

SEEING SWINBURNE:

Toward a Mobile & Augmented-Reality Edition of *Poems and Ballads*, 1866

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Scholarly editing, in a literary-historical context, involves the painstaking visual and tactile examination of scores of printed and hand-written documents to identify their independent bibliographical qualities, and to compare sometimes-minute textual differences among them. This is done in order to understand and represent, for scholarly consideration, change over time. In the case of critical editing—a more interventionist form of textual scholarship—the goal is even *to attempt to reverse* transformations wrought by bygone agents and processes on poetry and prose. Such transformations range from the intentional (like minor revisions to a manuscript, or “stop the presses!” authorial corrections) to the accidental (through freaks of inking and binding or traces of damage to plates, or in the form of unauthorized changes in spelling or punctuation introduced when letterpress type is manually re-set). Errors and alterations are also often cumulative, generating near-genetic “family trees,” or textual stemmata, as they are handed down through generations of reprinting. The effect is that different reading audiences, over time, may receive markedly different literary works—a fact that can tempt us to view textual history as a chained sequence of abstractions. But it is important to understand that this sequence is not merely conceptual, but rather always anchored

in physical objects. Textual history is as much *material and embodied* as it is social and intellectual.

So, too, is the work of the bibliographer or textual critic, whose forensic findings are typically *predicated on* and often ultimately *remediated into* manipulable book objects—even today, when a goodly portion of textual scholarship is conducted and expressed online. Digital archives and editions have made it possible for editors to share an exponentially greater number of high-quality facsimiles of their original sources than would be economically feasible (or even physically possible) through printed works alone. But even when scanned page images are available, users of online editions rarely see or sense the visual and haptic engagement with our textual past that has resulted in the scholarly findings on their screens—the process of unraveling errors and mapping change. Contemporary digital editions seem frozen in time and lost in space: divorced from textual scholarship’s basis in book design, textual materiality, bibliographical examination, and optical collation—and stuck in trite, skeuomorphic page-turning interfaces or 1990s click-and-scroll paradigms of design interaction.

Our project takes the physicality of bibliography and textual criticism as its subject and invites student readers and fellow textual historians and critics to see differently, reach out, and step away from their desks. An in-progress scholarly and teaching edition of Algernon Charles Swinburne’s scandal-rocked and fundamentally-unstable *Poems and Ballads* (1866) becomes a playground for touch

and tablet-based presentation, augmented-reality interaction with printed book objects, temporal modeling, and experimentation with textual collation and the work of scholarly editing using abstract visualization and immersive VR. This chapter of *Seeing the Past* sketches for the first time the extraordinarily textual history of Swinburne's book (our problem set), surveys the design literature and theoretical landscape for our technical work, and describes four experimental interfaces—three of which are currently in progress at the Scholars' Lab of the University of Virginia Library—that we feel would bring sophisticated, readerly scholarly editions to fresh audiences and make the *material work* of textual scholarship visible in new ways.

Poems and Ballads, A Textual History

In the spring of 1866, Algernon Charles Swinburne was preparing for the publication, by the highly respected house of Edward Moxon and Company, of his first collected book of lyrics. Moxon had, in the past year, issued Swinburne's verse-dramas *Chastelard* and *Atalanta in Calydon* to great critical acclaim, and had asked the poet to edit a volume of Byron, which had appeared in February. To all appearances, Swinburne's relations with his publisher and reading public were excellent. His star was on the rise: his work was known to Queen Victoria, who was later to hint that Swinburne might follow Tennyson as poet laureate (Broadus 197). Moxon and Company were taking such care with *Poems and Ballads* that, although proofs had been pulled and authorial corrections made once already, the publisher consented to many costly last-minute changes Swinburne requested—

some very minor. These were made by hand and with the means of cancel-leaves (that is, by slicing pages with rejected text out and gluing new ones in), even after the book had gone to press and to the binder. The hand corrections were meticulous. Nowviskie's bibliographic examination of approximately 20 volumes of *Poems and Ballads* even shows evidence of commas being turned into periods at Swinburne's request, by means of scratching at the ink with a blade. This is not labor a publisher undertakes for a writer unless he is serious about the integrity of that writer's work.

On the 25th of July, 1866, *Poems and Ballads* was made available to the Victorian reading public. The book was widely advertised and, by all accounts, sold well, despite (or more likely, because of) its controversial subject matter. However, Moxon's heirs, still reeling from an unconnected blasphemy suit, quickly realized that a few initial negative reviews of *Poems and Ballads* were the first symptom of a growing literary scandal, centered around Swinburne's unconventional themes of lesbianism, hermaphroditism, wild sado-masochism, vampirism, and outright sacrilege. By the 10th of August, the poet had been summarily informed that Moxon meant to withdraw the book from publication, and sell remaining sheets as scrap paper (Marsh 83-90).

Swinburne's friends in the Pre-Raphaelite brotherhood—a group of collaborating artists and writers including the Rossetti family—sprang into action. A second, rather less-reputable publisher was located, and it was soon arranged that John

Camden Hotten (whose titles more commonly leaned toward railway novels and Victorian erotica) would take over all of Moxon's interests in *Poems and Ballads* as well as in Swinburne's previous and forthcoming work. In September, Hotten re-issued *Poems and Ballads*, thriftily using the Moxon volumes that were already prepared—only replacing the original title page with his own. The poems continued to sell at a rapid clip, and Hotten was shortly reduced to a stock consisting of faulty, not-yet-corrected books and loose proof sheets that had not received the careful emendations Swinburne ordered before publication. In other words, nothing was left but bad, error-filled copies and loose, error-filled sheets. These texts, too, were bound up, labeled as Hotten publications, and placed on booksellers' shelves. They quickly sold as well and, before the year was out, Hotten was forced to typeset a new edition of the book from scratch—a fact he seems to have hidden from Swinburne in order to avoid paying the royalties due on a new edition. Bibliographic evidence suggests that Hotten's typesetters used the only copy of *Poems and Ballads* remaining to them—one last text in the uncorrected Moxon state. This means that, between late July and mid-November of 1866, Swinburne's *Poems and Ballads* was put out in at least five versions: the Moxon Uncorrected state, a Moxon Corrected state, as a Hotten-labeled publication of Moxon Corrected stock, as a Hotten publication of Moxon *Uncorrected* stock, and finally as a Hotten Reprint—only this one constituting a *true* new edition—itself set from a Moxon Uncorrected edition and additionally introducing, through the complete re-setting of the type, a whole new collection of accidentals.¹

¹ These conclusions are based on Nowviskie's research and use the terminology of

In the meantime, Swinburne and his friends began to feel that his many detractors should be given some response, and October saw the publication of William Michael Rossetti's *Swinburne's Poems and Ballads: A Criticism*, the first independent work of scholarship on the poet, and Swinburne's own defiant pamphlet, *Notes on Poems and Reviews*. Interest in the controversy was building in America as well and, under a previous agreement with Moxon, the Carleton publishing-house of New York issued yet another a modified version Swinburne's text, also dated 1866, but now entitled *Laus Veneris: and Other Poems and Ballads*.

Swinburne considered this book a piracy. The New York edition shifts the order of the poems, Americanizes many of Swinburne's spellings, and regularizes punctuation in unauthorized ways. In addition to numerous accidental and intentional compositors' variants that pepper the text, all of the errors originally detected and corrected by Swinburne in the original Moxon state reappear. This means Carleton (like Hotten) typeset the new edition from a Moxon Uncorrected printing—and Nowviskie's examination of multiple copies of the 1886 Carleton New York edition has yielded independent textual variants *amongst them* as well.²

Hotten continued to reprint *Poems and Ballads* until his death in 1873, when his publishing house was taken over by an apprentice, Andrew Chatto. The Chatto and Windus editions that follow stretch on into the 20th century. They form the basis for

² American texts from 1866 are not represented in our online scholarly edition but will form part of a later study.

modern reading-texts of Swinburne both in print and electronic form. For instance, the widely-used and reproduced Chadwyck-Healey English Poetry database presents Hotten-derived Chatto and Windus texts, as does the sole scholarly online edition of Swinburne, the diplomatic *Swinburne Project*, edited by John Walsh. This means that our most common 21st-century conceptions of *Poems and Ballads*—the poetic language we receive today online and in modern printed editions—is not as Swinburne intended it. It has been sculpted by the events of 1866.

The drama of textual variation in *Poems and Ballads* is deepened, however—because the first scholar of the textual history of Swinburne was a fascinatingly bad man.

Thomas J. Wise, the most eminent bibliographer and book collector of his time, was also a forger and a thief: a person later shown to have capitalized on the trust and admiration of the literary world by sneaking into the British Museum's library with a razorblade in his pocket, which he used to cannibalize title pages and other key leaves from books. These loose pages later played a role in Wise's profitable and private deceptions with a glue-pot. It seems to have been easy to make a valuable first edition out of, say, a fifth edition, if only one had the proper title page and the absolute trust of late Victorian and Edwardian literary London. Soon Wise was drawn to imagine the possibilities of access to a printing press of his very own.

Wise studied and collected the works of some Victorian poets while they were still alive, and he befriended many of them. Swinburne, who had long since retired as a recovering alcoholic to the home of his admirer and caretaker Theodore Watts-

Dunton, was especially vulnerable. When Wise appeared on Swinburne's doorstep one day in 1890 with a smile and a hot-off-the-presses, forged pamphlet version of *Laus Veneris*, a key poem from the 1866 volume, it didn't take much to confuse the aging and infirm poet into validating the forgery as an extreme rarity.

Swinburne quickly went from having no memory of an 1866 pamphlet, to a firm belief that Moxon, whom he had never trusted, had deceived him by printing a portion of his manuscript without permission. In seeming generosity, Wise gave the forged document to Swinburne, and it went directly into the poet's private library. Soon after Swinburne's death, the culprit returned, calling on Watts-Dunton with an offer to buy the poet's entire collection. Later, when Wise literally *wrote the book* on all of Swinburne's publications (*A Bibliography of the Writings in Prose and Verse of A. C. Swinburne*), he could cite own Swinburne's letters and commentary about the forged pamphlet, establishing it as genuine. (In fact, Wise embellished a little more, to say that it seemed to have been printed as a test publication, on Moxon's part, to ascertain whether the public would be scandalized by the content of the larger *Poems and Ballads* project). Wise could also state truthfully that his own copy of the extremely rare "Laus Veneris" pamphlet had been found among the poet's personal effects. It was therefore made even more valuable by personal association. Interest was piqued and demand grew. Before long, Wise announced that he had miraculously located a small cache of the pamphlets, gathering dust in a pensioner's attic (Carter and Pollard 272ff.). He might be induced to part with a few for the right price.

The fraud was so successful that Wise continued it with other poets. It was not until 1934 that John Carter and Graham Pollard, a bookseller and a graduate student, became suspicious enough of Wise's regular pamphlet discoveries to apply modern—at that point, pioneering—techniques of analytical bibliography to their paper, ink, and typefaces. Chemical and type analysis, published as *An Enquiry into the Nature of Certain Nineteenth-Century Pamphlets*, proved not only that Swinburne's "Laus Veneris" was a forgery, but that many widely-accepted first editions of noted authors like Tennyson, Kipling, and the Brownings were absolute fakes.

The event of Moxon's hasty withdrawal of the first edition of *Poems and Ballads* and the campaign of Thomas J. Wise's deliberate interventions into its reception hover in our story like twin dark stars, exerting force not only on the history and documentary evolution of the work, but on interpretative scholarship being undertaken by modern critics of Swinburne as well. *Poems and Ballads* has never been adequately edited, and Nowviskie's work is geared toward untangling this textual conundrum. In terms of Swinburne studies, because the poet fell into disfavor and was not much examined by bibliographers in the 20th century—most extant biographies, works of literary criticism, and even rare book dealer's pricing guides contain false information about the actual texts and events of 1866. They repeat the story of the "test balloon" edition of "Laus Veneris," reprint words and phrases Swinburne had once deliberately and painstakingly replaced, misidentify

various editions and states, and draw false interpretive conclusions from this textual history, about the poet's life and art.

Such a vexed textual history lends itself to experimentation in the form of a digital edition, which might simultaneously emphasize the textual complexity and fascinating materiality of *Poems and Ballads* and creatively place it in relation to alternate timelines and imaginings.

State of the Art: Theoretical and Design Frameworks

The production of such alternative and critically remediated texts would participate in what Kari Kraus has termed “conjectural criticism,” a practice that exploits computational “tools of reconstruction and forecasting” for applications ranging from “the recovery of lost readings in classical texts and the computational modeling of the evolution of a literary work... [to] the descent of a natural language” (Kraus 4). Conjectural criticism, in Kraus's terms, is concerned—like scholarly editing and philology—“with issues of transmission, transformation, and prediction (as well as retrodiction),” but also requires an algorithmic and semiotic “computational model of textuality” in order to position itself “as a counterweight to the material model of textuality that now predominates” (4-5). Our work on the Swinburne project, however, is meant to demonstrate that that weighty textual materiality is itself a fruitful ground for speculation and retrodiction—or even re(tro)vision. We feel the time is right for this work. Heather Love, writing on the empirical revival of digital humanities, the hermeneutics of suspicion, and the

“descriptive turn,” notes a pronounced “disengagement” in most sectors of bibliography and material text studies from “critical hermeneutics—and, more generally, from the kind of speculative and abstract thought so common during the heyday of literary theory” (Love 382). This is problematic and not in line with our understanding of the ends of textual scholarship.

We strongly agree with Kraus that “a cogent theory of conjecture is a desideratum of textual studies” (66), and suspect—based on promising results from researchers like Natalie M. Houston and Ted Underwood—that such a theory can best emerge from and be tested in large-scale analysis. In Underwood’s terms, we “don’t already understand” some things that have been taken as foundational in the study of poetry and prose: even “the broad outlines of literary history” (2013). And while so-called “distant reading” is most commonly associated with the processing of texts divorced from their instantiation as typeset pages, or gatherings sewn into bindings—as in Underwood’s typical practice—Houston smartly applies computer vision and optical character recognition techniques to a macro-analysis of thousands on thousands of instances of “the visual page.” This work allows her to see with new eyes “the unremarked material aspects of ordinary books of [nineteenth-century] poetry” (505). “To look at a book of poems through data visualization,” Houston writes, “foregrounds visual and bibliographic codes obvious in the material object but often overlooked in its digital surrogates” (507). Houston, of course, is not looking at a solitary book, but at as many as her repositories and methods will allow. Equally important, however, is our ability to use a single, hand-held scholarly edition—so

long the basic unit of humanistic inquiry—to (in the terms of this collection) better help readers “see the past.”

In 1965, computer graphics pioneer Ivan Sutherland imagined what he called *The Ultimate Display*:

If the task of the display is to serve as a looking-glass into the mathematical wonderland constructed in computer memory, it should serve as many senses as possible. So far as I know, no one seriously proposes computer displays of smell, or taste. Excellent audio displays exist, but unfortunately we have little ability to have the computer produce meaningful sounds. I want to describe for you a kinesthetic display... The ultimate display would, of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal. With appropriate programming such a display could literally be the Wonderland into which Alice walked. (Sutherland 506-08)

By the late 1960s, together with Robert Sproull, Sutherland had made rudimentary gestures toward such a fully materialized “display,” by introducing a system that would prove foundational to future interaction designers’ and technologists’ work toward the compelling use of virtualized and augmented 3D environments.³

Sutherland and Sproull’s initial design had serious technical limitations. Their device—like most modern systems—consisted of a helmet with attached, partially

³ See for instance a video of Sutherland’s 1968 “Head-Mounted Three Dimensional Display” at https://www.youtube.com/watch?v=7B8aq_rsZao, described in *Proceedings of AFIPS 68*, pp. 757-764 .

transparent goggles that projected images to the user. However, because of the need to track head movements to calibrate the perspective of displayed wireframe cubes, this head-mounted display (HMD) required sensors to be physically attached to a long arm suspended from the ceiling. The system was affectionately named the “Sword of Damocles” (Rheingold).

Techniques have vastly improved in the nearly fifty years since. Head-mounted displays have not only been miniaturized, but have become commercial products that a growing number of consumers can afford. Facebook’s Oculus Rift creates a fully immersive 3-dimensional environment and, with key hires like John Carmack and Michael Abrash, the company is poised to enter the business of 3d gaming. Systems like Google Glass, in contrast, allow developers to overlay small amounts of requested or contextual information on a tiny screen, mounted to a lightweight pair of eyeglasses. Both of these platforms leverage the hardware computing available from cellular phones, and the Oculus Rift’s display itself is derived from Android-based phones. Augmented reality applications like Yelp’s Monocle app, which leverage open data and the user’s location to overlay information on the world as viewed through a cell phone’s camera, have grown in popularity and become increasingly robust due to advances in mobile chip technology and device battery life. And creative uses of virtual and augmented reality by independent developers, like book artist Amaranth Borsuk, have begun to focus academic and artistic interest on third-party peripherals like the gesture-based LEAP Motion controller (Kirschenbaum and Werner 446-7). Tools like these allow users to operate in a

post-WIMP manner—that is, to work in gestural and spatially enabled ways, beyond the long-established computing paradigm of windows, icons, menus and pointing devices (Van Dam 63-67). We can now imagine the book differently, and perhaps know it better through that imagining.

Taken together, we hope a focus on the material and conjectural, the haptic and the conceptual, the possible and the real, will allow us to participate in Donald Norman’s notion of reflective design—particularly its “subjunctive perspective... the possibility space of the *what if?*” so helpfully modeled by the work of Charity Hancock et al. in “Bibliocircuitry and the Design of the Alien Everyday” (76). We use modern, digital and augmented-reality reading devices both as platforms for experimentation and as defamiliarizing technologies, in order to allow us to see historical texts alternately and anew—valuing, in the early stages of our work “critical inquiry over usability and exploratory prototyping over fully-realized productions” (72). The theoretical, technical, and design frameworks we’ve described here inform our four experiments toward a digital edition of Swinburne’s *Poems and Ballads*.

In a nutshell, we are prototyping and refining:

- 1) the primary interface to the edition, meant to convey Nowvieskie’s original textual research, advance usability of TEI-based editions on tablet and mobile devices at the same time that it teaches users about textual materiality and the work of scholarly editing;

- 2) a simple, clean, print-on-demand reading text of *Poems and Ballads*, enhanced with footnotes and a wealth of supplementary material not visible on the page, but rather appear through the augmented reality viewport of a camera-phone;
- 3) a set of interactive timelines that not only convey the textual history of *Poems and Ballads*, but experiment with the alternate and conjectural histories that have been posed by Swinburne's bibliographers, forgers, and critics; and
- 4) a proof-of-concept optical collation mechanism that allows users to compare minute textual differences in two versions of *Poems and Ballads* using the head-mounted virtual reality display of the Oculus Rift.

All four experiments are described below.

Seeing Swinburne: Four Experiments

1. The Digital Edition

The goal of this experiment is to rethink the basic paradigm for electronic scholarly editions, creating a touch-friendly, contextual, "sliding pane" interface better suited to tablets and mobile devices, but also highly usable on a desktop display. The edition is meant to include textual and scholarly notes, a demonstration of collation techniques in 3D, and a "reveal codes" view of the underlying TEI-XML markup in which all known 1866 versions of *Poems and Ballads* have been encoded. Our emphasis is simultaneously on providing a fresh take on the design of digital

editions and on emphasizing the physical, optical, and bibliographic-historical processes that go into the creation of any scholarly edition.

The first step toward a digital edition involved translating Nowviskie's textual apparatus, which represented the collation, analysis, and categorization of approximately 20 copies of *Poems and Ballads* undertaken over a several-year period. Assisted by our UVa Library colleague Tyler Magill, who built on separate XML documents first created by John Walsh and (under Nowviskie's supervision) by graduate students Keicy Tolbert and Rob Stilling, we encoded various key groupings of textual witnesses using the Text Encoding Initiative's standards for collation. A TEI technique called parallel segmentation allowed us to nest variants and sped the encoding of the various textual witnesses, now combined into a single XML document. We are also encoding explanatory literary and historical information in the form of footnotes written by Nowviskie and Jerome McGann (provided with permission from his 2004 Yale collected reading edition of Swinburne, co-edited with Charles L. Sligh).

While the TEI provides a convenient, consistent, and sustainable method of encoding the texts associated with the various printings and assemblages of *Poems and Ballads*, it presents certain technical challenges to facilitating our desired user interactions, both on desktop computers and mobile devices. A typical technique for displaying a TEI-encoded document is to transform its data through various extensible stylesheet language transformations (XSLT) to produce a version suitable

for the Web. Editors have typically chosen to render such content as long, scrolling pages corresponding to an entire encoded work. Scholarly editions using this technology commonly either pre-process an entire project into static HTML, or employ a server-based page-rendering engine that can create responses on the fly for a given subset of the underlying XML document. The latter approach treats the XML document as a data store, but lacks many developer conveniences and opportunities for optimization that a more modern data store provides.

In order to build as flexible and tablet-friendly an edition as possible, we designed a hypermedia application-programming interface (API). This is an information architecture that adheres to representational state transfers of data (REST) based on URL hierarchies, but enhances programming capacities by explicitly providing the URL path any given state can perform. For instance, in a simple state, one may want to return a particular page from the primary reading text of *Poems and Ballads*. In the body of the response from the server, the application explicitly links to other actions that are available to this state, like the line groups contained on the page, marked stanzas, any textual variants, images, and scholarly textual notes—all of which are also individually addressable through a web-URL. This allows us the flexibility to abstract how the data is stored from various client applications of the data. By pre-processing our TEI, we can create highly optimized data structures for the various clients we are building to consume, minimizing latency and maximizing the responsiveness of the overall system to the end user. Clients of this data can then use this information in a way that makes the most sense for their particular

platforms, but which are still solidly grounded in the structural, scholarly arguments being made by the editor of the edition—in this case, by Nowviskie.

Our first experiment in rethinking a modern scholarly edition therefore started by rethinking the role of the Internet itself, as a delivery mechanism. The last several years have seen a trend away from generating statically accessible web content (such as web pages or downloadable PDF and EPUB files) in the favor of more powerful interactions with content in the form of “web applications.” This has been made possible by the work that browser vendors have done in the JavaScript runtime environment to ensure that JavaScript applications can take advantage of all of the central and graphical processing units available in modern computing platforms. Our project uses the most current thinking on developing for mobile devices first, and then scaling and enhancing the application to take advantage the additional computing power and space of desktop displays.

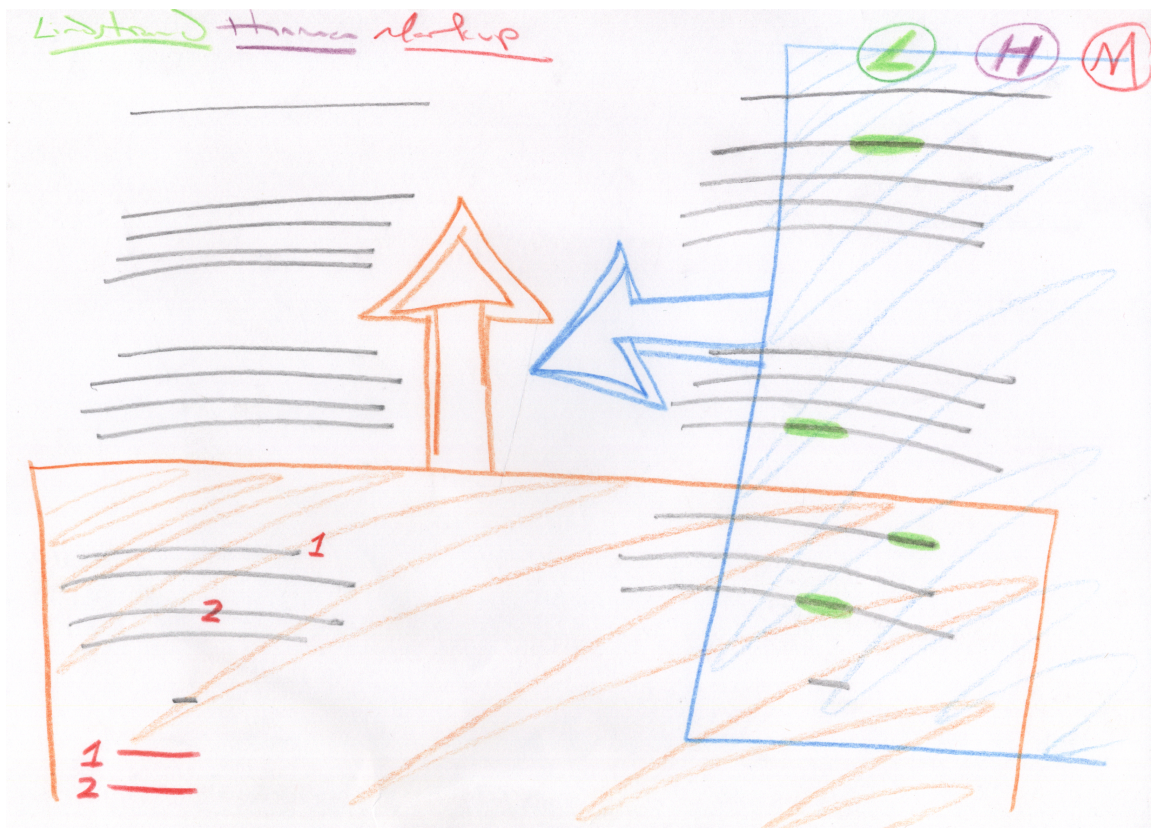


Figure 1.

Initial design sketch of desktop interface interaction. Nowviskie and Graham.

By treating our scholarly edition as an application rather than a series of web pages, we are able to better allow the user to interact with various components of its underlying information. A major goal of this application is to provide a haptic interface, natural to tablet-based interaction, through which users can “slide” additional panes of information over the primary reading text of *Poems and Ballads*. In this way, additional scholarly information, normally relegated to footnotes, is made immediately available within the context of the poem currently being read, but it can also be easily dismissed. Another such panel allows users access to the underlying data structures themselves, revealing the mechanisms and data

representations through which our edition has been constructed. In other words, this skeuomorphic sliding pane reveals the project's underlying code. Still another offers an experiment in simulating optical collation through superimposition of red and blue text from differing witnesses. Simple, cheap 3D glasses of the sort provided at movie theatres and in the cereal boxes of our youth reveal floating variants through anaglyphic filtering in much the same way that a bibliographer employing a Lindstrand Comparator device will observe textual differences as variations in a visual plane.⁴

Nowviskie's *Poems and Ballads* is therefore imagined as a teaching edition about the process of bibliography and about its own construction. We want users to *see* things normally hidden in electronic editions, or even information that has been "hidden in plain sight" in printed books—in the way that students new to descriptive bibliography suddenly notice page signatures (those little, marginal letters and numbers that serve as cues to bookbinders) *everywhere* in 18th and 19th century volumes. By composing the information from various textual witnesses to *Poems and Ballads* through a hypermedia API, we are able to provide contextual, as-needed data, and to recreate different editions of the work on an ad-hoc basis. Each bibliographic state of the text may be called on demand, allowing the edition to be used as a teaching tool through which students may compare historical or editorial/eclectic versions of the work. Our goal is to offer a new, mobile-ready, distraction-free, and touch-screen-first design paradigm for modern scholarly

⁴ See section 4 below for more information on optical collation.

editions, while simultaneously emphasizing the physical, optical, and bibliographic-historical processes that go into the creation of any edition. This, too, is a material text.

2. The Printed Edition

Augmented reality technologies provide unique opportunities for working with physical, printed scholarly and reading editions. Book publishers have begun to experiment with AR to better produce compelling editions of classic books. Penguin Books recently partnered with Zappar to create eye-catching augmented reality covers of several English novels, including *Moby Dick* and *Great Expectations*. With the Zappar application loaded, users can point their mobile devices at a physical book's cover to reveal and provoke an interactive experience. To date, though, such AR experiments are little more than sales gimmicks. ("Thar she blows!") More compelling user experiences are currently found in the gaming realm. Consider the Harry Potter-licensed *Wonderbook: Book of Spells*, released in 2012 for the PlayStation 3, which works with the gaming station's motion controller and eye camera, allowing users to wave a wand to interact directly with a printed book. And Steven Feiner's work with the Boeing Corporation, toward a system for enhancing real-world construction and repair manuals, leverages augmented reality technologies to help users accomplish critical tasks more quickly and safely (Feiner et al., 53ff).

In a scholarly context, an augmented reality client could easily supplement a physical, printed edition. Our second experiment lies in augmented reality interaction with a simple, uncluttered, printed or print-on-demand “reading text” of *Poems and Ballads*, which can be made to show textual and explanatory footnotes, related artworks and 1866 page images, and other bibliographic or scholarly features through a webcam or mobile phone camera. In addition to suggesting a new relation between serious textual criticism and lightweight and inexpensive classroom reading texts of the “Dover Thrift” variety, this experiment allows us to engage in book design and—appropriately to Swinburne’s Morris-influenced Pre-Raphaelite circle—to be more respectful than digital editions usually are, of the “opening” of a book, or its two-page spread, as a visual unit of analysis and display (Morris 70).

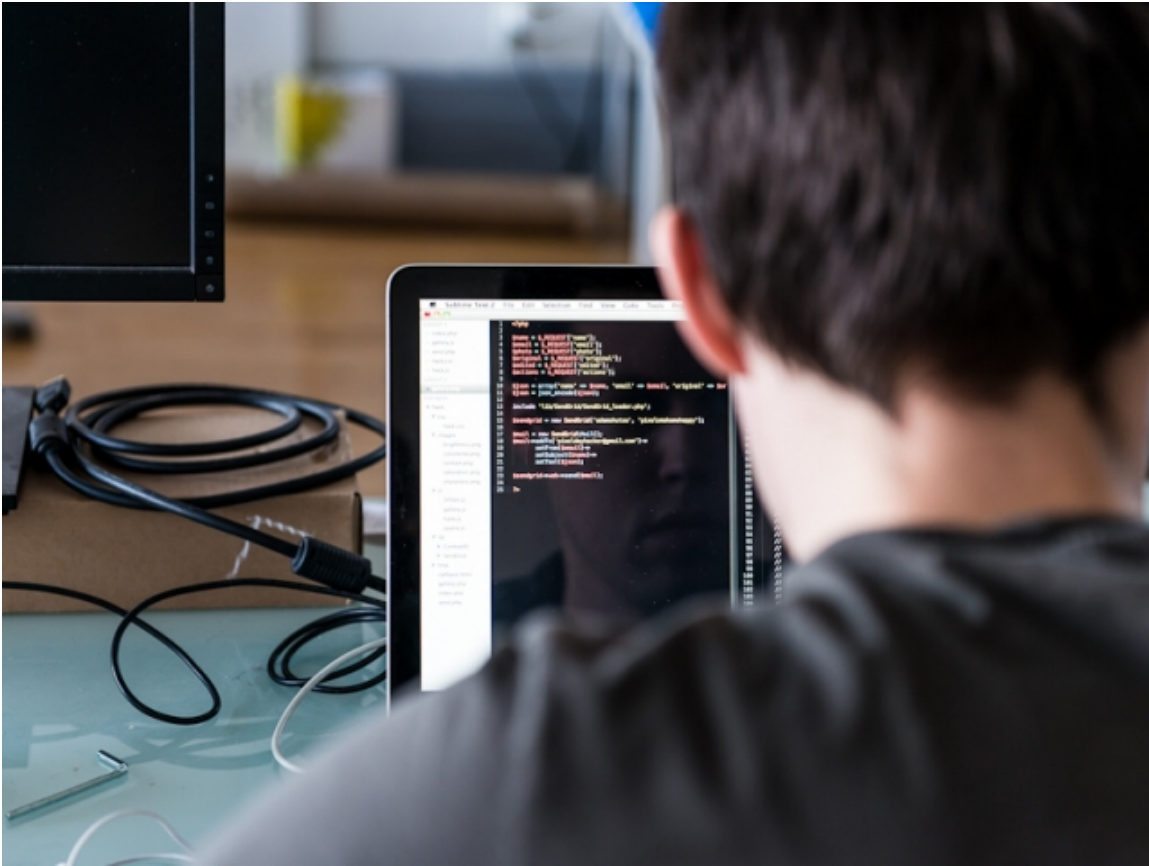


Figure 2.

Augmented reality interaction with a physical reading edition. Placeholder image.

Anecdotal evidence from use of digital collections such as the Rossetti Archive suggests that, for classroom use, students and instructors cleave to print. How might teaching practices change if they had ready access through their mobile devices—slim, attractive printed books in hand—to all of the bibliographic and scholarly features of a serious critical edition, and to more supplementary material than could be feasibly printed, even in multiple volumes and the heftiest of tomes? How might AR help bibliographers and textual scholars to work differently with primary sources in archives? Can augmented reality techniques more effectively bring

digitized page-images from a far-flung archive into conversation with a newly-encountered, undigitized physical object? The same techniques that allow users of our printed “reading text” to access digital facsimiles for reference may open up additional possibilities for optical collation—the visual comparison of one printed page with another—through cell-phone cameras. We have a working prototype for this experiment and are currently deciding between the creation of a dedicated “app” for the project, like Zappar/*ar, or the design of another responsive web application, similar to our primary electronic edition, using existing JavaScript frameworks.

3. Swinburne in Time

Most of the underlying data for our *Poems and Ballads* edition has been derived from bibliographic examination and takes the form of identified variants related to the production history of the work. These data imply an evidence-based textual stemma, or branching timeline of variant texts. Such a timeline, however, would be greatly enriched by an expression of the social, cultural, and biographical circumstances of the work’s production: its Victorian milieu. In addition to presenting a production history of *Poems and Ballads*, could we imagine producing additional timelines that offer subjective *reception* histories—the story of reviews, responses, and interventions or conjectures? Drawing on original research and the unpublished University of Cambridge D.Phil thesis of Clive Simmonds, on conceptual work by Johanna Drucker and Nowviskie—and later by Stan Ruecker et. al—on the *Temporal Modelling Project*, and on a technical planning process for a 3.0 version of

the Scholars' Lab's *Neatline* tool, we are wireframing possible interactive timeline expressions of the history of *Poems and Ballads*.

Available to plot on an imagined timeline are various attacks on the content and style of *Poems and Ballads* penned in 1866 as well as some immediate defenses by the Rossettis and by Swinburne himself. Similarly, circumstances of Swinburne's personal biography and his later evolution as a poet could be mapped out. And, alongside the scholarship and creative interventions of T. J. Wise, we can temporally position small revivals and moments of critical attention to Swinburne (LaFourcade, McGann...), and contemporary reviewers, as traced by Clive Simmonds.

In his growing 1870s conservatism, Swinburne himself expressed a desire to re-issue *Poems and Ballads* in a new order, rearranging some works and leaving many of the most controversial lyrics out. This means that one could plot the expurgated text that "could have been" alongside the now-established history of *Poems and Ballads*, and creatively map either Swinburne's imaginings of the impact of such a thing, or our own. And other alternate-timeline games could be played. Rikky Rooksby, who wrote the major modern biography of Swinburne, opens his study of the poet's life by imagining Swinburne's funeral—not, as it happened, in 1909 after 40 years of declining power in the protective custody of Watts-Dunton, but as if it had occurred in 1866, at the height of the literary scandal of *Poems and Ballads*, and of Swinburne's poetic vigor. If Swinburne had died in 1866, Rooksby asks, would he enjoy the reputation of a Byron today?

All of these later wrinkles—from Wise’s fictional production timeline to Swinburne’s proposal for an expurgated edition and Rooksby’s alternate historical imaginings—extend the already hugely complicated story of the printings and reprintings of 1866 and seem perpetually to prompt Swinburne and his later editors, critics, and bibliographers to posit alternative chronologies and networks of intent, cause, and effect. One question for our own editorial project might be whether conjectural timelines like these could be reconciled in productive ways in a visual environment in which the user is *also* modeling a textual stemma meant to have some relationship to the "truth" of the matter.

4. Swinburne in Space

Another avenue for the Swinburne dataset applies advances in inexpensive HMDs for immersive virtual reality to the age-old problem of comparing or collating two, slightly variant texts. To date, the bibliographic process of optical collation has either taken place unaided by instruments (that is, by simple back-and-forth comparison of two books held in the scholar’s hands), or with the use of specialized optical and mechanical collation devices. In the 1940s, Charlton Hinman built a wardrobe-sized system that employs lights and mirrors to superimpose views of two documents, resting on small tables to the left and right of the user. Where differences between the documents are present, the Hinman Collator causes variant words to appear to blink. Similarly, a 1970s-era Lindstrand Comparator allows the user to align two books housed in a large wooden box with mirrors, so that each eye

views one separate image. When the user's brain reconciles the disparity between the images through binocular convergence, differences are perceived in terms of depth-of-field, creating the optical illusion that any area of variance floats off the page. In contrast, experiments in computer vision for optical collation like the Sapheos Project have focused on automated superimposition of two images on a desktop display, with use of color to indicate regions of difference.



Figure 3.

Hinman Collator (left) and Lindstrand Comparator (right). Placeholder images.

Recently, several companies have produced or announced R&D work into lightweight, cheap, immersive virtual reality systems. Among them are Facebook's Oculus Rift, Sony's Morpheus, Samsung's Gear, and Google's Cardboard devices. HMDs for virtual reality produce stereoscopic displays to render seemingly three-

dimensional variants in depth-of-field, in much the same way as the Lindstrand Comparator. Collation machines have typically been quite unwieldy and are either impossible to transport or difficult for scholars to set up in the archives they visit. Even relatively lightweight versions (the McLeod Portable Collator and the Hailey's Comet) are only "portable" in the sense that they can be transported in large suitcases. HMDs, by comparison, weigh a few pounds and can be easily carried in a protective case. Perhaps even more interestingly, their use is not limited to physically present books.

Most libraries and archives now have the capacity to digitize a rare book on request. Because digital surrogates can also be easily created with modern cell phone cameras—themselves increasingly welcome in rare book libraries—bibliographers and textual critics can quickly create collections of page-images of various witnesses to a text. For these images to be viewed on a HMD like the Oculus Rift, they must be processed so that they are both aligned vertically and corrected to an identical focal length. Once calibrated to one another, the images must then be made to account for the specific barrel distortion of a given HMD's rounded lenses. With the correct distortion in place, page images can be projected to the user for optical collation

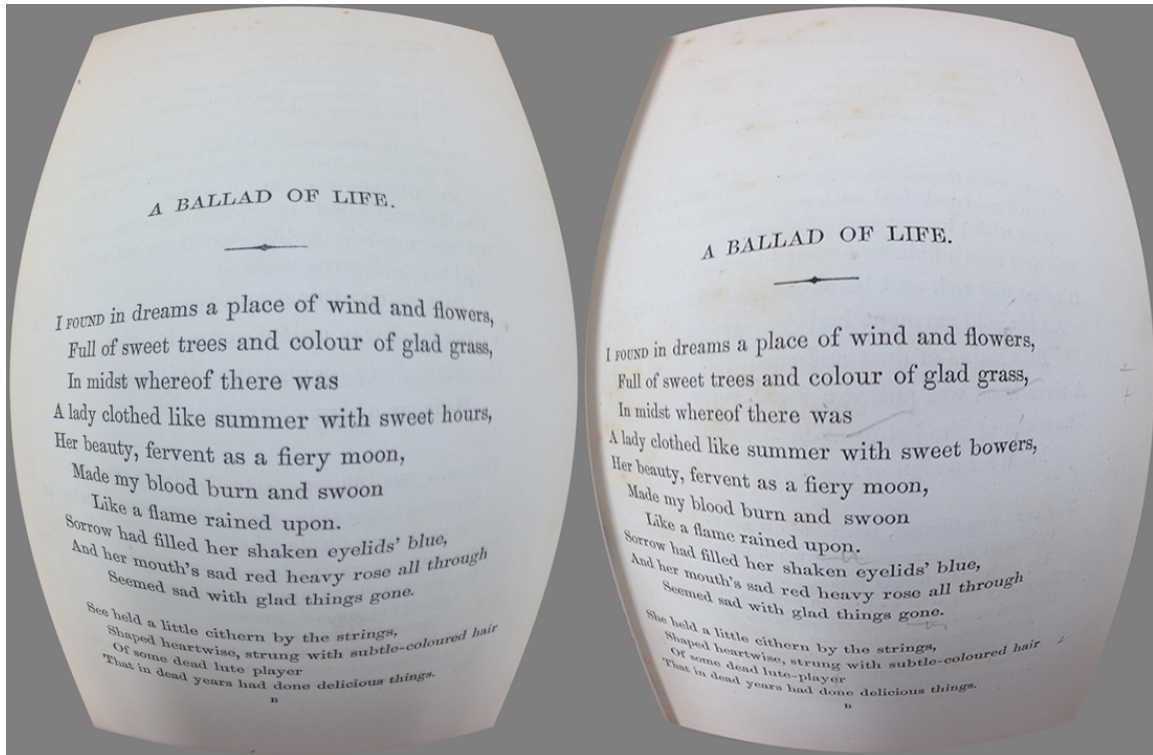


Figure 4.
“A Ballad of Life” with barrel distortion for rendering with Oculus Rift. Nowvieskie and Graham.

One well-known drawback to working with HMDs is that they separate users cognitively from the world around them. A scholar might quickly forget where his or her keyboard and mouse are located, breaking workflows for textual collation. We are experimenting with a potential work-around for this problem, integrating a third party 3D motion controller, such as the LEAP Motion or Microsoft Kinect, to provide a gestural interface to our collation application. Through these devices, we are providing users with a set of virtual “hands” for interacting with documents. Possible applications include noting differences in the text, adding flags for further

investigation, changing the source witnesses visible on the screen, or “turning” from one set of pages to another.

Ultimately, virtual reality approaches may provide a more congenial user environment for textual collation, and one particularly suited to our age of mass digitization, allowing scholars to make better use of witnesses from far-flung archives. New page images could be digitized and processed to verify their similarity to a particular edition, or even help discover alternate texts. In keeping with the pedagogical aims of our other Swinburne edition experiments, an interface like this might also serve as a teaching aid, exposing students to bibliographical techniques using tools they are—in the long run—much more likely to have access to, than to a rare, unwieldy (if beautiful) out-of-production mechanical and optical collation device.

Fault-lines and Failures

“If,” as digital humanities pioneer John Unsworth claimed in 1997, “an electronic scholarly project can't fail and doesn't produce new ignorance, then it isn't worth a damn” (1). We expect our four experiments to prove their full worth in this regard, and wish for failures and face problems relating not only to the technical implementation of the work (like image recognition challenges, or the calculation of optical distortions in augmented-reality collation), but also along the natural fault-lines that always exist between a human reader or user and her material texts (cf Kari Kraus's contribution to the present volume). Our project sees this particular

design intersection as a place of research opportunity, because are working to emphasize materiality and study Victorian textuality—the physical transformations of Swinburne’s work due to human error, intention, and implementation of mechanical processes of remediation like printing and binding—at the same time that we are remediating historical texts using 21st-century technologies and into 21st-century *things*. How will the materiality of a new computational object (a head-mounted display, a glossy tablet, the portal of a cellphone) articulate with the historical textual materiality being studied and expressed in our digital edition? How can we best explore and teach the conceptual and physical *disassembly* of poetic texts and book objects, using contemporary mobile devices and algorithmic procedures that—as most users experience them—lack hackable or exploitable seams? We know that every act of textual transmission is a material, embodied, and historically situated re-mediation. This applies equally to those we study and those we enact. We hope our attempts at seeing Swinburne’s textual condition—complete with successes and failures, past and present—will help us better see and understand our own.

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