at the heart of scholarly editing; its inclusive plurality oversimplifies the nature of the text it records, and it introduces new forms of instability into the textual record. This paper discusses, under the headings "Ontology", "Singleness" and "Stability", issues that have arisen from work to develop a new paradigm for electronic scholarly editions, The JITM[©] system⁶, which the following papers will discuss in more detail

1. Ontology

Rapid as has been the spread over the past fifteen years of electronic resources for representing written text, user practice has not changed as dramatically as some had predicted. Anyone who sold their shares in the photocopier companies in 1985 in anticipation of the paperless office would now regret it. It is not that electronic text cannot be delivered to us with amazing speed and convenience. It is rather that when it is delivered, either we find it inconvenient to process in that form, or some sort of atavistic scepticism takes over and we just don't believe in the reality of what we see on the screen. In our experience, most people, on receiving an electronic document they regard as important, print off a copy.

There is a usually a style-lag at the point of transition of technologies. Some of the earliest automobiles looked exactly like farm carts, except that the shafts for the horses had been replaced by a steering handle, and a small petrol engine had been installed on the buckboard. Similarly, as Jay Bolter has pointed out, the print age did not immediately find its technological feet:

The early printers tried to make their books look identical to fine manuscripts: they used the same thick letter forms, the same ligatures and abbreviations, the same layout on the page. It took a few generations for printers to realize that their new technology made possible a different writing space, that the page could be more readable with thinner letters, fewer abbreviations, and less ink.⁷

So, too, there is a noticeable retention of paper-based systems in the jargon and styling of the computer display of text. Words like "page" and "book" maintain a tenacious currency in this domain ("notebook", "web page", "subject page", "home page", "page up", "page down", "desktop", "folder"). Deleting files under one widely-used operating system is accompanied by a cute icon of a piece of paper flapping its way to the rubbish bin.

One reading of the current situation is that we are simply in a transitional period in which we have not yet internalised the resources of the new technology, and that as they are better understood, our electronic scholarly editions will be designed to exploit the resources of the medium. But some of the complexity and "inefficiency" of electronic editions comes not from a failure to exploit the medium fully, but rather from the fact that they are performing a multi-faceted representation, for they provide not only a conceptual

⁶ The JITM system is copyright 2001 to Berrie, Barwell, Eggert and Tiffin.

⁷ Jay David Bolter, *Writing Space*, 3.

map of an ideal text (or in its modern formulation, an OHCO), but also a representation of one or more previous instantiations of that text as documents. Much of the recurrent discussion among electronic text editors and theorists in the nineties seems to have proceeded from this multiple aim. The problem of concurrent hierarchies, for example, which has proven something of a bugbear for SGML-based systems, is often illustrated by the clash between chapter divisions and page divisions, one hierarchy deriving from some formulation of the ideal text and the other from the practical necessity in traditional print technology of dividing the typesetting into pages.

There seems little likelihood that a greater familiarity with the possibilities and protocols of electronic publishing will alleviate this situation by sweeping away irrelevant legacies of a past technology. Ever since Jerome McGann and D.F. McKenzie taught us the significance of the documentary-text-in-action — that a book in a reader's hand is worth several in the author's final intention — the material history of the book has assumed for editors an importance in its own right, not just as a means of backtracking to what the author might have hoped would be read. Some theorists even argue that the printed book's very failures to represent adequately the linguistic text it inscribes constitute a site of meaning which is lost when the text is re-presented in electronic form.

There is a kind of bibliographic meaning that resists electronic representation but may yet be considered as meaning-constitutive. It consists in the meaning generated through implied aesthetic resistance to bibliographic form itself, and it inheres in the availability of the material book as matter; as such it is an area of meaning inaccessible through the digitized representation of the page on the screen or the stored electronic facsimile. . . . In almost all cases, the substitution of one containing vessel for another liberates new meanings in a literary work, but it also closes off others. This can constitute an impoverishment — even an inauthenticity — of meaning.⁸

The argument here seems to be that every instantiation of a linguistic text, no matter how competent, is at the same time a partial failure, and that this failure constitutes part of the overall meaning available to the reader. “Implied aesthetic resistance” gestures towards the platonic or ideal text — the resistance the ideal text makes to the material in which it is instantiated. When this linguistic-cum-bibliographical text is represented in the computer, a less sedimentary medium allows for a more transparent representation and the partial failure is removed, and with it part of the meaning of the text. While this argument seems overly optimistic about the limpidness with which text can be represented in computers, it does underscore the tension between the specificity and materiality of a text's instantiations on the one hand and its immaterial, but describable, ideational or aesthetic patterns on the other. This is a tension which complicates all electronic scholarly editions which have print-based witnesses, and is not going to be confined to some transitional period while we learn how electronic text really works.

2. Singularity

One of the aspects of electronic texts that attracts most enthusiasm is their ability to present text in a non-linear way. Printed text, the argument goes, is rigid, fixed, limited,

⁸ Kathryn Sutherland, "Revised Relations? Material Text, Immaterial Text, and the Electronic Environment", *Text* 11 (1998): 35-36.

whereas electronic text is dynamic, three-dimensional, pluralist. Moreover, electronic text offers possibilities for interactivity, thereby empowering the reader, and removing him or her from the arbitrary control of the author.

Such claims, which admittedly were made most enthusiastically a decade ago⁹ painted a view of print-based writing which was by no means universally valid. It is true that many books and articles (including those that denounce the tyranny of the sequential author) are intended to be read in a particular way, and fashion their logic and rhetoric accordingly. But the fact that many such texts substantiate or expand their argument in footnotes shows that print-based texts are by no means limited to a sequential reading strategy. Any hypertext enthusiast who believes that the print version of *Sydney White Pages* can only be accessed sequentially is going to waste a lot of time getting a phone number for Paul Ziegenfuz.

Nor is it true that hypertext systems abjure sequentiality and its attendant controls, for having followed a link, the user reads that *lexia* sequentially until he or she finishes it or decides to follow another link. The text may have been fragmented by the author into a sort of linguistic smorgasbord, but the individual fragments are intended to be processed in exactly the same way as a print-based book. And it should be noted that the method of processing is not exactly sequential anyway. As cognitive scientists point out, in the process of reading meaning is deferred until all the words necessary to complete the idea have been assimilated. If we read the sentence:

Whether the tickets are all sold or not, the show must go on next Friday night
we do not understand its meaning incrementally as we traverse each word, but rather we collect the semantic and syntactical elements progressively in clusters until we can derive a meaning from the whole sentence. The implication of this is that written language communicates in a series of packets to which the *lexia* of the hypertext correspond more closely than we realise.

There is a further clarification to be made. We have argued that the current generation of electronic editions are doing two things: producing as accurately as possible, "the text itself", and offering also a history of the documentary renditions of that text. Although this suggests a textual pluralism, that pluralism is historical rather than ontological, and to move to the electronic domain does not change it. Print-based editions may offer parallel texts, synoptic texts, reading texts with apparatus, or variorum texts, but they assemble those versions from different physical instantiations. They collapse a temporal plurality of versions rather than unlocking a plurality in the text itself. The point can be illustrated by considering the evolution of that last sentence. Its "plural" version would be:

What they collapse is a the temporality of vision of versions rather making presenting a text which is inherently multiple or plural.

That is the plural text which encapsulates its evolution. It includes all the readings which were rejected in the process of framing that sentence, and so offers a far more complete account of the evolution of the sentence than does its final form. But it is not an easily comprehensible communication and its historical comprehensiveness does not represent

⁹ A representative collection of views from this period can be seen in Paul Delany and George P. Landow, eds, *Hypermedia and Literary Studies* (Cambridge, Mass.: MIT Press, 1992). For a more recent assessment of electronic text and its implications see, Espen Aarseth, *Cybertext: Perspectives on Egordic Literature* (Baltimore: Johns Hopkins University Press, 1997).

either the authors' intention or the normal conventions of the linguistic code in which it is embedded. It is difficult to entertain an idea of text which fails *both* of these tests. This suggests that while the history of the text can be mapped through all its variants, that composite of its history is not the text, for some elements of it are contingent on the prior rejection of others, and conflict with them in signifying meaning if both are present. There is, then, a property of *singleness* about text which has been lost sight of in some of the more generously inclusive textual theories of the 1980s and their hypertextual successors.¹⁰

Even the vaunted plurality of hypertext is suspect. Admittedly, the individual lexia in a hypertext are not mutually exclusive in the way that alternative words in a sentence are. This is because the traditional sentence is formed to the point of utterance by the author, whereas the hypertext document consists of a matrix of such formed sentences (and possibly sounds, images and other non-lexical items) the assembly or ordering of which is left to the reader. However, alternative hypertext links and their target lexia cannot normally be chosen simultaneously, and choosing one may make it difficult or impossible to access another. The hypertext document, then, is really an archive from which the text is realised on a Just-In-Time basis, and this realised text has exactly the same property of singleness as a text whose lexia are authorially or editorially assembled and printed in a rag paper codex.

This choice available to the reader of hypertext is often argued to be liberatory and empowering, but it is useful to ask how or why. There is nothing to prevent the reader of a conventional book reading a paragraph on p.36, then turning to p.73 and reading two and a half sentences, then turning to p.11 and reading the last six words in reverse order, and then reading the caption under the illustration on p.238 in conjunction with the picture on p.239. One feels, perhaps, that this might constitute a rather capricious use of the book, and it might not be what the author expected or intended but there is no actual constraint on the reader to prevent its happening. In fact, to move randomly through a conventional book is as easy as turning the pages. In a hypertext however, one is limited to rather more laborious sequential scrolling or to following a finite set of links provided by the hypertext author which are available only at certain points. The reason why what is actually a lessened mobility in a hypertext can be lauded as a greater mobility is that the question is not just one of choosing pathways through a text, but rather of choosing meaningful pathways of communication, and the hypertext provides a (finite) number of these.

The author of the printed book directs the reader via generic conventions in a particular way which may include alternatives (continue to read the sentences or consult the footnote) but are substantially sequential. Print books arrange their lexia in ways which the author expects to be efficient for communicating with the reader. These may be some sort of dictionary sequence or a progression of logical, narrative, or conceptual steps which allow the reader to process the information in a successful way. The perceived inadequacies of this process can be gauged from the conclusion to an

¹⁰ A more fruitful discussion recently has concentrated on the multi-dimensionality of text. Peter Shillingsburg, in his discussion of the ontology of the literary work finds it necessary to define it according to different viewing perspectives: "From the author's perspective...From the editor's and reader's perspective...". Peter L. Shillingsburg. *Scholarly Editing in the Computer Age: Theory and Practice* 3rd ed. (Ann Arbor: University of Michigan Press, 1996), 42-43.

influential book on hypertext which offered its readers also a hypertext version of the same text.

The hypertext shadows the printed version, presenting paragraphs that appear in print and offering hypertextual notes that expand the particular ideas. These elaborations could not be included in the printed version because of limited space or because a particular digression did not seem appropriate to the linearity of print.

Readers who obtain the diskette will see that the hypertext cheerfully violates the constraints imposed by the medium of print. The hypertext does not contain a single hierarchical-lexia structure. It does not confront the reader with a single persona; instead, it speaks in several, sometimes contradictory voices. The style does not depend on rhetorical transitions, since the transition is provided by the reader in the act of branching from one textual unit to another.¹¹

These claims for hypertext over the printed book are worth teasing out, and can be summarised as:

- i) hypertext allows the inclusion in an edition of relevant material which is uneconomic to print
- ii) hypertext allows the inclusion of relevant text which it would be "inappropriate" to include in a print version because of the latter's linearity
- iii) print constrains ideas by its hierarchical-linear structure
- iv) print constrains ideas by its single persona
- v) print constrains ideas by signaling transitions in the argument

Of these propositions, the first is certainly true. Many an author or editor has come to blows with a print publisher over the constraints that a fixed number of pages imposes. The remaining propositions are less convincing, and depend on the premise that a well-fashioned argument is some sort of oppression which violates the reader's constitutional right to be confused. The additional "paragraphs" on the diskette which are made available to the purchaser of the book do, of course, consist of structured sentences arranged in a deliberate order, and if they themselves didn't have a hierarchical-linear structure they would be ineffective communication or, to use print-era terminology, plain bad writing.

The relevance of these observations for electronic scholarly editors is in the choice of a reading text. Whereas the mechanics of the printed book make it difficult to avoid offering one version of the text as normative, the electronic edition can be genuinely more pluralistic, and this possibility has led some critics such as Jerome McGann to argue that in the electronic domain, all versions are to be equally prioritised since the reader's needs cannot be predicted.¹² The issues have been cogently explored by Peter Robinson who points out that the potential of the electronic medium to reproduce a whole archive of variant versions does not excuse an editor from the responsibility of actually editing.¹³ An electronic edition is not just a catch-all archive, and while the editors of the electronic edition certainly have the ability to present a far

¹¹ Jay David Bolter, *Writing Space*, 240.

¹² Jerome McGann, "The Rationale of Hypertext" *Electronic Text: Investigations in Method and Theory*. Ed Kathryn Sutherland (Oxford: Clarendon, 1997), 19-46. Especially 40-45.

¹³ Peter Robinson, "Is There a Text in These Variants?" *The Literary Text in the Digital Age*. Ed. Richard J. Finneran (Ann Arbor: University of Michigan Press, 1996), 110-11.

richer account of the text than is easily available to the print editor, electronic editing has the same commitment as printed book editing to rigorous discrimination between the pieces of evidence the edition is able to assemble and present.

3. Stability

The issue of stability is of supreme importance to scholarly editing because the scholarly edition aims to provide a faithful representation of *something* whose criteria are declared, and if either the version represented or the edition produced is not stable then the work becomes nugatory. However, the forms of stability and instability in the print age and those in the electronic age are quite different. Texts in both forms are broadly protected by proliferation — a text held on 40 servers can be considered more stable and less vulnerable than a text on only one, just as a book which exists in 40 copies in dispersed locations is more stable than one which exists as a unique copy. The more interesting issues, however, have to do with the stability of the text during propagation.

While the printed text is susceptible to considerable instability in the process of its duplication or reduplication, once an edition is produced, the text remains stable. It would be unwise to say the text of a book, once printed, could never change, but any such changes would be the result of complicated and deliberate manipulation (forgery) or by obvious physical decay (loss of pages). The complexity of the processes by which a printed book was duplicated (at least until the age of quality photocopying) meant that its text had a degree of protection once printed since the technology for reproducing it was expensive and specialised. Moreover, the printed transcription of the text is immediately available to the reader through the well-practiced, and therefore apparently transparent, technology of reading.

The case is different with electronic text for two reasons. First, the electronic text is available for manipulation and analysis in a way that print text is not. Although the fundamental mode of analysis still depends, in most cases, on primitive string matching, this can enable a wealth of sophisticated tools to examine stylistic and vocabulary patterns as well as providing concordance and navigational functions. These analytical possibilities can be extended infinitely into the features of the text if the text is first prepared by having those features identified and marked up. This markup is usually performed by inserting identifying tags into the sequence of computer codes that represent the words and punctuation of the text.

There is, however, a quality control problem in this process. Electronic text is easy for a computer to read and process but it is opaque to the human reader, and even when displayed on screen may contain codes which are not visible. Hence, involuntary changes made to the text during tagging or manipulation may remain undetected. But scholarly editions are scholarly precisely because they claim to represent certain phenomena accurately, and a carefully prepared text which may be subject to involuntary alteration in the course of its enhancement or propagation quickly loses its claim to make that accurate representation.

The second way in which electronic text has a different order of stability from print text is concerned with the technology required to make it available to the human reader. This is not only more elaborate and expensive than the technology required to read the printed book, but it is a technology which is itself unstable through evolutionary

obsolescence. For economic and technical reasons, hardware and software producers have little interest in supporting older technologies or making the newer ones infinitely backwardly compatible, so the number of examples of data on older systems being now inaccessible rises daily. Thus Richard Lanham's book *The Electronic Word: Democracy, Technology and the Arts* was issued in 1993 in bundled print and Macintosh hypertext forms. Despite the book extolling the electronic text as the way of the future, its electronic life has been short: the current range of Macintosh computers can no longer read the disks on which it was issued.¹⁴ Obsolescence can be quite deliberate. RosettaBooks has recently announced a series of read-once electronic editions which after ten hours' use are programmed to scramble themselves.¹⁵

To counter these problems of potential instability, the JITM[©] system adopts four key principles: simplicity, externality, openness, and validation.

Simplicity The essential text is defined in the most minimal way compatible with the need to supply a mapping system to enable the markup of the text's structural and historical features. The JITM[©] definition of text is "a sequence of words, punctuation (and white space) represented by characters and entity references", (the latter being used to encode characters which are not part of the ISO 646 character set). This definition focuses strongly on the representational requirements of electronic text, which as Claus Huitfeldt reminds us is always a complex set of translations:

Internally, a computer represents a text as a long string of characters, which in turn will be represented by a series of numbers, which in turn will be represented by a series of binary digits, which in turn will be represented by a variation in the physical properties of the data carrier.¹⁶

Externality Some features of the text and all markup of features for analysis are held in stand-off files which are applied at the time of processing or analysis. The text file is not progressively modified by layers of inserted markup, and hence retains its integrity.

Openness The JITM[©] system uses international standard conventions, the ISO646 character set, and the TEI-SGML markup language to maintain forward compatibility. Moreover, our source files can support other DTDs and even other markup systems. The JITM[©] system lends itself to collaborative research since its stand-off markup files can be prepared by different researchers and used in combination.

Validation After the base text has been used in a processing run, the tags are removed and a check is run automatically to ensure that the integrity of the original text file has not been compromised.

These measures should guarantee the stability of the text file even when it is used by many people in different locations, over an extended period. Using a pragmatically determined definition of text, though, does not eliminate the theoretical complexities, and

¹⁴ The latest range of iMac computers do not include a floppy disk drive anyway, but this disk version was unreadable even by an external floppy drive.

¹⁵ *CNET News*, 12 August 2001. (<http://news.cnet.com/news/0-1005-200-6815857.html?tag=st.ne.1005.saslnk.saseml>) The read-once version costs \$1 but permanent electronic copies (which may not be printed) can be obtained for \$5. To launch the series, the publisher has chosen the appropriately named Agatha Christie novel, *And Then There Were None*.

¹⁶ Claus Huitfeldt, "Multi-Dimensional Texts in a One-Dimensional Medium", *Computers and the Humanities* 28 (1995): 236.

we conclude with just one example of the inelegant theoretical inconsistencies to which our practice has led.

Some episodes in our text take place at sea and consequently the names of ships occur several times in the early chapters. Early editions vary between putting these ships' names in quotation marks and in italics. Good TEI practice would require the coder to treat both these forms of emphasising the names as accidental to the text itself, to code the names as a content object, and to use stylesheets to determine how the names are to be displayed. Our system, however, is less platonic and more focussed on the representational tools available to us. Since our definition of text includes punctuation, the quotation marks would be included in our base text, whereas the italics would be represented by tags stored in a stand-off file containing a tagset covering "appearance of the text" tags. This means that two arbitrary and equivalent systems for indicating the special status of ships' are handled by our system in quite different ways.

This apparent inconsistency, however, comes not from our lack of mental hygiene or rigour, but rather from the divided nature of the thing we are representing. It may validly be thought of as an Organized Hierarchy of Content Objects, and it may also be validly thought of as one or more finite sets of symbols which were issued in books or magazines at a particular time. Our point is that all the capacity and navigating power of the electronic scholarly edition isn't going to dispel that fundamental contradiction. The contradiction is not a temporary condition caused by a time lag in assimilating and exploring a new paradigm; we cannot solve it by creating de-centred archives in a medium which has no representational limitations; and unless we plan carefully, we may even find that our editions are more fragile, vulnerable, and limited than print ones ever were. The electronic era has certainly shown scholarly editors a good time, and we have clicked with a lot of happy hypertext sailors along the way, but it has not, by any means, made an honest woman out of us yet.