WEB REVIEW: *Perseus Digital Library*

by James Marion Darlack

The Perseus Digital Library (http://www.perseus.tufts.edu) provides access to a host of resources related to Classical literature. It can be an invaluable resource for the student, scholar, or pastor who is interested in researching the Greco-Roman backgrounds of the New Testament. Perseus provides access to Greek and Latin texts, English translations, supporting lexicons, and other materials that can fill in some of the cultural blanks that help make biblical studies come alive. Of course, the best feature of the Perseus Digital Library is its cost. It is free. By using Perseus to complete assignments, a student will be learning how to use a tool that will be available to them well after graduation. In addition to creating a fantastic resource in itself, the developers of the Perseus Project have contributed to the growing corpus of scholarship in the digital humanities, authoring dozens of works analyzing and showcasing the project for those interested in the project.[1] The goal of this review is to expose the reader to the background and content of the Perseus Digital Library, offer examples of its use, give an evaluation.

Background

In 1987, Dr. Gregory Crane, a junior faculty member in Classics at Harvard University, initiated the Perseus project.[2] With the intent of helping students study and appreciate the Greek poetry of Pindar, the project linked texts, maps, images, and other resources to various tools used for the study of the Classics, such as dictionaries and lexicons. The first edition was published on CD-ROM for Macintosh computers by the Yale University Press in 1992. The project migrated online in 1995 (with the addition of the Liddell-Scott-Jones *Greek-English Lexicon*), and the second edition CD-ROM was published in 1996 for use on both PC and Macintosh platforms.[3] In 2000, the website was revised and expanded to include new collections and was dubbed "Perseus 3.0." In 2005, version 4.0 was released, and in 2006 the TEI XML collections were released under a Creative Commons license.[4]

Prior to the recognition and expansion of the Perseus Project, senior scholars at Harvard did not look favorably on Crane's work "because it was not considered serious scholarship," so the project (and Crane) moved to Tufts University.[5] According to the founder, "our long-term goal must be to make accessible, both physically and intellectually, to every human being on this planet the complete record of humanity."[6]

While the Perseus project houses hundreds of Classical texts (in Greek, Latin, and English translations) as well as thousands of images related to the Classical material culture, its greatest innovation is the rich structuring of these texts through the Text Encoding Initiative (TEI), a standard that applies XML/SGML to format complexly structured texts.[7]

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[1] "Perseus Publications," accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/about/publications.

[2] Gregory Crane, "The Perseus Project and Beyond: How Building a Digital Library Challenges the Humanities and Technology," *D-Lib Magazine* 4.1 (January 1998): n.p., accessed March 4, 2016; William Y. Arms, *Digital Libraries* (Cambridge, MA: Massachusetts Institute of Technology, 2000), 80. http://www.dlib.org/dlib/january98/01crane.html

[3] "Perseus Version History," accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/help/versions.jsp.

[4] Ibid.

[5] Ibid.

[6] Crane, "The Perseus Project and Beyond," n.p.

[7] Robert Fox, "The Library as Virtual Abbey," *OCLC Systems & Services: International Digital Library Perspectives* 24 (2008): 81; Text Encoding Initiative (TEI), http://www.tei-c.org.

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Content

Primacy of place is given to the Greek and Roman materials, which include both primary and secondary sources for the study of Classical Western civilization (containing over 68 million words). Along with their corpus of Classical texts, they also include an "Art & Archaeology Artifact Browser" which documents thousands of coins, vases, sculptures, and archaeological sites. Each entry includes descriptions of the object and contexts, and most include images.[8] For example, see the entry "Corinth, Temple of Apollo."[9] In addition to Classical resources, Perseus has also expanded to include Arabic Materials (5.5 million words), Germanic Materials (1 million words), 19th-Century American Materials (53 million words), Renaissance Materials (7.75 million words), the Richmond Times Dispatch (19.5 million words), and Humanist and Renaissance Italian Poetry in Latin (3 million words).[10]

All Perseus collections are freely available to the public, and are mirrored in two other locations. The University of Chicago hosts the texts using the PhiloLogic interface,[11] and Perseus 3.0 is still hosted by the Max Planck society in Berlin.[12] The Perseus 4.0 site is available for download at SourceForge as is the Arts & Archaeology Collection.[13] All public domain texts are downloadable in XML format directly from the site. Most images in the Arts & Archaeology collection are available in Public Domain as well.[14]

Example Usage

The Perseus Digital Library is an invaluable resource for both student and scholar. It has contributed greatly to the promotion of the Classical Greco-Roman literature, history, and culture. It has also made available an array of texts in a format that is fairly easy to search and navigate (both in original language and translation). The hyperlinked nature of these texts is Perseus's greatest achievement. The rich interweaving of primary and secondary literature is illustrated in the following "chain of research" starting with the "Search Tool" (Figure 1).[15]

The Search Tool effectively searches the corpus of Greek/Latin texts. One can search for all forms of a particular Greek word. Pictured in Figure 1 is a

Figure 1. Search Tool

search for the Greek word for "abyss" (ἄβυσσος / *abussos*). One drawback to the Search Tool is that it is necessary to use the accented Greek text, transliterated into "Beta Code," the standard for transcribing Greek text into ASCII Latin characters.[16] This can be somewhat daunting for the beginner in Classical Greek, having to type out ἄβυσσος / *abussos* as **a)/bussos**. The Perseus mirror at the University of Chicago overcomes this difficulty by allowing the user to type in standard Greek transliteration, like *abussos*.[17] The minor difficulty with using Beta Code on the Tufts site is overshadowed by the extremely helpful list of "hits" that occur in 21 Greek texts found in the corpus (Figure 2):

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[8] "Perseus Collections/Texts," accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/collections.

[9] http://www.perseus.tufts.edu/hopper/artifact?name=Corinth,%20Temple%20of%20Apollo&object=Building

[10] Links to these collections are available at "Perseus Collections/Texts."

[11] http://perseus.uchicago.edu/

[12] http://perseus.mpiwg-berlin.mpg.de/

[13] Perseus 4.0: http://sourceforge.net/projects/perseus-hopper; Arts & Archaeology Collection: http://sourceforge.net/projects/perseus-artarch/.

[14] "Perseus Copyrights," accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/help/copyright.

[15] http://www.perseus.tufts.edu/hopper/search

[16] http://www.tlg.uci.edu/encoding/

[17] http://perseus.uchicago.edu/

Showing **1** - **10** of **21** document results in **Greek**.

1 2 3 ▶ ▶▶

Aeschylus, *Seven Against Thebes* (ed. Herbert Weir Smyth, Ph.D.)
(Greek) (English, ed. Herbert Weir Smyth, Ph. D.)

card 945: ... μέλεοι διοδότων ἀχθέων: ὑπὸ δὲ σώματι γᾶς πλοῦτος ἄβυσσος ἔσται. ἰὼ πολλοῖς ἐπανθίσαντες πόνοισι γενεάν: τελευταῖαι δ᾽

Aeschylus, *Suppliant Women*   More(2)
(Greek) (English, ed. Herbert Weir Smyth, Ph. D.)

card 438: ... πράγματα, κακῶν δὲ πλῆθος ποταμὸς ὣς ἐπέρχεται: ἄτης δ᾽ ἄβυσσον πέλαγος οὐ μάλ᾽ εὔπορον τόδ᾽ ἐσβέβηκα, κοὐδαμοῦ λιμὴν κακῶν

Figure 2. Search Hits

Figure 3. Seven Against Thebes

ἄβυσσος   bottomless, unfathomed,
(Show lexicon entry in LSJ Middle Liddell) (search)

| ἄβυσσος | adj sg masc nom | *no user votes* | 24.9% | [vote] |
| ἄβυσσος † | adj sg fem nom | 3 user votes | 75.1% | [vote] |

† This form has been selected using statistical methods as the most likely one in this context. It may or may not be the *correct* form. (More info)

Word Frequency Statistics (more statistics)

Words in Corpus	Max	Max/10k	Min	Min/10k	Corpus Name
5,341	1	1.872	1	1.872	Aeschylus, Seven Against Thebes

Figure 4. Word Study Tool

ἄβυσσος , ον,

A. *bottomless, unfathomed,* "πηγαί" **Hdt.2.28**; "ἄτης ἄβυσσον πέλαγος" **A.Supp.470**; "χάσματα" **E.Ph.1605**; "λίμνη" **Ar.Ra.137**: generally, *unfathomable, boundless,* "πλοῦτος" **A.Th.948**; "ἀργύριον" **Ar. Lys.174**; "φρένα Δίαν καθορᾶν, ὄψιν ἄβυσσον" **A.Supp.1058**.

   II. "ἡ ἄ." *the great deep,* LXX **Ge.1.2**, etc.: *the abyss, underworld, Ev. Luc.8.31*, **Ep.Rom.10.7**, **Apoc.9.1**, etc.; *the infinite void, PMag.Par. 1.1120*, cf. *PMag.Lond.121.261.*

Henry George Liddell. Robert Scott. A Greek-English Lexicon. revised and augmented throughout by. Sir Henry Stuart Jones. with the assistance of. Roderick McKenzie. Oxford. Clarendon Press. 1940.

The National Science Foundation provided support for entering this text.

Figure 5. A Greek-English Lexicon

In the first result, the user can click "card 945" and read the Greek text. In the second result, the "More(2)" indicates that there is more than one occurrence of ἄβυσσος in Aeschylus' *Suppliant Women*. Clicking the hyperlinked "English, ed. Herbert Weir Smyth, Ph. D." will navigate directly to the English translation of the text. It is particularly useful to click the "card" link so that ἄβυσσος is displayed in context (Figure 2).

Note that the word ἄβυσσος is highlighted. Each Greek word is also hyperlinked to a "Greek Word Study Tool" that includes the parsing of the word, links to the usages of the word in the Perseus corpus of materials, as well as links to any Lexical entries of the word (Figure 3).

The Word Study Tool leads not only to parsing information (noting part of speech, etc.), but also to the gold-standard Classical Greek lexicon, edited by Liddell, Scott and Jones, *A Greek-English Lexicon* (Figure 4).[18]

The power of Perseus's highly structured and richly linked material is seen in the hyperlinks shown in Figure 5. A student viewing the entry for ἄβυσσος / *abussos* is exposed to the quality lexical data provided by the LSJ, but also any Greek text displayed in the lexicon is hyperlinked to the Greek Word Study Tool. So, a student unfamiliar with the vocabulary can quickly see the definition and be led to further lexical entries. Any primary source material mentioned that is present in the Perseus corpus is hyperlinked as well. For instance, the linked Hdt.2.28 points to Herodotus' *Histories* 2.28 (see Figure 6).

In Figure 6, the link takes the user directly to the English translation of Herodotus by A. D. Godley. For the purpose of display, I highlighted the English gloss "bottomless" that represents the translation of ἄβυσσος. As in the LSJ lexical entry, all Greek text is hyperlinked to the Word Study Tool. Under the English text of Herodotus is a formatted citation of the print edition behind Perseus's electronic text. In the bottom-right of Figure 6, there is a link to "View a map of the most frequently mentioned places in this document." This leads to a GIS-integrated Google Map of all geographic locations mentioned in Herodotus's *Histories* (Figure 7).[19]

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[18] Henry George Liddell, Robert Scott, and Henry Stuart Jones. *A Greek-English Lexicon* (Oxford: Clarendon Press, 1940), accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0057.

[19] Fox, "The Library as Virtual Abbey," 83.

This "chain of research" shows the power of the Perseus Digital Library in searching for a single Greek word, moving from a list of instances to a top-quality Greek-English lexicon, on to the texts cited in that lexicon, and then on to a map of locations mentioned in the document.

While primacy of place is given to Greco-Roman material, other texts are available as well. In Figure 8, the Old English text of Beowulf is displayed in parallel with an English translation. Both the Old English and the English translations are fully searchable, and the user can "scroll" through the text keeping both text and translation in sync.

The Arabic text of the Qur'an is available as well, along with three English translations (Figure 9).

A few biblical texts are available: Westcott and Hort's *New Testament in the Original Greek*, *The World English Bible*, and the Latin text of the Vulgate.[20] Additionally, the Greek text of Josephus (edited by Niese) and Whiston's English translation are available.[21]

Assessment

While Perseus is powerful, there are limitations. The site can be slow — especially during peak times of the academic year (inevitably when word studies are due). Understandably, there can be quite a strain on the servers at Tufts University. In the past, this was alleviated by providing mirror sites. The Berlin mirror is now out of date, and PhiloLogic, at the University of Chicago, employs a completely different user interface. It can serve as an alternate during peak times of the year, but its content is not as richly integrated. The second drawback of the corpus is its age. The English translations available in Perseus are of a high quality, but they are often out of date. The corpus draws heavily on public domain texts, and while expertly edited and structured, they do not necessarily reflect

Figure 6. Herodotus' *Histories*

Figure 7. Places in Herodotus' Histories

Figure 8: Beowulf

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[20] Brook Foss Westcott and Fenton John Anthony Hort, *The New Testament in the Original Greek* (New York: Harper & Brothers, Franklin Square: 1885), accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.01.0155; *World English Bible*, accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.01.0156; The Vulgate Bible, accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.02.0060.

[21] B. Niese, *Flavii Iosephi opera* (Berlin: Weidmann, 1892), accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/searchresults?q=niese; William Whiston, *The Works of Flavius Josephus* (Auburn and Buffalo, NY: John E. Beardsley, 1895), accessed March 4, 2016, http://www.perseus.tufts.edu/hopper/searchresults?q=whiston.

Figure 9. Qu'ran

the latest advances in philology available in modern translations.[22] Its small selection of biblical texts and translations is evidence of this problem. The third drawback of the site is that it does not offer a *comprehensive* selection of Classical texts. Perseus does offer "the greatest hits" of Classical literature, but the most comprehensive database for searching Greek materials is the subscription-based database *Thesaurus Linguae Graecae* (*TLG*).[23] *TLG* provides links to English translations in *some* instances (often through Perseus), but the typical seminary student would likely lack the proficiency necessary to 'sight read' Classical Greek.

Perseus serves as a focused specialized digital library. The project is unbound by book covers, library shelves, or physical walls. It leverages the hyperlinked environment of the Web to connect primary texts on a word-by-word level with secondary materials (e.g., lexicons, dictionaries, maps, and images). To accomplish the same string of research in a traditional brick-and-mortar library would be a considerably more complex task — locating multiple Classical Greek concordances, lexicons, texts, translations, and even maps. In Perseus, these resources are freely available to students, scholars, and pastors with a point-and-click.

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[22] Many of the translations present in Perseus are taken from public domain volumes in the Loeb Classical Library (LCL). The subscription-based Digital Loeb Classical Library (DLCL) is now available, and provides online access to the latest editions of LCL volumes (http://www.loebclassics.com). While the DLCL provides recent translations, it lacks important features that are present in Perseus for free. For instance, the user can perform a search of the lexical form of a Greek or Latin word and find all instances in the Perseus corpus, while the DLCL provides only wildcard searches that can barely approximate a lemma search. The DLCL also lacks hyperlinks to lexical and morphological tools, and it lacks a richly structured text that takes into account both the physical volume/book/page number and the versification assigned to the ancient text in different critical editions. It would be a tremendous boon to the scholarly world if these features could be added to the DLCL. The value of the DLCL is in its presentation of the most current Loeb volumes.

[23] http://stephanus.tlg.uci.edu