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The Digital Critical Apparatus: Thoughts from the Field

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Abstract: This article continues the discussion about the future of critical editions begun in volume 112 of *The Classical Journal* by Keeline and continued in volume 114 by Olson. Written from the point of view of two scholars working in the field of digital philology, the article affirms some elements of Keeline's vision and addresses Olson's concerns about that vision. Concrete examples from an active project that seeks to translate the visual elements of traditional critical editions into machine-readable data reveal that Keeline and Olson's views are not as far apart as they seem.

In volume 112 of *The Classical Journal*, Tom Keeline articulates a vision for critical editions in the digital age. He discusses the limitations of traditional critical editions in print and describes his "dream" of digital editions that offer one-click access to a wide variety of information, including full transcriptions of sources, images of manuscripts, commentary on the text, and a ranking system for variant readings. In Keeline's dream, readers would have access to every bit of information about a text, and they would have the freedom to make their own choices about it without being limited by what an editor or a publisher deems worthy of publication. In short, Keeline "would like to transform passive readers" of traditional critical editions into "active users" of digital editions.[1] In theory (and he does acknowledge that it is a theory)[2] the sort of digital edition that Keeline describes might be possible sometime in the

[1] Keeline (2017) 350.
[2] Keeline (2017) 353.

future, but it is far from what we have now. Accordingly, Keeline also offers some more realistic ideas about how a digital critical apparatus might improve upon the format presented to us in printed critical editions.

S. Douglas Olson's response to Keeline raises important points about the costs, in terms of both money and effort, associated with building and using digital editions of the type that Keeline imagines.[3] He also takes aim at Keeline's critique of printed editions, arguing against Keeline's characterization of the traditional critical apparatus as "almost unusable even for the most advanced readership."[4] But Olson focuses his most critical comments on Keeline's vision for more active readership of critical editions. Far from seeing it as a dream, he views it as "potentially a dystopia in which those who do not wish to spend their working time on textual criticism are nonetheless required to do so, and in which no text can be consulted or quoted without fully pursuing all the philological issues it raises."[5] He concludes with a twofold challenge to those who wish to "invest enormous amounts of the profession's personal and economic resources in a new style of electronic apparatus": demonstrate that it will make a real contribution and that there is a "genuine demand" for it.[6]

As insightful as their discussion is, it is almost entirely theoretical. Indeed, that is the point of Keeline's article: to describe a possible future for textual criticism. Olson's article is a reaction to that possible future; it does not suggest an alternative to what we already have, but it does raise some important factors to consider. But, since neither scholar has significant practical

[3] "What is under discussion is a tectonic shift in the structure of the texts we use as basic research tools and the enormous investment of time and resources that will likely be required to make that shift possible." Olson (2019) 338.
[4] Keeline (2016) 348; cf. Olson (2019) 333.
[5] Olson (2019) 341.
[6] Olson (2019) 344.

experience with creating digital editions, we offer this third contribution to the discussion, based on our work on the Digital Latin Library (DLL) over the past several years.[7] In doing so, we aim to address some common misconceptions about digital critical editions that both Keeline and Olson voice, and we hope to encourage more scholars to consider contributing to the DLL's *Library of Digital Latin Texts* (LDLT), its platform for publishing born-digital, critical editions.[8]

The Crux of the Matter

How to deal with the apparatus criticus has been an essential research question for the DLL since its inception. The fact that most, if not all, Latin texts available on the internet still do not include a critical apparatus (or any other features of critical editions) means that readers are not getting the full picture of the texts they read online.[9] But that has long been true of readers who use traditional critical editions without consulting the apparatus. Their reasons are many, but Keeline offers a good summary:

> Consider how few "general readers" read footnotes. Now picture those footnotes festooned with cryptic symbols, cloaked in the obscurity of a learned language, and provided without any superscript signaling in the main text that there might be something relevant at the bottom of the page—then add in the pervasive notion that the apparatus is merely a repository for what the editor thinks *does not* belong in the text.[10]

[7] https://digitallatin.org/.
[8] For an overview of the DLL and the LDLT, see Huskey (2019).
[9] Notable exceptions are Dániel Kiss' *Catullus Online* (http://www.catullusonline.org/) and the texts collected at *Musisque Deoque* (http://mizar.unive.it/mqdq/public/). See Tarrant (2016, 149–56) for a review of the issues with texts currently online. For the challenges of constructing a digital critical apparatus, see Apollon and Bélisle (2014); Monella (2018).
[10] Keelin (2017) 342.

Described that way, it is no wonder that he has heard his students speak of the "crapparatus"![11] After all, the critical apparatus has evolved over centuries into a specialized format for presenting to scholars information about the text in a printed volume.[12] It stands to reason, then, that using a critical apparatus takes training, practice, skill, and motivation. That undergraduate and graduate students might lack any or all of those things is understandable—even professional scholars sometimes treat the critical apparatus as an afterthought, if they think of it at all. Nevertheless, those who know how to read a critical apparatus have access to a rich resource about the text in front of them. For that reason, Keeline is eager to make it accessible to more readers. We share that eagerness, which is why we have devoted so much of our work to accomplishing that goal.

The main obstacle, according to Keeline, is the printed page itself: the physical boundaries of a page restrict the amount of content that can be printed on it.[13] The economic concerns of publishers are also a significant influence; otherwise, they would not care if editors filled their pages with notes on variants and other matters affecting the text. All of this leads Keeline to express frustration with the "rhetoric of the printed page," by which he means the unavoidable fact that the editor's version of the text occupies a privileged position on the page, even if the editor is only dimly certain that a word or phrase is the best choice.[14]

Olson, however, objects to Keeline's assertions about the false sense of security that the rhetoric of the printed page fosters. He argues that the very reason for the critical apparatus'

[11] Keeline (2017) 349.
[12] Kenney (1974) is a good survey of the evolution of the critical apparatus.
[13] For an extended discussion of the page as a medium for communication, see Mak (2011).
[14] Keeline (2017) 345.

existence is to "undermine this naive view of the situation."[15] That is, the whole point of printing variant readings in the critical apparatus is to demonstrate that "no text is ever entirely secure and no edition can be truly definitive."[16] But Keeline does not dispute this fact. Rather, he argues that digital formats have the potential to elevate the critical apparatus and make it more accessible to readers, regardless of their level of skill. Keeline also sees the potential of digital formats to encourage readers to explore a text by interacting with it.

For example, Keeline imagines an interface that will allow readers to evaluate a variant reading by swapping it into the text itself.[17] Olson, on the other hand, prefers using a pencil to cross out one reading and supply another.[18] Both methods achieve the same result, but it cannot be denied that having access to a digital edition affords many more possibilities for interacting with the text, including not having to use an eraser to restore the edition's original version of the text.[19]

That those possibilities also include printing out a PDF of a digital edition in the familiar format of a traditional edition in print leads us to the crux of the matter: the distinction between print and digital editions is a false dichotomy. It is time to consider a different point of view.

Visualizing Critical Editions

Although it appears that Keeline and Olson are debating the merits of traditional printed

[15] Olson (2019) 333.
[16] Olson (2019) 333.
[17] Keeline (2017) 352.
[18] Olson (2019) 342.
[19] A digital edition can also allow the editor to lay down clear paths for exploring variation that will not create "impossible" texts. For example, in instances where variant readings in two or more places in a text depend upon each other, a digital edition can be encoded in such a way that those variants are always connected.

editions and digital editions, they are, in fact, mostly concerned with the *visualization* of the information contained in critical editions. To understand that distinction, consider the contents of a typical critical edition. Flipping the pages from the front to the back of a critical edition in print, one encounters information about the publication of the volume, the names of the people involved (author, editor, etc.), the title of the work(s), the manuscript tradition, primary and secondary scholarship, abbreviations and sigla used in the edition, the text and critical apparatus, appendices, and indices, among other things. The format, layout, and typography of a critical edition in print help readers to distinguish these types of information and to make connections between them, along with connections to external resources such as commentaries, monographs, books, and manuscripts.

In sum, a critical edition (or any scholarship published in book form, for that matter) is a systematic and organized collection of information. Put in a different way, a critical edition is a database, albeit an analog one.[20] To extend the metaphor, the codex is a storage medium; the format, layout, and typography are the interface; and the reader's hands, eyes, and mind are the software and hardware for using it. Over the centuries since Wettstein's edition of the New Testament introduced a critical apparatus,[21] the traditional printed format has been optimized for visualizing information on pages of paper. This platform, as it were, has worked well for the profession for a long time, and we do not think that it will be displaced any time soon.

That is not to say that the traditional printed volume is without limitations, the main one being that the information in a printed edition is frozen on its pages. For that reason, Keeline's

[20] See O'Donnell (2009) for an extended discussion of this point.
[21] See Kenney (1974) 152–57 for a survey of the development of the critical apparatus and the importance of Wettstein's edition.

criticism of the "rhetoric of the printed page" is valid. Readers cannot change the layout or content of a printed edition; no matter how skillful they might be with a pencil and eraser, the editor's and publisher's decisions will always exert a strong influence on readers' experience of the text. Moreover, as useful as indices are, they cannot include everything, so readers must look to digital resources to expedite the simplest of word searches, unless they have access to a printed concordance. This is to say nothing of the cost of a printed edition or the copyright restrictions that limit the reuse of its contents.

But these are not arguments against printed editions *per se*, or in support of digital editions, for that matter. Rather, they are arguments for thinking of print as just one of many possible expressions of an edition's data. That, at least, has been the working principle of the LDLT: one file, many outputs, many uses. If an edition is encoded according to our guidelines, it can be rendered as an interactive web page (with many of the features Keeline envisions) or as a printable PDF in the traditional format.[22] We have also demonstrated that the data in such an edition can also be visualized in a variety of graphical formats.[23] And, owing to the open license of our editions, others are free to create tools and visualizations for their own purposes.

But there is a big "if" in the previous paragraph. If an edition is to be encoded according to the LDLT's guidelines, someone will have to do that work. Semantically encoding all of the details that have been traditionally represented by typographical conventions in print can be a major undertaking, and Olson is right to have questions about how, by whom, and at what cost

[22] See Cayless and Viglianti (2018) and Cayless (2018) for more information about applications for rendering an XML-encoded edition as an interactive web page. On turning XML into a printable PDF, see Witt (2018) and Dunning (2020).
[23] See Asokarajan et al. (2017; 2016) and Silvia et al. (2016).

that work will be done.[24] When we already have a functional way of publishing critical editions that does not require editors to learn new technologies and ways of working, it may well seem preposterous to invest time, effort, and resources in a new format. But, as we shall now argue, the investment has the potential to pay dividends in terms of improved scholarly communication and, yes, a revival of interest in textual criticism.[25]

Hoc opus, hic labor est

After describing a digital future for critical editions, Keeline aptly notes, "The first task is to build such a platform; the second, not less important, is to convince editors and readers to embrace it and take advantage of its power."[26] We have built such a platform for the LDLT. It consists of guidelines for encoding editions;[27] an interactive, web-based application for reading editions;[28] an application for transforming editions into printable PDFs;[29] a number of scripts for automating much of the encoding process;[30] a process for publishing editions as version-controlled code repositories and certifying their peer-reviewed status.[31] That first task was not easy—indeed the work is ongoing. But, we have learned, it pales in comparison to the difficulty of the second task mentioned by Keeline.

There is no shortage of interest in digital critical editions. Indeed, the dream that Keeline

[24] E.g., Olson (2019) 341: "And to be once again very clear: the costs involved in carrying out this project will be enormous, and we as a profession must decide whether we are willing to pay them or whether we prefer to make our investments elsewhere."
[25] For more on investing in digital editions, see Huskey (2020).
[26] Keeline (2017) 350, n. 27.
[27] https://digitallatin.github.io/guidelines/LDLT-Guidelines.html
[28] For an example text see https://ldlt.digitallatin.org/library/texts/urn:cts:latinLit:phi0830.phi001.dll_1/. The source code for the application is available at https://github.com/DigitalLatin/LDLT-reading-room.
[29] https://github.com/DigitalLatin/DLL-Stylesheets
[30] https://github.com/DigitalLatin/automation
[31] Huskey and Witt (2019).

describes in his article shows what can happen when scholars allow themselves to consider the possibilities. But when they see the hundreds of tags in an edition that has been encoded in XML, their enthusiasm for working on a digital edition tends to diminish significantly. We can attest to the tedium of manually encoding all of the details in a critical edition. Writing the encoding guidelines and then encoding our pilot edition of Calpurnius Siculus' bucolic poetry taught us all about that.[32] But it also taught us some other important lessons, and it led us to develop some tools and techniques for overcoming many of the obstacles that prevent scholars from working on a digital paradigm.[33]

Although most editors these days use word processors and other digital tools to create their editions, those tools are oriented toward how an edition will *look* in print. Consider that the "page" is still the basic unit in most word processors. Indeed, Apple's word processing program is called "Pages." Digital though they may be, such tools still aim primarily at print production.

Some may recall the early days of inserting codes to produce italic or boldface text in printed documents, but that is about as far as most scholars have gone when it comes to encoding anything. Yet, it may come as a surprise to many that editors have been encoding their texts for centuries: with typographical conventions, abbreviations, sigla, and other visual cues. Consider that angle brackets, square brackets, curly braces, and parentheses all communicate specific things about a text, and that their meaning might change from edition to edition. Depending on the context, italic type, bold type, and Greek typefaces can distinguish any number of other things. These conventions and all of the abbreviations and other symbols convey information to

[32] https://ldlt.digitallatin.org/library/texts/urn:cts:latinLit:phi0830.phi001.dll_1/
[33] See Sahle (2016) for a discussion of the digital paradigm for scholarly editions.

readers *visually*. If the edition itself does not explain all of the conventions in use, it is up to readers to use their experience and intuition or to seek enlightenment elsewhere. If a reader is visually impaired in any way, these conventions can be significant obstacles.

In contrast, we aim to separate information from its visualization. In the case of the LDLT, this means using *semantic* encoding to represent all of the things that have been communicated visually in printed editions. For example, square brackets or curly braces have traditionally been used to indicate the editor's belief that some text is extraneous; in an LDLT edition, `<surplus>` tags surrounding the extraneous text clearly communicate that message. A program can transform those `<surplus>` tags into square brackets, curly braces, or even Unicode snowmen (☃), depending on the requirements or preferences of the user. Indeed, if the user does not care about text marked as `<surplus>`, the edition can be displayed without those (or any other) tags. Regardless of the user's preferences, the edition's underlying data will remain unchanged.

Another major difference is that instead of treating the text and the apparatus criticus as different things that are subject to the rhetoric of the printed page, a digital edition encodes a lemma next to its variant readings, with accompanying annotations about witnesses, sources, and context. The following basic example uses fake Latin to demonstrate the concept:

```
<p>Lorem ipsum dolor sit <app>
      <lem>amet</lem>
      <rdg wit="#A">amat</rdg>
</app>, consectetur adipiscing elit.</p>
```

A paragraph tag (`<p>`) begins the paragraph. The text of the edition continues until the editor decides to record a variant reading. The apparatus tag (`<app>`) signals the beginning of one entry

in the critical apparatus. Inside of it, there is the lemma (<lem>), or the text that the editor believes should be included in the edition's main text, and a reading (<rdg>), which records a variant. The attribute "wit" indicates the siglum (A) of the witness that contains that reading. After the variant reading, the apparatus tag is closed (</app>) and the edition's text resumes. This is just a simple example. It is possible to report as many readings as the editor has evidence for. The editor can also insert <note> tags if further commentary is needed. Indeed, extended textual commentary on a passage can be encoded elsewhere and linked to the apparatus entry.

Encoded this way, the apparatus criticus is not an afterthought, lingering at the bottom of the page, hoping to be noticed; instead, it models textual variation as a data structure that gives all the relevant information in parallel at the locus of variation, effectively neutralizing the effect of the "rhetoric of the printed page." When visualized on screen or in a printable PDF, that rhetoric can reassert itself, depending on the nature of the visualization, but the underlying data are always available for examination.

Labor vincit omnia?

But the question remains: Who will do the work of encoding the edition? Although some editors prefer to work in XML, delighting in their freedom from working with modern word processors,[34] many more wish to avoid, at least as much as possible, typing angle brackets. Fortunately, the existing visual encoding standards for printed editions make it relatively easy to automate much of the encoding process. Accordingly, we have developed some applications that will encode paragraphs, variant readings, and the standard editorial symbols.

[34] For example, the spelling and grammar check features "helpfully" correct Latin texts.

Describing those applications and the process for using them would require a deep dive into the world of XSLT, Python, Regular Expressions, and other technologies, and that is beyond the scope of this article. Nevertheless, we have made great strides toward reducing the tedious nature of encoding so that textual critics can focus on the issues that cannot be reduced to an algorithm. This means that they can still prepare their editions in the word processor of their choice, provided that they are willing to make a few changes in their approach to facilitate the automation process.

Those changes have to do with treating the information in an edition as data. That means moving beyond relying on purely visual means to separate the discrete pieces of information in an edition. It is useful to consider, in this regard, Keeline's examples of apparatus entries in three different editions of Tacitus' *Annales* 12.50.2:

> Vacuamque rursus Armeniam Radamistus invasit, truculentior quam antea, tamquam adversus defectores et in tempore <re>bellaturos.
>
> Fisher's OCT: rebellaturos *Rhenanus* : bellaturos *M*
>
> Koestermann's Teubner: bellaturos, *em. Rhen*.
>
> Heubner's Teubner: rebellaturos *al. Leid* (re *add. s. lin., cf.* rebellatores *Stuttg*^{2}) (*Rhen*.)

Keeline critiques the shortcomings of these apparatus entries, particularly for those who are not familiar with the work of Beatus Rhenanus or the abbreviations commonly used for annotations.[35] Olson argues that the notes of Fisher and Koestermann are "exceedingly clear" and that "there are no secrets here and very little obscurity—provided one is willing to undertake

[35] Keeline (2017) 346–48.

the pre-digital equivalent of one or two clicks of the mouse by turning a few printed pages."[36] We have, then, differing opinions from two professional scholars as to the efficacy of the visual cues in the critical apparatus of three traditional editions.

Since both Keeline and Olson remark on *Rhenanus*, let us demonstrate how that citation might be handled in an edition encoded in TEI XML according to the LDLT's guidelines. The following would be entered in the bibliography of the edition:

```
<bibl xml:id="rhenanus"><abbr
type="siglum">Rhenanus</abbr><editor>Rhenanus, Beatus</editor>. <title
level="m">P. Cornelii Taciti Equitis Romani Annalium ab Excessu Augusti
…</title>. <pubPlace>Basileae</pubPlace>: <publisher>In officina
Frobeniana</publisher>. <date>1533<date>. <ptr
target="https://www.google.com/books/edition/Annalium_ab_excessu_August
i_sicut_ipse_v/2XNCAAAAcAAJ/></bibl>
```

Similarly, the manuscript identified as *M* would be encoded as follows:

```
<witness xml:id="M"><abbr type="siglum">M</abbr><name>Codex
Laurentianus Plut. 68.2 (Mediceus)</name> <ptr
target="http://mss.bmlonline.it/s.aspx?Id=AWOIyXbxI1A4r7GxMPoB&amp;c#/b
ook"/></witness>
```

Observe that there are two identifiers in each entry: an `xml:id` and an `<abbr>` (abbreviation). The former is a machine-readable identifier that can be linked to whenever the human-readable label is used so that the information is always readily available to the reader. Note, too, that each entry has a `<ptr/>` (pointer) that links to an openly available digital reproduction so that readers

[36] Olson (2019) 334.

will have access to the source, if they wish to see it.

As for the text of the edition and the critical apparatus, here is one way of encoding it:

```
<p>Vacuamque rursus Armeniam Radamistus invasit, truculentior quam
antea, tamquam adversus defectores et in tempore <app>
<lem source="#Rhenanus" type="emendation">
      <supplied reason="omitted">re</supplied>bellaturos
</lem>
      <rdg wit="#M">bellaturos</rdg>
</app>.</p>
```

As above, the apparatus entry is encoded alongside the text itself. Both the lemma and the variant reading have references to the bibliographic data for their respective source and witness elsewhere in the file, which means that a user could follow a link to the full citation at any time. Moreover, the `type` attribute on the lemma indicates that the main edition's text here is an emendation, and instead of just noting "*em. Rhen.*", the `source` attribute tells us who emended the text, and the `<supplied>` tag encloses the part of the reading that is Rhenanus' emendation. Further, the `<supplied>` tag has the attribute `reason`, which uses a controlled vocabulary to explain why the text has been supplied. In this case, the argument is that the letters "re" were omitted at some point when the text was copied.

It is also possible to encode the palaeographical data in Huebner's critical apparatus:

```
<app>
      <lem source="#Rhenanus" type="emendation"><supplied
reason="lost">re</supplied>bellaturos</lem>
```

```
            <rdg source="#L" xml:id="rdg-12.50.2-rebellaturos"><add
place="above">re</add>bellat<add place="above">ur</add>os</rdg>
            <note target="#rdg-12.50.2">v. <ptr
target="http://hdl.handle.net/1887.1/item:884318"/></note>
            <rdg source="#Stutt2">rebellatores</rdg>
         </app>
```

Observe that the `<note>` points to a permalink for the page of L (Leidensis BPL 16 B) where the reading *rebellaturos* can be viewed.

Of course, the prospect of entering metadata like that for an entire critical edition is daunting. Indeed, the tedious nature of the data entry process could even lead to the introduction of new errors into the text. Fortunately, there are tools that facilitate the encoding process and reduce much of the tedium.[37] But even if scholars do not wish to enter all of those tags and attributes manually, they can still work on a digital paradigm by organizing their work in the form of a table, giving careful attention to the types of information they are providing. The format that we have developed is based on a review of dozens of critical editions published by a variety of publishers. The types of information one usually finds in a critical apparatus include:

1. A reference to the line or lines in question;
2. The lemma, whether implicitly or explicitly stated;
3. Witnesses and/or sources for the lemma, if explicitly stated;
4. Editorial annotations on the lemma, if explicitly stated;

[37] E.g., the Oxygen XML editor (<https://www.oxygenxml.com/>) or the XML tools available in the free Visual Studio Code editor (<https://code.visualstudio.com/>).

5. First variant reading;[38]
6. Witnesses and/or sources for the variant reading;
7. Editorial annotations on the reading;
8. Repeat 4–6 for each additional reading;
9. General annotation (e.g., *alii alia*).

There are, of course, some variations, but for the most part, this is the order of information in a typical apparatus criticus entry. Those data can be represented in tabular form in applications found on most personal computers (e.g., Microsoft Excel, LibreOffice, Numbers, etc.) or on the internet (e.g., Google Sheets), and we have a template for anyone who wishes to work in this way. We can process this tabular data and return a TEI XML file with most, if not all, of the apparatus entries fully encoded. Those who have tried this method have said that it helps them to think more systematically about the information they report in their editions, so it has some benefits apart from facilitating the automatic encoding of their work.

We maintain that those who refuse to type even one character of XML can still work on a digital paradigm to produce a digital critical edition of a Latin text. That is because the LDLT hews closely to the implicit data model of traditional critical editions. It assumes that an editor is advancing an argument, or a series of arguments, about a text. For this reason, LDLT editions will not realize the dream the Keeline and others have envisioned, since that dream belongs to an entirely different category.

[38] The order in which readings are reported in a critical apparatus often indicates the editor's judgment about plausibility, from most to least plausible. This implicit communication is replicated in the ordering of readings in the LDLT's encoding guidelines, but an attribute (e.g., `@ana`, `@n`) could be used to make the order explicit.

Digital Critical Edition ≠ Digital Variorum Edition

Because a digital edition does not have to be constrained by what a codex can contain, it can also include much more information than a traditional one ever could. For example, it has long been the norm to publish critical notes on the text in a separate volume or a series of articles, but it is trivial to include that material in a digital edition's file.[39] If including images of a text or other materials would be helpful, it is easy enough to insert links to them.[40] In the case of the LDLT's editions, ancillary materials such as collation tables, transcriptions, notes, bibliographies, correspondence, etc., can be included in an edition's data repository.

At a certain point, however, the accretion of materials and features obscures the core mission of a critical edition, which is to provide access to a text and information about it. Keeline and Olson disagree about where the tipping point is. Let us examine Keeline's dream (his term) for a digital edition and Olson's reservations about it, with a view to illuminating another important distinction: just as there is a difference between data and the visualization of that data, there is a difference between a digital edition and the tools and applications that might be developed for using it.

Keeline's dream "is to record everything, but to tag each piece of the material with metadata so that all available information is placed on permanent record, but the user can pick what is actually displayed."[41] With this information at one's fingertips, he suggests, it would be possible to recreate "at a keystroke" a previous editor's text and "a reconstruction of the

[39] Cynthia Damon's forthcoming LDLT edition of the *Bellum Alexandinum* will include a textual commentary.
[40] Roberto Pesce's forthcoming LDLT edition of Paulinus of Venice's *Tractatus de diis gentium et fabulis poetarum* will have links to such resources.
[41] Keeline (2017) 351.

reception history of the text at any time or place for which manuscript evidence has been preserved."[42]

The seemingly limitless capacity of the digital realm inspires fantastic visions of what might be called the "totalist" edition, expanding the minimalist-maximalist spectrum that Tarrant identifies for apparatuses.[43] Heslin, for example, argues that "anyone reading a digital version of a classical text ought to be able to view at a single click the notes of every commentator from the incunabular age to the watershed of copyright."[44] Tarrant, too, imagines being able to use a digital edition to "construct an entire text as it appears in any given manuscript,"[45] but he also thinks that "it would be a grievous loss if the apparatus were to be reduced to a mechanical record of variants and conjectures, and the editor's personal voice no longer heard."[46]

Indeed, the totalist view tends to diminish the role of the editor, whose job is to chart a course for the reader through the messy history of a text. If the edition is just a portal to that whole unfiltered history, then the reader must become an editor to use it effectively. And that is at the heart of Olson's critique of Keeline's dream. He worries that Keeline's "ideal new world" would become "a dystopia."[47]

But Olson does not acknowledge that Keeline says that he is dreaming, or that the reality he would settle for is more modest. As a next-best thing, Keeline suggests that a digital format should allow editors to share more, or all, of the work that they did, instead of what generally

[42] Keeline (2017) 351.
[43] Tarrant (2016) 130–40.
[44] Heslin (2016) 498.
[45] Tarrant (2016) 154.
[46] Tarrant (2016) 130.
[47] Olson (2019) 341. See above for the full quotation.

appears in the apparatus criticus of a published edition. He also does not see any harm in making a tagging system available to them to use if they wish to add extra information about variants.[48] We do not see the harm in that, either. In fact, with help and guidance from Robert A. Kaster, we have built that functionality into the encoding guidelines for the LDLT.[49]

The difference between Keeline's dream and the reality he would settle for illustrates an important point, namely that digital editions and the interfaces and tools for using them are different things.[50] Recreating a previous editor's text "at a keystroke" or visualizing the reception history of a text are actions that interfaces and tools can be designed to do, provided that they have sufficient data to process. That is a major proviso, however, since encoding all of that data would take an enormous amount of time. Building a tool that will "promote the orthography of the earliest manuscript to the main text for all proper names, while also showing emendations by Heinsius, Hosius and Housman but suppressing those by 19th century German scholars assigned a probability of 3 or lower by the editor"[51] is possible, in theory, but while that might be Keeline's dream, constructing the database query that would produce those results would be a nightmare for someone who lacks the specialized skills and knowledge of a programmer.

In any case, we aver that Keeline's dream does not describe a critical edition; it describes an interface, a tool, or an application for exploring a *variorum* edition. To be sure, having access to full transcriptions of manuscripts and editions is a dream that many share. Some argue that such access would make critical editions unnecessary, since readers could explore the evidence

[48] Keeline (2017) 352.
[49] https://digitallatin.github.io/guidelines/LDLT-Guidelines.html#apparatus-criticus-analysis.
[50] See the essays collected in Bleier et al. (2018) for exploration of this point.
[51] Keeline (2017) 353.

directly, instead of through the filter of a textual scholar's judgment.[52] There is no question that access to all of the evidence would be a boon to scholars, teachers, and students. But even with unfettered access to images of manuscripts and full transcriptions of every existing version of a text, critical editions still serve the vital purpose of providing expert guidance through all of that information.[53]

There are many reasons why comprehensive access to the raw materials for critical editions has not yet become reality. Cost is the biggest factor. It is understandable that institutions are reluctant to give away their materials for free, and it is difficult to imagine anyone paying for an army of scholars to transcribe their way through all extant manuscripts. Then there is time. If the Digital Humanities have demonstrated anything, it is that "digital" does not mean "fast," at least when it comes to research and scholarship. Copyright restrictions also limit access to modern editions, and even many older editions are available only behind paywalls.

But there is also the fact that, as useful as access to those materials might be, simply compiling them does not count as scholarship, at least not in most academic research institutions—or if it does, it does not count for much. Whether it should count is not the subject of this article, but the question is important, since it will determine whether anything like the future Keeline describes will come to pass.

The Critical Edition in the Digital Age

If diplomatic transcriptions and variorum editions are not highly valued in the marketplace of

[52] Heslin (2016); Robinson (1993) 274.
[53] Robinson (1993) 282.

scholarship (analog or digital), then it is worth asking what might be. Surely a critical edition aiming to replace one of the current standard editions that were published more than half a century ago would be acceptable, whether in print or digital form?[54] What about an edition that seeks merely to update one of those older standard editions, in light of new scholarship or discoveries? If an editor surveyed all existing editions and compiled the findings into a single, updated edition, with references to relevant scholarship, would that count as scholarship?[55] How about a repertory of known conjectures,[56] or a critical transcription of a single manuscript that is the ancestor of all subsequent versions?[57]

We cannot know what will count until scholars take encoding seriously as a form of scholarly communication. That will indeed take a "tectonic shift," to use Olson's phrase, but not in the way he meant it.[58] Digital editions will not change the expertise, skills, and techniques required for critical editing, but they will require additional skills and a new way of looking at texts as data. But nothing says that this paradigm shift must happen suddenly. This project will take decades. Nonetheless, we should get started on it now.

[54] See Tarrant (2016) 146: "[F]or most authors, a good edition will have a useful lifespan of one or two generations, with fifty years an especially long life."
[55] See Damon (2016) 213: "What classicists need, I would argue, is a way to give digital form now to the mature state of textual scholarship represented by print editions, while leaving open the possibility of adding the underlying image and transcription data when and if opportunities arise." See also Tarrant's suggestion (2016, 140) of "compiling as full an apparatus as possible for every text, to serve as a point of reference."
[56] See Kiss (2017) for an online repertory of conjectures on the text of Catullus.
[57] For example, Kenney (1969, 185) argues that the next editor of Vibius Sequester should focus on providing a diplomatic transcription of the principal manuscript from which all others descend.
[58] Olson (2019) 338.

Works Cited

Apollon, Daniel, and Claire Bélisle. 2014. “The Digital Fate of the Critical Apparatus.” In *Digital Critical Editions*, Daniel Apollon, Claire Bélisle, and Philippe Régnier, eds. 81–113. Urbana, IL: University of Illinois Press.

Asokarajan, Bharathi, Ronak Etemadpour, June Abbas, and Chris Weaver. 2016. “Visualization of Latin Textual Variants Using a Pixel-Based Text Analysis Tool.” In *EuroVis Workshop on Visual Analytics (EuroVA)*, 19–23. Gronigen: The Eurographics Association. https://doi.org/10.2312/eurova.20161119.

———. 2017. “TexTile: A Pixel-Based Focus+Context Tool For Analyzing Variants Across Multiple Text Scales.” In *EuroVis 2017 - Short Papers*, 49–53. Barcelona: Eurographics Association. https://diglib.eg.org/handle/10.2312/eurovisshort20171132.

Bleier, Roman, Martina Bürgermeister, Helmut W. Klug, Frederike Neuber, and Gerlinde Schneider, eds. 2018. *Digital Scholarly Editions as Interfaces*. Vol. 12. Schriften Des Institus Für Dokumentologie Und Editorik. Norderstedt: Herstellung und Verlag: Books on Demand GmbH.

Cayless, Hugh. 2018. “Critical Editions and the Data Model as Interface.” Bleier, Roman et al., 249–63.

Cayless, Hugh, and Raffaele Viglianti. “CETEIcean: TEI in the Browser.” Presented at Balisage: The Markup Conference 2018, Washington, DC, July 31–August 3, 2018. In *Proceedings of Balisage: The Markup Conference 2018*. Balisage Series on Markup Technologies, vol. 21 (2018). https://doi.org/10.4242/BalisageVol21.Cayless01.

Damon, Cynthia. 2016. “Beyond Variants: Some Digital Desiderata for the Critical Apparatus of Ancient Greek and Latin Texts.” In Driscoll, Matthew J. and Elena Pierazzo, eds., 201–218.

Driscoll, Matthew J. and Elena Pierazzo, eds. 2016. *Digital Scholarly Editing*. Cambridge: Open Book Publishers.

Dunning, Andrew. 2020. “Review of ‘Reledmac. Typesetting Technology-Independent Critical Editions with LaTeX.’” *RIDE* 11. https://doi.org/10.18716/ride.a.11.1.

Heslin, Peter. 2016. “The Dream of a Universal Variorum: Digitizing the Commentary Tradition.” In *Classical Commentaries: Explorations in a Scholarly Genre*, Christina Kraus and Christopher Stray, eds. 494–511. Oxford: Oxford University Press.

Huskey, S. J. 2019. “The Digital Latin Library: Cataloging and Publishing Critical Editions of Latin Texts." In *Digital Classical Philology Ancient Greek and Latin in the Digital Revolution*. Monica Berti, ed. Berlin: De Gruyter Saur, 19–34. Open Access: https://doi.org/10.1515/9783110599572-003.

——. 2020. “Scholarly Digital Editions: A Wise Investment for Scholars and Institutions.” In *Der digital turn in den Altertumswissenschaften: Wahrnehmung — Dokumentation — Reflexion*. Anna Novokhatko, Stelios Chronopoulos, and Felix Maier, eds. Heidelberg: Universitätsbibliothek Heidelberg. https://doi.org/10.11588/propylaeum.563.

Huskey, S. J. and J. Witt. 2019. “Decoupling Quality Control and Publication: The Digital Latin Library and the Traveling Imprimatur.” *Digital Humanities Quarterly* 13.4. http://digitalhumanities.org/dhq/vol/13/4/000438/000438.html.

Keeline, Tom. 2017. “The Apparatus Criticus in the Digital Age.” *CJ* 112 (3): 342–63.

https://doi.org/10.5184/classicalj.112.3.0342.

Kenney, E.J. 1974. *The Classical Text: Aspects of Editing in the Age of the Printed Book*. Vol. 44. Sather Classical Lectures. Berkeley: University of California Press.

——. 1969. "Quot Editores, Tot Vibii." *CR* 19.2: 183–185.

Kiss, Dániel. 2017. *Catullus online*. http://www.catullusonline.org/CatullusOnline/index.php. Accessed November 9, 2021.

Mak, Bonnie. 2011. *How the Page Matters*. Toronto: University of Toronto Press.

Monella, P. 2018. *Why Are There No Comprehensively Digital Scholarly Editions of Classical Texts?* libreriauniversitaria.it edizioni. https://iris.unipa.it/handle/10447/294132.

O'Donnell, Daniel Paul. 2009. "Back to the Future: What Digital Editors Can Learn from Print Editorial Practice." *Literary and Linguistic Computing* 24 (1): 113–25. https://doi.org/10.1093/llc/fqn039.

Olson, S. Douglas. 2019. "Further Notes on the Apparatus Criticus." *CJ* 114 (3): 330–44.

Tarrant, Richard J. 2016. *Texts, Editors, and Readers: Methods and Problems in Latin Textual Criticism.* Cambridge: University Press.

Robinson, Peter M. W. 1993. "Redefining Critical Editions." In *The Digital Word*, George P. Landow and Paul Delany, eds. 271–91. Cambridge, MA: MIT Press.

Sahle, Patrick. 2016. "What Is a Scholarly Digital Edition?" in Driscoll, Matthew J. and Elena Pierazzo, eds., 19–40.

Silvia, Shejuti, Ronak Etemadpour, June Abbas, Samuel J. Huskey, and Chris Weaver. 2016. "Visualizing Variation in Classical Text with Force Directed Storylines." In *Proceedings of the Workshop on Visualization for the Digital Humanities*. Baltimore.

https://cs.ou.edu/~weaver/academic/publications/silvia-2016b/materials/silvia-2016b.pdf.

Witt, Jeffrey C. 2018. “Digital Scholarly Editions and API Consuming Applications.” In *Digital Scholarly Editions as Interfaces*, 219–47.