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<u>Turning the Pages: A New Chapter in the History of the Book</u>

The world of rare books and manuscripts is changing. As the volume of digital resources grows, these artifacts can no longer afford to be confined by physical location. Instead, they must cross the digital divide to secure their future and to meet evolving user expectations. The British Library's Turning the Pages (TTP), one of a number of digitization initiatives that have arisen in the past decade to tackle this changing world, is poised to be the digital future of special collections. While other ventures, such as Google books and Project Gutenberg, are far more comprehensive, they are primarily concerned with the textual component of books rather than the book itself. As such, they do not offer the contextual information that is an indispensable element of rare books and manuscripts. It is the retention of context that sets TTP above other digitization initiatives and places it firmly at the forefront of the field. This paper will explore the TTP program and why it is better suited than other alternatives to bring rare books and manuscripts into the digital age.

A discussion concerning the necessity of digitizing special collections lays the groundwork for our exploration. We then examine the Turning the Pages program, including its history, capabilities, and advantages. Next, we address why TTP is ideal for presenting rare materials and take an in-depth look at an example, the original manuscript of *Alice's Adventures under Ground*, to better illustrate the importance of TTP. We conclude with thoughts regarding where the future of rare materials lies and how TTP can shape it.

Why Digitize?

For centuries, books have been the "key medium of communication" for society, "providing access to information, knowledge, and cultural heritage."[1] The advent and incredible growth of the Internet over the past few decades has supplanted this tradition, leading to changes in communication, information seeking and expectations regarding availability and accessibility of information. As perfectly summarized by Pearson, "the fundamental truth is that digital technology, including its associated communication networks, has radically altered the way in which texts can be accessed."[2] This statement points to the first, and perhaps most important, reason why special collections must be digitized – in order to remain relevant, they must be findable and accessible in the digital domain.

With the abundance of information available at their fingertips, users expect instant gratification: materials need to be discoverable, accessible, and comprehensible from anywhere, including within the comforts of users' offices and homes. These expectations have evolved to the point where information NOT available digitally seems to no longer exist. This trend is evidenced by the fact that "twenty-first century scholars are increasingly bypassing books" in lieu of online resources, since "looking for background information in print library collections may slow down the scholar who wants to be productive."[3] In that regard, a recent study conducted by ARL and ITHAKA found that academics in fields including the humanities, social sciences, and medical sciences, frequently preferred online resources. The most common reason

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[1] David Pearson, *Books as History: the Importance of Books Beyond Their Texts*, (London; New Castle, DE: British Library; Oak Knoll Press, 2008), 7.

[2] David Pearson, "Digitisation: Do We Have a Strategy?," *Ariadne* 30 (December 2001), http://www.ariadne.ac.uk/issue30/digilib/ (accessed January 13, 2010).

[3] Trudi B. Hahn, "Mass Digitization: Implications for Preserving the Scholarly Record," *Library Resources & Technical Services* 52, no. 1 (January 2008), http://0-vnweb.hwwilsonweb.com.library.simmons.edu/hww/results/results_single_fulltext.jhtml;hwwilsonid=KN1OVV5WANXHPQA3DIMSFGOADUNGIIV0 (accessed January 13, 2010).

given was ease of access to the most current research, but "access to different types of content including data, primary source material, reviews, and teaching materials" was also appreciated by many subjects.[4] Even in the scholarly world, physical existence of materials is no longer enough – they must instead be as easily available as possible, in some cases along with supplementary materials, in order to remain useful and relevant.

Another reason for digitization is broader audience reach. This is important, in part, because it contributes to the continued relevance of special collections. As Clifford Lynch highlights in his article discussing special collections in the Digital Age, "the creation and geographically distributed replication of digital representations of unique treasures is fast becoming an *obligation...*" of libraries and archives as it "offers new pathways to help ensure the survival of the materials in these collections."[5] The increased reach that digitization provides means that (1) new users can find and access collections, (2) multiple users can examine the same objects simultaneously, and (3) the chances that collections will be used improve, which, in turn, augments the perceived value of a collection. Many libraries with digitization programs, including the University of Cincinnati, University of Virginia and the New York Public Library (NYPL), noted increased usage both in-house and on the web once their collections were online.[6]

Digitization also provides opportunities for the use of special collections that are unlikely in the physical world, leading to the potential for new scholarship. This opportunity is best summarized by Lynch who states that "…digital surrogates offer scholarly opportunities that

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[4] Nancy L. Maron and K. Kirby Smith, *Current Models of Digital Scholarly Communication: Results of an Investigation Conducted by Ithaka for the Association of Research Libraries*, (Washington, DC: Association of Research Libraries, 2008), 15, http://www.arl.org/bm~doc/current-models-report.pdf (accessed January 8, 2010).
[5] Clifford A. Lynch, "Special Collections at the Cusp of the Digital Age: A Credo," *Research Library Issues: A Bimonthly Report from ARL, CNI, and SPARC,* no 267 (Dec 2009): 5, http://www.arl.org/resources/pubs/rli/ archive/rli267.shtml (accessed January 15, 2010).
[6] Ron Chepesiuk, "Digitizing Rare Materials: Special Collections Go Global," *American Libraries* 32, no. 5 (May 2001), http://0-vnweb.hwwilsonweb.com.library.simmons.edu/hww/results/results_single_fulltext.jhtml;hwwilsonid =KN1OVV5WANXHPQA3DIMSFGOADUNGIIV0 (accessed January 13, 2010).

would be effectively impossible with the original artifact, and they are becoming, in effect, complements to the actual artifact."[7] Although partly due to the broad audience surrogates can reach (and which allow multiple researchers to work on the same objects contemporaneously), the potential for new scholarship owes more to the very nature of the digital world. First, because digital surrogates can be accessed from anywhere, at anytime, physically disparate materials can be brought together for comparison and examination. Examples include The Early Buddhist Manuscripts Project and the Codex Sinaiticus Project, both of which re-unite long separated materials online. Second, high-quality digital surrogates can often provide more detail than would otherwise be visible. An excellent example is the Archimedes Palimpsest project, through which layers of erased and illegible text were restored using digital imaging.[8] Finally, the digital environment can combine the surrogate with Web 2.0 functionality, "[enabling] scholars to publish commentary and annotations around [primary source materials], making them richer forms of publication than simple libraries of digital images" or even of the original objects themselves.[9] We will return to this topic of unique opportunities later in regards to the potential of digitized rare materials.

   The final reason to digitize is preservation. First, having a high-quality digital surrogate as a use-copy means much less handling of the original object, which can be stored in proper environmental conditions indefinitely. Second, digital surrogates help provide a "social 'insurance policy' against disasters that could damage or destroy irreplaceable treasures…," meaning that even if the original were to be irrevocably damaged, at the very least a digital

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[7] Clifford Lynch, "Repatriation, Reconstruction, and Cultural Diplomacy in the Digital World," EDUCAUSE Review (Jan/Feb 2008), http://net.educause.edu/ir/library/pdf/ERM08110.pdf (accessed January 25, 2010).
[8] Although it is outside the realm of this paper to discuss each project in depth, they all demonstrate the great potential that the digitization of special collections holds. More information on each can be found, respectively, at http://www.ebmp.org/; http://www.codexsinaiticus.org/en/; and http://www.archimedespalimpsest.org/.
[9] Maron and Smith, 25.

surrogate would exist to provide content and context information for the future.[10] Finally, while

digital surrogates certainly have their own share of preservation concerns, they are different from

those impacting the physical object. As Lynch summarizes, "the digital representations are both

robust and fragile in the way that digital things are, and these strengths and weaknesses are very

different from those of the physical collections; given both the physical material and its digital

representations, chances are much better that *something* will survive."[11]

The importance of digitization seems indisputable, but the question still remains as to HOW

this should occur. Large initiatives such as Google Books, as well as individual institutions such

as The British Library, are working to put texts and cultural history online for the masses, but

they are approaching the task in very different ways and with disparate philosophies, namely,

quantity versus quality.

Both Project Gutenberg and Google Books aim for quantity; the goal is to digitize as many

books as possible for mass consumption. This, however, has led to sacrifices in the quality of the

digital surrogate. Both projects are mainly concerned with the textual element of books (the

content), so the user is typically looking at flat scans of pages with no sense as to what the actual

paper, ink or binding is like. Additionally, text is sometimes "normalized" to improve

readability and searchability, but this comes at the expense of authenticity since original

spellings, language, and/or type faces are changed (see fig.1). On the other hand, when text is

not normalized, the OCR (and related full-text search) capabilities of these projects are seriously

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[10] Lynch, "Repatriation."
[11] Lynch, "Special Collections," 5.

impacted (see fig. 2).   Finally, duplicate or missing pages as well as crooked scans can often be

found, all of which impact the usability and effectiveness of the surrogate.[12]

World Digital Library and The British Library take a different approach. They strive for

quality in their digitization projects. While each digitizes relatively small amounts of materials,

they make these materials truly accessible to users and present accurate and authentic digital

surrogates. The first project, a collaboration among UNESCO, the Library of Congress and

other international libraries, digitizes "significant primary materials from countries and cultures

around the world" and presents them as high-quality digital images.[13] Along with the images,

detailed metadata (in several languages) and object descriptions are provided to allow for easy

navigation, fortuitous discovery, and to fully contextualize each item.

The British Library (BL) has participated in and initiated numerous digitization projects,

including Endangered Archives, Voices of History, and Turning the Pages. While each project

had different foci and objectives, they all resulted in quality digital surrogates that represent the

original object as closely as possible and each provides additional content designed to facilitate

learning and use. The BL's "Digitisation Strategy 2008-2011" further underscores this

commitment to quality as evidenced by the priorities and guiding principles which include

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[12] It is interesting to note that some of Google's partners have admitted the sub-par quality, but continue their partnership in the hopes that researchers will choose to visit their repository to view the actual materials. For further reading on quality issues related to Google books and other mass digitization projects, see Hahn, "Mass Digitization;" Paul Duguid, "Inheritance and Loss? A Brief Survey of Google Books," *First Monday* 12, no. 8 (August 2007), http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1972/1847 (accessed February 2, 2010); and Geoffrey Nunberg, "Google's Book Search: A Disaster for Scholars," *The Chronicle of Higher Education*, August 31, 2009, http://chronicle.com/article/Googles-Book-Search-A/48245/ (accessed February 2, 2010).

[13] World Digital Library, "About – World Digital Library, Mission," Library of Congress, http://www.wdl.org/en/about/ (accessed February 16, 2010).

"[facilitating] the interpretation of [the BL's] content by others for new audiences" and providing consistent metadata for all digitized content.[14]

Regardless of approach, a successful digitization project must "… [get] materials into the hands of users more quickly and in ways that promote dynamic and meaningful advancement of knowledge."[15] While the "quantity" method of mass digitization furthers the first criteria, it falls woefully short on the second. The "quality" method nicely fulfills the second criteria, but does not necessarily produce the quickest results. In its latest incarnation, the British Library's Turning the Pages program can achieve both. This will be explored in detail below.

The British Library's Turning the Pages

Turning the Pages (TTP) began as an idea by the British Library in 1996 to provide visitors with greater access to many of the Library's treasures. They worked jointly with Armadillo New Media, which "[specializes] in producing unique applications that provide access and interpretation for items that would otherwise remain under glass…," to develop new software that would bring the objects in the Library's Exhibition Gallery to life.[16] The first version was constructed using Macromedia Director and was released in 1997. Unique among contemporary digitization projects, it offered a page-turning feature which gave users the ability to virtually "read" through each item. This feature worked by displaying photographs taken at different stages of a page turning – essentially, each time a user virtually turned a page, he/she was presented with this sequence of photographs to recreate the effect. While this approach produced a high quality digital surrogate, it made both the digitization process and finished product

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[14] British Library, "Digitisation Strategy 2008-2011," British Library Board, http://www.bl.uk/aboutus/stratpolprog /digi/digitisation/digistrategy/ (accessed January 24, 2010).

[15] Lisa R. Carter, "Moving Special Collections Forward in an Age of Discovery: Themes from the ARL-CNI Forum," Research *Library Issues: A Bimonthly Report from ARL, CNI, and SPARC,* no 267 (Dec 2009): 12, http://www.arl.org/resources/pubs/rli/archive/rli267.shtml (accessed January 15, 2010).

[16] Armadillo Systems, "Turning the Pages: About Us," Armadillo Systems, http://www.armadillosystems.com/ ttp_commercial/about.html (accessed January 24, 2010).

awkward and slow since each page had to be photographed numerous times as someone

physically turned it. This method also required a physical object to photograph – one could not

create the effect with born digital material – and led to severe limitations on both the size of the

book that could be modeled and how many texts could be included in the program.[17]

In 2004, a less expensive and faster version, TTP3D, was completed, enabling the British

Library to make Turning the Pages an online resource available via the Web. Users could now

interact with the BL's treasures from anywhere in the world. The most recent version, Turning

the Pages 2.0, was released in January 2007 and was developed using Windows Vista to harness

some of Microsoft's newest technologies (it can also run on other platforms including Windows

XP, Windows 7, MAC, and other platforms using Silverlight). TTP 2.0 is more powerful and

realistic than its predecessors, with upgraded features including an accurate conveyance of paper

weight and allowing pages with gold leaf to reflect light.[18] Work to improve TTP, including

enhanced features, greater interactivity and increased object scope, continues to this day.

Since its inception, TTP has been widely acclaimed. Most recently, TTP 2.0 won the Best

Web Technology award from the British Computer Society. Prior versions also won awards,

including the British Interactive Multimedia Award, National Heritage/NP Museum of the Year

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[17] Yi-Chun Chu et al., "Realistic books: a bizarre homage to an obsolete medium?," *Proceedings of the 4th ACM/IEEE-CS Joint Conference on Digital Libraries* (Tucson, AZ, June 07 - 11, 2004): 78, DOI= http://0-doi.acm.org.library.simmons.edu/10.1145/996350.996372 (accessed January 26, 2010); Lichan Hong, Stuart K. Card, and Jock D. Mackinlay, *Page Turning Design for 3D Electronic Books* (Palo Alto, CA; Palo Alto Research Center: 2004), 4, http://www2.parc.com/istl/projects/uir/publications/items/UIR-2004-11-Hong-PageTurning.pdf (accessed January 13, 2010).

[18] No information detailing the development of TTP 2.0 could be found, presumably because it uses proprietary Microsoft technologies. However, other projects which model 3D books now exist and much development has occurred since the first inception of TTP. The "page turn" is now digitally re-created rather than photographed, allowing for faster programs, more realistic interactions (such as being able to account for page weights), and increased scalability. For further reading on 3D book modeling and re-created page turns, see Chu et al, "Realistic Books…;" Hong, Card and Mackinlay, *Page Turning Design...*; and Michael S. Brown and W. Brent Seales, "Beyond 2D Images: Effective 3D Imaging for Library Materials," *Proceedings of the 5th ACM Conference on Digital Libraries* (San Antonio, TX, June 02-7, 2000), 27-36, DOI= http://0-doi.acm.org.library.simmons.edu/10.1145/336597.336623 (accessed January 26, 2010).

Multimedia Award, "Best User Experience" from International Information Industry Awards, and "Technical Achievement Award for adult & lifelong learning" from Learning on Screen Awards.[19]

TTP 2.0 is intended to "reshape how libraries and museums think about access and interpretation."[20] Like prior versions, TTP 2.0 was developed in collaboration with the British Library and other cultural heritage institutions to ensure that the needs of disparate users, including researchers, members of the public, and educators, were met. During development, TTP 2.0 underwent extensive user testing by both academics and members of the public. Developers then modified the software based on user feedback. The result, as explained by Peter Collins of WUP (the firm that ran the testing), is software that "has a user-centered approach which is absolutely integral" to its success.[21]

At bottom, the purpose of TTP 2.0 is to provide a 3-D digital surrogate of objects with which users can interact (see fig. 3). Features include the ability to pick up and examine the object at any angle, to zoom and magnify portions of the object, collaboration with other users via personal and group note taking, full text search functionality, and the ability to put two objects side by side for comparison. TTP 2.0 also supports multimedia functionality, including an audio "read to me" function and the ability to add video. Each digital surrogate has comprehensive metadata attached, including title, description, paper material, page width and height. The software itself is cost effective and fully scalable to accommodate any number of books.[22]

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[19] Armadillo Systems, under "Press & Awards."
[20] Ibid, under "About Us."
[21] "User Testing Ensures Accessibility for Turning the Pages website – Helped by Microsoft and WUP," *Multimedia Information and Technology* 33, no. 2 (May 2007), http://0-vnweb.hwwilsonweb.com.library.simmons.edu/ hww/results/results_single_fulltext.jhtml;hwwilsonid=ICED4HTKIQK2NQA3DIMSFGOADUNGIIV0 (accessed January 13, 2010).
[22] Armadillo Systems, under "Products."

In October 2008, the inclusion of a content management system (CMS) allowed the developers to begin offering TTP as a salable toolkit. The CMS includes a Dublin Core compliant database, which is vital for interoperability and will enable institutions to virtually "share" their objects. It also allows institutions to independently upload their own digital scans, to add features such as text, keywords and video, to customize the TTP interface, and to choose how the application is run (i.e., in house or as an online resource). Institutions, other than the BL, which have already adopted TTP include The Wellcome Library (UK), The Royal Society (UK), and The National Library of Medicine (USA), among many others.

TTP 2.0 has numerous noteworthy advantages. First, it accounts for and seeks to preserve and convey the entire object, not just the textual content. This is important because, as Pearson highlights, "…typography, layout, physical format and everything surrounding the words themselves all contribute to the framework within which meaning is constructed."[23] Other projects – even those that focus on quality such as the World Digital Library – do not use the same 3-D imaging approach. High quality digital surrogates are presented by such projects, but they do not permit a user to virtually handle the objects themselves. TTP 2.0, in contrast, incorporates page turning based on page weight and other factors, creating a more realistic (and therefore better) "feel" for the actual objects.

Second, TTP 2.0 offers substantial and enhanced functionality. For instance, as detailed above, objects can be compared side by side. A pointed example used by the developers upon launch of the software was a side by side comparison of the Codex Arundel and the Codex Leicester (two of da Vinci's notebooks) – in reality, these two items are separated by thousands of miles but were brought together on TTP 2.0 for the first time in hundreds of years.

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[23] Pearson, *Books as History,* 34.

Additionally important is TTP 2.0's note taking functionality which allows multiple users to annotate a single object. As Lynn Brindley (Chief Executive of the BL) observes, this capability "...offers researchers the first glimpse of the next generation of digitized texts, combining a rich and lifelike interaction with the text itself with the potential for collaborative international research."[24]

Third, TTP 2.0 is highly customizable, allowing the user to adapt the software to new and novel uses. For example, the National History Museum (UK) used TTP 2.0 to develop an interactive Herbarium; through animation, a visitor turning the pages can see "plants grow & butterflies flit about the pages." Another recent example is a project for English Heritage, which holds a collection of scrolls. In order to better suit these objects, Armadillo Systems recoded TTP so the scrolls could be displayed in a single, long roll (*i.e.*, as they actually exist).[25]

We've looked at why digitization of special collections is important, different tacks that various projects take and also an in-depth look at one approach, the BL's TTP. Why, however, is Turning the Pages ideal for rare materials? The next section investigates this question.

Books ARE History

Books are not simply "passive conduits" of texts and ideas. They are historical objects in their own right, providing context for the texts they contain and communicating information about the times they were produced and the hands they have passed through. This is especially true for special collections, where items may be totally unique and both content and context are vital in order to understand the materials. As Pearson notes, "the book as an object is something for which there is no complete substitute" especially considering that "…their physical reality

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[24] "User Testing Ensures Accessibility."
[25] Armadillo Systems, under "Case Studies."

has been fully exploited for the opportunity for interaction between texts and their recipients."[26]

It is the retention of both an object's physical characteristics as well as this opportunity for interaction that sets TTP apart.

The 3-D images presented by TTP make it the perfect solution for accessing rare materials online. As noted in the previous section, this approach represents original objects as accurately as is currently possible in the digital domain (down to the weight of the paper affecting how each page turns), thereby preserving context as well as content, and also retains the interactive aspects of reading for users. These key aspects underscore the historical significance of the objects themselves (i.e. object as artifact) and allow for comprehensive study using the digital surrogates. The importance of this is explored below.

First, books are "records of the language as it was used in various periods or genres," and the unadulterated representation offered by TTP means that original language and spelling of the text itself is shown.[27] This feature is imperative for accurate study because (1) the meaning and spelling of words change over time, (2) it retains contemporary colloquialisms that may no longer be common and (3) misspellings or other textual errors can still be identified. Many digitization projects that are concerned with only the content, such as Project Gutenberg and Google Books, normalize the text once it's been scanned so it can be recognized using OCR. However, this both affects the authenticity of the original objects and, in some instances, could even make them unsuitable for research since the language itself has been altered.

Second, because rare books and manuscripts are artifacts unto themselves, their physical characteristics are as important as, if not more important than, their content. They place the

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[26] Pearson, *Books as History,* 22.
[27] Geoffrey Nunberg, "Google's Book Search: A Disaster for Scholars," *The Chronicle of Higher Education*, August 31, 2009, http://chronicle.com/article/Googles-Book-Search-A/48245/ (accessed February 2, 2010).

object within an historical time frame, can offer hints about the relative value of its contents, and can speak to how the object was marketed to and viewed by its readers. Paper, typeface, binding, and cover design can all help to date an object since they each have characteristics which belong heavily to specific periods in history. The materials and techniques used for each can also denote place of manufacture since locations often had signature styles. Pearson sums this up well; "books become part of, *and testify to* [emphasis added], the aesthetics and values of their time."[28]

The quality of the materials used in construction of an object can also provide information about the owner and about the perceived value of its contents. For instance, whether a text is printed on paper or vellum, the size of its margins and the quality and intricacy of its binding can all denote the status and wealth of its original owner or signal the high regard in which the contents were held. The condition of the object itself can also speak to the value of its contents. For example, an old book in excellent condition likely means it wasn't used very often. Similarly, many First Folios were rebound during the 19th century because they were held in such high esteem.[29]

The physical characteristics of an object may also suggest how it was marketed to the public, which, in turn, reflects contemporary values. Book covers, for example, "speak eloquently not only about the subject of the text, but also about the aesthetic and cultural values of their age" because they were used to "[capture] new generations of readers with imagery that will appeal to

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[28] Pearson, *Books as History,* 41.
[29] Pearson, *Books as History,* 144-46. For in-depth discussion on this topic, Pearson's text acts as an excellent starting point and includes references for further reading on both book design and bookbinding.

them."[30] Since covers act as an introduction to the text, they were often used as marketing tools

and would thus change along with society's mores and perceptions of the text (see fig. 4).

Third, good representations of the original object are vital in order to study any annotations

that may be present since they offer tremendous insight into contemporary opinions and values.

Annotations or other marginalia can provide "valuable testimony of the ways in which books

were being absorbed or reacted to in the past," even if they are by unknown readers. Deletions

of text are equally telling and often indicative of periods of great political or theological change,

since owners would often "delete things they find offensive or unsuitable," in order to ensure the

books were still useable.[31]

Fourth, the importance of having authentic, reliable digital surrogates is imperative when

comparing multiple copies of materials, whether they are subsequent editions or contemporary

copies. Comparing subsequent editions can highlight deletions and additions that point to

changes in cultural mores, authorial opinion or larger societal change. This is supported by one

author who asserts that "variant versions of a text are…legitimate textual formations worth

studying in their own right."[32]

Comparing contemporary copies can be just as important as each can have individual

characteristics that set them apart. As one author notes, "virtually every copy of every early

printed book is unique, differing in small or large ways from others even in the same edition."[33]

This is echoed by Pearson, who goes on to explain how the time-consuming process that was

early printing provided "ample opportunities for variations….between the first and last set of

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[30] Ibid, 43.

[31] Pearson, *Books as History*, 114; 129.

[32] Heather MacNeil and Bonnie Mak, "Constructions of Authenticity," *Library Trends* 56, no. 1 (Summer 2007), http://0-vnweb.hwwilsonweb.com.library.simmons.edu/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e0df0e 5347ba8f6b2fa513a5b4860511833871906a89204fca136eeaca79e5c94&fmt=H (accessed January 13, 2010).

[33] Leslie Howsam, *Old Books, New Histories: An Orientation to Studies in Book and Print Culture*, (Toronto; Buffalo; London: University of Toronto Press, 2006), 13.

impressions." He further notes that errors or omitted passages were often corrected using cancels or errata slips (corrected pages that were pasted over or inserted into originals).[34] It is important to note here that neither the subtle variations in printing nor the corrected pages would be visible in normalized, flat scans of these objects, thereby making TTP's imaging doubly necessary.

Finally, each object develops its own individual history based on who owned it, how they treated it and what personalization it may have undergone. In addition to the annotations already discussed above, ownership markings, bookplates or even additional illustrations included by the owner (either bound or pasted in) can all make an object unique. One author notes that "…book historians are increasingly coming alive to the lessons that annotated or otherwise personalized copies of books have to offer."[35] TTP, through its 3-D representations of entire objects, allows these "lessons" to be taught in the digital environment. More importantly, perhaps, it also adds to an object's history by allowing users to contribute their own thoughts and insights.

In discussing the study of book and print culture, Leslie Howsam makes the point that "…the culture of the past can be reconstructed from books alone."[36] This statement both sums up the above discussion and underscores the relative value of the objects themselves. The physical construction of an object says much about the time when it was made, text can indicate changes in societal thought and belief, and individual copies offer their own views of history based on how owners and readers interacted with them. By providing an accurate and complete digital

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[34] Pearson, *Books as History,* 80.
[35] Pearson, "Digitsation." For more in-depth discussion on the individual history of books, see Pearson, *Books as History*; and Robin Meyers, Michael Harris, and Giles Mandelbrote, eds., *Owners, Annotators, and the Signs of Reading* (New Castle, DE; London: Oak Knoll; British Library, 2005).
[36] Howsam, 14.

surrogate, TTP successfully retains all the artifactual elements of objects and provides users with the opportunity to reconstruct the past remotely.

An Example: *Alice's Adventures Underground*

A brief review of a concrete example, *Alice's Adventures under Ground*, shows how TTP works in practice and why it is the best alternative so far for digital presentation of special collections. The below first explains why the history and continued popularity of *Alice* makes it an apt example of a work that benefits from a robust digital presentation (one that goes beyond only textual content). Next, we review the digital surrogates of *Alice* appearing on TTP and other digitization projects. Finally, we examine why TTP offers the preferred digital representation of objects such as the *Alice* manuscript, *i.e.,* objects that do not merely contain history, but *are themselves history*.

Alice has its roots in a story told aloud to the Liddell sisters (one of the sisters being, of course, "Alice") by Charles Dodgson (aka and hereafter referred to as, Lewis Carroll) during a 4th of July boat outing in 1862. The sisters, entranced by the tale containing familiar Oxford personas and events, encouraged him to write it down. Two and a half years later, in November 1864, Carroll presented Alice Liddell with a handwritten, illustrated copy of the story, which he called *Alice's Adventures under Ground*. Meanwhile, he was also working on *Alice's Adventures in Wonderland*, a revision that expanded on the original story and which would became the classic known today. John Tenniel, a professional illustrator, illustrated the revised text based on Carroll's specifications and illustrations from the original *under Ground* manuscript.[37] *Alice's Adventures in Wonderland* was published in 1865.

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[37] Will Brooker, *Alice's Adventures: Lewis Carroll in Popular Culture* (New York; London: Continuum, 2004), 105-107; Roger Lancelyn Green, "Alice," in *Aspects of Alice: Lewis Carroll's Dreamchild as Seen Through the Critics' Looking-glasses*, ed. Robert Phillips (New York: Vanguard Press, 1971), 22.

Critics and the public praised the work from the outset and it was annually reprinted from 1866-1868.[38] In December 1871, Carroll published a sequel, *Through the Looking Glass and What Alice Found There*; it too was an immediate success.   In 1886, due to the enormous popularity of the *Alice* franchise, Carroll decided to publish a facsimile of the manuscript that he had presented to Alice Liddell. Since then, numerous versions of the story have appeared, including *The Nursery Alice* for children under five in 1889, more than 20 film versions since 1903, including a modern re-telling breaking box office records at the time of writing, and even other promotional media (see fig. 5). Many generations after that July 4th boat outing, *Alice's* status as an enduring classic is beyond dispute. As Robert Phillips observed in his festschrift to *Alice*, their popularity and endurance can be measured by the number of allusions made daily to aspects of the texts and by the borrowing of the "dream-like" world Carroll created to set the tone for other stories.[39]

Why such endurance? Attempting to identify all of the reasons is beyond the scope of this paper, but several are apparent.[40] As an initial matter, the story is historically significant as arguably the first ever published purely for the enjoyment of children, not merely to teach life lessons. As one author notes, the story represented a break from the tradition of the "teaching tome" for children; Carroll instead took "the child's side and showed the grownups to be an uncivil lot, making and breaking rules to suit themselves while holding Alice to a standard of courtesy and grace."[41]   Further, although written for a child, the *Alice* stories appeal widely to

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[38] Sally Brown, *The Original Alice: From Manuscript to Wonderland* (London: British Library, 1997), 51.
[39] Phillips, foreward, xix.
[40] Many texts have been written analyzing, interpreting and trying to explain the fascination with the *Alice* texts. Two examples for further reading are Martin Gardner, *The Annotated Alice* (New York: C.N. Potter, 1960) and Harry Morgan Ayres, *Lewis Carroll and the "Alice" Books* (New York, 1932).
[41] John Goldthwaite, *The Natural History of Make-Believe* (New York; Oxford: Oxford University Press, 1996), 127. The idea that *Alice's Adventures in Wonderland* holds a unique place in the history children's literature is a popular one. For more reading on this subject, see Seth Lerer, *Children's Literature: A Reader's History from*

adults as well. An 1887 article noted that Carroll's simple style and extravagant ideas

"...probably accounts for the fascination which these stories...have had over the minds of so

many thousands of children and parents."[42] Evidence of this appeal lies in the facts that, by

1971, the stories had been translated into over 100 languages, and that they share company with

the King James Bible and Shakespeare as the most quoted English language works ever

written.[43] Finally, the stories invite readers to craft their own interpretations. One author notes

that, "the *Alices* are permeated with a haunting sense of mythic applicability to life that seems to

defy the boundaries of geography, culture, class, or age" while another states that "the most

central theme is the construction of identity and meaning."[44] Taken together, these statements

point to the fact that, regardless of background, each reader finds something to relate to in the

Alice stories; this could be as simple as understanding Alice's attempts to make sense of a

nonsensical world, or as complex as relating to Alice's quest to find and retain her own identity.

     With the above history in mind, we can now examine how the manuscript that began it all –

Alice's Adventures under Ground – entered the digital world. That story starts in 1928, when

Alice Liddell sold the original manuscript via Sotheby's. It was bought by an American collector

who, in turn, donated it to the British Library, where it remains to this day. On September 21,

2005, a digitized version of the manuscript became available on the TTP website. Within five

days of its appearance, 60,000 users had accessed the digital surrogate – a pointed testimony to

the power and longevity of the story.[45]

Aesop to Harry Potter (Chicago; London: University of Chicago Press, 2008) or Jack Zipes, *Why Fairy Tales Stick: The Evolution and Relevance of a Genre* (New York: Routledge, 2006).
[42] Edward Salmon, "From 'Literature for the Little Ones'," in Phillips, 87.
[43] Donald Rackin, *Alice's Adventures in Wonderland and Through the Looking Glass: Nonsense, Sense, and Meaning* (New York: Twayne Publishers, 1991), 13.
[44] Rackin, 68; Brooker, 93.
[45] Armadillo Systems, under "About Us."

A visitor to TTP is rewarded with a highly interactive experience. In addition to standard functionality mentioned above (*e.g.,* note taking ability and magnification), it offers many important extras particular to the *Alice* manuscript. For instance, the original handwritten manuscript optionally appears alongside a typed transcription for ease of reading. It is also possible to manipulate the work, including via rotation to view landscape portions (such as drawings) as they were meant to be presented. Full text searching as well as a voice-over "read to me" function are also available (see fig. 3). Of particular importance is the presentation of the final page, which contains a drawing that Carroll pasted over with a photograph; through TTP, the visitor can virtually "lift" off the photograph to reveal the drawing beneath.

The contrast with other digital presentations is dramatic. All surrogates other than the BL version suffer from a basic shortcoming: they were created from published facsimiles of the manuscript – they are copies of copies. The Internet Archive's version is a page scan, which is illegible and therefore unusable (see fig. 6). The Google Books version is legible, but does not offer rotation (drawings sometimes appear sideways). It also purports to offer full text search, but produces absurd results such as failing to find "Alice" on a page littered with the word (see figs. 7 and 2, respectively). Project Gutenberg offers a version that is largely a transcription of the handwritten text. While illustrations are offered, they are placed differently than the illustrations in the original, thereby obscuring authorial intent (see fig. 1). Finally, all versions other than TTP are non-interactive, *e.g.*, they lack virtual page turning ability, and display only scanned pages rather than the "book" itself.

Particularly for a work such as the *Alice* manuscript, omitting the illustrations – or, perhaps worse, distorting their placement or otherwise – is consequential. Illustrations, presented as the author intended, are vital because "…Carroll rarely describes the characters at all in visual

terms." Thus, the reader's only way to see the author's vision is through the surviving

illustrations that had Carroll's approval. Moreover, placement is important, as "…Carroll was

finicky about the location of the images on the page and their relation to specific lines of

dialogue and description." Simply put, "Carroll's drawings, however – naïve and primitive as

they might seem – often better illustrate both the original and the published book...."[46]

In light of everything above, TTP's approach to digitization is preferable for a work such as

the *Alice* manuscript. The manuscript does not just contain content of historical significance, it

is a piece of history itself – something worthy of display and preservation irrespective of the

words it contains. Gaining a full appreciation of the work involves not just reading, but feeling

the weight of the pages and paper used, the author's penmanship, seeing the illustrations in the

layout and sequence that they actually appear, and, indeed, experiencing everything about the

work – just as the author intended – right down to the pasted-on photograph on the last page.

While nothing can be quite like seeing the actual manuscript, TTP's approach, treating a work as

an entire object with visual and tactile properties, does far more justice than the alternatives for a

work like *Alice*.

Looking Towards the Future

Technology has rapidly evolved over the past few decades. It was not so long ago that the

idea of the Internet, let alone a program such as TTP, seemed laughable, but now, as Pearson

rightly notes, "…the day draws ever closer when there is an electronic option available for most

of the texts that people want to read…."[47] Between the growing number of born digital objects

and the increasing digitization of existing special collections, the question becomes how can we

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[46] Brooker, 106, 130-31; Rackin, 117.
[47] Pearson, *Books as History,* 19.

best harness the potential applications of technology, thereby making the best use of collections? There are some exciting possibilities afoot and the groundwork for many has already been laid.

At the heart of all possibilities lies the fact that the digital environment has a tremendous advantage over the physical world, namely that objects (or at least their surrogates) are no longer confined to a single time or place. With this in mind, it is imperative, as one author points out, that, "as we transplant special collections to an online environment, we should avoid the temptation to transplant traditional approaches that do not accommodate the profound differences that await us, where institution borders blur, where digital communities thrive, where the [general populace] seek to use our materials in ways not fully imagined."[48] Institutions which digitize special collections must embrace the opportunities to both approach objects and collections in entirely new ways and to involve new users with existing collections. By doing so, they can promote new scholarship (as discussed earlier) and find new uses for existing objects.

The re-use of both collections and individual objects is likely to happen in two ways - through the building of virtual collections and through user contributions. Virtual collections (i.e. collections that are constructed in the digital environment) stem either from the "[re-structuring] and [re-creating of] special collections along logical intellectual lines…" or can be socially constructed (built by users).[49] The first type occurs through the re-unification of original materials that have long been separated (such as the Codex Sinaiticus Project mentioned earlier), or through the formation of new, subject-oriented collections built out of previously un-related items (such as Mr. Lincoln's Virtual Library, a part of the American Memory Project).[50]

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[48] Anne R. Kenney and Carl A. Kroch, "The Collaborative Imperative: Special Collections in the Digital Age," *Research Library Issues: A Bimonthly Report from ARL, CNI, and SPARC,* no 267 (Dec 2009): 28, http://www.arl.org/resources/pubs/rli/archive/rli267.shtml (accessed January 15, 2010).
[49] Lynch, "Special Collections," 6.
[50] "Mr. Lincoln's Virtual Library" can be found at http://lcweb2.loc.gov/ammem/alhtml/alhome.html.

Regardless of initial development, this type of collection offers exciting opportunities to study

existing materials within new contexts and can even help construct new meanings for them.

Hopefully, greater use will be made of this type of digital collection moving forward as materials

become increasingly available online.

The second type of virtual collection is constructed wholly by users – it is driven by user

interest, built (at least in part) by user contribution and typically revolves around a topic that has

tremendous societal impact. An example of this type is "The September 11 Digital Archive."

Built entirely of digital items contributed by users, this collection contains emails, personal

stories, images and even videos that document the events and aftermath of 9/11.[51] It is a

powerful testament to what was, arguably, the defining event of the 21st century so far and will

carry first person accounts into the future for all to read. Virtual collections of this sort not only

document significant events, but a shared social history that would otherwise be difficult to

grasp.

The potential for re-use also arises through user contributions. By combining online special

collections resources with Web 2.0 applications (as TTP does), institutions will provide users

with a way to have their individual voices heard and to more easily share information. Those

voices may be scholars with in-depth knowledge of a particular subject area, or they may be

"everyday Joes" who have personal experiences to share or inquiries to make. Regardless, each

contribution will provide valuable insight about the user base (including how they use and

interpret materials) and potentially reveal new information about objects and collections. One

author goes so far as to state that "…real transformation occurs when digital collections are

turned over to the users for unexpected interpretation and reuse," while another believes that the

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[51] The 9/11 Digital Archive can be found at http://911digitalarchive.org/index.php.

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collective annotation, transcription and translation possible through such functionality will

"[produce] new critical scholarly editions" that would not otherwise be feasible.[52]

The potential for re-use has ever-expanding promise.   Pearson astutely notes that, "meaning

or interpretation…is not something absolute, but is endlessly re-created through the experiences

of successive readers…."[53] As technology continues to grow, more collections will be available

on-line (hopefully with increasingly robust services) and more users will become aware of the

existence of these resources. The experiences, insights and contributions of each of these users

will invariably increase the likelihood that exciting new uses, and perhaps even new collections,

will be unveiled.

Finally, the digitization of special collections could lead to the repatriation and rebuilding of

cultural heritage. Looting of cultural objects has occurred for perhaps as long as civilized

societies have existed, but for the first time, the opportunity exists to restore looted materials to

the satisfaction of both parties. Digital surrogates have the "potential to contribute to the

reconstruction of the available cultural record…," by allowing for the virtual repatriation of

looted or destroyed objects.[54] Conversely, if the actual object is repatriated or has been

destroyed, the digital surrogate will still allow continued access to the material. This

repatriation, whether virtual or not, will also help to fill in the cultural heritage gaps of many

countries whose culturally significant objects have been looted through the years. As one author

posits, digital surrogates help "point toward a future in which cultural heritage, enhanced by

digital surrogates, may perhaps be more robust, less concentrated, and less vulnerable than when

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[52] Carter, 15; Lynch, "Special Collections," 6.
[53] Pearson, *Books as History,* 34.
[54] Lynch, "Repatriation."

it was represented only by physical collections of artifacts."[55] This is both because the

surrogates can reunite objects that reside in locales around the world, thereby restoring a

country's cultural history, and because the surrogates can act as a safeguard against destruction,

theft and deterioration.

Conclusion

The world of rare books and manuscripts is changing. Lynch perhaps puts it best by

saying, "technology is transfiguring our existing physical collections in every dimension: our

understanding of the materials, the potential uses and users of the materials, the relationships

between the local special collections and the collective worldwide archives of cultural

memory."[56] Turning the Pages is poised to take the next step in bridging the gap between the

physical reality of special collections – and attendant limitations on accessibility – and the

broader world of Internet users waiting to engage with them. By treating an object as more than

just words, by accounting for context, and by allowing for collaboration bounded only by users'

imaginations, TTP sets a new standard for bringing rare books and manuscripts into the digital

age.

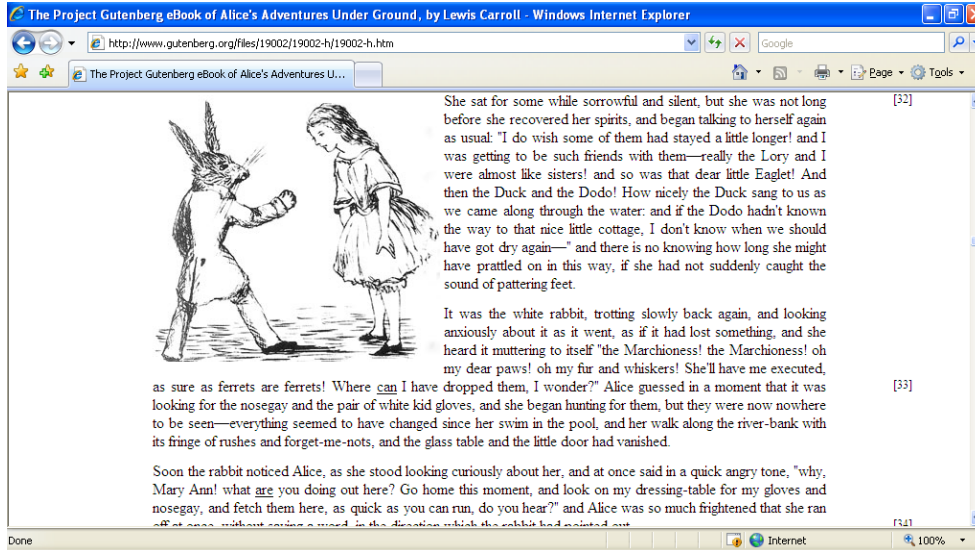[55] Ibid.
[56] Lynch, "Special Collections," 5.

Figure 1. *Alice's Adventures Underground* by Project Gutenberg. Note that the text is transcribed so original handwriting is not seen and position of illustrations has been notably altered. *Source*: Lewis Carroll, *Alice's adventures under ground: being a facsimile of the original ms. Book Afterwards Developed into "Alice's Adventures in Wonderland*," (Lon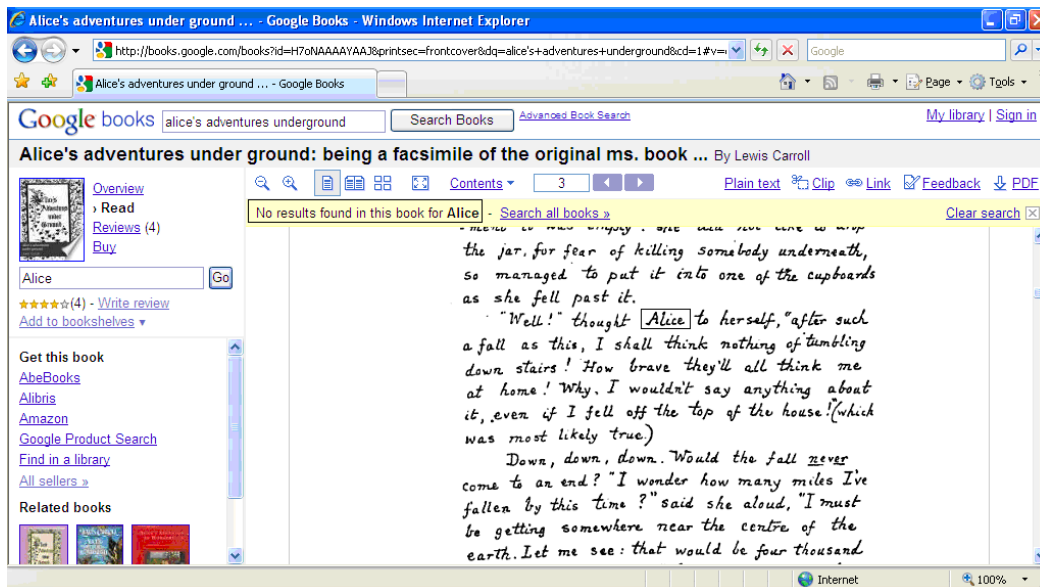don; New York: MacMillan, 1886), Project Gutenberg e-book, http://www.gutenberg.org/files/19002/19002-h/19002-h.htm (accessed March 4, 2010).

Figure 2. *Alice's Adventures under Ground* on Google Books. This shows how retaining the original handwriting had a serious impact on full-text search capabilities; a search for "Alice" returns no results even though "Alice" is clearly visible on the page. *Source:* Lewis Carroll, *Alice's adventures under ground: being a facsimile of the original ms. Book Afterwards Developed into "Alice's Adventures in Wonderland*," (London; New York: MacMillan, 1886), http://books.google.com/books?id=H7oNAAAAYAAJ&printsec=frontcover&dq= alice's+adventures+underground&cd=1#v=onepage&q=Alice&f=false (accessed March 4, 2010).
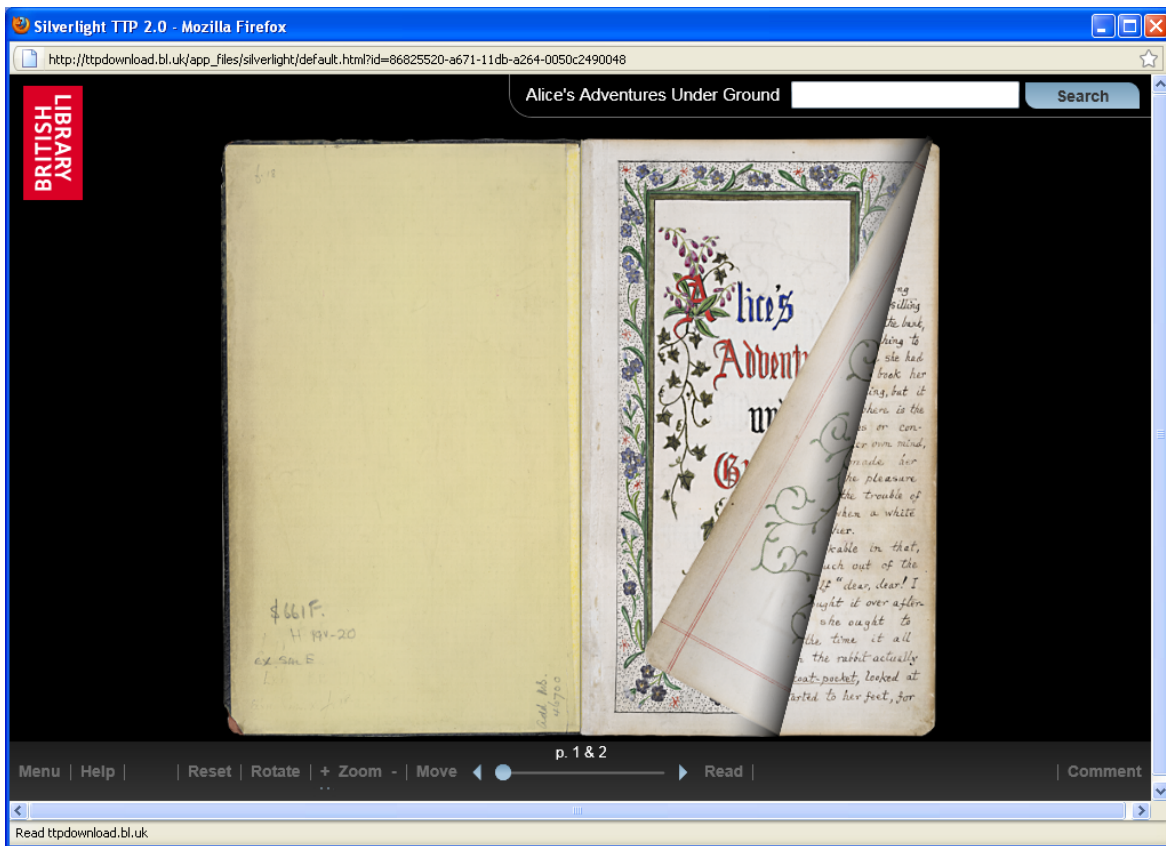
Figure 3. *Alice's Adventures under Ground* on TTP. Note the 3D presentation of the object itself, the realistic page turning feature, and the toolbar along the bottom where additional functionality (such as zoom, audio, and note-taking) are located. *Source:* Lewis Carroll, 1864, *Alice's Adventures under Ground*, British Library, http://ttpdownload.bl.uk/app_files/silverlight/default.html?id=86825520-a671-11db-a264-0050c2490048 (accessed March 4, 2010).

Figure 4. Covers from various editions of *Alice's Adventures in Wonderland*. They are presented chronologically and demonstrate both the changing aesthetics and perceptions of the text since it was first published. The earliest (1888, left) relies on Tenniel's illustrations for its imagery, while the most recent (1999, right) has completely re-imagined Alice for the 21st century child (modern hairstyle, dress, etc). *Source:* David Pearson, *Books as History: the Importance of Books Beyond their Texts* (London; New Castle, DE: British Library; Oak Knoll Press, 2008), 44-45.

Figure 5. A sampling of products based on various editions and re-tellings of the *Alice* story. This underscores the enormous influence and continued popularity the text has had since its publication in 1865. *Source:* Barnes & Noble, e-mail to Barnes & Noble e-mail list, March 3, 2010.
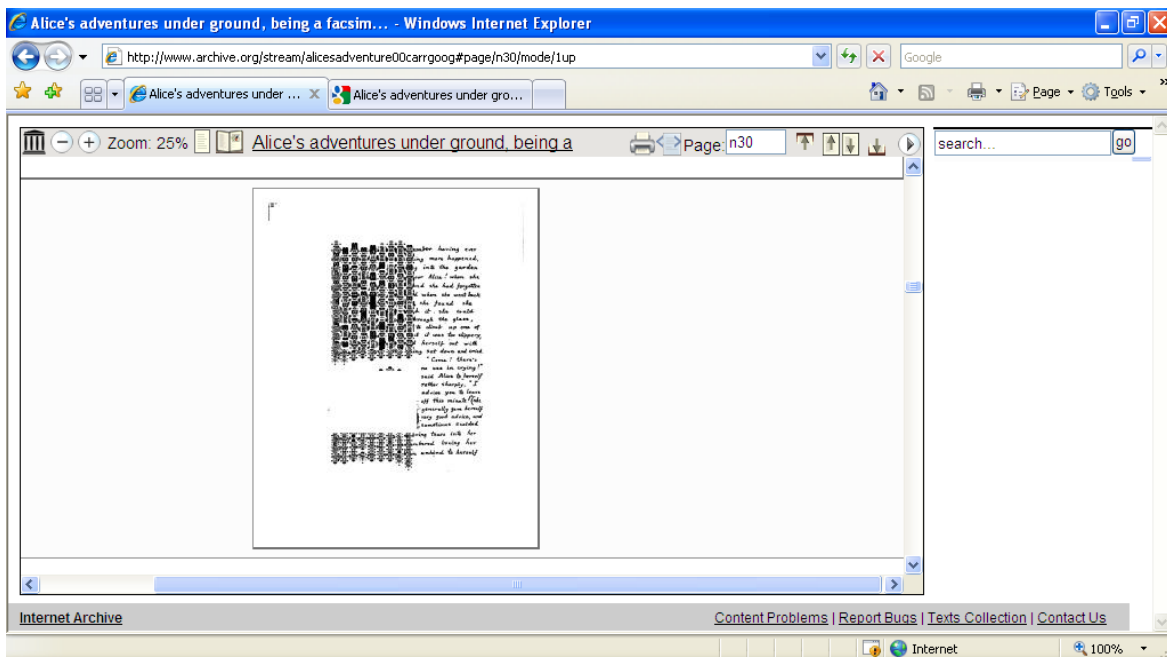

Figure 6. *Alice's Adventures under Ground* as presented by The Internet Archive. Although purportedly pulled from Google books, the text of this copy is completely illegible (as seen along the left-hand side of this page), rendering this surrogate useless. *Source:* Lewis Carroll, *Alice's adventures under ground: being a facsimile of the original ms. Book Afterwards Developed into "Alice's Adventures in Wonderland*," (London; New York: MacMillan, 1886), http://www.archive.org/stream/alicesadventure00carrgoog#page/n30/mode/1up (accessed March 4, 2010).
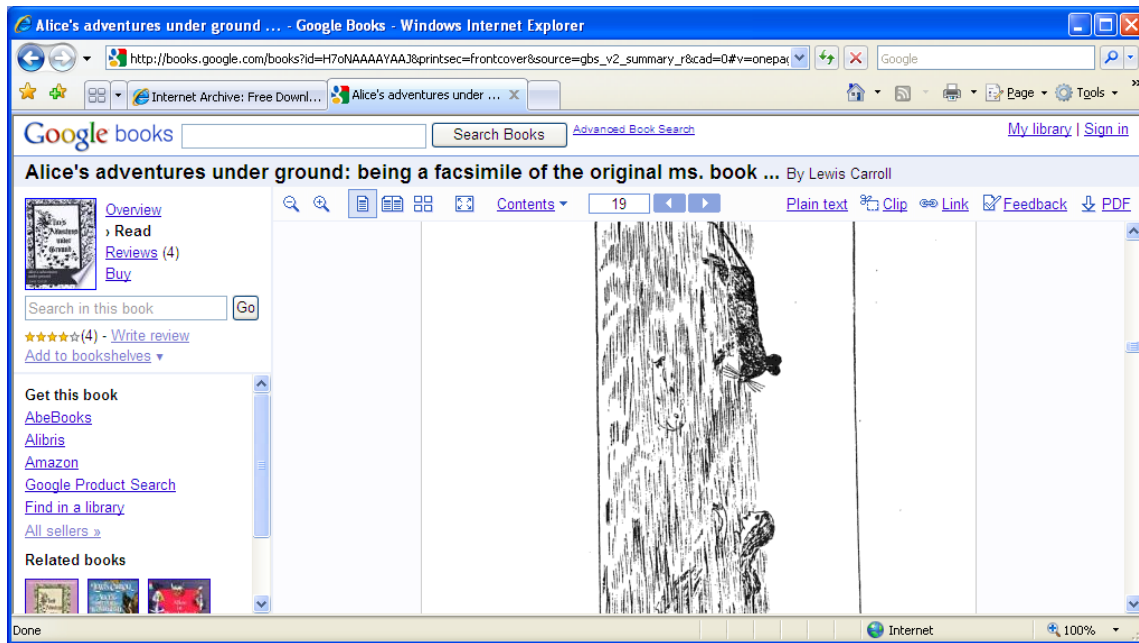
Figure 7. Example of an illustration from the Google books surrogate. While the original illustration is presented, there is no way for a user to rotate or otherwise manipulate the image in order to view it correctly. *Source:* Lewis Carroll, *Alice's adventures under ground: being a facsimile of the original ms. Book Afterwards Developed into "Alice's Adventures in Wonderland*," (London; New York: MacMillan, 1886), http://books.google.com/books?output=text&id=H7oNAAAAYAAJ&q=Alice# (accessed March 4, 2010).

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