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Electronic Textual Editing: The Poem and the Network: Editing Poetry Electronically

Steven Jones
Sjones1@luc.edu

Neil Fraistat

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Electronic Textual Editing: The Poem and the Network: Editing Poetry Electronically [Neil Fraistat (University of Maryland) and Steven Jones (Loyola University, Chicago)]
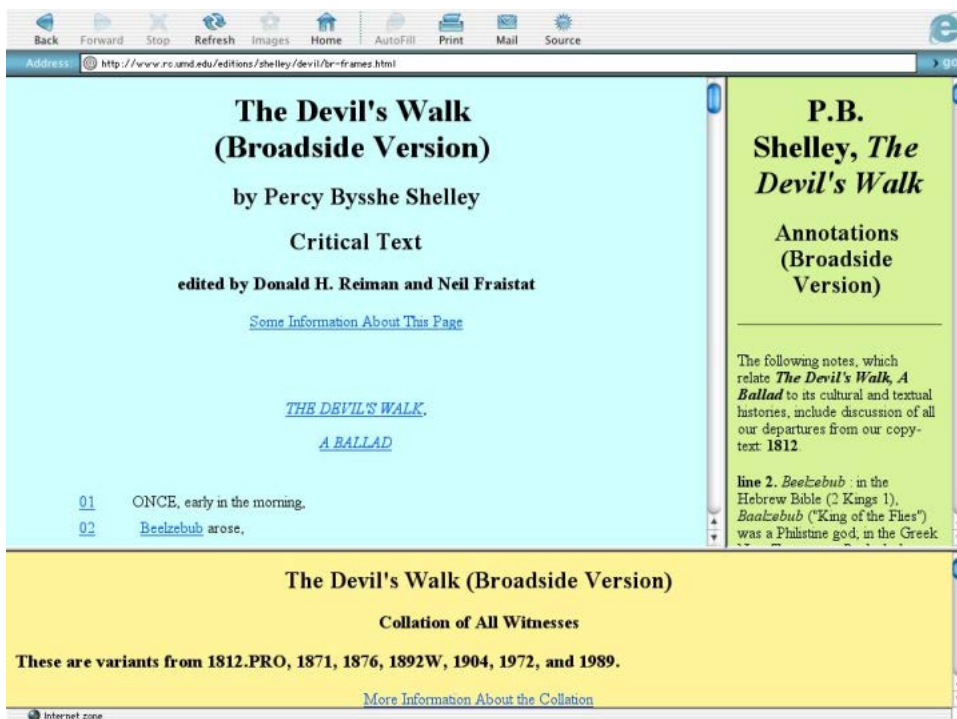
Editing scholarly editions of poetry has never been an enterprise for the faint of heart. The challenges, however, are multiplied by several orders of magnitude when one sets out to edit poetry electronically, as many scholarly editors now beginning their projects must do. The tasks of learning how to encode, of how to adopt or create a DTD (Document Type Description) sufficiently complex to account for all of the poems and manuscripts that will be a part of the edition, of how to imagine the overall editorial environment the edition will provide, of how to ensure the stability and portability of the edition over time, and of how to make deliverable over the Web (if desired) the finished edition can be truly daunting. They take the sort of time, money, and special expertise that is immensely more difficult to acquire without the strong institutional and programming support offered to those affiliated with such technology centers as the University of Virginia's Institute for Advanced Technology in the Humanities, or the University of Maryland's Maryland Institute for Technology in the Humanities. Perhaps the largest challenge of all is to produce an electronic edition that doesn't simply translate the features of print editions onto the screen, but instead takes advantage of the truly exciting possibilities offered by the digital medium for the scholarly editing of poetry. In what follows we offer a few practical examples from our own experience as co-editors of the collaborative Romantic Circles Website as a means of exploring the kinds of issues those planning to produce electronic editions of poetry must confront.

All scholarly editing requires the editor to pay attention to texts in more than one way, to what Jerome McGann has called the 'concurrent structures' that divide the editor's attention between, on the one hand, bibliographic codes for design and presentation and, on the other hand, linguistic codes for structural and semantic communication (McGann, 'Editing'). Imaginative texts, and poetry in particular, clarify the need for this kind of divided attention, since so much of the history of poetic expression is a matter of what is sometimes dismissively treated as 'layout,' the 'mere' appearance of the words on the page (or screen). Poetry as a form, then, tests and sometimes strains the resources of any textual encoding system. A predominantly structural approach to mark-up, such as SGML (the Standard Generalized Mark-up Language), may unwittingly encourage critical editors to revert to privileging linguistic codes at the expense of bibliographic codes, though XML, the EXtensible Mark-up Language, is an exciting recent development precisely because it points to a more capacious view of electronic textuality, one that enables the kind of double attention that we think is necessary for serious critical editing. [1]

Because poetry, with its enhanced self-consciousness of the physique of texts, expresses itself inextricably through particular interfaces, any editor of poetic texts in the digital medium must be centrally concerned with the interface, with matters of textual display and appearance. The venerable dichotomy that divides the digital world into opposing demesnes, one focused on the 'front end' (physical display features) and one on the 'back end' (logical search and navigation) of digital texts, must give way in practice to a more complex approach, as experienced electronic editors know. Editors of poetry in the electronic medium need to possess a clear imagination of the front end, the interface or desired physical display of the text, when going into an editing project, in order efficiently to plan the logical, structural markup—and vice versa. The two sides of electronic editing, like the two foci of all serious critical editing according to McGann ('bibliographic' and 'linguistic' codes), are always intertwined, dialectically enmeshed. It seems to us as well that any serious editor of electronic texts

must pay attention to an even wider field for such questions, looking outward to the 'contextural' relation of multiple individual texts and other materials on the Net as a whole and within hyperlinked clusters, paying attention to the poem *and* the network. [2]

Romantic Circles has from the start been dedicated to producing and providing reliable and theoretically significant electronic editions over the existing dominant network, the World Wide Web of 1995 to the present. [3]. This means of course that we have been committed to HTML, the limited tagset derived from SGML that became the lingua franca of the Web as Tim Berners-Lee and others established it. What is at stake in that devil's bargain with HTML is perhaps best illustrated in one of our very early texts, Shelley's broadside ballad of 1812, 'The Devil's Walk.' This electronic edition was based on the texts and notes produced for Volume I of *The Complete Poetry of Percy Bysshe Shelley*, edited by Donald H. Reiman and Neil Fraistat and published by Johns Hopkins University Press. At the time (1996), the text was essentially encoded in HTML 3.0, including a limited use of tables and frames. In fact, we used tables as a fundamental formatting device, as did many HTML texts of this era, before the advent of cascading stylesheets (CSS) and other devices for giving Web designers and editors more control over the layout of the electronic page. [4]. HTML was originally derived from SGML in order to facilitate the exchange of simple, mostly scientific, informational documents over the Web; it inherited a deliberate lack of interest in typeface, indentation, and so on—all the graphical features of texts that matter to serious textual critics and editors (and to most poets). Consequently, HTML was bent and stretched over time so that, for example, the table element became commonly used as a way to control the relative or absolute placement of bits of text and image on the formatted page. In this way we used table cells to hold individual lines of Shelley's ballad, as this example of the source code for 'The Devil's Walk' demonstrates:

```
 <TABLE BORDER="0" cellspacing=7>
<TR>
<TD COLSTART="1" ALIGN=RIGHT VALIGN=TOP WIDTH="25">
<a href="variantsb.html#B1">01</a></TD>
<TD COLSTART="2" ALIGN=LEFT WIDTH="550">
<p>      </p>
<p>ONCE, early in the morning, </TD></TR>
<TR>
<TD COLSTART="1" ALIGN=RIGHT VALIGN=TOP WIDTH="25">
<a href="variantsb.html#B2">02</a></TD>
<TD COLSTART="2" ALIGN=LEFT WIDTH="550">
<p>        </p>
<a href="brnotes.html#B2">Beelzebub</a> arose,
</TD></TR>
```

The pragmatic limitations of HTML mark-up are clear, here, to anyone with an elementary knowledge of encoding, including the then-necessary but inelegant use of the non-breaking-space tag (" ") to create indentation. But the result was an accurately formatted clear text that was viewable on the actual browsers that were then available to users:

01 ONCE, early in the
     morning,

02 Beelzebub arose,

Of course the text availed itself of other features of the Web as a hypertext network, such as hyperlinks

to a complete apparatus (the 'variants' and 'notes' HREF tags above). Our edition was not born digital; preliminary work on the text had been done for the Hopkins letterpress edition. But its electronic version was born live on the Web, the historically situated hypertext network of the early to mid-1990s.

One's ability in HTML to divide a screen window into separate frames allowed us to think creatively about how to display the textual apparatus of the 'The Devil's Walk' edition in relation to the text proper. At the time, before the widespread use of Javascript pop-up windows or mouse-overs, most hypertextual editions that included such things as annotations placed them on separate Web pages to which one jumped by clicking a link in the primary text; this wasted a great deal of time (waiting for the new page to load), caused user disorientation, and necessitated a very liberal use of the 'back' button. Ultimately, we decided on a more user-centered and aesthetically pleasing interface, dividing the screen window for 'The Devil's Walk' into three scrollable frames: (1) the largest frame—covering three-quarters of the width and the length of the entire window—contains the text of the poem, with line numbers and links to the apparatus; (2) immediately to the right of the text frame is a narrower frame, one-quarter of the window's width and three-quarters of its length, that contains annotations to the text; (3) below the frames for the text of the poem and the annotation, running the entire width of the window, is a frame containing the collations of variants.

Clicking a link in the text proper, whether to the annotations or the collations, brings to the top of the relevant frame the appropriate gloss or variant.

The advantage of this design is that it visually streamlines the architecture of the edition, making each part of the textual apparatus visible to the user at a glance, to be easily read and referenced in relation to every other part. Because all three frames are scrollable, the user can even read all of the text, annotations, or collations independently. We also took advantage of frames for the contextual material provided in the edition, creating a window with two parallel scrollable frames so that users could compare, side-by-side, two substantively different versions of 'The Devil's Thoughts,' a poem by Robert Southey and S. T. Coleridge that was a major influence on Shelley's 'The Devil's Walk.' Because frames were not always successfully read by browsers of the day, and because they create a series of design complications in hypertext navigation and with search engines, we also provided non-frame versions of the edited poem and its apparatus. Along with the Web design community, Romantic Circles has since

moved away from the use of frames wherever possible, but they served a purpose for a time within the wide-area protocols of the Web, and they illustrate the kinds of provisional editorial solutions the larger context and infrastructure of the network sometimes requires.

'The Devil's Walk' made a good choice for an experiment in electronic editing in part because of the form of its material embodiment as a single surviving copy (in the Public Record Office) of a multi-stanza ballad printed on a large-format broadside sheet. Shelley had it printed—he may even have had a hand in the typesetting—and it was distributed mainly by his servant. The Web made it possible to link the edition to a zoomable photofacsimile of the unique document that users could examine from any point within the edition. Besides comparing the printed words of the original document with our edited text users can get a concrete sense of the dimensions and other physical characteristics of the large sheet (18 1/16 x 14 7/8 inches) with its three columns of stanzas, and they can better grasp facts like its mode of distribution: the clandestine posting of the broadside on walls and fences. Evidence for detective work by Fraistat and Reiman, such as establishing that the colophon had not in fact been cut away from the sheet, as it had long been thought, was made immediately available to the user. Hyperlinking allowed for an efficient apparatus, a way of presenting parallel versions and complete variants, along with a wealth of textual and contextual annotation, but the heart of the project is its providing of full access to both the facsimile and the carefully edited HTML text at any point in the reading process. The 'horizontally' linked hypertextual text-and-image architecture of the Web actually helped determine the simple yet powerful shape this edition took.

Hypertext is of course the essence of the World Wide Web, and it extends beyond the poem itself, to allow for apparently encyclopedic possibilities, a potentially infinite expansion of the traditional editorial apparatus. [5]

Because of this fact, the Romantic Circles edition of 'The Devil's Walk' was eventually used as a source text for a virtual conference in our MOO, the Villa Diodati. [6] Afterwards, the transcript of the conference papers and online discussion was then linked to and from the text of the ballad, becoming an integral part of the electronic edition. Then, at a later date, a volume of critical essays that was focused on 'Early Shelley' and published in the Praxis series of Romantic Circles was also able to cite this edition by hyperlink, in effect incorporating 'The Devil's Walk' into that collection. [7]

What has happened to the text of 'The Devil's Walk' beyond its initial encoding and publication usefully illustrates the extensibility of an electronic edition out onto the Web, the interactions that are possible between the poem and the network.

In fact, even the text of this single poem is more complicated than we have so far described it. 'The Devil's Walk' comes down to us in both the broadside version and a letter version in Shelley's hand; the two versions vary in significant ways. The electronic edition did its best to create parallel versions, something HTML and the hypertext structure of the Web would seem designed for. We aimed to represent the manuscript letter version diplomatically, as a kind of partial typographic facsimile, but found that this strained the limited formatting capabilities of HTML at the time, even beyond the clumsiness of using table cells to place or 'paste up' the lines of the broadside version.

This is just one example of some of the special complications presented by editing poetic manuscripts electronically, complications operating at *both* the front end (display encoding) and back end (structural encoding). At present, no single mark-up scheme is fully adequate to address these editorial complications. [8] For example, the hypertext links that the Web makes so effortless to construct and use, the apparent integration of text and image into a seamless whole in an HTML edition of this sort, really only takes place on the surface, as it were. The digital image of 'The Devil's Walk' broadside is

not itself marked up or encoded. And the text is marked up in order to determine its appearance and presentation—for example, where individual lines are to be placed using table cells, how (relatively) far they are to be indented.

If we wish to encode a poetic text at the level of its structure, to describe (not format) its components—stanzas, parts of stanzas, lines, and so on, for search, retrieval, analysis, and recombination by a computer—we must turn to SGML proper and the guidelines developed by the Text Encoding Initiative (TEI). A very simple SGML version of 'The Devil's Walk' (encoded using the basic TEIlite tagset) was in fact produced simultaneously with our HTML version by collaborative agreement with the University of Virginia's Institute for Advanced Technology in the Humanities and Electronic Text Center. [9] This version, translated into HTML by DynaWeb middleware, was immediately browsable on the Web, but, under then-current conditions of the network and available browsers—not to mention the limitations of DynaWeb itself—it sacrificed the relatively sophisticated visual formatting of the HTML version. It now seems likely that both the HTML 3.0 and SGML (TEIlite) versions of 'The Devil's Walk' will in the near future need to be made available in XML (or the Web-ready standard it has created, XHTML [10]).

This is not the place for a detailed explanation of XML, but the difference between it and HTML can be quickly grasped in this way: whereas HTML tags might indicate a preferred typeface, point size, font color, and even something of the arrangement on the page of a poetic stanza, XML could tag the stanza *as* a stanza (a particular instance of the 'line group' element— `<lg>`), and could add to that tag the attribute 'type' with specific content labels of immediate use to literary critics, for example, pointing out that it is a 'quatrain.' Then with every line tagged (surrounded by `<l>` and `</l>`), the encoded stanza would look like this:

```
<lg  type="quatrain">
<l>Long banish'd Peace again descends,</l>
<l>Array'd in all her heav'nly charms;</l>
<l>Her dove-like wings to  earth she bends,</l>
<l>Bids Europe drop the deathful arms.</l>
</lg>
```

By nesting multiple sets of tags of this sort it becomes possible logically to mark the portions of a stanza—the 'octet,' 'sestet' or 'quatrain' and 'couplet'—such that software recognizing the document type could parse, search, and manipulate the text in complex ways. This is to focus on the text's 'content objects' as they can be described in an 'ordered hierarchy,' to put it in computer terms. But the X in XML stands for 'extensible,' meaning that encoders can develop their own tags (for, say, 'personification') so long as they are incorporated in the overall formal schema (a Document Type Description or DTD is a necessary schema for any 'valid' code) that lists the rules by which the text has been encoded and can be decoded. The point for the would-be editor is that this kind of encoding is a way to think structurally about poetic texts and to allow the computer to 'think' structurally about them as well.

The stanza cited in the example above is in fact taken from *British War Poetry in the Age of Romanticism*, an XML project now in progress at Romantic Circles, co-edited by Betty T. Bennett and Orianne Smith (with help from Steven Jones). This will be a new electronic edition of a 528-page book originally edited by Bennett and first published in 1976, a collection of poems on war (and peace) published mostly in British newspapers between 1789 and 1815, by a range of authors, including some that remained anonymous. When Garland Press published the book it was already a reprint edition, a gathering of materials originally published elsewhere; some of the bibliographic and contextural codes

with which each poem was first published, while of obvious historical interest to the scholar and critic, have been bracketed off and set aside, at least for the first phase of this project.

Instead of an edition of poems based on first publications, ours will be an entirely new 'reprint' edition of the 1976 Garland volume that first anthologized them, making no attempt beyond page numbering to reproduce that volume's original bibliographic codes. The Romantic Circles electronic edition of *British War Poetry* will amount to a kind of database of the individual poems extracted and repurposed for the new medium, a thematic anthology with a historical focus, with individual entries retrievable and combinable in various ways, depending on the needs of the reader or scholarly researcher. As such, the project makes a perfect field for editorial experiments with XML. [11]

We are starting with the TEI core tagset but may eventually add other tagsets as necessary (e.g., for verse), and thus creating our own customized DTD, [12] we'll mark the general structural and formal features as well as the basic historical circumstances of the publication of each poem in the collection. XML will allow us to record bibliographic data such as title, author, date, and place of publication, which, for the poem on peace above will include the information that it was titled 'From the Belfast News-Letter,' was written by William Cunningham, and was published in *The Gentleman's Magazine* for November 1801. In addition, the XML encoding of the poem itself will include structural and formal elements, ranging from the individual lines and, if we wish, their poetic meter, to stanza type and general form (ballad, sonnet, etc.). All of this data and metadata will be marked in the text itself, not in a separate file, and will then be carried with the edition in a form that will survive across various platforms and delivery systems.

As we write this, the newest browsers are capable of reading XML and a number of businesses, publishers, and scientific projects are using it. Humanities scholars and textual editors, it seems likely, will increasingly turn to XML for serious encoding projects. Its advantages for complex editorial projects are many. For example, with the use of XSLT, a special style sheet language for XML, [13] one large document can, depending on software applications, serve up both 'scholarly' and 'classroom' texts of the same work. In general, XML now promises to overcome the crudest form of the binary opposition between structural and display mark-up, and this is very good news for electronic editions of poetry.

The *British War Poetry:* project at Romantic Circles is just one example of an XML-based edition that would embody in its plan the complex double attention we have been suggesting is necessary to all editing but especially—and in this inescapable, concrete form, at the level of encoding scheme—for electronic editions of poetry. These two example texts, 'The Devil's Walk' and *British War Poetry*, one very early and one extremely recent in the history of Romantic Circles, demonstrate how fundamental are mark-up schemes to digital editing—and they also indicate some of the limits of all existing schemes. Those of us who would edit poetry electronically thus find ourselves working at an interesting moment, rife with possibilities but with experiments still to be done and solutions invented as new projects attempt new schemes.

As the Web has evolved, Romantic Circles has worked with an expanding group of collaborators and contributing editors around the world, deliberately publishing an experimental and diverse list of editions of varying design and editorial approach. Several of these editions have used HTML strategically so as to thicken the interrelations between the poem and the Net. For example, Lisa Vargo and Allison Muri's edition of Anna Barbauld's *Poems :* (1773), [14] instead of in effect translating print apparatus into HTML (as 'The Devil's Walk' did) uses a full range of hypertextual links to produce native-to-the-Web representations of context, most especially the 'Poem Web' focused on the lyric 'On a Lady Writing,' which includes images from writing manuals of the eighteenth century, extended notes
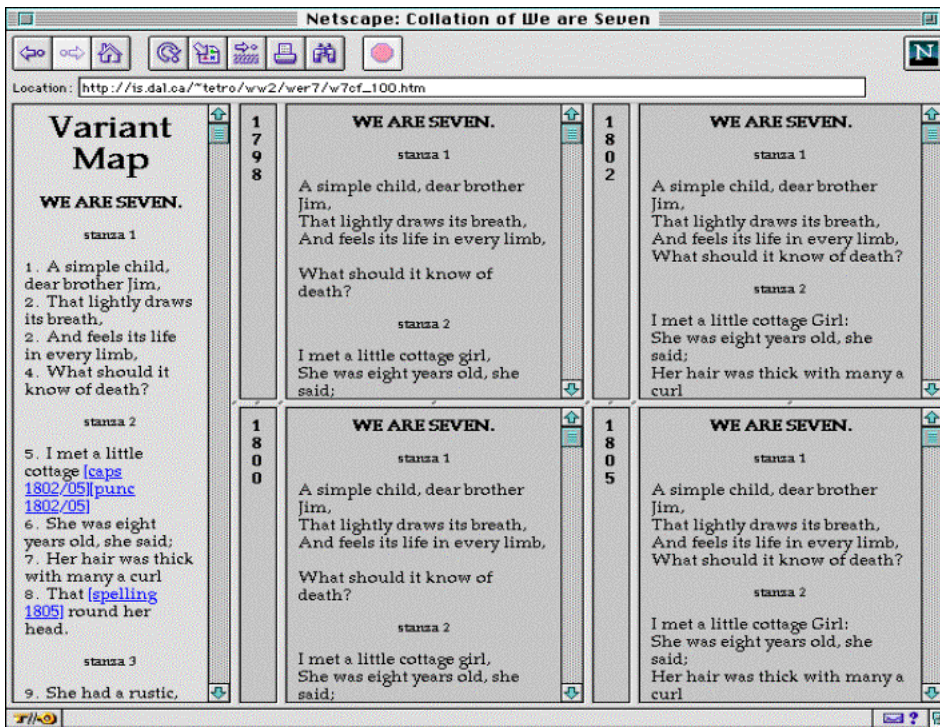
on copy books and quills, a contextual presentation of the way Mary Wollstonecraft anthologized the poem in *The Female Reader:* , and an excerpt from Hugh Blair's influential *Lectures on Rhetoric and Belle Lettres.*

In their edition of L. E. L.'s *'Verses' and :* The Keepsake *for 1829:* , [15] to cite another example, Terence Hoagwood and Kathryn Ledbetter created an edition that exists mostly *as* context, emphasizing the interconnectedness of Letitia Elizabeth Landon's lyric and the popular annual giftbook in which it first appeared, a volume that was itself crafted by its editor Frederic Mansel Reynolds to emphasize the contextural relations among its contents, especially between word and image. Hoagwood and Ledbetter's edition thus reproduces several especially important works that appeared in the *Keepsake:* for 1829, including an engraving of Edwin Landseer's painting, *Georgiana, Duchess of Bedford*, to which Landon's poem refers.

Experiments have also been done at Romantic Circles with editions that push the boundaries of HTML, trying to take advantage of the performative and participatory properties of the digital environment. For instance, Neil Fraistat and Melissa Jo Site's dialogical HTML edition of Percy Shelley's lyric, 'On the Medusa of Leonardo da Vinci in the Florentine Gallery,' [16] presents a critically edited text of the poem with an apparatus that consists entirely of verbal commentary and images provided by users and structured through a forms-based interface that allows the editors to vet all potential contributions to the apparatus.

Of all the electronic editions currently mounted on Romantic Circles, one of the most ambitious in terms of design is Bruce Graver and Ronald Tetreault's SGML encoded edition of Wordsworth and Coleridge's *Lyrical Ballads:* , which reproduces in full the texts of both 1798 imprints of the volume, as well as the three subsequent editions of 1800, 1802, and 1805. [17] Photofacsimile images of every page in all five editions are also included, linked hypertextually to the encoded text, which is marked up in TEIlite. This edition exploits the digital environment to emphasize two important characteristics of *Lyrical Ballads* that have been obscured in print editions: 'first, the complex interaction between authors, publishers, and printers that brought it into being, and second, the multiplicity of versions of the collection that readers had available to them in the early nineteenth century.' In order to represent that multiplicity of versions in meaningful ways, Graver and Tetrault replace the standard apparatus criticus with what they call 'Dynamic Collation,' a script that allows for comparative viewing of textual cruxes within their original contexts. Here's a brief description from the edition itself:

What is seen on the screen is an array of four windows displaying the text of any poem as it varies through the four lifetime editions (1798, 1800, 1802, 1805). This parallel display is accompanied by a fifth window on the left which maps the changes in the poem as descriptive hyperlinks. Clicking on a link in this 'variant map' causes the text in each of the four windows to leap to the same line where the revision in question may be observed in context. . . . The variant map acts a guide to revisions that were made at various stages in the poem's development. . . . Scrolling down the variant map, the reader is thus alerted by a sort of palimpsest that an alteration has been made, and by clicking on the 'hotspot' or hyperlink can summon up the parallel passages.

Variant Map

WE ARE SEVEN.

stanza 1

1. A simple child, dear brother Jim,
2. That lightly draws its breath,
2. And feels its life in every limb,
4. What should it know of death?

stanza 2

5. I met a little cottage [caps 1802/05][punc 1802/05]
6. She was eight years old, she said;
7. Her hair was thick with many a curl
8. That [spelling 1805] round her head.

stanza 3

9. She had a rustic,

1798

WE ARE SEVEN.

stanza 1

A simple child, dear brother Jim,
That lightly draws its breath,
And feels its life in every limb,

What should it know of death?

stanza 2

I met a little cottage girl,
She was eight years old, she said;

1802

WE ARE SEVEN.

stanza 1

A simple child, dear brother Jim,
That lightly draws its breath,
And feels its life in every limb,
What should it know of death?

stanza 2

I met a little cottage Girl:
She was eight years old, she said;
Her hair was thick with many a curl

1800

WE ARE SEVEN.

stanza 1

A simple child, dear brother Jim,
That lightly draws its breath,
And feels its life in every limb,

What should it know of death?

stanza 2

I met a little cottage girl,
She was eight years old, she said;

1805

WE ARE SEVEN.

stanza 1

A simple child, dear brother Jim,
That lightly draws its breath,
And feels its life in every limb,
What should it know of death?

stanza 2

I met a little cottage Girl:
She was eight years old, she said;
Her hair was thick with many a curl

This re-imagination of the traditional static foot-of-the-page or back-of-the-book treatment of variants takes advantage of the electronic medium to provide an inviting editorial environment for the meaningful close reading of textual variation. [18]

More recently, we have moved beyond the Web page and HTML as such in *MOOzymandias:* , an ambitious collaborative experiment in editing that situates Percy Shelley's sonnet 'Ozymandias' in a text-based multi-user virtual-reality environment, making the edition, its text and apparatus more like a game or theatrical space than a letterpress artifact. [19] *MOOzymandias:* was created to attempt what no existing mark-up scheme can really do well yet: deal with the multidirectional, spatialized, phenomenological effects of poetic language—and the multilayered complexity with which poems *mean,* in terms of their presentational *and* structural features, and in terms of the contextual editorial environments constructed by every edition through its acts of annotation and interpretation. Through *MOOzymandias* we are seeking to learn how the potential of the digital medium might be tapped in pursuit of new kinds of editions that engage editors and scholarly readers and researchers in collaborative editorial environments, foregrounding the making of knowledge as central to the editorial endeavor.

An experiment like *Moozymandias* serves to highlight some of the limits of editions in traditional mark-up schemes, whether in HTML or XML. [20] While searchability, retrieval, and textual display are all important to take into account in electronic scholarly editions, there are other dimensions to be explored. Indeed, the digital medium promises to engage makers and users of editions in exciting new ways, to exploit the imaginative energy, ambiguity, and intertextual dynamics of literary works—and of poetry in particular—in ways that may call into question the customary relations between the edited text and its reader/user. Textual editors should be among those attempting such important and innovative experiments in electronic environments. There are, for instance, interesting possibilities for using 3D editorial environments to interrelate text and apparatus, as suggested by Matthew Kirschenbaum ('Lucid'). [21] We could even imagine future editions or archives structured as databases that could be customized to the needs and interests of individual users: first in response to a user's electronic registration form indicating those interests, and then by pushing relevant information to

users based on their behavior while interacting with the edition or archive, much as Amazon.com tailors itself to the behavior of individual customers.

In the meantime, we believe that given the current state of mark-up, institutional expectations, and the Web, editors would be well advised in the near future to use XML for most major electronic editions of poetry. But the challenge for editors of poetry working within such hierarchical mark-up schema is to resist letting the computational and analytical powers of the digital environment eclipse its performative and expressive possibilities, its use as an engine of artistic representation. Editors should strive to produce the richest possible editorial environments, to exploit the full range of resources provided by the digital medium. To date, however, as Susan Schreibman has recently noted, editors have largely played the 'role of assembler of electronic texts,' becoming 'on the one hand the literary-librarian, building a library or the more commonly termed *archive* of multimedia objects, and on the other hand, the literary-encoder grappling with a logic more amenable to programmers than literary scholars. . .' (285).

Schreibman's editor as 'literary-encoder' has already at some point learned how to grapple with a logic native to computer programmers. As we have discovered over time through our work at Romantic Circles, those highly competent textual scholars who do not already possess such knowledge face an extremely steep learning curve, even though there are several helpful XML tutorials online and the TEI guidelines can also be found online or ordered in a two-volume letterpress edition. [22] In time, it is likely that tools will be developed to allow editors to produce simple mark-up by uploading the text and then filling in fields in an online form. (A version of such a form is already in development at the University of Maryland for use by the Dickinson Electronic Archive.) But this will not do away with the need for careful analysis of the structure of the text, detailed planning for the mark-up, and editorial judgment. For now, editors planning to use XML mark-up would do well to purchase a software editor such as XMetaL or OXygen, that can facilitate uniform and valid encoding throughout the edition (even though such software, it must be acknowledged, has its own learning curve).

Our general advice to prospective editors of electronic editions of poetry is to consider the same kinds of questions facing scholarly editors of letterpress editions, especially when it comes to ensuring the accuracy and logical relationships of the texts in question, but to frame these questions anew in the face of the procedural demands and interactive opportunities of the electronic medium. The relevant set of questions will vary from case to case but might include the following: [23]

(1) What is the focus of the edition: form and structure, linguistic intertextuality, contextural relations and publishing history, the larger historical contexts for the material production and reception of the text? What is the relationship of the various texts of the poetic work in question? Which variants, versions, or genetic layers will be included in the edition?

(2) What mark-up scheme—HTML or XML, or some other subset of SGML (using an existing DTD or creating a new one?)—will optimize your ability to represent the features of the poetic text for the scholarly user? Is the primary goal an archival edition for computerized search and retrieval or an edition publicly accessible to students and others on the Web? What will be gained and lost in each case?

(3) What kind of electronic 'apparatus' or editorial environment will support the poetic text in this edition? Traditional lists of variants, hypertext clusters of other poems or contextual materials (including image, video, or sound files or specialized programs for manipulating the text), or more experimental architectures, such as collaborative editorial environments and forms-based encoding? (The TEI includes helpful standards on the critical apparatus.)

(4) What plans are in place for long-term maintenance or updating of the edition, either the text itself or the apparatus? Where will the edition be published—online (and where?) or on CD-ROM or other medium? Will it be 'portable' or translatable from one format or medium to another? Will it be stable? Will the edition's contents survive major changes in platforms, standards, or the protocols of the Internet? (These last questions, it should be clear, are meant to suggest the value of structural, descriptive encoding in SGML/XML.)

(5) What electronic editions currently online might serve as helpful models? What can be learned by contacting the editors of such editions to gain the benefit of their experience? [24]

These kinds of fundamental questions ought to be asked and answered before the project proper begins, though the initial set of answers is likely to be modified by subsequent experience. The answers, in turn, need to be evaluated by being applied to a test case, a sample poem or group of poems that embody the most challenging issues faced in the edition, so that all of these issues are encountered beforehand and addressed at the level of editorial practice.

Finally, we would exhort the editor of an electronic edition to use editorial judgment and creativity (and to consider working collaboratively with others who have experience in technology and encoding) in designing an edition. In uniting the poem and the Net, the larger goal of an electronic scholarly edition should be not only to meet the current needs of the scholarly researcher but to stimulate and challenge 'scholars' of various kinds, including teachers, students, even poets and specialists in digital media, to use the text in order to make new knowledge—which is to say, to use it in ways none of us has yet fully imagined.

Notes

1. On the split of 'the computerized imagination' into two worldviews, and the decision of the Rossetti Archive to build along a 'double helix' of attention to both structure and appearance, see McGann ('Editing' 89). But note that one of McGann's analogs, 'the gulf separating a Unix from a Mac world' (89), no longer applies, given Apple's recent release of OS X, an operating system built on Unix—which serves as a reminder of how quickly the computing landscape can change. The need for such divided attention, given the current state of mark-up, follows logically from McGann's earlier theoretical distinction between the 'bibliographic' and 'linguistic' codes of any text, e.g., in McGann *The Textual Condition* (12-14).

2. For the use of the term 'contexture' to denote the contextuality provided for each poem by the larger frame in which it is placed, the intertextuality among poems so placed, and the resultant texture of resonance and meanings, see Fraistat, *The Poem and the Book*.

3. Romantic Circles, co-edited by Fraistat and Jones with Carl Stahmer, is found at http://www.rc.umd.edu . Online since 1996, the site has been published by the University of Maryland since 1998.

4. On the use of cascading stylesheets, see the W3C (World Wide Web Consortium) pages at http://www.w3.org/Style/ .

5. The encyclopedic nature of hypertextuality, however, is often overrated and abused when there is no well-conceived interface to structure the information critically and coherently for users. Resources conceived as electronic 'archives,' with all the expansiveness invited by that master trope, need especially beware of this danger.

6. MOO stands for 'Multi-User Domain, Object Oriented.' Romantic Circles' MOO, the 'Villa Diodati,' can be accessed at: http://www.rc.umd.edu:7000 .

7. This is basically the process that Ted Nelson, who coined the term 'hypertext,' had in mind when he speculated about the explicit intertextuality of virtual copies over the network, or the 'transclusion' of one text by another. See a 1996 interview published by IBM's Almaden Research Center: http://www.almaden.ibm.com/almaden/npuc97/1996/tnelson.htm .

8. Two sections of the Text Encoding Initiative are especially useful for understanding these issues: on Critical Apparatus, section 19: http://www.tei-c.org/P4X/TC.html —and on the Transcription of Primary Sources, section 18: http://www.tei-c.org/P4X/PH.html .

9. See the TEIlite-encoded version of 'The Devil's Walk' at the Electronic Text Center, University of Virginia: http://etext.lib.virginia.edu/toc/modeng/public/SheDevB.html . See also the larger SGML archive of which it is a part: *British Poetry 1780-1910: a Hypertext Archive of Scholarly Editions*: http://etext.lib.virginia.edu/britpo.html .

10. This is especially true of its HTML incarnation. As browsers have conformed to newer and more restrictive standards for HTML, they are losing their ability to read resources encoded in older and more tolerant HTML versions. XHTML combines the syntax of XML with the standards of HTML 4.01 and is read by browsers as well-formed XML mark-up. For a useful introduction, as well as tutorials for learning XHTML, see http://www.w3schools.com/html/html_xhtml.asp .

11. In many ways we have learned a great deal for this project in particular from the Brown University Women Writers Project http://www.wwp.brown.edu , which also collects far-flung poems under the rubric of an electronic database or anthology. See the essay by Julia Flanders in this volume.

12. For the use of the TEI's 'Pizza Chef' to build one's own customized DTD, see the TEI pages: http://www.tei-c.org/pizza.html . We recommend this method for projects in their formative stages; many will find that TEIxlite is sufficient for their purposes, others will quickly discover that they need a wider range of tagsets, for which they can consult TEI documentation.

13. XSLT (XSL Transformations) is a subdivision of XSL (Extensible Stylesheet Language), whose purpose is to transform an XML document into another XML document. For XSLT, see http://www.w3.org/TR/xslt . Samples of two different java-driven XSLT engines for transforming XML to HTML can be found at The Melville Electronic Library http://www.iath.virginia.edu/melville .

14. http://www.rc.umd.edu/editions/contemps/barbauld/poems1773 .

15. http://www.rc.umd.edu/editions/contemps/lel/keepcov.htm .

16. http://www.rc.umd.edu/editions/shelley/medusa/medcover.html .

17. http://www.rc.umd.edu/editions/LB/index.html .

18. For a more extensive discussion of the rationale and structure of their edition, see Graver and Tetreault.

19. MOOzymandias can be browsed on the Web (not in the fully-interactive MOO version) by going to http://www.rc.umd.edu:7000/705/ . For a fuller discussion of MOOzymandias as a new kind of textual edition, see Fraistat and Jones.

20. Shreibman usefully summarizes the current debate about the limitations inherent in SGML's (and its derivatives) understanding of a poem as an ordered hierarchy of content objects. To get beyond the limitations of editions or archives that are structured merely as ordered hierarchies, Shreibman suggests that electronic editions might be fundamentally organized to represent multiple versions of the same work and that electronic archives might be developed whose primary purpose is to represent a work's reception history. Those editors

interested in textual versioning should know that Shreibman has led a team at the Maryland Institute for Technology in the Humanities in the development of a new and freely available software tool, The Versioning Machine, an editorial environment 'designed specifically for displaying and comparing deeply-encoded, multiple versions of texts': http://mith2.umd.edu/products/ver-mach/index.html .

21. Elsewhere we discuss, in light of experiments Robert Coover has been doing in Brown University's Virtual Reality Chamber, the possibility of textual editions in the form of Virtual Reality Chambers that would allow, for example, Shelley or Joyce scholars to make and share discoveries about the text while inside of Prometheus Unbound or Ulysses (see Fraistat, (need title) forthcoming).

22. See the TEI's 'Gentle Introduction to XML': http://www.tei-c.org/Guidelines/P4/html/SG.html .

23. These questions are adapted from the CSE's Guidelines for Scholarly Editions, which appear in the present volume and are currently under revision to account for electronic editing. See http://www.mla.org , 'Committees and Commissions'—CSE.

24. For a list of projects currently using the TEI, see http://www.tei-c.org/Applications/index-subj.html .