

ἔκδοσις

Typesetting TEI `xml`-Compliant Critical Editions

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Abstract

`ekdosis` is a LuaL^AT_EX package designed for multilingual critical editions. It can be used to typeset texts and different layers of critical notes in any direction accepted by LuaT_EX. Texts can be arranged in running paragraphs or on facing pages, in any number of columns which in turn can be synchronized or not. In addition to printed texts, `ekdosis` can convert .tex source files so as to produce TEI xml-compliant critical editions. Database-driven encoding under L^AT_EX then allows extraction of texts entered segment by segment according to various criteria: main edited text, variant readings, translations or annotated borrowings between texts. It is published under the terms of the GNU General Public License (GPL) version 3.

License and Disclaimer

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fdl1.3 This document is part of the work: The `ekdosis` Package.

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- comments, feature requests, bug reports: <https://gitlab.com/ralessi/ekdosis/issues>

gpl3+

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This release of ekdosis consists of the following source files:


- `ekdosis.ins`
- `ekdosis.dtx`
- `ekdosis.el`
- `Makefile`

1 Introduction

THE READER will find here, by way of introduction, a summarized version of the first part of an article published in the *Journal of Data Mining and Digital Humanities* as a contribution to a Digital Humanities workshop held at Stanford University (April 15, 2019).¹

The name of this package, `ekdosis`, derives from a Greek action noun—ἐκδοσις—the meaning of which is: “publishing a book”, and also in concrete sense: “a publication, treatise”. For us moderns, this term refers to a long tradition of scholarly work consisting in establishing from manuscript evidence the texts of Greek and Latin classics that were handed down through the Middle Ages to the time of the first printed editions. Of course, this definition is extendible to other languages as well. The basic premise is that critical editions exhibit reconstructed texts from manuscript evidence either under the title of the edited text (direct tradition) or from explicit citations or parallel passages or translations in other languages (indirect tradition).

Whether in print or digital, critical editions come with an apparatus criticus in which is mentioned all the evidence that was used to build the edited text. Arguably, it is precisely on this common point that the two kind of editions part ways for reading a traditional, well written apparatus criticus is only meant for experienced readers. Getting oneself familiarized with its many conventional rules is not unrelated to learning a language, equipped with technical terms, grammar rules and style embellishments, which came into existence out of over three centuries of scholarly attainments. Nevertheless, whereas this language is immediately accessible to human mind’s ability to use language and interpret

1. Robert Alessi, “ekdosis: Using Lua^LTeX for Producing TEI `xml`-Compliant Critical Editions and Highlighting Parallel Writings,” *Journal of Data Mining and Digital Humanities: Collecting, Preserving, and Disseminating Endangered Cultural Heritage for New Understandings through Multilingual Approaches* (Nov. 2020), [jdmhdh: 6536](#). 

conventional symbols, it is quite inaccessible to a computer unless every item of information has been encoded in the rather dumb format that is suited to machines.

On the other hand, editions in print have their own limitations. For example, every detail that editors of classical texts decide to discard to save space, regardless to its relevance to the purpose of the edition, is lost permanently as in the case of dialectal coloring of ancient books. Furthermore, passages collected as indirect tradition are only available as references in the *apparatus testium* and cannot be referred to the original text. As a result, the reader is refrained from bestowing attention upon major parallel passages to understand better difficult passages.

To conclude on these issues, print publications and digital editions are often contrasted as they belonged to two different worlds.² It is commonly said that the content of editions in print is the result of the binding of the book itself as an object, whereas digital editions, in which format and presentation are by definition separated from content, are free from limitations coming from such bindings. To sum up from the foregoing considerations, this statement is likely to be qualified: as already seen above, the apparatus criticus must be looked at as a brilliant production of mind refined by centuries of scholarly tradition—and surely tradition must go on—arguably not as compact paragraphs that require special and painful training to be ‘decoded’. On the other hand, what editions in print do not provide are what Donald J. Mastronarde and Richard J. Tarrant have called “actionable texts for use in digital research”,³ namely database-driven texts allowing the reader to select annotations and display or arrange translations, parallel passages or borrowings in a variety of ways.

ekdosis can be seen as an attempt at combining the two approaches.

1.1 Requirements

Please refer to [sect. 18 on page 92](#).

1.2 Features

A list of the main features of *ekdosis* follows:—

- (a) *Multilingual critical editions*: *ekdosis* can be used to typeset any number of texts in any direction accepted by LuaTeX. Running paragraphs of text can be arranged in any number of columns, either on single or facing pages, which in turn can be synchronized or not. *ekdosis* is also suitable for complex layouts as in the case of Arabic poetry or images where three-way alignment is required, or diagrams, *etc.*
- (b) *Apparatus criticus*: Edited texts can receive multiple layers of apparatus, e.g. apparatus criticus (to record variant readings), apparatus fontium (to collect references to texts quoted or cited in the edited text), apparatus testium (to collect testimonia or parallel passages), or any kind of short notes to be printed on the same page as the edited text, *etc.*
- (c) **TEI xml** output: *ekdosis* can be instructed to output both PDF and **TEI xml** files at the same time.
- (d) *Database-driven encoding* under L^AT_EX of texts entered segment by segment allows for alignment of parallel texts from multilingual corpora.

2. For a good illustration of this point, see Digital Latin Library, “Textual Criticism,” <https://digitallatin.org/library-digital-latin-texts/textual-criticism>, accessed May 24, 2020, “Content, not Display.”

3. Donald J. Mastronarde and Richard J. Tarrant, “Review: Guidelines for Encoding Critical Editions for the Library of Digital Latin Texts,” Society for Classical Studies (Dec. 4, 2017), <https://classicalstudies.org/scs-blog/donald-j-mastronarde/review-guidelines-encoding-critical-editions-library-digital-latin>.

Before going into detail, the following simple example will give the reader a general idea of the method of encoding with `ekdosis` authoritative texts composed of lemmata, in a way that is very close to TEI `xml` encoding:—

Listing 1: The “Peter/John” basic example

```

1 \begin{ekdosis}
2   I
3   \app{
4     \lem{saw}
5     \rdg{met}
6   }
7   my friend \app{\lem{Peter}\rdg{John}} at the station yesterday.
8 \end{ekdosis}

```

PDF output:—

1 I saw my friend Peter at the station yesterday.

1 saw] met Peter] John

TEI `xml` output:—

```

<p>I
<app>
  <lem>saw</lem>
  <rdg>met</rdg>
</app>my friend
<app>
  <lem>Peter</lem>
  <rdg>John</rdg>
</app>at the station yesterday.</p>

```

As can be seen from [listing 1](#), the edition text is inserted in the `ekdosis` environment (l. 1 to 8). Then two `\app{apparatus entry}` commands (ll. 3 and 7) contain the lemma (`\lem{lemma}`), namely the reading that is accepted by the editor, and at least one variant reading (`\rdg{reading}`), ll. 5 and 7). As the listing shows, the editor is free to lay out the code in a legible manner to the eye: the first lemma above spans several lines whereas the second one is written in sequence without spaces.

In the PDF output, the edition text is printed in the upper part of the page, above the line, and naturally shows the accepted readings. The margins are used for numeration. In the apparatus criticus, below the line, reference to the text is made by specifying the number of the line and if several entries refer to the same line, numbers are not repeated. Instead, entries are separated from one another by a broad horizontal space. Finally, a square bracket is used inside entries to distinguish the lemma from the variant readings.

Furthermore, as said above, if a TEI `xml` output be required, `ekdosis` compiles an additional `.xml` file an excerpt of which is provided above.

2 The Basics of `ekdosis`

2.1 Loading the Package—General Options

`ekdosis` is loaded in the preamble like so:—

```
\usepackage{ekdosis}
```

ekdosis may be loaded with five optional ‘named arguments’ either of which is set using the syntax $\langle key \rangle = \langle value \rangle$. The description of the optional arguments follows.



The reader is invited to refer to the relevant sections of this documentation for more information on how to use these options.

layout

`layout=float|footins|keyfloat|fitapp`

Default: float

- (a) `layout=float` By default, layers of critical notes are inserted as floating environments to be printed at the bottom of the pages.
- (b) `layout=footins` This can be set to insert critical notes in the default footnote block which can be considered to be a special kind of float that is printed at the bottom of the pages. In this case, the apparatus criticus will be inserted between regular numbered footnotes, but will carry no footnote mark of its own.
- (c) `layout=keyfloat` does approximately the same as the default option `layout=float` but uses the `keyfloat` package⁴ to generate the floating environments to be used as containers for critical footnotes. This way, the keys and values provided by this package⁵ may be used to achieve such effects as append additional, informative text below the apparatus, draw a line around the apparatus block or change its width.⁶
- (d) `layout=fitapp` As described below in [sect. 11.1 on page 59](#), “[The Oscillating Problem](#)”, `ekdosis` may oscillate indefinitely between different sets of page decisions when one or more apparatus entries attached to the last lines of the edition text on a given page do not fit in the apparatus block. The reader will find in this section of the documentation a detailed account of several ways to circumvent this issue. Alternatively, or rather conjointly with those ways, `layout=fitapp` can be used to instruct `ekdosis` to scale down the characters of the apparatus block so that the contentious entries can fit. This mechanism uses the “fitting” library provided by the `tcolorbox` package.⁷ When this option is set, the apparatus criticus grows normally until a predefined height is reached. This height is set to `0.5\textheight` by default.⁸ From this point on, the apparatus block ceases to grow; rather, the size of the characters is reduced to allow for additional entries. As a consequence of this rationale, the total number of entries on a given page must not be too high. It is therefore advisable to use `layout=fitapp` conjointly with `maxentries` as described below on page [35](#) and in [sect. 11.1 on page 59](#).



If used appropriately, this mechanism gives excellent typographical results, notably with complex edition texts of which the entries in the associated apparatus can be quite abundant in number. It may even put an end to the “[oscillating problem](#)” in most of the cases. However, as suitable it may be for high quality typeset texts and final, camera-ready copies, its benefit comes at the expense of slowing down the compilation process. Yet looser algorithms can be selected when speed must prevail over quality for intermediate or draft copies.⁹

divs

`divs=ekdosis|latex`

Default: ekdosis

In many occasions, L^AT_EX standard textual divisions do not meet the specific requirements of classical and literary texts, the divisions of which may depend on many different received

4. Brian Dunn, *The Keyfloat package: Provides a key/value interface for generating floats* (version 2.06) (June 29, 2021), <https://ctan.org/pkg/keyfloat>.

5. See *ibid.*, sect. 2.3, pp. 13–16.

6. See below, on page [32](#) for more information.

7. Thomas F. Sturm, *The Tcolorbox package: Coloured boxes, for LaTeX examples and theorems, etc* (version 4.51) (June 14, 2021), <https://ctan.org/pkg/tcolorbox>, sect. 22, pp. 438–49.

8. Of course, this height can be modified. See below on page [32](#) for details.

9. See below on page [32](#) for more information.

traditions. `ekdosis` provides a flexible mechanism in which format and presentation have been carefully separated from content. It is designed to build un-numbered TEI divisions allowed to nest recursively.¹⁰ However, if `divs` be set to `latex`, L^AT_EX standard textual divisions can be used and will be translated into TEI numbered `<div>` elements.



It must be noted that the two styles are mutually exclusive.

`poetry` `poetry=verse` Default: not set
New feature v1.2 `poetry=verse` instructs `ekdosis` to load and use the facilities supplied by the `verse` package for the typesetting of lines of poetry.¹¹ The `ekdverse` environment must then be used instead of the `verse` environment that is provided by the `verse` package as described below in [sect. 7.2 on page 40](#).

`parnotes` `parnotes=true|false|roman` Default: not set
This named argument does not need a value as it defaults to `true` if used. Apparatus criticus typeset by `ekdosis` may contain notes and footnotes. The latter can be laid out as paragraphed notes below the block of critical notes by means of the `parnotes` package. Additionally, `parnotes=roman` prints these footnotes numbered with Roman numerals.

`teiexport` `teiexport=true|false|tidy` Default: not set
This named argument does not need a value as it defaults to `true` if used. If `teiexport` be set to `true`, `ekdosis` is instructed to output both PDF and TEI `.xml` files at the same time. By default, the TEI file will receive the same basename as the `.tex` source file, suffixed with `-tei.xml`. The raw `.xml` file that is produced by `ekdosis` can be further processed by the `tidy` console application.¹² To make this happen, `tidy` must be installed and the `.tex` source file must be compiled with the `--shell-escape` facility so that spawning programs from L^AT_EX can be allowed.¹³

As an example, the following line loads `ekdosis` and instructs it to output a TEI `.xml` file (in addition to the PDF one) and to use `parnotes` to format with Roman numerals the footnotes that are inserted in the apparatus criticus:—

```
\usepackage[teiexport, parnotes=roman]{ekdosis}
```

2.2 Setup

`\ekdsetup` `\ekdsetup` Starting from v1.3, `\ekdsetup` can be used to specify options that affect the general behavior of `ekdosis`. `\ekdsetup` is a preamble-only command. It accepts the following `key=value` options the number of which is expected to increase as `ekdosis` grows:

`showpagebreaks` `showpagebreaks=true|false` Initially: false; Default: true

This named argument, which defaults to `true` if used without value, has specific marks printed in the margins so as to spot with a rapid cast of the eye the locations of conditional page breaks generated by the `\ekdpb` command described below on [page 60](#). By default, page breaks generated by `\ekdpb` are identified by the string `spb`—for “soft” page break—whereas those generated by `\ekdpb*` are identified by `hpb`—for “hard” page break. Furthermore, when `\ekdpb` triggers no page break, the marker is printed between square brackets, like so: `[spb]`. In this way, inoperative `\ekdpb` can be easily spotted and removed.

`spbm` `spbm=<string>` Default: spb
`spbm` is used to change the string associated to “soft” page breaks.

¹⁰. See below, [sect. 10 on page 54](#).

¹¹. `verse` does not need to be set if the memoir class be used. See [sect. 7.2 on page 40](#) for more detail.

¹². See <http://www.html-tidy.org>.

¹³. See <https://texfaq.org/FAQ-spawnprog> for more information on how to do this.

hpbmk hpbmk=*(string)*

Default: hpb

hpbmk is used to change the string associated to “hard” page breaks.

As an example, what follows has “soft” page breaks printed in blue and “hard” page breaks printed in red:—

```
\ekdsetup{
  showpagebreaks,
  spbmk = \textcolor{blue}{spb},
  hpbmk = \textcolor{red}{hpb}
}
```

2.3 Using a Configuration File

Complex editions may use a large number of witnesses, sources and scholars. It may also be required to define a multiple-layer apparatus criticus, several text environments to be aligned and quite a number of new commands. **ekdosis** provides a convenient way to avoid overloading the document preamble: all the settings related to the critical edition can be gathered in a separate configuration file named `\jobname-ekd.cfg`. If such a file can be found, its contents are automatically read and used by **ekdosis**.

2.4 Witnesses, Hands, Sources, Scholars & Shorthands

Terminology Strictly speaking, the term “witness” should apply to any manuscript evidence dating back to the Middle Ages used by the editor to establish the edition text. That said, editors often consult many other types of documents, such as modern editions, articles, notes, correspondence and the like, all of which fall into the category of “sources”. Furthermore, unpublished conjectures are also taken into account, not to mention the corrections and emendations that are proposed in many places by the editor of the text. As it is necessary to refer to scholars as individuals, “scholars” naturally emerges as a third category.

Any reference that is to be used in the apparatus criticus must be “declared” in the preamble beforehand, namely: manuscript sigla (either for single manuscripts or manuscript families, primary or later hands, &c.), abbreviated last names of sources and scholars. To that effect, **ekdosis** provides the following preamble-only commands:—

`\DeclareWitness` **Witnesses** `\DeclareWitness{(unique id)}{(rendition)}{(description)}[(options)]`

This command requires three mandatory arguments enclosed between curly braces used to specify consecutively:

- (a) The unique identifier of the witness to be used both in the `.tex` source file and as an `xml:id` in the TEI `xml` output if any.¹⁴
- (b) The rendition to be used in the printed apparatus criticus, which also will be found within the `<sourceDesc>` element of the TEI header where the description of the witness occurs, within a `<abbr type="siglum">` element.
- (c) A basic description of the manuscript to be found in a typical printed Conspectus Siglorum, namely: the name of the manuscript followed by its call number.

Finally, the optional argument of `\DeclareWitness` accepts a comma-separated list of the following “name=value” arguments the first six of which are used to collect items of information to be found within the `<msIdentifier>` element in the TEI header:¹⁵—

14. See on page 64 for more information.

15. See <https://tei-c.org/release/doc/tei-p5-doc/en/html/MS.html#msid> for detailed information on these elements.

settlement settlement=*<name>*: The name of a city or administrative unit.
 institution institution=*<name>*: The name of an institution such as a university or library.
 repository repository=*<name>*: The name of the repository within which the witness is stored.
 collection collection=*<name>*: The name of a collection of manuscripts.
 idno idno=*<call #>*: Any form of call number.
 msName msName=*<name>*: The name commonly used for the witness.
 origDate origDate=*<date>*: Any form of date used to identify the date of origin for the witness.
 locus locus=*<locus>*: The sequence of folio references where the edition text is found in the manuscript.

New feature v1.3

To take here one example, a witness such as the *Marcianus Graecus* 269, referred to as manuscript ‘M’ in the editions, which contains sixty treatises transmitted under the name of Hippocrates, could be declared as follows:¹⁶—

```
\DeclareWitness{M}{M}{\emph{Marcianus Gr.} 269}[
  settlement=Venice,
  institution=Marciana Library,
  msName=Marcianus Gr.,
  idno=269,
  origDate=s. X,
  locus=fol. 416\textsuperscript{v}-426\textsuperscript{v}]
```

`\DeclareHand` **Hands** `\DeclareHand{<unique id>}{<base ms.>}{<rendition>}[<note>]`

This command requires three mandatory arguments enclosed between curly braces and one optional argument between square brackets used to specify consecutively:—

- (a) The unique identifier of the hand to be used both in the `.tex` source file and as an `xml:id` in the TEI `xml` output if any.¹⁷
- (b) The unique identifier of the witness the hand is related to. Of course, this witness must have been declared beforehand.
- (c) The rendition to be used in the printed apparatus criticus, which also will be found within the `<handNote>` element of the TEI header where the description of the hand occurs, within a `<abbr type="siglum">` element.
- (d) Some further information about the hand.

To continue the preceding example, here is how additions and corrections found in the *Marcianus Gr.* 269 could be declared after this witness has been declared itself:—

```
\DeclareHand{M1}{M}{M\textsuperscript{1}}[Emendatio scribae ipsius]
\DeclareHand{M2}{M}{M\textsuperscript{2}}[Manus posterior]
```

As can be seen, values such as M, M1 and M2 in the `.tex` source file will be printed as M, M¹ and M² respectively. Not only the code gains legibility, but also flexibility for simply changing any declared rendition will update corresponding sigla throughout the entire edition.

As a final example, here is how `ekdosis` would encode information as declared above for the *Marcianus Gr.* 269 should a TEI output be required:—

```
<sourceDesc>
  <listWit>
    <witness xml:id="M">
      <abbr type="siglum">M</abbr>
```

16. The locus specified refers to Hippocrates’ *Epidemics*, Book 6.

17. See on page 64 for more information.

```

<emph>Marcianus Gr.</emph>269
<msDesc>
  <msIdentifier>
    <settlement>Venice</settlement>
    <institution>Marciana Library</institution>
    <idno>269</idno>
    <msName>
      Marcianus Gr.
    </msName>
  </msIdentifier>
  <physDesc>
    <handDesc hands="2">
      <handNote xml:id="M1">
        <abbr type="siglum">M
        <hi rend="sup">1</hi></abbr>
        <p>Emendatio scribae ipius</p>
      </handNote>
      <handNote xml:id="M2">
        <abbr type="siglum">M
        <hi rend="sup">2</hi></abbr>
        <p>Manus posterior</p>
      </handNote>
    </handDesc>
  </physDesc>
  <history>
    <origin>
      <origDate>s. X</origDate>
    </origin>
  </history>
</msDesc></witness>
</listWit>
</sourceDesc>


```

`\DeclareSource`
New feature v1.1

Sources `\DeclareSource{<unique label>}{<rendition>}`

The *Conspectus Siglorum* that is placed ahead of the edition text is traditionally divided into two parts: a) *Codices*, which provides the list of sigla used in the apparatus, b) *Editiones uel Studia*, which provides references to sources, either published or unpublished, which contain conjectures used in the apparatus criticus. `\DeclareSource` takes two mandatory arguments used to specify consecutively:—

- (a) A unique label used in the `.tex` source file to refer to the work where the conjecture is found.
- (b) The rendition to be used in the printed apparatus criticus.

 As ekdosis can include and use TEI `xml`-compliant lists of references,¹⁸ it is advisable to use Bib(L)TeX labels in the first argument of `\DeclareSource`. Otherwise, the unique label used to declare the source would point to no `xml:id` and the TEI `xml` would not be valid. Likewise, shorthands fields from the bibliographical database can be recalled from within the second argument of `\DeclareSource`:—

18. See below [sect. 12.7 on page 70](#).

```
\DeclareSource{Wil}{Wilamowitz}
% or for example:
\DeclareSource{Wil}{\citenam{Wil}{shorteditor}}
```

\DeclareScholar
New feature v1.1

Scholars \DeclareScholar{<unique id>}{<rendition>}[<options>]

Occasionally, it is necessary to refer to a scholar as a person. For example, corrections and conjectures are commonly inserted as self-references to the editor of the text in the apparatus criticus in print with such words as *scripsi*, *addidi*, *correxi* and the like. Other examples come from unpublished conjectures of other scholars found in private libraries. \DeclareScholar takes two mandatory arguments to specify consecutively:—

- (a) The unique identifier of the scholar to be used both in the .tex source file and as an `xml:id` in the TEI xml output if any.¹⁹
- (b) The rendition to be used in the apparatus criticus in print, which also will be found within the <sourceDesc> element of the TEI header where the description of the persons cited occurs, within an <abbr type="siglum"> element.

Finally, the optional argument of \DeclareScholar accepts the following comma-separated list of key-value arguments:—

rawname rawname=<name>

rawname refers to a name that is not to be dissected into name part components such as forename, surname and the like. If rawname be used, then ekdosis will ignore the following three optional arguments: forename, surname and addname.

forename forename=<forename>

forename refers to first and middle names or initials.

surname surname=<surname>

surname stores the last name.

addname addname=<additional name>

addname refers to an additional or alternate name by which the scholar is known viz. a Latinized form of the name, a nickname, an epithet or alias.

note note=<note>

note may hold any relevant information about the material used by the editor. For example, a note may specify that this material has been found as marginal notes by the hand of the scholar in some edition in print.

\DeclareShorthand

Shorthands \DeclareShorthand{<unique id>}{<rendition>}{<csv list of identifiers>}

This command provides a convenient way to declare families of witnesses. It takes three mandatory arguments used to specify consecutively:—

- (a) The unique identifier of the family to be used in the .tex source file.
- (b) The rendition to be used in the printed apparatus criticus.
- (c) A comma-separated list of previously declared witnesses.

As an example, the manuscripts of Caesar's *Gallic War* are divided into two families: α , which includes mss. A, M, B, R, S, L and N, and β , which includes mss. T, f, U and l. Therefore, provided that all these witnesses have been already declared, here is how the two families α and β could be declared:²⁰—

```
\DeclareShorthand{a}{\alpha}{A,M,B,R,S,L,N}
\DeclareShorthand{b}{\beta}{T,f,U,l}
```

19. See on page 64 for more information.

20. These witnesses are used in the example provided below in listing 6 on page 26.

Then, symbols **a** and **b** can be used in the `.tex` source file in place of manuscripts that belong to either family.

That said, `\DeclareShorthand` is not meant to be restricted to declared witnesses. On the contrary, it also applies to any declared sources and scholars by means of `\DeclareSource` and `\DeclareScholar`. As an example, assuming that a self-reference to the person responsible for the edition has been set in the preamble, an associated shorthand can be defined like so:—

```
1 \DeclareScholar{ego}{ego}[
2   forename=John,
3   surname=Smith,
4   note=Main editor of the text]
5 \DeclareShorthand{egoscr}{\emph{scripsi}}{ego}
```

Then, the shorthand `egoscr` (l. 5) can be used to print in the apparatus criticus the technical term *scripsi* and use at the same time the pointer `#ego` that is expected in the TEI `xml` output file. Detailed examples of this technique will be provided below in [sect. 3 on page 20](#).

2.4.1 Printing Formatted Witnesses — Conspectus Siglorum

Once witnesses, hands, scholars and sources have been declared, `ekdosis` provides two commands to have them printed as declared from their identifiers.

`\getsiglum` `\getsiglum{<csv list of witnesses or single witness>}` behaves exactly as the `wit` optional argument of `\lem` and `\rdg` described below on pages 14 and 15. From a single identifier or from a comma-separated list of identifiers, it returns their formatted counterparts. To return to the example provided on pages 9–10, `\getsiglum{M}` would return **M**, while `\getsiglum{M1}` would return **M**¹.

`\SigLine` `\SigLine{<unique id>}` returns from `<unique id>` used in the first argument of `\DeclareWitness`²¹ a line ready to be inserted in a table set to print a Conspectus Siglorum with the following items of information separated by the symbol `&`: the siglum referring to the witness, the contents of the `description` field, followed if applicable by the sequence of folios that refers to the edition text, and the contents of the `origDate` field. An example of how one could print the Conspectus Siglorum of the manuscripts of Caesar’s *Gallic War* from the list provided on the preceding page follows:—

Listing 2: Conspectus Siglorum of Caesar’s *Gallic War*

```
\begin{xltabular}[c]{0.75\linewidth}{lXl}
  \caption*{\textbf{Conspectus siglorum}}\
  \multicolumn{3}{c}{\emph{Familia} \getsiglum{a}}\
  \SigLine{A}\
  & \getsiglum{A1} \emph{Emendationes scribae ipsius} & \
  \SigLine{M}\
  [...]
  \SigLine{N}\
  \multicolumn{3}{c}{\emph{Familia} \getsiglum{b}}\
  \SigLine{T}\
  [...]
  \SigLine{l}\
\end{xltabular}
```

21. See above on page 8.

Conspectus siglorum

<i>Familia α</i>		
A	<i>Bongarsianus</i> 81	s. IX–X
	A ¹ <i>Emendationes scribae ipsius</i>	
M	<i>Parisinus</i> Lat. 5056	s. XII
B	<i>Parisinus</i> Lat. 5763	s. IX–X
R	<i>Vaticanus</i> Lat. 3864	s. X
S	<i>Laurentianus</i> R 33	s. X
L	<i>Londinensis</i> Br. Mus. 10084	s. XI
N	<i>Neapolitanus</i> IV, c. 11	s. XII
<i>Familia β</i>		
T	<i>Parisinus</i> Lat. 5764	s. XI
f	<i>Vindobonensis</i> 95	s. XII
U	<i>Vaticanus</i> Lat. 3324	s. XI
l	<i>Laurentianus</i> Riccard. 541	s. XI–XII

2.5 Editing a Single Text

ekdosis Running paragraphs of one single text to be edited should be inserted in the **ekdosis** environment, like so:²²—

```
\begin{ekdosis}
  Edition text goes here.
\end{ekdosis}
```

\app **Apparatus Entries** `\app[type=<type>]{<apparatus entries>}`
 This command takes one mandatory argument and accepts one optional argument. Once references to be used as witnesses in the apparatus criticus have been declared in the preamble as described in [sect. 2.4](#) on pages 8–11, the **\app** command is used for inserting entries in the apparatus criticus, either lemmata, readings or notes, like so:—

```
I saw my friend \app{\lem{Peter}\rdg{John}} yesterday.
or:
I saw my friend
  \app{
    \lem{Peter}
    \rdg{John}
  }
yesterday.
```

\app accepts one further optional argument:—

type `type=<type>` Default: default
 As will be described below in [sect. 5.3](#) on page 34, **ekdosis** initially sets one layer of notes—the **default** layer—in the apparatus criticus. This layer is fit to receive notes related to variant readings from witnesses and sources used by the editor to establish the edition text. Additional layers can be defined to receive other kinds of notes, such as references to texts quoted or cited in the text of the edition (*apparatus fontium*), references to testimonia, or quotations of the edited text by other authors (*apparatus testium*), explanatory notes, and so forth.²³ Once additional layers have been defined and assigned to new ‘types’, such

22. See above [listing 1](#) on page 5.

23. See below, [sect. 6.2](#) on page 36.

as ‘testium’ and the like, these types can be used as values appended to the **type** ‘named option’. For more information about inserting notes in multiple-layer apparatus, see [sect. 6 on page 36](#).

Base text and variants As can be seen in the example above, there are two kinds of individual readings: the *lemma*, which contains the base text accepted by the editor, and the *reading*, which contains deviant readings rejected by the editor.



What follows refers to the notions of “witness”, “source” and “scholar” as defined above on page 8.

\lem **Lemmata** **\lem**[*options*]{*lemma text*}

As *lemma text* is a word or a phrase judged by the editor to be authentic or authoritative, **\lem** prints it by default both in the edition text and as the first part of a new entry in the apparatus criticus, preceded by the line number where it occurs or a broad space when the entry refers to the same line as the preceding entry. The optional argument of **\lem** accepts the following comma-separated list of “name=value” arguments:—

wit **wit**=*(csv list of witnesses)*

While a single witness may be recorded as in **wit=A**, comma-separated lists of multiple witnesses must obviously be enclosed in curly braces, like so: **wit={A,B,C}**. It must be noted that witnesses can be grouped by using spaces as separators, like so: **wit={A,B,C, D,E,F}**. Although any unique identifiers or labels used to “declare” sources and scholars as described above on pages 10–11 can also be used as values of the **wit** optional argument, it is recommended to use **sources** and **resp** to refer to either category respectively as described below.

source **source**=*(csv list of sources)*

New feature v1.1

A “source” refers to any type of document consulted by the editor to establish the edition text. Most commonly, corrections and emendations from previous editions are cited in the apparatus criticus.²⁴

resp **resp**=*(csv list of scholars)*

New feature v1.1

resp refers to scholars responsible for the emendations, conjectures and corrections that are cited in the apparatus criticus.²⁵

alt **alt**=*(alternate lemma)*

While the mandatory argument of **\lem**, *lemma text*, is always used to print the edition text in the upper part of the page, *alternate lemma*, if specified, supersedes what is printed in the related entry of the apparatus criticus. This mechanism is useful in more than one respect. For instance, it can be used to insert abbreviated lemmata in the apparatus criticus, or to introduce an alternate way of writing entries with Latin technical terms in the apparatus criticus as will be demonstrated below in the example provided by [listing 3 on page 16](#).

sep **sep**=*(separator)*


sep allows to change the symbol used to separate the lemma text from deviant readings, which is by default the closing square bracket (])

nosep **nosep**=**true**|**false**

This named argument does not need a value as it defaults to **true** if used. **nosep** removes the separator mentioned above. Obviously, **nosep** must be used when for some reason no **\rdg** command follows a **\lem** command that has just been used, as shown below in [listing 5 on page 23](#), l. 7.

²⁴ For edition texts used as sources, see examples below in [sect. 3 on page 20](#) and [sect. 12.7 on page 70](#).

²⁵ See detailed examples in [sect. 3 on page 20](#).

`\ekdsep`  If `nosep` be used so as to insert an explanatory note after the lemma text with the `\note` command described below on the next page, then `\ekdsep` can be used—for instance as value of the `post` optional argument of the note—to put back in the separator. This technique is demonstrated below in [listing 5 on page 23](#), ll. 23–5.

`nolem` `nolem=true|false`

This named argument does not need a value as it defaults to `true` if used. `nolem` completely removes the lemma text from the related entry in the apparatus criticus.

`type` `type=<value>`

This named argument has no effect on the apparatus criticus of the edition in print, but it is used in the TEI `xml` output to classify the variation recorded in the entry according to some convenient typology. Categories such as lexical, morphological, orthographical and the like may apply. Obviously, `type=emendation` should be restricted to lemma texts and `type=conjecture` to variant readings recorded by means of `\rdg` described below.


`num` (no-value argument)

New feature v1.3 `num` takes no value. If used, this argument instructs to print any line number that `ekdosis` may have decided not to print in the apparatus criticus before the lemma text.

`nonum` (no-value argument)

New feature v1.3 Compared to `num`, `nonum` does the opposite. If used, any number that `ekdosis` may have decided to print before the lemma text is suppressed.

Finally, four named arguments can be used to insert words at the following specific places in the lemma text:

	
<code>pre</code>	<code>pre=<words></code> <code>pre</code> inserts <code><words></code> before the lemma text.
<code>post</code>	<code>post=<words></code> <code>post</code> inserts <code><words></code> after the lemma text.
<code>prewit</code>	<code>prewit=<words></code> <code>prewit</code> inserts <code><words></code> before the list of witnesses.
<code>postwit</code>	<code>postwit=<words></code> <code>postwit</code> inserts <code><words></code> after the list of witnesses.

`\rdg` **Readings** `\rdg[options]{<variant reading>}`

As `<reading>` is a word or a phrase judged by the editor to be unsatisfactory or corrupted, `\rdg` prints it by default in the last part of the corresponding entry in the apparatus criticus, after the symbol that is used to separate words of the base text (the lemma text) from words rejected by the editor. The optional argument of `\rdg` accepts a comma-separated list of “name=value” arguments that is almost identical to `\app`. Therefore, emphasis will be placed here only on the differences. The reader is invited to refer to the description provided above on pages [14–15](#) for more detailed information:—

`wit` `wit=<csv list of witnesses>`

`source` `source=<csv list of sources>`

`resp` `resp=<csv list of scholars>`

`alt` `alt=<alternate reading>`

`nordg` `nordg=true|false`

This named argument does not need a value as it defaults to `true` if used. `nordg` completely removes the variant reading from the related entry in the apparatus criticus.

`type` `type=<value>`

Obviously, `type=conjecture` should be restricted to variant readings and `type=emendation` to lemma texts recorded by means of `\lem` described above.

`pre` `pre=<words>`


```

post post=⟨words⟩
prewit prewit=⟨words⟩
postwit postwit=⟨words⟩

```

\note **Notes** **\note[⟨options⟩]{⟨text⟩}** or **\note*[⟨options⟩]{⟨text⟩}**
\note* It may happen that editorial notes are needed to record short comments of general nature *between* lemmata and readings. **\note** inserts inline comments while **\note*** places comments below the entire apparatus block. Furthermore, if **ekdosis** be loaded with the **parnotes** option as described above on page 7, **\note*** will use the **parnotes** package to lay out the notes as an additional paragraph below the apparatus criticus. The optional argument of **\note**/**\note*** accepts the following comma-separated list of “name=value” arguments:—

pre **pre=⟨words⟩**
pre inserts *⟨words⟩* immediately before the note.

post **post=⟨words⟩**
post inserts *⟨words⟩* immediately after the note.



Under no circumstances is it permitted to insert this command **\note** or **\note*** inside the argument of **\lem** or **\rdg**. **\note**/**\note*** must go *between* these commands. As a general rule, within **\app{}** elements, notes are inserted immediately *after* the lemma or the variant reading they are related to. However, as will be described below in [sect. 6.2 on page 36](#), the command **\note**—with no star appended—that is used to insert explanatory notes or references to sources or testimonia is permitted within the mandatory argument of **\lem{}**, although it is subject to a very strict syntax.

[Listing 3](#) provides an illustration of some of the possibilities afforded by the commands just described:—

Listing 3: The “Peter/John” full example

```

1 \begin{ekdosis}
2   I
3   \app{
4     \lem[wit=A]{saw}
5     \rdg[wit=B]{met}}
6   my friend
7   \app{
8     \lem{Peter}
9     \rdg{John}
10  }
11  at the station yesterday. We were both in a
12  \app{
13    \lem[wit=A]{great}
14    \rdg[wit=B]{good}}
15  mood.
16  \app{
17    \lem[wit=A, alt={How nice... said}]{\enquote{How nice to find
18      you here!} he said.}
19    \note*{There are no quotation marks in the mss.}
20    \rdg[wit=B, alt={\emph{om.}}]{}
21    I chuckled to myself, recalling the last time we
22    \app{
23      \lem[wit=A,nolem]{met}
24      \rdg[wit=B, alt={\emph{post} met \emph{add.} there}]{met}

```

```

25     there}
26     \note*{Ms. \getsiglum{B} provides other additions of this kind.}}.
27     \end{ekdosis}

```

1 I saw my friend Peter at the station yesterday. We were both in a great mood. “How
2 nice to find you here!” he said. I chuckled to myself, recalling the last time we met.

I saw A] met B Peter] John great A] good B 1–2 “How nice... said A]ⁱ *om.* B 2 *post* met *add.* there Bⁱⁱ

ⁱ There are no quotation marks in the mss. ⁱⁱ Ms. B provides other additions of this kind.

REM. 1 Close examination of lines 17–8 from [listing 3 on the preceding page](#) shows how `alt` has been used to insert an abridged lemma text in the apparatus criticus in print while keeping safe what is to be found in the TEI `xml` output.

REM. 2 The same technique has been used at line 24 to insert alternate words, including Latin technical terms, in place of the variant reading. Hence the use of `nolem` at line 23 to remove the lemma text from the apparatus criticus in print.

REM. 3 `\note*` has been used to insert short annotations in two places (ll. 19 and 26).

REM. 4 For an example of the use of `nordg`, see below [listing 6 on page 26](#), l. 11.

The corresponding TEI `xml` output produced by `ekdosis` from the L^AT_EX source file follows:—

Listing 4: The “Peter/John” full example: TEI `xml` output

```

<p>I
<app>
  <lem wit="#A">saw</lem>
  <rdg wit="#B">met</rdg>
</app>my friend
<app>
  <lem>Peter</lem>
  <rdg>John</rdg>
</app>at the station yesterday. We were both in a
<app>
  <lem wit="#A">great</lem>
  <rdg wit="#B">good</rdg>
</app>mood.
<app>
  <lem wit="#A">
    <quote>How nice to find you here!</quote> he said.</lem>
    <note>There are no quotation marks in the mss.</note>
    <rdg wit="#B" />
  </app>I chuckled to myself, recalling the last time we
<app>
  <lem wit="#A">met</lem>
  <rdg wit="#B">met there</rdg>
  <note>Ms.
    <ref target="#B">B</ref>provides other additions of
    this kind.</note>
</app>.</p>

```

2.6 Indicating Subvariation in Apparatus Entries

It must be noted that grouping readings so as to keep emphasis on subvariation, regardless of its cause, is entirely optional. Furthermore, the applicability of this technique is limited to the TEI `xml` output as it helps the machines to understand a grouping otherwise immediately accessible to human mind from the information that is available in well-written apparatus. `ekdosis` provides two ways of expressing subvariation.

2.6.1 Implicit Grouping

Because apparatus entries may nest recursively, the `\app` command can be used to group similar readings.

⚠ However, for nesting to work, the `alt` optional argument must be used in every `\lem` and `\rdg` command involved in the nesting. This rule applies to both parent and child commands, as demonstrated in the following example:—

```
As I was walking home through Times Square, I saw my friend
\app{
  \lem[wit={A,B}, alt={Peter\---Street}]{Peter at the
    \app{
      \lem[wit=A, alt=station]{station}
      \rdg[wit=B, alt=bookstore]{bookstore}
    }
    on 42nd Street}
  \rdg[wit=C, alt={John on Broadway}]{John on Broadway}
}.
```

PDF output:—

1 As I was walking home through Times Square, I saw my friend Peter at the station on
2 42nd Street.

1 station A] bookstore B 1–2 Peter—Street AB] John on Broadway C

REM. Two `\app` commands naturally insert two entries in the apparatus criticus. As the subvariation comes first, what ms. C reads is only mentioned in the subsequent entry.

TEI `xml` output:—

```
<p>As I was walking home through Times Square, I saw my
friend
<app>
  <lem wit="#A #B">Peter at the
    <app>
      <lem wit="#A">station</lem>
      <rdg wit="#B">bookstore</rdg>
    </app>on 42nd Street</lem>
  <rdg wit="#C">John on Broadway</rdg>
</app>.</p>
```

⚠ It must be noted that from a technical standpoint, albeit the nested lemmas are printed *before* their parents in the apparatus criticus, they are seen by `ekdosis` *after* the latter as the source file is compiled. As a result, notably when the whole nested group of lemmas falls on the same line without being preceded by an apparatus entry on this line, it may

be needed to suppress redundant numbers that *ekdosis* may have decided to print in the apparatus criticus. Conversely, it may be needed to print numbers that *ekdosis* may have decided not to print. To both ends, the `num` and `nonum` optional arguments of the `\lem` command can be used as described above on page 15.

2.6.2 Explicit Grouping

`\rdgGrp`
New feature v1.1

`\rdgGrp[⟨options⟩]{⟨lemma text | readings⟩}`

Explicit grouping of readings can be achieved by means of the `\rdgGrp` command. It takes as mandatory argument the commands used for inserting lemma texts, readings and notes that are described on pages 14–17, viz. `\lem`, `\rdg` and `\note`. `\rdgGrp` accepts one further optional argument:—

type `type=⟨value⟩`

This named argument is used in the TEI `xml` output to define an attribute common to all elements representing the variation.

Here follows how the technique of explicit grouping would apply to the same passage as above:—

```
As I was walking home through Times Square, I saw my friend
\app{
  \rdgGrp[type=subvariation]{
    \lem[wit=A, alt={Peter\---Street}]{Peter at the station
      on 42nd Street}
    \rdg[wit=B, alt={bookstore \emph{pro} station}]{Peter at the
      bookstore on 42nd Street}
  }
  \rdg[wit=C]{John on Broadway}
}.
```

PDF output:—

1 As I was walking home through Times Square, I saw my friend Peter at the station on
2 42nd Street.

1–2 Peter—Street A] bookstore *pro* station B John on Broadway C

REM. In this example, the subvariation is emphasized with a Latin technical term and may be expressed in one single entry in a more economical manner.

TEI `xml` output:—

```
<p>As I was walking home through Times Square, I saw my
friend
<app>
  <rdgGrp type="subvariation">
    <lem wit="#A">Peter at the station on 42nd
      Street</lem>
    <rdg wit="#B">Peter at the bookstore on 42nd
      Street</rdg>
  </rdgGrp>
  <rdg wit="#C">John on Broadway</rdg>
</app>.</p>
```

3 Emendations and Conjectures

From a technical standpoint, “conjectures” are readings that are not supported by manuscript evidence, but are instead proposed by scholars to be taken into consideration for establishing the edition text. A conjecture is called an “emendation” when it is adopted in place of what is provided by or missing from the text provided by the manuscripts. Emendations and conjectures are therefore readings and as such expected to be found within `<lem>` or `<rdg>` elements. However, as both come from editions or scholars, not from manuscripts, they are naturally associated with `source` or `resp` attributes as described above on page 14,²⁶ and can be distinguished from one another by the `type` attribute, eg. either `emendation` or `conjecture`.

As an example, the representation of witnesses, editors and shorthands of Hippocrates’ *Epidemics*, Book 2 could be summarized as follows:—

```

1 % Witnesses:
2 \DeclareWitness{V}{V}{\emph{Vaticanus Gr.} 276}
3 \DeclareWitness{I}{I}{\emph{Parisinus Gr.} 2140}
4 \DeclareHand{Iac}{I}{I\textsuperscript{ac}}[Lectio ante correctionem]
5 \DeclareHand{Ipc}{I}{I\textsuperscript{pc}}[Lectio post correctionem]
6 \DeclareWitness{R}{R}{\emph{Vaticanus Gr.} 277}
7 \DeclareWitness{H}{H}{\emph{Parisinus Gr.} 2142}
8 % Sources (the first arguments below must refer to biblatex labels and
9 % an xml bibliographical database must be supplied):
10 \DeclareSource{Lit}{Littré}
11 \DeclareSource{Erm}{Ermerins}
12 \DeclareSource{Sm}{Smith}
13 % Persons:
14 \DeclareScholar{ego}{ego}[
15     forename=Robert,
16     surname=Alessi]
17 % Useful shorthands:
18 \DeclareShorthand{codd}{codd.}{V,I,R,H}
19 \DeclareShorthand{edd}{edd.}{Lit,Erm,Sm}
20 \DeclareShorthand{egoscr}{\emph{scripsi}}{ego}

```

As can be seen from lines 18–20, three useful shorthands have been defined: `codd` prints “codd.” for Latin pl. *codices* viz. “all manuscripts” and refers to the three `xml` identifiers `V`, `I`, `R` and `H` declared at ll. 2–3 and 6–7; `edd` prints “edd.” for Latin pl. *editores* viz. “all editors” and refers to the three `xml` identifiers `Lit`, `Erm` and `Sm` declared at ll. 10–12;²⁷ finally, `egoscr` (l. 20) is used to print the technical Latin term “*scripsi*”, “I wrote”, to denote a personal conjecture. Then, the `.tex` source file can be structured as follows:—

```

1 \begin{ekdosis}
2   καὶ ἐγένετο μᾶλλον \app{
3     \lem[wit={V, Ipc,R,H}]{νότῳ}
4     \rdg[wit=Iac]{νότου}
5     \rdg[source=Erm, type=conjecture]{ἐν νότῳ}}. [...] % conjecture
6
7   εἰ
8   \app{
9     \lem[resp=egoscr, type=emendation]{μὲν} % emendation

```

26. See also on pages 10–11.

27. For detailed information on how to use `\DeclareSource` and insert references to cited works, the reader is invited to refer to [sect. 12.7](#) on page 70.

```

10 \rdg[wit=codd, source=edd]{μη}
11 } εἴη διὰ ταῦτα [...]
12 \end{ekdosis}

```

REM. 1 Line 5 introduces a *conjecture* which has been annotated with `type=conjecture` to facilitate its identification. Other optional arguments could have been used, such as `prewit=coni.` or `prewit=falso coni.`, to print explanatory words in the apparatus criticus before the abridged name of the scholar.

REM. 2 Conversely, line 9 introduces an *emendation* for which the shorthand `egoscr` has been used to print the exact term *scripsi* in the apparatus criticus while keeping `ego` as an `xml:id` for the TEI xml output file. Other strategies could have been used. For example, one could have defined a specific shorthand to print nothing in place of `ego` and leave the insertion of technical terms to the `post` optional argument of `\lem`, like so:—

```

% Preamble:
% (\unskip is for removing the space left by the empty 2nd argument
% below.)
\DeclareShorthand{egomute}{\unskip}{ego}

% Document:
\app{
  \lem[resp=egomute, post=\emph{scripsi}, type=emendation]{μὲν}
  \rdg[wit=codd, source=edd]{μη}
} εἴη διὰ ταῦτα [...]

```

PDF output:—

```

1 καὶ ἐγίνετο μᾶλλον νότῳ· [...]
2 εἰ μὲν εἴη διὰ ταῦτα [...]

```

1 νότῳ V I^{pc} RH] νότου I^{ac} ἐν νότῳ Ermerins 2 μὲν *scripsi*] μη codd. edd.

TEI xml output:—

```

<p xml:lang="grc">καὶ ἐγίνετο μᾶλλον
<app>
  <lem wit="#V #Ipc #R #H">νότῳ</lem>
  <rdg wit="#Iac">νότου</rdg>
  <rdg source="#Erm" type="conjecture">ἐν νότῳ</rdg>
</app>· [...]</p>
<p>εἰ
<app>
  <lem resp="#ego" type="emendation">μὲν</lem>
  <rdg wit="#V #I #R #H" source="#Lit #Erm #Sm">
μη</rdg>
</app>εἴη διὰ ταῦτα [...]</p>

```

3.1 Editorial Addition and Deletion

ekdosis provides a set of commands to indicate that text has been supplied or removed by conjecture. As regards critical symbols conventionally used for representing emendations, lacunae, omissions, gaps, editorial deletions or additions and the like, *ekdosis* follows the standards as described by West:²⁸—

28. Martin L. West, *Textual Criticism and Editorial Technique* [Applicable to Greek and Latin Texts] (Stuttgart: B. G. Teubner, 1973), 80–2.

<> text added by conjecture or from a parallel source.
 *** lacuna in the whole textual tradition.
 <***> conjectured lacuna.
 {} editorial deletion.
 †† text judged by the editor to be corrupt. Note that if only one word be suspect, only one crux is needed.

`\SetCritSymbols` *New feature v1.1* `\SetCritSymbols{<csv list of options>}` can be used to change the critical symbols described above. This command accepts the following list of **key-value** optional arguments:—

<code>suppbegin</code>	<code>suppbegin=<symbol></code>	Default: <
	The opening symbol used to mark the text that is supplied.	
<code>suppend</code>	<code>suppend=<symbol></code>	Default: >
	The closing symbol used to mark the text that is supplied.	
<code>delbegin</code>	<code>delbegin=<symbol></code>	Default: {
	The opening symbol used to mark the text that is deleted.	
<code>delend</code>	<code>delend=<symbol></code>	Default: }
	The closing symbol used to mark the text that is deleted.	
<code>sicbegin</code>	<code>sicbegin=<symbol></code>	Default: †
	The opening symbol used to mark the text that is deemed to be suspect.	
<code>sicend</code>	<code>sicend=<symbol></code>	Default: †
	The closing symbol used to mark the text that is deemed to be suspect.	
<code>gapmark</code>	<code>gapmark=<symbols></code>	Default: ***
	The symbols used to mark lacunae.	

As an example, what follows sets [] for deletions and ... for lacunae:—

```
\SetCritSymbols{
  delbegin = [,
  delend = ],
  gapmark = \dots
}
```

⌘ If modified, brackets can be adapted to languages that are written from right to left. To that effect, `ekdosis` provides a boolean expression `al@rlmode` which is evaluated as `true` if the writing direction be set from right to left and as `false` otherwise. As the `etoolbox` package is loaded by `ekdosis`, `\ifboolean{al@rlmode}{<rtl symbol>}{<ltr symbol>}` can be used to perform the test.

`\supplied` *New feature v1.1* **Editorial Addition** `\supplied{<text>}` is used to mark `<text>` that is by definition missing from the tradition as supplied by the editor or some other scholar. This command is normally expected in `\lem{}` or `\rdg{}`.

`\surplus` *New feature v1.1* **Editorial Deletion** `\surplus{<text>}` is used to mark `<text>` that is deemed to be inauthentic, but nevertheless retained between braces in the edition text as it is transmitted by all witnesses. This command is normally expected in `\lem{}` or `\rdg{}`.

`\sic` *New feature v1.1* **Crux** `\sic{<text>}` takes as mandatory argument the text deemed by the editor to be readable but not understandable. `\sic` inserts `<text>` between cruces while `\sic*` prints only one crux before `<text>`.

\gap *New feature v1.1* **Lacuna** `\gap{<csv list of options>}` indicates that some amount of text has fallen away from the entire tradition. It takes as mandatory argument a comma-separated list of options that can be used to further specify the reason for omission, the unit of measurement, the quantity or the extent, as follows:—

reason `reason=<reason>`
reason gives the reason for omission.

unit `unit=<unit>`
unit provides some regularized measurement, such as **character**, **word**, **line** and the like.

quantity `quantity=<n>`
quantity specifies the number of the given unit that comprise the measurement.

extent `extent=<description>`
extent describes the size, including quantity and unit in a single string of words.

Conjectured Lacuna Assumably, the conjectured lacuna should be enclosed by `\supplied` and as such contained by `\lem` with `type=emendation` to indicate that the lacuna has been accepted by the editor.

Examples follow:²⁹ —

Listing 5: Emendations, conjectures and corrections

```

1 % Preamble:
2 \DeclareShorthand{egomute}{\unskip}{ego}
3
4 % Document:
5 \begin{ekdosis}
6   σχεδόν \app{
7     \lem[resp=egomute, nosep, post={post σχεδόν quattuor uerba
8       excidissee uid.}, type=emendation]{\supplied{gap{reason=lost,
9         unit=word, quantity=4}}}}
10   } οὗτοι
11
12   subsidiis magnis \sic*{epicuri} constabilitas
13
14   declinare quis est qui \sic{possit cernere sese}.
15
16   \app{
17     \lem[resp=egomute, type=emendation, nosep, post={ante
18       ὑπογίν.}]{\surplus{καί}}
19     \note{deleui e Gal.P}
20   } ὑπογίνονται
21
22   Πάντων δὲ \app{
23     \lem[resp=egomute, type=emendation, nosep]{\supplied{τῶν πυρετῶν}}
24     \note[post=\ekdsep]{addidi (\arb{^gamI`a 'l-.hummayAti}
25       \getsiglum{Gal})}
26     \rdg[nordg, source=Gal]{\arb{al-.hummayAti}}
27     \rdg[wit=codd, source=edd, alt=om.]{
28       },
29   \end{ekdosis}

```

29. On the use of `egomute` (l. 2), see above [REM. 2 on page 21](#).

PDF output:—

1 σχεδὸν <***> οὕτοι
2 subsidiis magnis †epicuri constabilitas
3 declinare quis est qui †possit cernere sese†.
4 {καὶ} ὑπογίνονται
5 Πάντων δὲ <τῶν πυρετῶν>,

1 *** post σχεδὸν quattuor uerba excidisse uid. 4 καὶ ante ὑπογίν. deleui e Gal.P 5 τῶν πυρετῶν addidi (جميع المجليات Gal.)] om. codd. edd.

TEI xml output:—

```
<p>σχεδὸν  
<app>  
  <lem resp="#ego" type="emendation">  
    <supplied>  
      <gap reason="lost" unit="word" quantity="4" />  
    </supplied>  
  </lem>  
</app>οὕτοι</p>  
<p>subsidiis magnis  
<sic>epicuri</sic> constabilitas</p>  
<p>declinare quis est qui  
<sic>possit cernere sese</sic>.</p>  
<p>  
<app>  
  <lem resp="#ego" type="emendation">  
    <surplus>καὶ</surplus>  
  </lem>  
  <note>deleui e Gal.P</note>  
</app>ὑπογίνονται</p>  
<p>Πάντων δὲ  
<app>  
  <lem resp="#ego" type="emendation">  
    <supplied>τῶν πυρετῶν</supplied>  
  </lem>  
  <note>addidi (  
    <foreign xml:lang="ar-Latn" type="transliterated"  
      subtype="arabtex">^gamI`a 'l-.hummayAti</foreign>  
    <ref target="#Gal">Gal.</ref></note>  
    <rdg source="#Gal">  
      <foreign xml:lang="ar-Latn" type="transliterated"  
        subtype="arabtex">al-.hummayAti</foreign>  
    </rdg>  
    <rdg wit="#V #I #R #H" source="#Lit #Erm #Sm" />  
  </note>  
</app></p>
```

4 Alignment of Parallel Texts

As already said above,³⁰ `ekdosis` can arrange sundry texts in parallel columns—synchronized or not—either on the same page or on facing pages. Depending on what is needed, any text can be equipped with an apparatus criticus. The most common example is that of an edition of a classical text with an apparatus criticus accompanied by a translation into a modern language on the facing page. One can also imagine an edition of two classical texts or two different recensions of the same text, each of which provides variants recorded in separate apparatus criticus, laid out on the left-hand pages, with one or more translations on the corresponding right-hand pages, and so forth.

alignment **The alignment Environment** `\begin{alignment}[\langle options \rangle]...\end{alignment}`
This environment can be used as it is provided to typeset a standard critical edition, namely an edition text, equipped with an apparatus criticus and laid out on the left-hand pages, accompanied by a translation into a modern language on the facing pages.
edition Within **alignment**, two environments are available by default: `\begin{edition}`
translation `...\end{edition}` and `\begin{translation}...\end{translation}`. Obviously, the former is used to typeset the edition text with an apparatus criticus on the left, while the latter is used to typeset the translation on the right, like so:—

```
\begin{alignment}
  \begin{edition}
    First § of the edition text.
  \end{edition}
  \begin{translation}
    First § of the translation.
  \end{translation}
  \begin{edition}
    Second § of the edition text.
  \end{edition}
  \begin{translation}
    Second § of the translation.
  \end{translation}
\end{alignment}
```

edition* Furthermore, so-called “starred” versions of these environments can be used at any
translation* point to synchronize texts, that is to print them in such a way that the tops of all paragraphs are vertically aligned. To that effect, it must be noted that merely applying this command on a single environment—for instance the leftmost one—will have all other associated paragraphs printed aligned.



While the whole edition text and the whole translation can be inserted in a single **edition/translation** environment respectively, it is recommended to enter both texts paragraph by paragraph as shown in the example above. Not only this method of encoding allows not to lose sight of paragraphs that are meant to be read together, but it is also the only way to align paragraphs in print, and it is much more suitable to mark up correspondence between spans of texts.

As an illustration, a short extract of Caesar’s *Gallic War*, VI, XIII.1 follows.³¹ See the list of sigla for manuscripts and manuscript families above on page 11. As this document is

30. See point (a) on page 4.

31. Latin text: Caesar, *Gallic War* (*Guerre des Gaules*), ed. L.-A. Constans (Collection des Universités de France; Paris: Les Belles Lettres, 1987) (originally pub. 1926); English translation: Caesar, *Gallic War*, ed. W. A. McDevitte and W. S. Bohn (Harper’s New Classical Library; 1st edn., New York: Harper & Brothers, 1869).

not set for duplex printing, both texts have been put together on the same page. However, the reader will find the full `.tex` source file in [sect. 16.1 on page 84](#) and `TEI xml` output in [sect. 16.2 on page 86](#). The corresponding PDF output is available in [a separate file](#).³²—

Listing 6: Caesar’s *Gallic War*, VI, 13.1

```

1 \begin{alignment}
2   \begin{edition}
3     \ekddiv{head=XIII, depth=2, n=6.13, type=section}
4     In omni Gallia eorum hominum qui \app{
5       \lem[wit=a]{aliquo}
6       \rdg[wit=b, alt=in al-]{in aliquo}}
7     sunt numero atque honore genera sunt duo. Nam plebes paene
8     seruorum habetur loco, quae \app{
9       \lem[wit={A,M}, alt={nihil audet (aut et \getsiglum{A1})
10        per se}]{nihil audet per se}
11       \rdg[wit=A1,nordg]{nihil aut et per se}
12       \rdg[wit={R,S,L,N}]{nihil habet per se}
13       \rdg[wit=b]{per se nihil audet}}, \app{
14         \lem[wit=a]{nullo}
15         \rdg[wit=b]{nulli}} adhibetur \app{
16           \lem{consilio}
17           \rdg[wit={T, U}, alt=conc-]{concilio}}.
18   \end{edition}
19   \begin{translation}
20     \ekddiv{head=XIII, depth=2, n=6.13, type=section}
21     Throughout all Gaul there are two orders of those men who are of
22     any rank and dignity: for the commonality is held almost in the
23     condition of slaves, and dares to undertake nothing of itself,
24     and is admitted to no deliberation.
25   \end{translation}
26 \end{alignment}

```

1 XIII. In omni Gallia eorum hominum qui
2 aliquo sunt numero atque honore genera sunt
3 duo. Nam plebes paene seruorum habetur
4 loco, quae nihil audet per se, nullo adhibetur
5 consilio.

2 aliquo α] in al- β 4 nihil audet (aut et A¹) per se
AM] nihil habet per se RSLN per se nihil audet β nullo
α] nulli β 5 consilio] conc- T U

XIII. Throughout all Gaul there are two
orders of those men who are of any rank and
dignity: for the commonality is held almost
in the condition of slaves, and dares to un-
dertake nothing of itself, and is admitted to
no deliberation.

REM. 1 As can be seen from the apparatus entry related to l. 4 above, a subvariant has been inserted in the lemma part: “(aut et A¹)”. This was done by using `alt` in [listing 6](#), ll. 9–10. But as this variant is already recorded—and printed—in the lemma part, it was necessary to remove the entire otherwise redundant variant from the apparatus criticus in print. Hence the use of `nordg` at l. 11.

REM. 2 For examples of abbreviations, see ll. 6 and 17.

REM. 3 Line 17 shows how mss. T and U (which belong to two distinct subfamilies) have been separated from one another: `wit={T, U}`. See above on page 14 for more information on this technique.

Finally, the corresponding `TEI xml` output follows:—

32. On the use of `\ekddiv` (ll. 3 and 20), see below [sect. 10.2 on page 55](#).

```

<div xml:id="div-edition_1" xml:lang="la">
  <div type="section" n="6.13">
    <head>XIII</head>
    <p>In omni Gallia eorum hominum qui
    <app>
      <lem wit="#A #M #B #R #S #L #N">aliquo</lem>
      <rdg wit="#T #f #U #l">in aliquo</rdg>
    </app>sunt numero atque honore genera sunt duo. Nam
    plebes paene seruorum habetur loco, quae
    <app>
      <lem wit="#A #M">nihil audet per se</lem>
      <rdg wit="#A1">nihil aut et per se</rdg>
      <rdg wit="#R #S #L #N">nihil habet per se</rdg>
      <rdg wit="#T #f #U #l">per se nihil audet</rdg>
    </app>,
    <app>
      <lem wit="#A #M #B #R #S #L #N">nullo</lem>
      <rdg wit="#T #f #U #l">>nulli</rdg>
    </app>adhibetur
    <app>
      <lem>consilio</lem>
      <rdg wit="#T #U">concilio</rdg>
    </app>.</p>
  </div>
</div>
<div xml:id="div-translation_1" xml:lang="en">
  <div type="section" n="6.13">
    <head>XIII</head>
    <p>Throughout all Gaul there are two orders of those men
    who are of any rank and dignity: for the commonality is
    held almost in the condition of slaves, and dares to
    undertake nothing of itself, and is admitted to no
    deliberation.</p>
  </div>
</div>

```


4.1 Alignment of Several Texts

As described above on page 25, the `alignment` environment may receive an optional argument in which the following “name=value” arguments are accepted:—

<code>tcols</code>	<code>tcols=<number></code>	Default: 2
	<code>tcols</code> stores the total number of <u>columns</u> of text to be aligned.	
<code>lcols</code>	<code>lcols=<number></code>	Default: 1
	<code>lcols</code> stores the number of <u>columns</u> to be printed on the left-hand page, <i>out of the total number</i> of columns specified with <code>tcols</code> . As can be seen from the preceding two default values, <code>alignment</code> initially sets two columns of text on facing pages. Of course, for this setting to work properly, one must ensure that the <code>alignment</code> environment is started on a left page.	
<code>texts</code>	<code>texts=<semicolon-separated values></code>	Default: edition;translation

Depending on the total number of columns that has been specified with `tcols` above, `texts` is then used to define the names of the environments that shall receive edition texts, translations, *etc.* Furthermore, as described on page 25, `ekdosis` also defines “starred”

versions of these environments to be used to synchronize columns so that corresponding paragraphs are printed vertically aligned. Some very important points need to be emphasized in this respect:—

- (a) Only unaccented letters of the alphabet (whatever the case) are allowed to compose the names of L^AT_EX environments.
- (b) These names must be separated from one another by *semicolons*, as shown in red in the listing below at the end of lines 1 and 2.
-  The colon at the end of line 3 closes the whole value of **text** and acts as a higher level separator.
- (c) Each name may be followed by a ‘suboptional’ argument between square brackets which will then be used to insert TEI **xml** attributes in the corresponding **<div>** element. For example,

```

1  texts=latin[xml:lang="la"];
2      english[xml:lang="en"];
3      french[xml:lang="fr"],


```

will be converted into TEI **xml** as follows:—

```

<div xml:id="div-latin_1" xml:lang="la">
...
</div>
<div xml:id="div-english_1" xml:lang="en">
...
</div>
<div xml:id="div-french_1" xml:lang="fr">
...
</div>

```

 As can be seen, **ekdosis** takes care of computing and inserting the **xml:id** attributes which are therefore not accepted in the ‘suboptional’ arguments of **texts**.

- (d) The names of the environments must be specified in exactly the same order as they are supposed to appear in the print edition, from left to right.

apparatus	apparatus = <i>(semicolon-separated values)</i> Default: edition
	Then, the apparatus option, just as texts , takes a semicolon-separated list of previously defined environments that shall receive at least one layer of apparatus criticus.
paired	paired = true|false Default: true (initially not set)
	This named argument does not need a value as it defaults to true if used. By default, ekdosis follows the L ^A T _E X page numbering scheme when multiple texts are arranged on facing pages. The paired option leaves every right-hand page number unchanged, so that both facing pages hold the same page number.
lineation	lineation = page|document Default: document
	This option applies to edition texts initially set to receive an apparatus criticus. By default, lines are continuously numbered throughout the document. lineation=page sets the numbering to start afresh at the top of each page.
flush	flush = true|false Default: false
	This named argument does not need a value as it defaults to true if used. This option applies when two or more distinct alignment environments are started on the same page. Should this happen, any subsequent alignment environment must be set with the flush option so that every one of them carry its own apparatus criticus.

As an example, the alignment of the Latin edition text of Caesar's *Gallie War*, printed on left-hand pages, along with two translations into English and French, printed on right-hand pages, can be set as follows:—

```
\begin{alignment}[tcols=3,
    lcols=1,
    texts=latin[xml:lang="la"];
    english[xml:lang="en"];
    french[xml:lang="fr"],
    apparatus=latin,
    lineation=page]
\begin{latin}
    Gallia est omnis divisa in partes tres quarum unam incolunt
    Belgae, [...]
\end{latin}
\begin{english}
    All Gaul is divided into three parts, one of which the Belgae
    inhabit, [...]
\end{english}
\begin{french}
    L'ensemble de la Gaule est divisé en trois parties: l'une est
    habitée par les Belges, [...]
\end{french}
\end{alignment}
```

`\SetAlignment` `\SetAlignment{<alignment settings>}`

If the same alignment settings be shared by several `alignment` environments, common settings can be collected in the argument of `\SetAlignment`, like so:—

```
\SetAlignment{
    tcols=3,
    lcols=1,
    texts=latin[xml:lang="la"];
    english[xml:lang="en"];
    french[xml:lang="fr"],
    apparatus=latin,
    lineation=page
}
\begin{alignment}
    ...
\end{alignment}
```

`\SetAlignment` can be used either in the preamble or at any point of the document to set or to modify alignment settings.

4.1.1 Appending Hooks to Environments

`\AtBeginEnvironment`

Once environments corresponding to texts to be aligned have been defined, it is advisable to use the `\AtBeginEnvironment{<environment>}{<code>}` command to further adjust languages, hyphenation rules, and/or fonts to be applied in each environment. To return to the example provided above, once `\SetAlignment` has been used, the languages can be set as follows:—


```

\AtBeginEnvironment{latin}{\selectlanguage{latin}}
\AtBeginEnvironment{english}{\selectlanguage{english}}
\AtBeginEnvironment{french}{\selectlanguage{french}}

```

4.2 Laying Out Parallel Texts

As `ekdosis` uses the `paracol` package for the layout of parallel texts, most of the commands provided by this package apply. In this respect, quite useful are the commands described in sections 7.3 to 7.6 on pp. 15–21 of the documentation of this package.³³



It must be noted that all these commands are to be inserted *before* the `alignment` environments on which they are supposed to operate.

4.2.1 Columns and Gutters

\columnratio **Column Ratio on Single Pages** `\columnratio{⟨ r_1, r_2, \dots, r_n ⟩}`, where r_1 refers to the leftmost column, can be used to set the ratio of the columns in relation to each other. Depending on the total number of columns on which one wishes to operate, a comma-separated list of decimal numbers is expected. As an example, `\columnratio{0.6}` will instruct `ekdosis` to have the first column spread over 60 % of the total width of the text block, minus the total width of intercolumnar gutters.

Column Ratio on Facing Pages `\columnratio` accepts an optional argument which can be used as described above to set the ratio of columns to be printed on right-hand pages, like so: `\columnratio{⟨ r_1, r_2, \dots, r_n ⟩}[⟨ r_1, r_2, \dots, r_n ⟩]`.

\setcolumnwidth **Column Width on Single Pages** `\setcolumnwidth{⟨ w_1, w_2, \dots, w_n ⟩}` operates the same way as `\columnratio` described above, except that dimensions are expected instead of ratios. As an example, `\setcolumnwidth{1in}` will have the width of the first column set to 1 in.

Gutter Width Each value accepted by `\setcolumnwidth` can be expressed as a pair as in `\setcolumnwidth{⟨ $w_1/g_1, w_2/g_2, \dots, w_n/g_n$ ⟩}` where the character `/` acts as a separator, in which case g_x is used to set the width of the gutter that follows the x^{th} column. As an example, `\setcolumnwidth{1in/0.25in}` will print a 1 in first column, followed by a 0.25 in gutter.

Automatically Computed Values Widths of columns and widths of gutters can be replaced with `\fill` and `\columnsep` respectively. As an example, `\setcolumnwidth{\fill/0.25in}` will only operate on the width that follows the first column, all remaining values being computed automatically.

Column and Gutter Width on Facing Pages Just like `\columnratio`, `\setcolumnwidth` accepts an optional argument which can be used to set the width of columns and gutters to be printed on right-hand pages, like so: `\setcolumnwidth{⟨ w_1, w_2, \dots, w_n ⟩}[⟨ w_1, w_2, \dots, w_n ⟩]` for columns only, and `\setcolumnwidth{⟨ $w_1/g_1, w_2/g_2, \dots, w_n/g_n$ ⟩}[⟨ $w_1/g_1, w_2/g_2, \dots, w_n/g_n$ ⟩]` for columns and gutters.

³³ Hiroshi Nakashima, *The Paracol package* (version 1.35) [Multiple columns with texts “in parallel”] (Dec. 31, 2018), <http://www.ctan.org/pkg/paracol>.

Vertical Rules Vertical rules between columns can be drawn by setting the length of the L^AT_EX `\columnseprule` register to a non-zero value, like so:—

```
\setlength{\columnseprule}{0.4pt}
```

4.2.2 Marginal Notes

By default, marginal notes that refer to the first column are printed in the left margin, while notes that refer to subsequent columns are printed in the right margin.

`\marginparthreshold` `\marginparthreshold{<n>}`, where *n* is an integer, can be used to change the default settings. This command instructs `ekdosis` that columns of text, up to the *n*th column included, shall have their marginal notes printed to the left. As a result, to take an example, `\marginparthreshold{0}` will have all marginal notes printed in the right margin. `\marginparthreshold` also accepts an optional argument, namely `\marginparthreshold{<n>}[<n’>]`, that can be used to set the threshold for columns printed in right-hand pages.

4.2.3 Regular Footnotes

`\footnotelayout` By default, regular footnotes are printed at the bottom of the column on which they are called. `\footnotelayout{<key-letter>}` can be used to change this setting. This command accepts as mandatory argument a key-letter which can be either *c*, *p* or *m*. *c* means *column-wise* footnotes, which is the default value. *p* means *page-wise*: footnotes from all columns are gathered in a single spanning block at the bottom of the page. Finally, *m* stands for *merge*, which means that all footnotes that are called on a given page, including notes that are called outside the `\alignment` environment, are printed in a single spanning block at the bottom of the page.



Regular footnotes are printed above the block of critical notes. The respective places of these blocks can be interchanged by just loading the `fnpos` package in the preamble.³⁴

5 Laying Out the Apparatus Criticus

5.1 General Hooks

Some hooks are shared by all layers of notes that are inserted in the apparatus criticus (e.g. sources, testimonia, variant readings &c.)

<code>\SetHooks</code>	<code>\SetHooks{<csv list of hooks>}</code> can be used either in the preamble or at any point of the document. The list of accepted hooks at the time of writing follows:—
<code>appfontsize</code>	<code>appfontsize=⟨command⟩</code> <div style="float: right; border: 1px solid black; padding: 2px;">Default: <code>\footnotesize</code></div> <p>This option sets the size of the font to be used in the whole apparatus criticus. By default, it is the same as the size used for footnotes.</p>
<code>refnumstyle</code>	<code>refnumstyle=⟨command⟩</code> <div style="float: right; border: 1px solid black; padding: 2px;">Default: <code>\bfseries</code></div> <p><code>refnumstyle</code> can be used to set the family, series or shape of the font used to print references to line numbers in the apparatus criticus. By default, numbers are printed in bold face. As an example, <code>refnumstyle=\normalfont</code> will have them printed in the font and shape selected by default for the document, while <code>refnumstyle=\bfseries\itshape</code> will have them printed in bold and italic.</p>
<code>postrefnum</code>	<code>postrefnum=⟨command | chars⟩</code> <div style="float: right; border: 1px solid black; padding: 2px;">Default: <code>~</code></div>

³⁴ Hiroshi Nakashima, *The Fnpos package* (version 1.0) [Control the position of footnotes on the page] (Sept. 3, 2018), <http://www.ctan.org/pkg/fnpos>.

`postrefnum` can be used to set what immediately follows the reference to line numbers. By default, it is `~`, namely an unbreakable space. As an example, `postrefnum=\hskip 0.5em` will insert a 0.5 em space between the numerals and the beginning of all subsequent notes.

<code>lemmastyle</code>	<code>lemmastyle=<command></code>	Default: not set
New feature v1.2	<code>lemmastyle</code> can be used to set the family, series or shape of the font used to print lemma texts in the apparatus criticus. For example, <code>lemmastyle=\bfseries</code> will print all instances of lemma text in bold while <code>lemmastyle=\color{blue}</code> will print them in blue.	
<code>readingstyle</code>	<code>readingstyle=<command></code>	Default: not set
New feature v1.2	<code>readingstyle</code> operates in the same way as <code>lemmastyle</code> but applies to variant readings.	
<code>initialrule</code>	<code>initialrule=<command></code>	Default: <code>\rule{0.4\columnwidth}{0.4pt}</code> (initially not set)
New feature v1.2	<code>initialrule</code> draws a separating rule between the edition text and all subsequent layers of critical notes. Of course, this option only makes sense when multiple-layer apparatus criticus are set. Therefore, it has no effect on single-layer apparatus criticus.	
<code>noinitialrule</code>		Default: not set

This is a no-value option. It removes any previously set `initialrule`.

An example of the way these hooks may be used is provided below in [listing 7 on page 44](#).

Option Specific to the `layout=keyfloat` Global Setting³⁵

<code>keyparopts</code>	<code>keyparopts=<csv options></code>	Default: empty
New feature v1.3	The comma-separated options that can be used are those described in the documentation of the <code>keyfloat</code> package. ³⁶ As an example, <code>keyparopts={ft, tr={made with ekdosis}, lw=1.2}</code> will draw a tight frame around the apparatus block, have the words “made with ekdosis” printed below this block on the right and set its width to <code>1.2\linewidth</code> .	

Options Specific to the `layout=fitapp` Global Setting³⁷

<code>appheight</code>	<code>appheight=<dimension></code>	Default: <code>0.5\textheight</code>
New feature v1.3	This option is used to change the maximum height up to which the apparatus block is allowed to grow before the size of the characters is reduced to allow for more entries. The value must be a dimension, namely a number followed by a length unit, such as <code>0.65\textheight</code> , <code>18cm</code> or <code>6in</code> .	
<code>fitalgorithm</code>	<code>fitalgorithm=fontsize|hybrid|areaseize|squeeze</code>	Default: <code>fontsize</code>
New feature v1.3	The four algorithms that can be used to have the entries inserted in the apparatus criticus fit to the selected height are presented here from the tightest to the loosest, that is, the slowest to the fastest. ³⁸ While it is advisable to limit the use of <code>fontsize</code> to high quality typesetting for camera-ready copies, <code>areaseize</code> offers a satisfactory settlement when speed must be given an advantage for intermediate or draft copies. <code>squeeze</code> should be avoided as it gives results that are offensive to the sight and unacceptable to any reader.	

5.2 Single-Layer Apparatus Criticus

Specific Commands Single-layer apparatus criticus can be laid out in a variety of ways with the following specialized commands, all of which can be used in the preamble or at any point of the document:—

<code>\SetLTRapp</code>	<code>\SetLTRapp</code> and <code>\SetRTLapp</code> are two argument-less commands to set the direction of the apparatus criticus, either left-to-right or right-to-left.
<code>\SetRTLapp</code>	
<code>\SetSeparator</code>	<code>\SetSeparator{<separator>}</code> is used to change the separator between lemma texts and

³⁵. See above [\(c\) on page 6](#).

³⁶. Dunn (cf. n. 4), sect. 2.3, pp. 13–5.

³⁷. See above [\(d\) on page 6](#).

³⁸. See Sturm (cf. n. 7), 446–9 for details and illustrative examples.

variants readings. By default, the separator is a closing square bracket followed by a space (`]␣`).

`\SetBeginApparatus` `\SetBeginApparatus{⟨characters|commands⟩}` can be used to append `⟨characters⟩` or `⟨commands⟩` at the beginning of the apparatus block. By default, nothing is appended. For instance, `\SetBeginApparatus{\textbf{Apparatus:}}` will append “**Apparatus:**” at the beginning of the apparatus block, while `\SetBeginApparatus{\hskip 1em}` will set an indentation of one em.

`\SetEndApparatus` `\SetEndApparatus{⟨characters⟩}` can be used to append `⟨characters⟩` at the end of the apparatus block. By default, nothing is appended. As an example of use, `\SetEndApparatus{.}` will have a period printed at the end of the apparatus as it is customary in some editions.³⁹

`\SetUnitDelimiter` `\SetUnitDelimiter{⟨delimiter⟩}` can be used to set the delimiter between entries in the apparatus criticus. By default, there is no delimiter except a simple space. `⟨delimiter⟩` can be a broad space (such as `\hskip 0.75em` for instance as in the OCT series) or the divider-sign (`||`, as in the Budé series).

`\SetDefaultRule` By default, `ekdosis` draws a separating line between the edition text and the apparatus criticus. This line is initially defined as `\rule{0.4\columnwidth}{0.4pt}`. `\SetDefaultRule{⟨line definition⟩}` can be used in the preamble or at any point of the document to change the default setting. Leaving this argument empty as in `\SetDefaultRule{}` removes the line.

`\SetApparatusLanguage` `\SetApparatusLanguage{⟨language name⟩}` can be used when it is needed to apply in the apparatus criticus a language different from the one that is selected in the edition text.

`\SetApparatusNoteLanguage` `\SetApparatusNoteLanguage{⟨language name⟩}` can be used when it is needed to apply in text entries introduced by the mandatory argument of the `\note` command as described in [sect. 6.2 on page 36](#)—namely `\note[⟨options⟩]{⟨text⟩}`—a language different from the one that is selected in the edition text.

`\SetApparatus` **General Command** `\SetApparatus{⟨csv list of apparatus settings⟩}`
Finally, all the settings described above can also be collected in the argument of `\SetApparatus`. `\SetApparatus` accepts the following list of comma-separated **key=value** options:—

<code>direction</code>	<code>direction=LR|RL</code>	Default: LR
	The writing direction of the apparatus criticus, either left-to-right (LR) or right-to-left (RL).	
<code>sep</code>	<code>sep=⟨command | chars⟩</code>	Default: <code>]␣</code>
	The separator between lemma texts and variant readings.	
<code>delim</code>	<code>delim=⟨delimiter⟩</code>	Default: not set
	The delimiter between entries in the apparatus criticus. As said above, there is no default delimiter except a simple space.	
<code>bhook</code>	<code>bhook=⟨characters|commands⟩</code>	Default: empty
	The characters or commands to be appended at the beginning of the apparatus block.	
<code>ehook</code>	<code>ehook=⟨characters⟩</code>	Default: empty
	The characters to be appended at the end of the apparatus block. ⁴⁰	
<code>rule</code>	<code>rule=⟨command⟩</code>	Default: <code>\rule{0.4\columnwidth}{0.4pt}</code>
	As described above, rule is used to draw the separating line between the edition text and the apparatus criticus.	
<code>norule</code>		Default: not set
	norule does not accept any value and is used to remove the line.	

39. See also below on page 61 on how to remove superfluous dots.

40. See also n. 39.

`lang` `lang=<language>` Default: not set
New feature v1.2 `lang=<language>` is used as described on the previous page when it is needed to apply in the apparatus criticus a language different from the one that is selected in the edition text. `language` can be any value accepted by `babel` or `polyglossia`.

`notelang` `notelang=<language>` Default: not set
New feature v1.3 `notelang=<language>` is used as described on the preceding page when is needed to apply in text entries introduced by the mandatory argument of the `\note` command as described in [sect. 6.2 on page 36](#)—namely `\note[<options>]{<text>}`—a language different from the one that is selected in the edition text. `language` can be any value accepted by `babel` or `polyglossia`.

As an example, an apparatus criticus with references to line numbers printed in normal font, a colon as a separator between lemma texts and variant readings, a broad space as a delimiter between entries and a 0.7 in line above could be laid out as follows:—


```
\SetHooks{
  refnumstyle=\normalfont
}
\SetApparatus{
  sep={: },
  delim=\hspace 1em,
  rule=\rule{0.7in}{0.4pt}
}
```

`\footnoteruletrue` **Footnote Separator** As already seen above, `ekdosis` takes care of drawing a separating line between the edition text and the apparatus criticus. Therefore, it may be not desirable to have the standard L^AT_EX “`footnoterule`” printed on every page where regular footnotes are found. `\footnoterulefalse` removes it while `\footnoteruletrue` leaves it untouched. The latter is set by default.

`\footnoterulefalse`

5.3 Multiple-Layer Apparatus Criticus

As said above in [\(b\) on page 4](#), `ekdosis` can print edition texts equipped with multiple-layer apparatus criticus. To take an example, most classical editions provide at least two layers of notes: one to collect references to testimonia or parallel passages (apparatus testium) and the other to record variant readings (the apparatus criticus *stricto sensu*). The former is always printed above the latter.

 The default single-layer apparatus criticus that is described above in [sect. 5.2 on page 32](#) is called `default` internally. If any additional layer of notes be declared in the preamble, this `default` layer must be included in the list of declared layers.

`\SetDefaultApparatus` `\SetDefaultApparatus{<name>}` can be used at any point of the document to change the name to be used as the default one by `ekdosis`.

5.3.1 Declaring Additional Layers

`\DeclareApparatus` `\DeclareApparatus{<name>}[<csv list of apparatus settings>]` is a preamble-only command. As a mandatory argument, it takes the name of the new layer of notes to be inserted in the apparatus block. Declared layers are then printed one below the other in the exact same order as they are declared in the preamble. Therefore, one additional layer meant to print the testimonia above the variant readings (apparatus testium) can be declared as follows:—

```

1 % preamble:
2 \DeclareApparatus{testium}
3 \DeclareApparatus{default}

```

In this example, `testium` is a new name for `default`, as said just above, is already known to `ekdosis` and used as the default layer of notes. Furthermore, as `testium` is declared before `default`, `ekdosis` will print the testimonia at the top of the apparatus block.

5.3.2 Laying Out Layers With The Optional Argument of `\DeclareApparatus`

direction With regard to layout, any declared layer inherits the default values described above in [sect. 5.2 on page 32](#). That said, as the optional argument of `\DeclareApparatus` accepts the exact same **key-value** options as `\SetApparatus` described on [page 33](#), `ekdosis` provides a straightforward mechanism to have any layer printed in a distinct layout.

hook To return to the example provided on the preceding page, one could keep the same settings as above for the variant readings, declare an apparatus `testium` with a closing square bracket as a separator and finally remove the line between the testimonia and the variant readings like so:—

```

notelang
1 \SetHooks{
2   refnumstyle=\normalfont,
3   initialrule=\rule{0.7in}{0.4pt}
4 }
5 \DeclareApparatus{testium}[
6   sep={ } ],
7   delim=\hskip 1em,
8   norule
9 ]
10 \DeclareApparatus{default}[
11   sep={: } ],
12   delim=\hskip 1em,
13   rule=\relax
14 ]

```

REM. 1 The general hook `initialrule` used here (l. 3) is described above on [page 32](#).

REM. 2 `\relax` (l. 13) is a TeX primitive that instructs to do nothing. Therefore, `rule=\relax` is not strictly equivalent to `norule`: with the former, `\relax` removes the rule but leaves untouched the subsequent carriage return: as a result, the layers are visually separated from one another by a blank line. With the latter everything is removed, carriage return included.

Limiting the Number of Entries per Page In some instances, it can be useful to set a limit to the number of entries per page that a given layer of critical notes may accept, notably when entries are so abundant in number that `ekdosis` may oscillate indefinitely between different sets of page decisions without being able to settle down.

maxentries `maxentries=<n>` (where $n \geq 10$)

Default: not set

If `maxentries=<n>` be set, then `ekdosis` will issue `\pagebreak` (namely `\penalty-10000`) just after the n^{th} entry has been inserted in the layer of the apparatus criticus this option is related to. As a result, the page will actually break at the end of the current line. The particulars of this technique will be discussed below in [sect. 11.1 on page 59](#).

6 Inserting Notes in Multiple-Layer Apparatus

As said above in [sect. 5.3 on page 34](#), `ekdosis` initially sets one layer of notes that is called the “**default**” layer. As a result, any note inserted within the argument of `\app{}` as described on [page 13](#) will go into that layer of the apparatus, unless `\SetDefaultApparatus` has been used to set another name for the default layer (see above on [page 34](#)).

6.1 Variant Readings

In most cases, all variant readings go into the “**default**” layer of the apparatus criticus. But in some other cases, for example when the manuscripts used refer to different recensions, it may happen that one wishes to record the related variants in separate layers. As already described on [page 13](#), the `type` optional argument of the `\app` command can be used to insert lemma texts and associated variants in any other ‘declared’ layer of the apparatus criticus.

The following example assumes that some edition text is received in two different recensions and the variant readings that belong to the first recension are recorded in the default layer of notes while those of the second recension are to be printed in a second layer, below the default one. First, both layers must be declared in the preamble in sequence, like so:—

```
\DeclareApparatus{default} % default layer
\DeclareApparatus{rec2} % additional layer below the default one
```

Should one wish to refer to `rec1` as the default layer, then `\SetDefaultApparatus` must be used, like so:—

```
\SetDefaultApparatus{rec1}
\DeclareApparatus{rec1} % new layer set as default
\DeclareApparatus{rec2} % additional layer below the default one
```

Then, whatever option has been chosen, lemma texts and variants inserted with `\app{}` will go into the upper, default layer of notes, while those inserted with `\app[type=rec2]{}` will go into the lower one:—

```
Some \app{
  \lem{word}
  \rdg{reading}
} to go into the default layer of notes.

Some \app[type=rec2]{
  \lem{note}
  \rdg{comment}
} to be recorded as part of the second recension.
```





At any rate, `type=default` or `type=rec1`, depending on what has been chosen, must be used should the editor wish to retain that information in the TEI `xml` output file.

6.2 Other Notes for Comments, Sources or Testimonia

Additional layers of notes can be used to print short comments or to record references to texts quoted by the author of the edited text or references to the edited text by other

authors or translators. The former set is called an *apparatus fontium* while the latter is called an *apparatus testium*.

 From a technical standpoint, these notes are very different from the short editorial notes inserted between lemma texts and variant readings that have been described above on page 16. However, for the sake of consistency with TEI xml encoding, *ekdosis* uses the same command `\note` to insert both kinds of notes.

 One must also keep in mind that the notes that are described in this section refer either to a single word or to a span of text. By consequence, as boundaries must always be set outside spans of text, notes must be inserted immediately before the word or words they are related to. As a result of this rule, all spaces subsequent to `\note` are ignored.

`\note` `\note[options]{text}`

As said above, `\note`, when found outside `\app{}`, is used to insert in additional layers of the apparatus short comments or references to texts quoted or cited in the edition text. It accepts the following comma-separated list of **key-value** optional arguments:—

type `type=<type>`

`type` is used to specify the name of the layer where the note is to be printed.⁴¹

sep `sep=<command | chars>`

The separator between the lemma text and the contents of the note.

nosep `nosep=true|false`

This named argument does not need a value as it defaults to **true** if used. Obviously, **nosep** removes the separator mentioned above.

lem `lem=<lemma text>`

`lem` is the span of text the note is about. It may consist of one or more words, or of an abridged lemma text.

num (no-value argument)

New feature v1.3 **num** takes no value. If used, this argument instructs to print any line number that *ekdosis* may have decided not to print in the apparatus criticus before the note.


nonum (no-value argument)

Compared to **num**, **nonum** does the opposite. If used, any number that *ekdosis* may have decided to print before the note is suppressed.

labelb `labelb=<label>`

Mandatory

`labelb` is the unique label to serve as a reference for the point immediately preceding the lemma text.

 `labelb` is used by *ekdosis* to print the line numbers in the apparatus criticus and to set the `left()` XPointer should TEI output be required. Therefore, it must be specified. Otherwise, *ekdosis* will issue an error message. However, two strictly consecutive `\note` commands are allowed to share the same `labelb` value for it may happen that consecutive notes need to refer to spans of text that begin at the exact same location. In this case, *ekdosis* generates only one `\linelabel` and one corresponding `<anchor>` element in the TEI xml file.

labelc `labelc=<label>`

`labelc` is the unique label to serve as a reference for the point immediately following the lemma text. Contrary to `labelb`, `labelc` may be left unspecified if the note be only about one word. If the note be about a span, then `labelc` must be specified.

`\linelabel` `\linelabel{<label>}`

If `labelc=<some_label>` be specified in the optional argument of `\note`, `\linelabel{<some_label>}` must be inserted immediately after the span of text that the note is about so that

41. See [sect. 5.3.1 on page 34](#) to learn how to declare and lay out new layers of notes.

ekdosis can locate the exact point where the lemma text addressed by the note ends, like so:—

```
% Preamble:
% \DeclareApparatus{fontium}[
%     delim=\hskip0.75em,
%     bhook=\textbf{Sources:},
%     ehook=.]
% \DeclareApparatus{default}[
%     delim=\hskip0.75em,
%     ehook=.]
% Document:
\begin{ekdosis}
  The oldest monument of the Germans is their language, which, before
  untold centuries, was the companion of their travels from central
  Asia; a language, copious, elastic, inviting self-explaining
  combinations and independent development; lending itself alike to
  daily life and imagination, to description and abstract thought.
  \note[type=fontium, labelb=B61e, lale=B62a, lem={They
    had... slave}]{Waitz, \emph{Deutsche Verfassungs Geschichte},
    i. 86} They had a class of nobles, but their tongue knew no word
    for slave.\lineb=B62a\footnote{George Bancroft, \emph{History
      of the United States from the Discovery of the American
      Continent}, II.61--2.}
\end{ekdosis}
```

PDF output:—

- 1 The oldest monument of the Germans is their language, which, before untold centuries,
- 2 was the companion of their travels from central Asia; a language, copious, elastic, inviting
- 3 self-explaining combinations and independent development; lending itself alike to daily life
- 4 and imagination, to description and abstract thought. They had a class of nobles, but their
- 5 tongue knew no word for slave.⁴²

Sources: 4–5 They had... slave] Waitz, *Deutsche Verfassungs Geschichte*, i. 86

TEI xml output:—

```
<p>The oldest monument of the Germans is their language,
which, before untold centuries, was the companion of their
travels from central Asia; a language, copious, elastic,
inviting self-explaining combinations and independent
development; lending itself alike to daily life and
imagination, to description and abstract thought.
<note type="fontium" target="#range(right(B61e),left(B62a))">Waitz,
<emph>Deutsche Verfassungs Geschichte</emph>, i. 86</note>
<anchor xml:id="B61e" />They had a class of nobles, but
their tongue knew no word for slave.
<anchor xml:id="B62a" />
<note place="bottom">George Bancroft,
<emph>History of the United States from the Discovery of
the American Continent</emph>, II.61--2.</note></p>
```

42. George Bancroft, *History of the United States from the Discovery of the American Continent*, II.61–2.

\note or \linelabel inside \lem It may happen that the `\note` or `\linelabel` command is found inside the argument of `\lem`. Obviously, inserting such a command in the apparatus criticus in print makes no sense and will lead to an error. The solution is to insert in the value of the `alt` optional argument of `\lem` a duplicate of the lemma text devoid of that command, like so:—

```
This is some \app{
  \lem[alt=dummy]{\note[type=fontium, labelb=bnote, labelc=enote,
    lem=dummy... command]{Text of the note.}
  dummy}
  \rdg{pseudo}}
text to demonstrate how to insert a note in the argument of the
\emph{lem} command.\linelabel{enote}
```

PDF output:—

```
1   This is some dummy text to demonstrate how to insert a note in the argument of the
2   lem command.

Sources: 1–2 dummy... command] Text of the note.

1 dummy] pseudo
```

TEI xml output:—

```
1 <p>This is some
2 <app>
3   <lem>
4     <anchor xml:id="bnote" />dummy</lem>
5     <note type="fontium"
6       target="#range(right(bnote),left(enote))">Text of the
7       note.</note>
8     <rdg>pseudo</rdg>
9   </app>text to demonstrate how to insert a note in the
10  argument of the
11  <emph>lem</emph>command.
12  <anchor xml:id="#enote" /></p>
```

As can be seen from the TEI xml output above, the span of text the note is about has been carefully delimited by two anchors (ll. 4 and 12), the first of which falls within `<lem>` (l. 4), but `ekdosis` has taken care of moving the note itself out of this element (ll. 5–7). Otherwise, the TEI output would not be valid.

7 Poetry

7.1 The Standard verse Environment

In order to typeset verse texts or poems, L^AT_EX provides the standard `verse` environment. Within this environment, `\` is normally used to end lines, with the exception of the last line. As a result, stanzas are separated from one another by a blank line.

`ekdosis` provides `ekdverse` which is recommended for use in place of the standard `verse` environment. By default, `ekdverse` produces the same result as `verse`. However, `ekdosis`

deviates a little from the standard usage for it needs all lines of poetry to be ended by `\\` as a distinct marker. In the following listing, stanzas are visually separated from one another by an additional vertical space of 2 ex (l. 5). Between stanzas, `%` is used to prevent `TEX` from introducing a blank line. But a blank line—or even no blank line—would produce the exact same result:—

```

1 \begin{ekdverse}
2   It is an ancient Mariner,\\
3   And he stoppeth one of three.\\
4   'By thy long grey beard and glittering eye,\\
5   Now wherefore stopp'st thou me?\\[2ex]
6   %
7   The Bridegroom's doors are opened wide,\\
8   And I am next of kin;\\
9   The guests are met, the feast is set:\\
10  May'st hear the merry din.'\\
11 \end{ekdverse}

```

PDF output:—

```

1   It is an ancient Mariner,
2   And he stoppeth one of three.
3   'By thy long grey beard and glittering eye,
4   Now wherefore stopp'st thou me?

5   The Bridegroom's doors are opened wide,
6   And I am next of kin;
7   The guests are met, the feast is set:
8   May'st hear the merry din.'

```

TEI `xml` output:—

```

<lg>
  <l>It is an ancient Mariner,</l>
  <l>And he stoppeth one of three.</l>
  <l>'By thy long grey beard and glittering eye,</l>
  <l>Now wherefore stopp'st thou me?</l>
  <l>The Bridegroom's doors are opened wide,</l>
  <l>And I am next of kin;</l>
  <l>The guests are met, the feast is set:</l>
  <l>May'st hear the merry din.'</l>
</lg>

```

One would have expected here the `<lg>` element to be used as delimiter to encode the stanzaic verse forms. But as can be seen, only the outermost level of line group has been converted into TEI `xml`, let alone the vertical spacing between stanzas which has been ignored. This is because it is about as much as the standard `verse` environment provides.

7.2 The verse Package

New feature v1.2 `ekdosis` can use the facilities offered by the excellent `verse` package⁴³ to which it adds a

specific environment for the encoding of line groups such as stanzas. Furthermore, as the `verse` package provides its own numbering mechanism, the lines can be numbered independently of prose text.⁴⁴

For what is described in this section to operate, `ekdos` must be loaded with the global option `poetry=verse` as explained above on page 7. Simply loading the `verse` package by means of `\usepackage` will have no effect.

The foregoing does not apply if the `memoir` class be used.⁴⁵ In this case, `ekdos` automatically uses the code provided by this class without the need to set the global option `poetry=verse`.

Compatible Verse Commands The reader is invited to refer to the documentation of the `verse` package for detailed information. Within the `ekdverse` environment, `\` must be used at the end of each line, as follows:—

- (a) `\` is the standard command to be used at the end of each line.
- (b) `\!` must be used at the end of stanzas or line groups instead of `\`.
- (c) `*` does the same as `\` except that it prohibits a page break after the line.
- (d) `\>` is for line breaks within a verse line.

All of these commands can take a dimension as optional argument, like so: `\[30pt]`, `\![30pt]`, `*[30pt]` or `\>[30pt]`. If `\`, `\!` or `*` be used, a vertical space of the dimension specified is added between lines, whereas `\>[...]` adds an horizontal space after the line break.

`\vin` `\vin` indents a verse line by a length which is by default 1.5 em. This length is stored as `\vgap` and can be changed by `\setlength` or `\addtolength`.

The `ekdverse` Environment `\begin{ekdverse}[\langle options \rangle] ... \end{ekdverse}`
This environment is used to hold verse lines as described above and may receive an optional argument in which the following “name=value” arguments are accepted:—

`width` `width=\langle length \rangle` **Default: `\linewidth`**
If `width` be supplied, it is taken as a length in relation to which the entire contents of the environment are to be horizontally centered. If given, this dimension may correspond to an average line or to the longest line of the line group. To this end, the standard L^AT_EX command `\settowidth` can be used, like so:—

```
\settowidth{\versewidth}{This is the average line,}
\begin{ekdverse}[width=\versewidth]
...
\end{ekdverse}
```

REM. `\versewidth` is provided by the `verse` package as a convenience and can be used by `ekdos`.

`type` `type=\langle type \rangle` **Default: not set**
This named argument is used in the TEI `xml` output to name the type of unit encoded within the `<lg>` element, viz. “sonnet”, “quatrain”, “couplet” and the like.

Unlike the TEI `xml` element `<lg>`, `ekdverse` may not nest hierarchically. Within this environment, `ekdstanza` must be used instead to encode stanzas as described below on page 43.

43. Peter R. Wilson and Will Robertson, *The Verse package* (version 2.4b) [Aids for typesetting simple verse] (May 10, 2014), <http://www.ctan.org/pkg/verse>.

44. See on page 48 for details.

45. Lars Madsen and Peter R. Wilson, *The Memoir package* (version 3.7o) [Typeset fiction, non-fiction and mathematical books] (Mar. 23, 2021), <http://www.ctan.org/pkg/memoir>.

As an example, the first five lines of Homer's *Odyssey* could be encoded like so:⁴⁶—

```
\begin{alignment}[tcols=2,
                    lcols=2,
                    texts=homer[xml:lang="grc"];murray[xml:lang="en"],
                    apparatus=homer]
\begin{homer}
\begin{ekdverse}
  Ἄνδρα μοι ἔννεπε, Μοῦσα, πολύτροπον, ὃς μάλα πολλά \\\
  πλάγχθη, ἐπεὶ Τροίης ἱερὸν πτολίεθρον ἔπερσεν· \\\
  πολλῶν δ' ἀνθρώπων ἴδεν ἄστεα καὶ
    \app{\lem{νόον}
          \rdg[resp=Zen]{νόμον}
          \note{Cf. Schol.}} ἔγνω, \\\
  πολλά δ' ὃ γ' ἐν πόντῳ πάθεν ἄλγεα ὃν κατὰ θυμόν, \\\
  ἀρνύμενος ἥν τε ψυχὴν καὶ νόστον ἐταίρων. \\\
\end{ekdverse}
\end{homer}
\begin{murray}
  Tell me, O Muse, of the man of many devices, who wandered full
  many ways after he had sacked the sacred citadel of Troy. Many
  were the men whose cities he saw and whose mind he learned, aye,
  and many the woes he suffered in his heart upon the sea, seeking
  to win his own life and the return of his
  comrades.
\end{murray}
\end{alignment}
```

PDF output:—

Ἄνδρα μοι ἔννεπε, Μοῦσα, πολύτροπον, ὃς μάλα πολλά 1 πλάγχθη, ἐπεὶ Τροίης ἱερὸν πτολίεθρον ἔπερσεν· 2 πολλῶν δ' ἀνθρώπων ἴδεν ἄστεα καὶ νόον ἔγνω, 3 πολλά δ' ὃ γ' ἐν πόντῳ πάθεν ἄλγεα ὃν κατὰ θυμόν, 4 ἀρνύμενος ἥν τε ψυχὴν καὶ νόστον ἐταίρων. 5	Tell me, O Muse, of the man of many devices, who wandered full many ways after he had sacked the sacred citadel of Troy. Many were the men whose cities he saw and whose mind he learned, aye, and many the woes he suffered in his heart upon the sea, seeking to win his own life and the return of his comrades.
--	--

3 νόον] νόμον Zen. Cf. Schol.

TEI xml output:—

```
<div xml:id="div-homer_1" xml:lang="grc">
  <lg>
    <l>Ἄνδρα μοι ἔννεπε, Μοῦσα, πολύτροπον, ὃς μάλα πολλά</l>
    <l>πλάγχθη, ἐπεὶ Τροίης ἱερὸν πτολίεθρον ἔπερσεν·</l>
    <l>πολλῶν δ' ἀνθρώπων ἴδεν ἄστεα καὶ
      <app>
        <lem>νόον</lem>
        <rdg resp="#Zen">νόμον</rdg>
        <note>Cf. Schol.</note>
      </app>ἔγνω,</l>
  </lg>
</div>
```

46. Homer, *The Odyssey*, ed. A. T. Murray, 2 vols. (Cambridge, MA. – London: Harvard University Press – William Heinemann, 1919).

```

    <l>πολλά δ' ὁ γ' ἐν πόντῳ πάθεν ἄλγεα ὃν κατὰ θυμόν,</l>
    <l>ἄρνύμενος ἦν τε ψυχὴν καὶ νόστον ἐταίρων.</l>
  </lg>
</div>
<div xml:id="div-murray_1" xml:lang="en">
  <p>Tell me, O Muse, of the man of many devices, who
  wandered full many ways after he had sacked the sacred
  citadel of Troy. Many were the men whose cities he saw and
  whose mind he learned, aye, and many the woes he suffered
  in his heart upon the sea, seeking to win his own life and
  the return of his comrades.</p>
</div>

```

Stanzas As can be seen above, the L^AT_EX `ekdverse` environment is translated into the TEI `xml` `<lg>` element. The `type` attribute may then be used to name the type of unit encoded by this element.

`ekdstanza` `\begin{ekdstanza}[options] ... \end{ekdstanza}`

This environment is used within `ekdverse` to encode succeeding stanzaic forms. Within `ekdstanza`, the last line is ended by `\\!` or `\\` depending on whether an additional vertical space is required between stanzas. This environment may receive an optional argument in which the following “name=value” argument is accepted:—

`type` `type=<type>`

Default: not set

As in the case of `ekdverse`, this named argument is used in the TEI `xml` output to name the type of unit encoded within the `<lg>` element, viz. “quatrain”, “couplet” and the like.

Indentation Patterns `ekdosis` can use the `patverse` environment and its associated command `\indentpattern` that are provided by the `verse` package. As described in the documentation of this package,⁴⁷ the indentation pattern consists of an array of digits, d_1 to d_n , where the n^{th} line is indented by d_n times the amount of `\vgap` described above on page 41.

The overall structure of lines grouped into stanzas may look as follows:—

```

1  \begin{ekdverse}[type={overall type}]
2    \indentpattern{digits}
3    \begin{patverse}
4      \begin{ekdstanza}[type={stanza 1 type}]
5        line 1 \\
6        line 2 \\
7        [...]
8        final line \\!
9      \end{ekdstanza}
10   \end{patverse}
11 \end{ekdverse}

```

Of course, if no indentation pattern be required or be only required occasionally, `patverse` (ll. 3 and 10) and `\indentpattern` (l. 2) are of no use:—

```

1  \begin{ekdverse}[type={overall type}]
2    \begin{ekdstanza}[type={stanza 1 type}]
3      line 1 \\
4      line 2 \\

```

47. Wilson and Robertson (cf. n. 43), 6.

```

5 \vin indented line 3 \
6 [...]
7 final line \!
8 \end{ekdstanza}
9 \end{ekdverse}

```

A detailed example follows. It is taken from Raymond MacDonald Alden's edition of Shakespeare's *Sonnets* from the Quarto of 1609 with variorum readings.⁴⁸ Compared to MacDonald's edition, an effort has been made to use the typography and punctuation of the original edition which can be consulted online at the British Library's website.⁴⁹ However, this typographical refinement has been retained for the sonnet only. For the sake of clarity, the line numbers and the apparatus criticus use modern typography. The references to line numbers in the apparatus criticus have been made consistent with MacDonald's edition, as have the entries in the apparatus criticus, namely the bare line number followed by a dot, then the lemma text in bold face, then the variant in italic shape:—

Listing 7: Poetry: Shakespeare's Sonnet 1

```

1 \junicode % Use the Junicode font with 'hist' feature enabled for
2 % long-s
3 % MacDonald's style for numbers and entries in the apparatus
4 % criticus:
5 \SetHooks{
6   refnumstyle=\normalfont,
7   postrefnum=.,
8   lemmastyle=\bfseries,
9   readingstyle=\itshape
10 }
11 % The lines are to be centered horizontally:
12 \settowidth{\versewidth}{Feed'st thy lights flame with selfe
13 substantiall fewell,}
14 % Format of the outermost <div> element:
15 \NewDocumentEnvironment{ekdcenter}{}{\par\centering}{\nobreak\par}
16 \FormatDiv{1}{\begin{ekdcenter}}{\end{ekdcenter}}
17 \begin{ekdosis}
18   \ekddiv{type=sonnets, n=1, head=1}
19   \begin{ekdverse}[type=sonnet, width=\versewidth]
20     \indentpattern{00000000000011}
21     \begin{patverse}
22       \begin{ekdstanza}[type=quatrain]
23         \ekdlettrine{F}{r}om fairest creatures we desire
24         increase,\
25         That thereby beauties \emph{Rose}
26         \app{
27           \lem{might}
28           \rdg[source={Gildon1710, Sewell1725, Ewing1771}]{may}
29         } neuer die,\
30         But as the ripper should by time
31         \app{
32           \lem{decease}
33           \rdg[source=Hudson1856]{decrease}

```

48. Raymond MacDonald Alden (ed.), *The Sonnets of Shakespeare* [From the Quarto of 1609 with Variorum Readings and Commentary] (Boston & New York: The Riverside Press Cambridge, 1916), Sonnet 1, p. 15.

49. Shake-speares *Sonnets*. Neuer before Imprinted. (A Louers Complaint. By William Shake-speare.). <https://www.bl.uk/collection-items/first-edition-of-shakespeares-sonnets-1609>. Call number C.21.c.44, fol. B.


```

34      },\\
35      His tender heire might beare his memory:\\
36  \end{ekdstanza}
37  \begin{ekdstanza}[type=quatrain]
38      But thou contracted to thine owne bright eyes,\\
39      Feed'st thy
40      \app{
41          \lem{lights}
42          \rdg[source={Butler1899, Walsh1908}]{life's}
43      } flame with
44      \app{
45          \lem{selfe substantiall}
46          \rdg[source=Gildon1714,
47              alt={\textnormal{Hyphened by}}]{selfe-substantiall}
48          \note{etc.} fewell,\\
49      Making a famine where abundance lies,\\
50      Thy selfe thy foe,to thy sweet selfe too cruell:\\
51  \end{ekdstanza}
52  \begin{ekdstanza}[type=quatrain]
53      Thou that art now the worlds fresh ornament,\\
54      And
55      \app{
56          \lem{only}
57          \rdg[resp=God, type=conjecture]{early}
58          \note{conj.}
59      } herauld to the gaudy spring,\\
60      Within thine owne bud buriest thy content,\\
61      And tender
62      \app{
63          \lem{chorle}
64          \rdg[source=Gildon1710]{churl}
65          \note{etc.}
66      } makst wast in niggarding:\\
67  \end{ekdstanza}
68  \begin{ekdstanza}[type=couplet]
69      Pitty the world,or else this glutton be,\\
70      To eate the worlds due,\app{
71          \lem{by the}
72          \rdg[resp=Stee, type=conjecture]{be thy}
73          \note{conj.}
74          \rdg[resp=God, type=conjecture]{by thy}
75          \note{conj.}
76      } graue
77      \app{
78          \lem{and}
79          \rdg[resp=God, type=conjecture]{as}
80          \note{conj.}
81      } thee.\\!
82  \end{ekdstanza}
83  \end{patverse}
84  \end{ekdverse}
85  \end{ekdosis}

```

- REM. 1 Gildon1710, Gildon1714, Sewell1725, Ewing1771, Hudson1856, Butler1899 and Walsh1908 have been declared as sources.⁵⁰ God and Stee, resp. Godwin and Steevens, have been declared as scholars.⁵¹
- REM. 2 `\ekdlettrine` (l. 23) is a specific command for the `lettrine` package does not work in list environments. `\TeXtoTEIPat` has been used as described below on page 68 to instruct `ekdosis` to convert this command into an acceptable TEI equivalent. The definition of `\ekdlettrine` follows:—

```
% Preamble:
\usepackage{adjustbox}
% This basic command actually requires an adjustment of the vertical
% space at the end of the current line (eg. \[-1.875ex]) and \vin at
% the beginning of the next line:---
\NewDocumentCommand{\ekdlettrine}{mm}{%
\adjustbox{valign=t,raise=-0.75ex}{\Huge #1}\textsc{#2}%
}
\TeXtoTEIPat{\ekdlettrine {#1}{#2}}{<hi rend="smallcaps">#1#2</hi>}
```

PDF output:—

	1	
FROM faireft creatures we defire increafe,	1	
That thereby beauties <i>Rofe</i> might neuer die,	2	
But as the riper should by time deceafe,	3	
His tender heire might beare his memory:	4	
But thou contracted to thine owne bright eyes,	5	
Feed'ft thy lights flame with felfe fubftantiall fewell,	6	
Making a famine where aboundance lies,	7	
Thy felfe thy foe,to thy fweet felfe too cruell:	8	
Thou that art now the worlds frefh ornament,	9	
And only herauld to the gaudy fpring,	10	
Within thine owne bud burieft thy content,	11	
And tender chorle makft waft in niggarding:	12	
Pitty the world,or elfe this glutton be,	13	
To eate the worlds due,by the graue and thee.	14	

2. might] *may* G S E 3. decease] *decrease* Hu² 6. lights] *life's* But Wa selfe substantia]l] Hyphened by G² etc. 10. only] *early* Godwin conj. 12. chorle] *churl* G etc. 14. by the] *be thy* Stee conj. *by thy* Godwin conj. and] *as* Godwin conj.

TEI xml output:—

```
<div type="sonnets" n="1">
  <head>1</head>
  <lg type="sonnet">
    <lg type="quatrain">
      <l>
        <hi rend="smallcaps">Fr</hi>om fairest creatures we
        desire increase,</l>
      <l>That thereby beauties
        <emph>Rose</emph>
      <app>
```

50. See above on page 10 and below sect. 12.7 on page 70.

51. See above on page 11.

```

    <lem>might</lem>
    <rdg source="#Gildon1710 #Sewell1725 #Ewing1771">
    may</rdg>
</app>neuer die,</l>
<l>But as the riper should by time
<app>
    <lem>decease</lem>
    <rdg source="#Hudson1856">decrease</rdg>
</app>,</l>
<l>His tender heire might beare his memory:</l>
</lg>
<lg type="quatrain">
    <l>But thou contracted to thine owne bright eyes,</l>
    <l>Feed'st thy
    <app>
        <lem>lights</lem>
        <rdg source="#Butler1899 #Walsh1908">
        life's</rdg>
    </app>flame with
    <app>
        <lem>selfe substantiall</lem>
        <rdg source="#Gildon1714">
        selfe-substantiall</rdg>
        <note>etc.</note>
    </app>fewell,</l>
    <l>Making a famine where aboundance lies,</l>
    <l>Thy selfe thy foe,to thy sweet selfe too
    cruell:</l>
</lg>
<lg type="quatrain">
    <l>Thou that art now the worlds fresh ornament,</l>
    <l>And
    <app>
        <lem>only</lem>
        <rdg resp="#God" type="conjecture">early</rdg>
        <note>conj.</note>
    </app>herauld to the gaudy spring,</l>
    <l>Within thine owne bud buriest thy content,</l>
    <l>And tender
    <app>
        <lem>chorle</lem>
        <rdg source="#Gildon1710">churl</rdg>
        <note>etc.</note>
    </app>makst wast in niggarding:</l>
</lg>
<lg type="couplet">
    <l>Pitty the world,or else this glutton be,</l>
    <l>To eate the worlds due,
    <app>
        <lem>by the</lem>
        <rdg resp="#Stee" type="conjecture">be thy</rdg>
        <note>conj.</note>
        <rdg resp="#God" type="conjecture">by thy</rdg>
        <note>conj.</note>
    </app>graue


```

```

    <app>
      <lem>and</lem>
      <rdg resp="#God" type="conjecture">as</rdg>
      <note>conj.</note>
    </app>thee.</l>
  </lg>
</lg>
</div>

```

8 Lineation Settings

 **ekdosis** uses **lineno** internally for line numbering.⁵² But it must be noted that **ekdosis** strictly prohibits the “pagewise” mode of operation that is provided by **lineno**. As a result of this hinderance, all “margin switching” functions of **lineno** are disabled within the environments that are specific to **ekdosis**, viz. **ekdosis** and **alignment**.

That said, **ekdosis** provides equivalents of its own to handle the line numbers the same way as **lineno**’s “pagewise” mode of operation does.

\SetLineation **\SetLineation{<csv list of options>}** may be used in the preamble or at any point of the document to set lineation preferences. Its argument processes the **key=value** options that follow:—

General Options

lineation **lineation=page|document|none** Default: document
lineation=document has the lines numbered continuously throughout the document while **lineation=page** instructs **ekdosis** that the numbering should start afresh at the top of each page. **none** does the same as **page** but prevents the numbers from being printed in the margins while keeping them in use in the apparatus criticus.

modulo **modulo** Default: not set
modulo does not accept any value. When this option is set, every fifth line is numbered.

modulonum **modulonum=n** (where *n* is an integer) Default: not set
modulonum allows to modify the interval between the numbers that are printed. **modulo** must be set for this option to have effect. As examples, **modulo**, **modulonum=3** has every third line numbered and **modulonum=1** disables modulo numbering.

margin **margin=right|left|inner|outer** Default: left
margin sets the margin in which the line numbers are to be printed.

numbers **numbers=elided|full** Default: elided
This option only has effect on the numbers that are printed in the apparatus criticus. **numbers=elided** applies on spans of numbers and elides the last number of a range to the fewest number of figures possible—viz. 35–7, 129–31 &c.—without eliding digits in the group 10 to 19 in each hundred—viz. 17–19, 115–18 &c. **numbers=full** leaves the numbers untouched.

\innerlinenumbers **\innerlinenumbers** and **\outerlinenumbers** are equivalent to **\SetLineation{numbers=outer}** and **\SetLineation{numbers=inner}** respectively. Both commands are complementary to **\rightlinenumbers** and **\leftlinenumbers** already provided by the **lineno** package.

Options Specific to the poetry=verse Global Setting⁵³

vlination **vlination=page|document** Default: document

⁵² Uwe Lück and Stephan Böttcher, *The Lineno package* (version 4.41) [Line numbers on paragraphs] (Nov. 2, 2005), <http://www.ctan.org/pkg/lineno>.

⁵³ See above [sect. 7.2 on page 40](#).

`vlineation` operates on verse texts in the same way as `lineation` on prose texts.

`vmodulo` `vmodulo= n` (where n is an integer) Initially: 1, Default: 5

`vmodulo= n` has every n^{th} lines of verse printed in the margin. If used without value, this option is equivalent to `vmodulo=5`. `vmodulo=0` prevents the numbers from being printed.

`vmargin` `vmargin=right|left` Default: right

`vmargin` sets the margin in which the verse line numbers are to be printed.

`continuousvnum` Default: not set

The `poetry=verse` global option has the succeeding lines of verse numbered independently of prose text. `continuousvnum` has all lines numbered continuously, irrespective of whether they are lines of prose or poetry text.

Useful Lineation Commands As implied above, pretty much all commands that are provided by the “running” mode of operation of the `lineno` package will work with `ekdosis`, notably the following:—

`\modulolinenumbers` `\modulolinenumbers[$\langle n \rangle$]` can be used to enable modulo line numbering as described above.

`\resetlinenumber` `\resetlinenumber[$\langle n \rangle$]` resets the line number to one or to n if specified.


`\linenumberfont` `\renewcommand{\linenumberfont}{ $\langle commands \rangle$ }` can be used to set the font used for the line numbers that are printed in the margins. By default, the definition is `\normalfont\footnotesize`.

`\linenumbersep` `\linenumbersep` is the distance between the numbers and the margin. By default, this distance is set to 10 pt. It can be redefined like so: `\setlength\linenumbersep{ $\langle length \rangle$ }`.

Poetry Lineation Commands In addition to these commands, if `ekdosis` be loaded with the global option `poetry=verse` as described above in [sect. 7.2 on page 40](#), the commands dedicated to line numbering that are provided by the `verse` package can be used.

`\resetvlinenumber` `\resetvlinenumber[$\langle n \rangle$]` has for lines of verse the same effect as `\resetlinenumber` for lines of prose text.

`\verselinenumfont` `\verselinenumfont{ $\langle commands \rangle$ }` can be used to set the font used for lines of verse. By default, the definition is `\normalfont\footnotesize`.

 If the `memoir` class be loaded, this command is replaced with `\linenumberfont` described above.


`\vrightskip` The `verse` package prints the numbers at the distance `\vrightskip` into the right margin. This distance can be redefined by means of `\setlength` like so: `\setlength\vrightskip{ $\langle length \rangle$ }`.

`\linelabel` **Labels** In prose as well as in poetry texts, `\linelabel{ $\langle label \rangle$ }` sets a line label that can be referred to with `\ref{ $\langle label \rangle$ }`.


As an example, what follows has every fifth line number printed in the inner margins. Additionally, the numbering shall start afresh at the top of each page:—

```
\SetLineation{
  lineation=page,
  modulo,
  margin=inner
}
```

9 Languages

 **ekdos** is fully compatible with **babel**. “Fully compatible” means that all features provided by **babel**, including language switching commands, are supported by **ekdos**. **ekdos** is also compatible with **polyglossia** with one notable exception: **luabidi**, which **polyglossia** loads for languages written from right to left, is not supported by **ekdos**, and most probably never will be. That said, as far as the author could see, single-layer apparatus, as described in [sect. 5.2 on page 32](#), can be typeset within the Arabic environment that is provided by **polyglossia**. Unfortunately, the same cannot be said for multiple-layer apparatus.

Whether **babel** or **polyglossia** is used, **ekdos** automatically applies the current language to the entries of the apparatus criticus, including the fonts that may have been associated to the languages in the preamble. In this respect, as **polyglossia** can use the same language switching commands as **babel**,⁵⁴ the general advice given above in [sect. 4.1.1 on page 29](#) applies in all cases. As regards setting languages in the TEI `xml` output file, the reader is invited to refer to point (c) on page 28, and [sect. 12 on page 62](#) including the example provided on page 67.

 In some cases, it may be needed to apply in the apparatus criticus a language different from the one that is selected in the edition text. To this end, **ekdos** provides a set of facilities which are described on pages 33–34 for single-layer apparatus and on page 35 for multiple-layer apparatus.

9.1 Languages Written From Right to Left

As said above, **polyglossia** is not supported by **ekdos** for languages that are written and read from right to left, like Arabic, Hebrew or Syriac. However, as **babel** is supported and can be loaded concurrently with **polyglossia**, an easy way is to use **babel** to print such languages.

 The reader is invited to refer to and become acquainted with the relevant parts of the documentation of the **babel** package.⁵⁵

babel Only In the following example, **babel** is used exclusively to set three different languages: Arabic, ancient Greek and English:—

Listing 8: Multilingual editions with **babel** only

```
1 \usepackage{fontspec}
2
3 \usepackage[greek.ancient,english]{babel}
4 \babelprovide[onchar=fonts]{arabic}
5
6 \babelfont{rm}{Old Standard}
7 \babelfont[greek]{rm}[RawFeature={+ss05;+ss06}]{Old Standard}
8 \babelfont[*arabic]{rm}{Amiri}
9
10 \babeltags{ancientgreek = greek}
11 \newcommand{\sg}[1]{\textancientgreek{#1}}
12
```

54. See François Charette and Arthur Reutenauer, *The Polyglossia package* (version 1.49) [An alternative to **babel** for XeLaTeX and LuaLaTeX] (Apr. 8, 2020), <http://www.ctan.org/pkg/polyglossia>, 3.2 p. 14.

55. Javier Bezos López and Johannes L. Braams, *The Babel package* (version 3.47) [Multilingual support for Plain TeX or LaTeX] (July 13, 2020), <http://www.ctan.org/pkg/babel>.

```

13 \newcommand{\RL}[1]{\bgroup\textdir TRT#1\egroup}
14 \newenvironment{Arabic}{\par\pardir TRT\textdir TRT}{\par}

```

- REM. 1 As can be seen, `fontspec` has been loaded before `babel`. To the author’s knowledge, this gives better results when `\belfont` is used.
- REM. 2 Line 3 loads `babel` and instructs it to use English as the default language and ancient Greek as a second optional language. The built-in `bidir` mechanism provided by `babel` is not enabled. As a result, specific language switching commands for Arabic must be defined just as it must be for every other language.
- REM. 3 Line 4 does not load any Arabic, but instructs `babel` that it should use the Arabic font that is set below with `\belfont` whenever an Arabic letter is encountered.
- REM. 4 Lines 6–8 select the fonts: `Old Standard` is the default font to be used for Roman shape (l. 6); the same font is used for Greek, with some additional Open Type features enabled; finally, the `Amiri` font is used for Arabic.
- REM. 5 Lines 10–11 define so-called “tags” for easier access to ancient Greek through `\begin{ancientgreek} ... \end{ancientgreek}` for running paragraphs and `\textancientgreek{<text>}` for short insertions of Greek in English text. `\sg{<text>}` is just a shorthand for this latter command.
- REM. 6 Finally, lines 13–14 define simple language switching commands for Arabic. As can be seen, no commands other than the LuaTeX primitives `\pardir` and `\textdir` have been used for `babel` already takes care of selecting the Arabic font. `\RL` is for short insertions of Arabic words in English paragraphs while `\begin{Arabic} ... \end{Arabic}` is for running paragraphs of Arabic text.

`\setRL` **Changing the Writing Direction** `\setRL` and `\setLR` are two argument-less commands provided by `ekdosis` that can be used to change the writing direction of running paragraphs. The former sets the direction from right to left and the latter from left to right. If `babel` be set as above, `\setRL ... \setLR` can be used in place of `\begin{Arabic} ... \end{Arabic}`.

polyglossia Associated With \babelprovide What follows illustrates how `babel` can be used conjointly with `polyglossia` for the same three languages as above without having to load `luabidi`:—

Listing 9: Multilingual editions with `babel` and `polyglossia`

```

1 \usepackage{fontspec}
2
3 \usepackage{babel}
4 \babelprovide[onchar=fonts]{arabic}
5
6 \setmainfont{Old Standard}
7 \newfontfamily\greekfont{Old Standard}[RawFeature={+ss05;+ss06}]
8 \belfont[*arabic]{rm}{Amiri}
9
10 \usepackage{polyglossia}
11 \setdefaultlanguage{english}
12 \setotherlanguage[variant=ancient]{greek}
13
14 \newcommand{\textarabic}[1]{\bgroup\textdir TRT#1\egroup}
15 \newenvironment{Arabic}{\par\pardir TRT\textdir TRT}{\par}

```

- REM. 1 Line 3 just loads `babel` with no default language.
- REM. 2 Lines 4 and 8 are used to have the Arabic font automatically selected as above.
- REM. 3 Lines 14–15 define the exact language switching commands that would have been defined if `polyglossia` and `luabidi` had been used for Arabic.

As one can see, the important points about languages written from right to left are to use `babel` only to select the Arabic fonts, avoid using the bidirectional mechanism it provides and define commands and environments that use only LuaTeX primitives to set

the writing direction. Then, an Arabic edition text—to continue with this example—can be entered as plainly as follows:—

```
\begin{ekdosis}
\begin{Arabic}
\app{
  إِنَّ أَيْ كَانَ مِنْ
  \lem{المقاتلة}
  \rdg{المقاتلين}
  } وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بَيُوتِ الزَّمَانَةِ.
\end{Arabic}
\end{ekdosis}
```

It should be reminded that the writing direction of the apparatus criticus itself is independent of that of the edition text and must be set either with `\Set(LTR|RTL)app` or with the `direction` optional argument of `\SetApparatus` for single-layer apparatus criticus, or by means of `\DeclareApparatus` for multiple-layer apparatus criticus.⁵⁶

The PDF output with left-to-right apparatus criticus follows:—

1 إِنَّ أَيْ كَانَ مِنْ الْمُقَاتِلَةِ وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بَيُوتِ الزَّمَانَةِ.

1 الْمُقَاتِلَةِ [المقاتلين]

And here follows the PDF output with right-to-left apparatus criticus:—

1 إِنَّ أَيْ كَانَ مِنْ الْمُقَاتِلَةِ وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بَيُوتِ الزَّمَانَةِ.

1 الْمُقَاتِلَةِ [المقاتلين]

9.2 Using arabluatex

`arabluatex` is a `LuaLaTeX` package that provides commands and environments which return Arabic writing from an ASCII transliteration (either `ArabTeX` or Buckwalter scheme).⁵⁷ It is particularly well-suited for complex documents such as critical editions where a lot of commands intertwine with Arabic writing. `arabluatex` can output Unicode Arabic in the same modes as `arabtex`⁵⁸ or in different accepted standards of romanization. It is also able to produce a duplicate of the original `.tex` source file in which all `arabtex` or `buckwalter`

56. See above [sect. 5.2 on page 32](#) (single-layer apparatus criticus) and [sect. 5.3 on page 34](#) (multiple-layer apparatus criticus).

57. Robert Alessi, *The Arabluatex package* (version 1.20) [ArabTeX for LuaLaTeX] (Mar. 23, 2020), <http://ctan.org/pkg/arabluatex>.

58. Klaus Lagally, *The Arabtex package* (version 4.00) [Macros and fonts for typesetting Arabic] (Mar. 11, 2004), http://baobab.informatik.uni-stuttgart.de/ifi/bs/research/arab_e.html.

strings are replaced with Unicode equivalents, either in Arabic script or in any accepted standard of transliteration.⁵⁹

arabluatex is fully supported by ekdosis. The following example illustrates how arabluatex and ekdosis interact with each other to produce distinct TEI xml outputs from a single .tex source file:—

Listing 10: ekdosis and arabluatex

```

1 % Preamble:
2 % load ekdosis and ask for TEI xml output:
3 \usepackage[telexport]{ekdosis}
4 % load arabluatex and request a LaTeX output with Unicode Arabic:
5 \usepackage[export,fullvoc]{arabluatex}
6
7 % document:
8 \begin{arabexport} % export arabtex strings to Unicode Arabic
9   \begin{ekdosis}
10     \begin{arab}
11       'inna 'abI kAna mina
12       \app{
13         \lem{'l-muqAtilaTi}
14         \rdg{'l-muqAtilIna}
15       }
16       wa-kAnat 'ummI min `u.zamA'i buyUti 'l-zamAzimaTi.
17     \end{arab}
18   \end{ekdosis}
19 \end{arabexport}

```

The PDF output with left-to-right apparatus criticus is of course the same as above:—

1 إِنَّ أَبِي كَانَ مِنَ الْمُقَاتِلَةِ وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بُيُوتِ الزَّمَانَةِ.

1 الْمُقَاتِلِينَ الْمُقَاتِلَةِ

However, assuming that the source file is called `source.tex`, ekdosis produces as instructed from this file an additional `source-tei.xml` as follows:—

```

<p xml:lang="ar-Latn" type="transliterated"
  subtype="arabtex">'inna 'abI kAna mina
  <app>
    <lem>'l-muqAtilaTi</lem>
    <rdg>'l-muqAtilIna</rdg>
  </app>wa-kAnat 'ummI min `u.zamA'i buyUti
  'l-zamAzimaTi.</p>

```

At the same time, arabluatex is instructed to produce on its own from the same `source.tex` an additional `source_out.tex` in which all `arabtex` strings found within `\begin{arabexport} ... \end{arabexport}` (see [listing 10](#), ll. 9–19) are replaced with full-vocalized Arabic Unicode script. Finally, compiling this latter file produces the following `sample-arabic_out-tei.xml` an extract of which follows:—

59. Alessi, *The Arabluatex package* (cf. n. 57), “Exporting Unicode Arabic to an External File.”

```

<p xml:lang="arb">إِنَّ أَيْنِ كَانَ مِنْ
<app>
  <lem>المُقاتلة</lem>
  <rdg>المُقاتلين</rdg>
</app>وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بَنِي
</p>الزَّمَازِمَةِ.

```

The reader will find the full `arabic-sample.tex` source file with instructions in [sect. 17 on page 90](#), and is invited to refer to the documentation of the `arabluatex` package for more information on the way to use its Arabic environments and built-in functions dedicated to export `arabtex` ASCII strings to Unicode.⁶⁰

10 Divisions of the Body

The features that are described in this section call for one general remark. `ekdosis` is designed to figure out where any L^AT_EX command that is converted to a TEI opening element allowed to nest recursively, such as `<div>`, `<lg>` and the like, is to be closed, even though there is no explicit indication of the point where the closure occurs. Thoroughly scanning L^AT_EX source files with Lua functions which involve complex string matching and recursions was required, as L^AT_EX ‘open’ commands such as `\chapter` or `\section` only act as milestones, contrary to TEI elements.

⚠ It must be noted that the two styles described hereinafter are mutually exclusive. TEI `xml` forbids that both be combined within a single `<body>` element.⁶¹ As a result, `ekdosis` will disregard whichever one is not selected.

10.1 L^AT_EX Standard Divisions

`ekdosis` can use the L^AT_EX standard textual divisions, such as `\book`, `\chapter`, `\section` and the like.

⚠ However, to have these divisions properly translated into TEI numbered `<div>` elements, the `divs` general option must be set to `latex` explicitly—viz. `divs=latex`—as described above on page 6.

⚠ As the `alignment` environment that is provided by `ekdosis` places all aligned texts within TEI `xml` un-numbered `<div>` elements and L^AT_EX textual divisions are converted into numbered `<divn>` elements, inserting such divisions in texts to be aligned will result in an invalid TEI `xml` output. Instead, un-numbered divisions through `\ekddiv` must be used as described below in [sect. 10.2 on the following page](#).

Once `divs` has been set to `latex`, `ekdosis` converts `\book`, `\part`, `\chapter`, `\section`, `\subsection` and `\subsubsection` into corresponding TEI ‘numbered’ `<divn>` elements, where $1 \leq n \leq 6$.

`\MkBodyDivs` **Adjusting the Levels of Textual Subdivisions** `\MkBodyDivs{<div1>}{<div2>}{<div3>}{<div4>}{<div5>}{<div6>}` takes six mandatory arguments. This command can be used in the preamble or at any point of the document to make the number of the first-level subdivision of the edition text, viz. `<div1>`, match to any L^AT_EX command

60. Alessi, *The Arabluatex package* (cf. n. 57).

61. See <https://tei-c.org/release/doc/tei-p5-doc/en/html/DS.html#DSDIV>.

other than `\book`. For example, if `\section` be the highest-level sectional command used, then `\MkBodyDivs{section}{subsection}{subsubsection}{-}{-}{-}` will have `\section`, `\subsection` and `\subsubsection` converted into `<div1>`, `<div2>` and `<div3>` respectively.

Inserting Variants in Headings Variant readings can be inserted in headings. In this case, the optional argument of the L^AT_EX sectional command must naturally be used to prevent variants from going into headers, footers or the table of contents, like so:⁶² —

```


1 % Preamble:
2 \usepackage[telexport=tidy, divs=latex]{ekdosis}
3 \MkBodyDivs{chapter}{section}{-}{-}{-}
4
5 % Document:
6 \chapter[Ιπποκράτους ἐπιδημιῶν βιβλίον δεύτερον]{Ιπποκράτους ἐπιδημιῶν
7   \app{
8     \lem[wit={I,R,H}]{βιβλίον δεύτερον}
9     \rdg[wit=V]{λόγος β'}}
```

TEI xml output:—

```

<div1 type="chapter">
  <head>Ιπποκράτους ἐπιδημιῶν
  <app>
    <lem wit="#I #R #H">βιβλίον δεύτερον</lem>
    <rdg wit="#V">λόγος β'</rdg>
  </app></head>
  <div2 type="section">
    <head>
      <app>
        <lem><supplied resp="#ego" type="emendation">Τμήμα
          πρώτον</supplied></lem>
      </app>
    </head>
    <p>Ἄνθρακες θερινοὶ ἐν Κραννῶνι· [...</p>
  </div2>
</div1>
```

10.2 TEI Un-numbered Divisions

 As already described on page 6, the un-numbered style of division is the one that is set by default. It is congruous to the general option `divs=ekdosis`.

This style provides a flexible mechanism in which format and presentation are separated from content. It is designed to meet the requirements of classical and literary texts the divisions of which may depend on many different received traditions.

62. On the use of `egomute` (l. 13), see above [REM. 2 on page 21](#).

<code>\ekddiv</code>	<code>\ekddiv{<key-value arguments>}</code> is the unique sectional command provided by <code>ekdosis</code> . This command converts the divisions into un-numbered TEI <code><div></code> elements allowed to nest recursively and takes one mandatory argument in which the following key-value arguments are accepted:—	
<code>type</code>	<code>type=<name></code> <code>type</code> corresponds to the TEI class <code>att.typed</code> and can be used to classify the element in which it is found in any way. Suitable values here can be <code>book</code> , <code>chapter</code> , <code>section</code> and the like.	Default: none
<code>n</code>	<code>n=<value></code> <code>n</code> is meant to provide a number or any kind of label for the division and does not have to be unique in the document.	Default: none
<code>head</code>	<code>head=<name></code> <code>head</code> holds the title of the division and may further contain variant readings.	Default: none
<code>barehead</code>	<code>barehead=<name></code> <code>barehead</code> is supposed to be used to prevent unwanted commands from going into such places as headers, footers and the table of contents.	Default: none
<code>depth</code>	<code>depth=<n></code> where $1 \leq n \leq 9$ As TEI un-numbered divisions are simply <code><div></code> elements allowed to nest recursively to indicate their hierarchic depth and <code>\ekddiv</code> is an ‘open’ <code>LaTeX</code> command, <code>n</code> is needed to indicate the depth of the division within the hierarchy, the largest being 1 and the smallest being 9.	Default: 1
<code>toc</code>	<code>toc=book|part|chapter|section|subsection|subsubsection|paragraph|subparagraph</code> If <code>toc</code> be set, the title of the division goes into the table of contents at the hierarchic level that is specified as value.	Default: not set
<code>mark</code>	<code>mark=<signpost></code> <code>mark</code> holds the signpost to be emitted as marker for headers and footers. Its value is recalled by <code>\ekdmark</code> as described below in sect. 10.3 on page 58 .	Default: none

New feature v1.3

\FormatDiv **Formatting the Titles** By design, `ekdosis` does not format the titles. Instead, depending on what is needed for the edition text, `\FormatDiv{<n>}{<code before>}{<code after>}` is provided to lay out the titles of any hierarchic depth of division. This command takes three mandatory arguments as follows: `<n>`, which is the number referring to the particular depth of division to be formatted and some `LaTeX` commands to go before and after the title itself. The following example illustrates how the titles of the largest division can be printed horizontally centered in a larger size:—

```
\FormatDiv{1}{\begin{center}\Large}\end{center}}
```

To elaborate on the example provided above in [sect. 10.1 on page 54](#), here follows how the first three hierarchical levels could be formatted as un-numbered divisions:—

Listing 11: Divisions of the body text

```
1 % Preamble:
2 \FormatDiv{1}{\begin{center}\Large}\end{center}}
3 \FormatDiv{2}{\begin{center}\large}\end{center}}
4 \FormatDiv{3}{\bfseries}{.}
5
6 % Document:
7 \begin{ekdosis}
8   \ekddiv{
```

```

9      head={Ἱπποκράτους ἐπιδημιῶν
10        \app{
11          \lem[wit={I,R,H}]{βιβλίον δεύτερον}
12          \rdg[wit=V]{λόγος β' }},
13      type=book,
14      depth=1,
15      n=II
16    }
17
18    \ekddiv{
19      head={\app{
20        \lem[resp=egomute, post=suppleui,
21          type=emendation]{\supplied{Τμήμα πρώτον}}
22        \rdg[wit=codd, alt=om.]{ }},
23      type=section,
24      depth=2,
25      n=II.1
26    }
27
28    \ekddiv{head=1, type=paragraph, depth=3, n=II.1.1}
29    Ἄνθρακες θερινοὶ ἐν Κραννῶνι· [...]
30  \end{ekdosis}

```

PDF output:—

1 Ἱπποκράτους ἐπιδημιῶν βιβλίον δεύτερον

2 <Τμήμα πρώτον>

3 1. Ἄνθρακες θερινοὶ ἐν Κραννῶνι· [...]

1 βιβλίον δεύτερον IRH] λόγος β' V 2 Τμήμα πρώτον suppleui] om. codd.

TEI xml output:—

```

<div xml:id="div-hippocrates_1" xml:lang="grc">
  <div type="book" n="II">
    <head>Ἱπποκράτους ἐπιδημιῶν
    <app>
      <lem wit="#I #R #H">βιβλίον δεύτερον</lem>
      <rdg wit="#V">λόγος β' </rdg>
    </app></head>
    <div type="section" n="II.1">
      <head>
        <app>
          <lem resp="#ego" type="emendation">
            <supplied>Τμήμα πρώτον</supplied>
          </lem>
          <rdg wit="#V #I #R #H" />
        </app>
      </head>
      <div type="paragraph" n="II.1.1">

```

```

<head>1</head>
<p>Ἀνθράκες θερμοὶ ἐν Κραννῶνι· [...]</p>
</div>
</div>
</div>
</div>
</div>

```

10.3 Headers and Footers

New feature v1.3

ekdosis provides a mechanism of its own for emitting header and footer marks. The first operation consists in recording the information to be printed as signpost by means of the `mark` optional argument of the `\ekddiv` command described above in [sect. 10.2 on page 55](#).

`\ekdmark`

Once this is done, `\ekdmark` can be inserted in commands used to make headers and footers where the mark is to be printed.

A common layout is that of headers in which one finds printed in sequence on even pages the page number, then the author’s name, and on odd pages the title of the edited text, then the current division, then the page number, like so:—

Even pages:

<code>\thepage</code>	Hippocratis
-----------------------	-------------

Odd pages:

Epidemiarum liber II, <code>\ekdmark</code>	<code>\thepage</code>
---	-----------------------

To return to the example provided by [listing 11 on page 56](#), the mark of the current division would be inserted in the third-level `\ekddiv` command printed at line 28 like so:—

28

```
\ekddiv{head=1, type=paragraph, depth=3, n=II.1.1, mark={1, 1}}
```

The following example finally illustrates how the corresponding headers and footers can be prepared in a straightforward way with the help of the `titleps` package:⁶³—

```

% Preamble:
\usepackage{titleps}
\newpagestyle{edition}{
  \sethead[\thepage][Hippocratis][ ]
  {}{Epidemiarum liber II, \ekdmark}{\thepage}
}
% Apply the page style:
\pagestyle{edition}

```

`\endmark`

It must be noted that `\ekdmark` is designed to print the first mark that is emitted on a given page and ignore the mark corresponding to any portion of text that may be printed between the top of the page and the point where the first mark is called. `\endmark` is an argument-less command that can be used just at the end of that portion of text to instruct ekdosis to print the last-emitted mark of the preceding page instead of the first-emitted mark of the current page.

Removing Headers and Footers Pages such as title pages must be printed with empty headers and footers. ekdosis must be given control over every item of information inserted in these areas beforehand.

`\ekdprintmark`

`\ekdprintmark{<selector>}{<signpost>}` The signposts printed in headers and footers

63. Javier Bezoz López, *The Titleps package* (version 2.13) [Page style control] (Oct. 16, 2019), <https://ctan.org/pkg/titleps>.

must be passed as second argument of `\ekdprintmark` so that `ekdosis` can remove them on pages where printing them is not desirable. *selector* refers to three symbolic letters where the first can be either `H` or `F`—for `header` or `footer`—, the second `E` or `O`—for `odd` or `even`—and the third `L`, `C` or `R`—for `left`, `center` or `right`. The example provided above would then read as follows:—

```
% Preamble:
\usepackage{titleps}
\newpagestyle{edition}{
  \sethead[\ekdprintmark{HEL}{\thepage}]
           [\ekdprintmark{HEC}{Hippocratis}]
           []
  {}
  {\ekdprintmark{HOC}{Epidemiarum liber II, \ekdmark}}
  {\ekdprintmark{HOR}{\thepage}}
}
% Apply the page style:
\pagestyle{edition}
```

`\ekdnohfmarks` Once all signposts are marked with `\ekdprintmark`, `\ekdnohfmarks` can be used at any point of the document with the same effect as the L^AT_EX standard command `\thispagestyle{empty}`.

`\ekdresethfmarks` Finally, `\ekdresethfmarks` is provided in rare cases when it is needed to reset headers and footers to their original, viz. printable state.

11 The Tricks of the Trade

As the `.tex` source file is compiled, `ekdosis` has to compute a tremendous amount of data. Most of this work is performed by Lua functions. An edition text narrowed down to a single page needs to be compiled at least three times. On the first run, the apparatus criticus does not show. Instead, `ekdosis` produces an auxiliary file named `\jobname.ekd` in which all the entries of the apparatus criticus are collected. Then, on the second run a test is performed on this auxiliary file to determine whether there are entries—and if so, which ones—to be printed on the current page. At the same time, references to the line numbers are updated if necessary. Finally, on the third run, the apparatus criticus is printed.

Of course, every change made to the input may similarly require LuaL^AT_EX to be run three more times to get everything to the right place with the right numbers.

11.1 The Oscillating Problem

In some instances, notably when on a given page entries are very abundant in number, specifically when the edition text is getting close to the bottom of the page, `ekdosis` may oscillate indefinitely between different sets of page decisions without being able to settle down. The condition may be typically illustrated as follows: after LuaL^AT_EX has been run, an entry is attached to the last line of the page. As said above, this entry does not show yet. But when it does, should it result in an additional line being printed in the apparatus criticus, the last line of the edition text—the one the entry was previously attached to—goes to the next page. As a result, this entry also moves to the next page with the line it belongs to. This point is literally critical, because unless a `\pagebreak` is inserted just here so as to keep the contentious line on the next page, `ekdosis` enters a vicious circle from which it cannot escape, not to mention that right entries with right line numbers cannot come on pages that follow a wrong page either.

An alert reader may have guessed that inserting a `\pagebreak` is a good way to get out of the vicious circle. And surely, if only a few pages be at stake, this is the way to go. However, `\pagebreak` commands should only be inserted when the whole edition text is ready for any substantial change in the preceding pages may result in pages that break just after they begin.

`\ekdpb` **Conditional page breaks** `\ekdpb[⟨page no⟩]{⟨line no⟩} \ekdpb*{} \ekdpb*\`
`\ekdpb*` One way to avoid this inconvenience is to use `\ekdpb` instead of the standard `\pagebreak`
New feature v1.2 command provided by L^AT_EX to insert conditional page breaks. `\ekdpb` takes as mandatory argument the line number, as it is printed in the margin, where the page break should take place. An optional argument allows to further specify the page number where the page break should occur. The value that is expected is the page number as it is printed—e.g. an Arabic, Roman or alphanumeric number. If the specified conditions be not met, then the page break is not triggered. Finally, the “starred” version of this command forces the page break, irrespective of the values specified as page or line numbers. Unlike `\ekdpb`, which requires the lines to be numbered, `\ekdpb*` is allowed at any point of the document: as `\ekdpb*` disregards the number given as argument, it is equivalent to the standard L^AT_EX `\pagebreak` command. Yet it can be used instead of the latter to have marks further printed in the margins so as to spot with a fleeting glance the locations where induced page breaks occur.⁶⁴

Using `maxentries` Another way—should the edition text fall into the vicious circle too often—is to limit the number of entries per page that a given layer of apparatus criticus may accept as described above on page 35. As a result, `ekdosis` will take care of inserting automatic breakpoints between pages whenever the number of entries on a given page reaches the value set as `maxentries`.

`maxentries` must not be too small: otherwise offensive to look at vertical spaces may come between the edition text and the apparatus criticus. Conversely, `maxentries` must not be too big: otherwise, should entries overflow on a given page, the edition text and the apparatus criticus may clash again. As said above, a couple of clashes can be managed with a couple of manually inserted page breaks. But if there be too many of them, it is a good indication that the selected value of `maxentries` is too high.

Complex edition texts do have a magic number. An advisable way to figure it out would be to start from a sample of only a few pages, selected as evidence for the complexity of the whole. As only a few pages would need to be compiled, the magic number should emerge quite rapidly.

`\addentries` **Adding and Removing Entries** `\addentries[⟨layer⟩]{⟨n⟩}`
New feature v1.1 If `maxentries` be set for a given layer of critical notes, `\addentries[⟨layer⟩]{⟨n⟩}`, where `⟨n⟩` is an integer, can be used to add `⟨n⟩` to—or remove it from if `⟨n⟩` be negative—the number of accepted entries on the current page. `\addentries` operates on the default layer of notes, but any other declared layer can be specified in the optional argument of the command.



Of course, `\addentries` must be issued before the number of entries on a given page has reached the value set as `maxentries`.

Once a sensible value for `maxentries` has been found, `\addentries` can further be used with a positive integer to allow for more entries and more lines on some pages so that offending vertical spaces are decreased. Conversely, `\addentries` with a negative integer

64. This requires the `showpagebreaks` option to be set to `true` as described above on page 7.

will remove entries on pages where there are too many of them and `ekdos` still oscillates between different sets of page decisions.

New feature v1.3

The `fitapp` Global Option The rationale of this option is discussed above (see (d) on page 6). As this mechanism has the characters of the apparatus block scaled down to allow for more entries once a predefined height has been reached, `ekdos` should settle down in most of the contentious cases.⁶⁵ However, it is advisable to use `fitapp` conjointly with `maxentries` to prevent the number of allowed entries from being too high, which would result in the characters being too small or even illegible.

11.2 Variae Quaestiones

This section is about issues that are not strictly speaking part of the documentation of `ekdos` but may nevertheless circumstantially arise.

Superfluous Dots As said above on page 33, it is customary in some editions to have a full stop printed at the end of the apparatus criticus. `ekdos` provides specific commands to achieve this in a straightforward way, such as `\SetEndApparatus` and the `ehook` optional argument of `\SetApparatus` and `\DeclareApparatus`.⁶⁶ However, if the last word of the apparatus criticus on a given page be an abbreviation followed by a dot, such a setting will have two dots printed at the end of the apparatus instead of one. The solution is to define a command to have a dot printed only if not followed by a dot, and append this command to the abbreviated form of the word, like so:—

```

1 % Preamble:
2 \usepackage{xspace}
3 \usepackage{ekdos}
4
5 \makeatletter
6 \newcommand{\ekddot}{\%
7   \ltx@ifnextchar{.}{\xspace}{.\xspace}}
8 \makeatother
9
10 \DeclareApparatus{default}[ehook=.]
11 \DeclareScholar{Erm}{Erm\ekddot}

```

REM. 1 Line 2: The `xspace` package is needed for `\xspace` is used by the `\ekddot` command that is defined at l. 6.

REM. 2 Line 7: `\ltx@ifnextchar` is part of the `ltxcmds` package which is loaded by `ekdos`. As this command uses a private control sequence, it must be found within `\makeatletter ... \makeatother`.

REM. 3 Line 10: `\ekddot` will only work with multiple-layer apparatus criticus. Therefore, `\DeclareApparatus` must be used even if only one layer of critical notes be needed.

Backup of Essential Files Each time the `.tex` source file is compiled, `ekdos` reads the `.aux` corresponding L^AT_EX auxiliary file and its own `.ekd` auxiliary file so as to process labels and collect entries of the apparatus criticus. If for whatever reason—e.g. some unknown command has been inserted—the compilation be frozen and so must be aborted, it may happen that most of the edition text has to be reconstructed page after page. For large and complex editions, this makes advisable to have current versions of those files backed up each time a new compilation begins, which can be achieved by inserting the following lines before the line that loads the document class:—

⁶⁵. That is, cases that arise *after* the predefined height has been reached.

⁶⁶. See above on pages 33–34.

```

\RequirePackage{verbatimcopy}
\IfFileExists{\jobname.aux}{%
  \OldVerbatimCopy{\jobname.aux}{\jobname.aux.bak}}{}
\IfFileExists{\jobname.ekd}{%
  \OldVerbatimCopy{\jobname.ekd}{\jobname.ekd.bak}}{}
\documentclass{book}

```

This way, both `.aux` and `.ekd` files can be recovered from `.aux.bak` and `.ekd.bak` just after the compilation has been aborted. Should this be needed, one must proceed carefully as follows:—

- (a) Just after the compilation has been aborted, move both `aux.bak` and `ekd.bak` files to a safe place.
- (b) Remove or correct the offending command or lines that broke the compilation and make sure that the issue is solved.
- (c) Restore the `.aux` and `.ekd` files from `aux.bak` and `.ekd.bak` and resume work where it was left off.

12 TEI xml Output

Several examples of TEI `xml` output have been provided hitherto. Before proceeding, the reader is invited to return to every one of them. In this respect, it may be of interest to review carefully the excerpt of Caesar’s *Gallic War* of which the L^AT_EX source file and its corresponding TEI `xml` output are printed in full below in [sect. 16 on page 84](#). Once `ekdosis` has been instructed to convert the edition text into TEI `xml` (l. 11), the preamble of this file shows how to set languages and fonts to be used in the document (ll. 2–6), format the titles (l. 16) and lay out the alignment of an edition text associated with two translations (ll. 18–25) in modern languages. Furthermore, it shows how information related to each language (Latin, English and French) is to be found in two different places, namely for TEI `xml` output (ll. 21–3) and for PDF output through L^AT_EX (ll. 27–9). Finally, it provides examples of declaring witnesses, hands and shorthands (ll. 31–60). As to the document itself, it shows how to lay out a conspectus siglorum in a table (ll. 64–80), before giving detailed examples of how the edition text is entered (ll. 85–101) and sectional commands provided by `ekdosis` are used (ll. 86, 103 and 110).⁶⁷

12.1 Requesting TEI xml Output

TEI `xml` output is requested by means of the `teiexport` global option as described above on [page 7](#). Once instructed to output TEI, `ekdosis` converts and exports in sequence the contents of `ekdosis` environments (see above [sect. 2.5 on page 13](#)). As regards the contents of `alignment` environments (see above [sect. 4 on page 25](#)), `ekdosis` first collates the contents of the environments that have been declared as values of the `texts` optional argument of `alignment` or `\SetAlignment`,⁶⁸ then places each of the corresponding TEI `xml` outputs within distinct `<div>` elements named after the declared environments themselves. For example, to return to Caesar’s text, the Latin edition text is found between a `\begin{latin}` ... `\end{latin}` environment (see the `.tex` source file, [sect. 16.1 on page 84](#), ll. 85–101) which is declared at l. 21. Then, the corresponding `xml` output is found within a `<div>` element, the `xml:id` of which has been given by `ekdosis` the value `div-latin_1` (see [sect. 16.2 on page 86](#), ll. 176–200).

⁶⁷ The PDF output is available as [a separate file](#).

⁶⁸ See above [sect. 4.1 on page 27](#).

`\SetTEIFilename` **TEI File Name** `\SetTEIFilename{<basename>}` is a preamble-only command. It can be used to set the base name of the TEI `xml` output file, to which the suffix `.xml` is appended. By default, the base name is `\jobname-tei`.

12.2 General Principles

Validation of the TEI `xml` Structure The reference tool that the author relies on is that provided by the *TEI by Example Project*.⁶⁹ As for `ekdosis`, it is designed to produce on request, in addition to an edition in print, a TEI `xml`-compliant output file. That said, one must keep in mind that the \LaTeX packages that are part of \TeX Live can be counted in thousands, and the commands they provide in tens of thousands. There may even be grounds in asserting that the possibilities offered by \TeX and \LaTeX quite exceed what can be afforded by TEI `xml`. On another hand, many \LaTeX commands make no sense in TEI. Therefore, a sensible choice is to keep them out of the environments the contents of which are to be translated into `xml` elements, as will be illustrated by the following.

Converting a \LaTeX document into TEI `xml` can be quite an intricate business. In many cases, however, \LaTeX strings are found within environments or groups that are easy to convert into TEI equivalents: unless instructed otherwise, whether such groups are delimited by opening and closing braces or by explicit `\begin ... \end` commands, `ekdosis` translates them into `xml` so that for example `\emph{word}` and `\begin{quote} <quoted words> \end{quote}` become `<emph> <word> </emph>` and `<quote> <quoted words> </quote>` respectively.

But \LaTeX does not place everything into groups or environments. To take here but a few examples, sectional divisions are marked in \LaTeX with “open” commands such as `\chapter` or `\section` with no clear indication where the closure of divisions occurs, contrary to TEI `xml` markup with numbered or un-numbered `<div>` elements allowed to nest recursively. As regards running paragraphs of text, the situation is even worse than in the latter case, as the following simple example shows:—

```
1 \begin{document}
2 \begin{ekdosis}
3   ...
4
5   ... These are the final words of some section in the body text.
6
7   \section{New Section}
8
9   Here is how some new section begins...
10
11   ... Final words.
12   \section{Other Section}
13   Opening words of the section...
14
15   ... Final words
16
17   \section{Other Section}
18   Opening words...
19
20   ... Final words.
```

69. Ron Van den Branden, Melissa Terras, and Edward Vanhoutte, “TEI by Example,” <http://www.teibyexample.org>, accessed Aug. 4, 2020. The TEI validator is here: <http://teibyexample.com/xquery/TBValidator.xq>.

```

21 \end{ekdosis}
22 \end{document}

```

Obviously, construing this L^AT_EX source file into TEI `xml` is a fairly complex task. For example, line 6 only closes a paragraph for line 7 opens a division (hence `</p><div1>`), line 8 only opens a paragraph just after the heading of the section (hence `</head><p>`) while line 14 both closes the foregoing paragraph and opens a new one (hence `</p><p>`), contrary to line 16 which both closes a paragraph and a sectional division (hence `</p></div1>`), not to mention lines 20–1, where notwithstanding the absence of blank line or any other indication, `</p></div1></body></text></TEI>` is needed.

`ekdosis` has been designed to implement this task through Lua functions which involve string matching (both forward and reverse matching) and recursions.


`\SetTEIxmlExport` **TEI `xml` Export Settings** `\SetTEIxmlExport{<csv list of options>}` can be used in the preamble or at any point of the document, except inside environments set to receive an apparatus criticus, namely the `ekdosis` environment or any other similar environment declared by means of the `alignment` environment or `\SetAlignment`.⁷⁰ At the time of writing, there is only one option, as follows:—


autopar `autopar=true|false` Default: true

The algorithm described above applies for edition texts composed in running paragraphs or lines of poetry, but it may fail to produce a valid TEI `xml` output with other arrangements, such as performance texts or transcriptions of speech for which the TEI Guidelines define specific rules. `autopar=false` instructs `ekdosis` to ignore blank lines in the `.tex` source file as markers for paragraph boundaries. As a result, each paragraph of the edition text must be found within an environment associated with the `xml` element `<p>`, such as `ekdpar` or any other environment declared as such by means of `\EnvtoTEI` described below in [sect. 12.4 on page 66](#). A typical use case of `autopar=false` is provided below in [sect. 12.6 on page 69](#).

ekdpar `\begin{ekdpar} ... \end{ekdpar}` is a simple environment that does nothing but insert `\par` primitives. It can be used to instruct `ekdosis` to place paragraphs within `<p>` elements when `autopar` has been set to `false` by means of `\SetTEIxmlExport` described above.

The `xml:id` Attribute As a general rule, the `xml:id` global attribute must be unique for the element that bears the attribute. Furthermore, it must begin with a letter or an underscore and contain no characters other than letters of the Latin alphabet—from `a` to `z`, either upper or lower case—digits, hyphens, underscores and full stops. `ekdosis` issues a warning when it finds that any *<unique id>* of *<unique label>* expected in the first argument of `\DeclareWitness`, `\DeclareHand`, `\DeclareSource` or `\DeclareScholar` is not unique or breaks the rules just described, but does not prevent the `.tex` source file from compiling. Instead, it prints the string `<??>` in place of the expected formatted siglum so that the error in the `.tex` source file can be easily spotted and corrected.

 As the *<unique id>* declared with `\DeclareShorthand` is not to be exported in the TEI `xml` output file, `ekdosis` checks neither its uniqueness nor its validness.

 It must be noted that L^AT_EX labels that are provided in commands such as `\label`, `\cite` and the like must also be unique in the document. As L^AT_EX will issue warnings if duplicates be found, `\ekdosis` does not check their uniqueness but will issue warnings if such labels contain invalid strings.

⁷⁰. See above [sect. 4.1 on page 27](#).

12.3 Routine L^AT_EX Commands and Environments

The list of L^AT_EX commands known by `ekdos` at the time of writing follows. To this list must be added the L^AT_EX standard commands that are used for sectional divisions as described above in [sect. 10.1 on page 54](#) and most of the commands provided by the `arabluatex` and `icite`⁷¹ packages. Standard citation commands are also supported as will be described below in [sect. 12.8 on page 73](#):—

L ^A T _E X command	TEI xml element
<code>\textsuperscript{}</code>	<code><hi rend="sup"></hi></code>
<code>\textsubscript{}</code>	<code><hi rend="sub"></hi></code>
<code>\textbf{}</code>	<code><hi rend="bold"></hi></code>
<code>\textit{}</code>	<code><hi rend="italic"></hi></code>
<code>\textsc{}</code>	<code><hi rend="smallcaps"></hi></code>
<code>\textsf{}</code>	<code><hi rend="sf"></hi></code>
<code>\footnote{}</code>	<code><note place="bottom"></note></code>
<code>\marginpar{}</code>	<code><note place="margin"></note></code>
<code>\enquote{*}{}</code>	<code><quote></quote></code>
<code>\label{label}</code>	<code><anchor xml:id="label"/></code>
<code>\linelabel{label}</code>	<code><anchor xml:id="label"/></code>
<code>\ref{label}</code>	<code><ptr ="#label"/></code>
<code>\pageref{label}</code>	<code><ptr ="#label"/></code>
<code>\vref{label}</code>	<code><ptr ="#label"/></code>
<code>\vpageref{label}</code>	<code><ptr ="#label"/></code>
<code>\pagebreak<[1-4]></code>	no output
<code>\mbox{<text>}</code>	<code><text></code>
From the <code>extdash</code> ⁷² package:	
<code>\--- or \===</code>	<code>—</code>
<code>\-- or \==</code>	<code>–</code>
<code>\-/ or \=/</code>	<code>-</code>

As for environments:—

L ^A T _E X environment	TEI xml element
<code>flushright</code>	<code><p rend="align(right)"></p></code>
<code>flushleft</code>	<code><p rend="align(left)"></p></code>
<code>center</code>	<code><p rend="align(center)"></p></code>
<code>quotation</code>	<code><quote></quote></code>
<code>quoting</code>	<code><quote></quote></code>
<code>verse</code>	<code><lg></lg></code>

Regarding other, very frequently used commands or environments, some do not need to be inserted in the translation tables: as already said above, `ekdos` converts by default the original names of these into xml elements. For instance, `\emph{}` and `\begin{quote}` ... `\end{quote}` will result in `<emph></emph>` and `<quote></quote>` respectively.

71. Robert Alessi, *The Icite package* (version 1.3a) [Indices locorum citatorum] (Mar. 5, 2020), <http://ctan.org/pkg/icite>.

72. Alexander I. Rozhenko, *The Extdash package* (version 1.3) [A range of dash commands for compound words] (June 24, 2018), <http://www.ctan.org/pkg/extdash>.

For the same simple reason, should one wish to have words within a TEI `xml` element that does not have any \LaTeX equivalent, all is needed is to define an inoperative \LaTeX command named after the TEI element, like so:—

```
% Preamble:
\newcommand{\mentioned}[1]{#1}

% Document:

Our usage corresponds to the \mentioned{aggregate} of many
mathematical writings and to the sense of \mentioned{class} found in
older logical writings.
```

TEI `xml` output:—

```
<p>Our usage corresponds to the <mentioned>aggregate</mentioned> of
many mathematical writings and to the sense of
<mentioned>class</mentioned> found in older logical writings.</p>
```

Of course, it is also possible to have the “mentioned” words printed in a different font family:—

```
\newcommand{\mentioned}[1]{\textsf{#1}}
```

This command will print them in a sans serif font family, with the exact same TEI `xml` output as above.

12.4 Processing New Commands or Environments

The following three commands are provided to instruct `ekdosis` how to convert unknown or unusual \LaTeX commands or environments into TEI `xml` equivalents.

`\TeXtoTEI`

```
\TeXtoTEI{<cname>}{<TEI element>}[<TEI attribute(s)>]
```

`\TeXtoTEI` takes two mandatory arguments and one optional argument, namely: the control sequence name to be converted, the TEI element it is to be converted into and any additional `xml` attributes to be appended to the opening TEI element. For example, the `\sidenote` command that is provided by the `sidenotes` package can be processed like so:—

```
% Preamble:
\TeXtoTEI{sidenote}{note}[place="margin"]

% Document:
\begin{ekdosis}
  \begin{ekdverse}
    The self-same moment I could pray;\sidenote{The spell begins to
      break}\footnote{The turning point of the poem...}
  \end{ekdverse}
\end{ekdosis}
```

TEI `xml` output:—

```
<lg>
  <l>The self-same moment I could pray;
  <note place="margin">The spell begins to break</note>
  <note place="bottom">The turning point of the
```

```
poem...</note></l>
</lg>
```

Even more subtly, provided that the code `#STC` points to some more information identifying the agency concerned:⁷³—

```
% Preamble:
\usepackage{sidenotes}
\usepackage[telexport=tidy]{ekdosis}

\TeXtoTEI{sidenote}{note}[place="margin"]

\newcommand{\STCsnote}[1]{\sidenote{#1}}
\TeXtoTEI{STCsnote}{note}[place="margin" resp="#STC"]

% Document:
\begin{ekdosis}
  \begin{ekdverse}
    The self-same moment I could pray;\STCsnote{The spell begins to
      break}\footnote{The turning point of the poem...}
  \end{ekdverse}
\end{ekdosis}
```

TEI xml output:—

```
<lg>
  <l>The self-same moment I could pray;
  <note place="margin" resp="#STC">The spell begins to
  break</note>
  <note place="bottom">The turning point of the
  poem...</note></l>
</lg>
```

`\EnvtoTEI` `\EnvtoTEI{*}{⟨env name⟩}{⟨TEI element⟩}[⟨TEI attribute(s)⟩]`
`\EnvtoTEI*` `\EnvtoTEI` instructs `ekdosis` how to convert \LaTeX environments into TEI xml equivalents. It takes two mandatory arguments and one optional argument, namely the name of the \LaTeX environment to be converted, the TEI element it is to be converted into and any additional attributes to be appended to the TEI opening element. `\EnvtoTEI*` is restricted to TEI elements that must never appear within `<p>` elements, such as `<p>` itself, `<div>`, `<lg>` and the like. The following example illustrates how `\EnvtoTEI` can be used conjointly with `babel` to convey information about the languages used from \LaTeX to TEI:—

```
% Preamble:
% Use babel and babeltags:
\usepackage[greek.ancient, english]{babel}
\babeltags{ancientgreek = greek}

\EnvtoTEI{ancientgreek}{p}[xml:lang="grc"]
```

73. At the time of writing, ‘sources’ can be declared with `\DeclareSource` as described above on page 10. Then the unique identifier used in the first argument of this command can point to the list of references inserted by `ekdosis` in the back matter section of the TEI output file. See below [sect. 12.7 on page 70](#) for more information on how to do this. Scholars can also be referred to as individuals by means of the `\DeclareScholar` command. See above on page 10.

```
% Document:
\begin{ekdosis}
  \begin{ancientgreek}
    περί πολλοῦ ἂν ποιησαίμην, ὃ ἄνδρες, τὸ τοιούτους ὑμᾶς ἔμοι
    δικαστὰς περί τούτου τοῦ πράγματος γενέσθαι, οἷοίπερ ἂν ὑμῖν
    αὐτοῖς εἴητε τοιαῦτα πεπονθότες...
  \end{ancientgreek}
\end{ekdosis}
```

TEI xml output:—

```
<p xml:lang="grc">περί πολλοῦ ἂν ποιησαίμην, ὃ ἄνδρες, τὸ
τοιούτους ὑμᾶς ἔμοι δικαστὰς περί τούτου τοῦ πράγματος
γενέσθαι, οἷοίπερ ἂν ὑμῖν αὐτοῖς εἴητε τοιαῦτα πεπονθότες...</p>
```

`\TeXtoTEIPat` `\TeXtoTEIPat{<TEX pattern>}{<TEI pattern>}`

Finally, this more flexible—and more delicate to handle—command uses pattern matching to instruct `ekdosis` how to convert (L^A)`TEX` commands into `TEI` equivalents. In the first mandatory argument, strings to be captured are marked in sequence with numbers prefixed by `#`, like so: `#1`, `#2`, `#3` and so forth. Then, in the second mandatory argument, the strings captured are inserted where each of them is expected in the `TEI` element.

⚠ If the entire string to be captured be enclosed in square or curly brackets, it is advisable to use `@bn` (for curly brackets) or `@sn` (for square brackets) instead of `#n`, where *n* is the number that is expected in the sequence. This will prevent any brackets that may be found in the captured string from being interpreted.

⚠ Strings must be entered exactly as `ekdosis` will find them as the `.tex` source file is compiled. Specifically, *control sequences*, namely the coded commands immediately preceded by `\` are always found followed by a space. For instance, `\emph{}` will be seen and processed by `ekdosis` as `\emph_{}{}`.

The following example illustrates how `ekdosis` can be instructed to process the `\textcolor{<color>}{<text>}` command:—

```
1 \TeXtoTEIPat{\textcolor_{#1}@b2}{<hi rend="#1">@b2</hi>}
2
3 Sample text with a \textcolor{red}{word} in red.
```

REM. As can be seen from l. 1, it is safe to use `#1` for the first string for color names are naturally formed of letters without braces. However, `@b2` is preferable to capture the whole second argument of `\textcolor` for it may contain words within braces.

```
<p>Sample text with a
<hi rend="red">word</hi>in red.</p>
```

12.5 Inserting Code in the TEI xml Output File

It may be needed to insert code in the `TEI xml` output file only, for example when clear enough information is written in the apparatus criticus by means of such optional arguments as `pre`, `post`, `prewit` or `postwit` that are not processed for `TEI xml` output.⁷⁴

`\teidirect`
New feature v1.3

`\teidirect[⟨xml attributes⟩]{⟨xml element⟩}{⟨code⟩}`

Two mandatory arguments are expected by `\teidirect`, namely the TEI `xml` element followed by the contents to be found in the output file between the opening and closing tags. Additionally, attribute-value pairs to be found inside the start-tag of the element can be specified in the optional argument of the command. An example follows:

```
1 % Preamble:
2 \DeclareWitness{GalE1.M}{Gal.E1(M)}{\emph{Monacensis Gr.}
3 231}[origDate=s. XVI]
4 \DeclareWitness{GalE1.Q}{Gal.E1(Q)}{\emph{Parisinus Gr.}
5 2174}[origDate=s. XIV]
6 \DeclareShorthand{GalE1.M.Q}{Gal.E1(MQ)}{GalE1.M,GalE1.Q}
7
8 % Document:
9 ἐν \app{
10 \lem[wit=codd]{καύμασιν}
11 \rdg[wit=GalE1.M.Q, postwit=\unskip(23.16)]{καύματι}
12 \teidirect{note}{p. 23, l. 16 Wenkebach}}
```

REM. 1 `GalE1.M.Q` (l. 11) has been defined as a shorthand to denote the agreement of two otherwise defined manuscripts by means of `\DeclareWitness: GalE1.M` and `GalE1.Q`. (See ll. 2–6.)

REM. 2 The `postwit` optional argument has been used to further specify the location where this variant reading can be found in the critical edition of Galen's Commentary on Hippocrates' *Epidemics*, Book 1 (l. 11). But as the effect of `postwit` is limited to the PDF output, `\teidirect` has been used to convey this item of information to the TEI `xml` output file (l. 12).

PDF output:—

```
1 ἐν καύμασιν


---


I καύμασιν codd.] καύματι Gal.E1(MQ)(23.16)
```

TEI `xml` output:—

```
1 <p xml:lang="grc">ἐν
2 <app>
3 <lem wit="#V #I #R #H">καύμασιν</lem>
4 <rdg wit="#GalE1.#M #GalE1.Q">καύματι</rdg>
5 <note>p. 23, l. 16 Wenkebach</note>
6 </app></p>
```

12.6 Specific TEI Modules

The following example illustrates how `ekdosis` can be adapted in a straightforward way to modules provided by the TEI for encoding specific texts such as transcriptions of speech.⁷⁵ The technique applied below uses `\EnvtoTEI` conjointly with `\SetTEIxmlExport{autopar=false}` described above on page 64:—

```
1 % Preamble:
2 \newenvironment{speech}{\par}{\par}
3 \newcommand{\speaker}[1]{\textbf{#1}\par}
```

⁷⁴. See above sect. 2.5 on page 13.

⁷⁵. See <https://tei-c.org/release/doc/tei-p5-doc/en/html/TS.html>.

```

4 \EnvtoTEI{speech}{sp}
5
6 \SetTEIxmlExport{autopar=false}
7
8 % Document:
9 \begin{ekdosis}
10   \begin{speech}
11     \speaker{Σωκράτης}
12     \begin{ekdpar}
13       κατέβην χθές εις Πειραιᾶ μετὰ Γλαύκωνος τοῦ Ἀρίστωνος
14       προσευζόμενός τε τῇ θεῷ καὶ ἅμα τὴν ἐορτὴν βουλόμενος θεάσασθαι
15       τίνα τρόπον ποιήσουσιν ἅτε νῦν πρῶτον ἄγοντες. καλὴ μὲν οὖν μοι
16       καὶ ἡ τῶν ἐπιχωρίων πομπὴ ἔδοξεν εἶναι, οὐ μέντοι ἦττον ἐφαίνετο
17       πρέπειν ἢ οἱ θοᾶρες ἔπεμπον.
18     \end{ekdpar}
19   \end{speech}
20 \end{ekdosis}

```

REM. 1 Lines 2–3 define a basic environment meant to contain individual speeches and a command to hold the name of the speaker. This name is printed in bold face and followed by a new paragraph in the PDF output.

REM. 2 Line 4 instructs `ekdosis` to convert `speech` L^AT_EX environments into `<sp>` TEI `xml` elements.

REM. 3 Line 6 disables the `autopar` algorithm that `ekdosis` provides by default for running paragraphs of text. As a consequence, `ekdpar` is used to mark the paragraphs.

PDF output:—

```

1 Σωκράτης
2 κατέβην χθές εις Πειραιᾶ μετὰ Γλαύκωνος τοῦ Ἀρίστωνος προσευζόμενός τε τῇ θεῷ καὶ
3 ἅμα τὴν ἐορτὴν βουλόμενος θεάσασθαι τίνα τρόπον ποιήσουσιν ἅτε νῦν πρῶτον ἄγοντες.
4 καλὴ μὲν οὖν μοι καὶ ἡ τῶν ἐπιχωρίων πομπὴ ἔδοξεν εἶναι, οὐ μέντοι ἦττον ἐφαίνετο πρέπειν
5 ἢ οἱ θοᾶρες ἔπεμπον.

```

TEI `xml` output:—

```

<sp>
  <speaker>Σωκράτης</speaker>
  <p>κατέβην χθές εις Πειραιᾶ μετὰ Γλαύκωνος τοῦ Ἀρίστωνος
  προσευζόμενός τε τῇ θεῷ καὶ ἅμα τὴν ἐορτὴν βουλόμενος
  θεάσασθαι τίνα τρόπον ποιήσουσιν ἅτε νῦν πρῶτον ἄγοντες.
  καλὴ μὲν οὖν μοι καὶ ἡ τῶν ἐπιχωρίων πομπὴ ἔδοξεν εἶναι, οὐ
  μέντοι ἦττον ἐφαίνετο πρέπειν ἢ οἱ θοᾶρες ἔπεμπον.</p>
</sp>

```

12.7 References to Cited Works

A full example of what is technically called a *Conspectus Siglorum* can be found above in [sect. 2.4.1 on page 12](#). Such a list of manuscript sigla should be found immediately before the edition text. Traditionally, this section is followed by a list of other sources used to establish the text, so that the edited text is in the end established both from manuscript evidence (the “witnesses”) and other works based on a scholarly approach of the text (the “sources”) which are called in Latin *Editiones uel Studia*. As a consequence of this classification as “witness” or “source”, the former must go within the `<listWit>` element of the TEI header, whereas the latter is to be found within the `<listBibl>` element.

`\AddxmlBibResource`

`\AddxmlBibResource{<basename or name.xml>}` is a preamble-only command. If a base name (either suffixed with `.xml` or not) for a TEI `xml`-compliant bibliographical

database be provided, ekdosis will use it and insert formatted data in the back matter section of its own TEI `xml` output file, as `<biblStruct>` elements within a `listBibl` section.


As an example, the following Bib(L)A_{TeX} entry and its TEI equivalent are provided:⁷⁶—

```

1 @Book{Drak,
2   title = {Punicorum Libri Septemdecim},
3   author = {Silius Italicus, Tiberius Catius},
4   editor = {Drakenborch, Arnold},
5   date = {1717},
6   publisher = {Trajecti ad Rhenum},
7   location = {Utrecht}
8 }

1 <?xml version="1.0" encoding="UTF-8"?>
2 <listBibl xmlns="http://www.tei-c.org/ns/1.0">
3   <biblStruct type="book" xml:id="Drak">
4     <monogr>
5       <title level="m">Punicorum libri septemdecim</title>
6       <author>
7         <forename>Tiberius Catius</forename>
8         <surname>Silius Italicus</surname>
9       </author>
10      <editor>
11        <forename>Arnold</forename>
12        <surname>Drakenborch</surname>
13      </editor>
14      <imprint>
15        <pubPlace>Utrecht</pubPlace>
16        <publisher>Trajecti ad Rhenum</publisher>
17        <date>1717</date>
18      </imprint>
19    </monogr>
20  </biblStruct>
21 </listBibl>

```

 As can be seen, the same string `Drak` is used as a label in the Bib(L)A_{TeX} file (l. 1) and an `xml:id` in the TEI file (l. 3). This same label must be used again in the preamble of the `.tex` source file to declare Arnold Drakenborch as a source,⁷⁷ like so:—

```

1 % Use 'bibl.xml' as a TEI xml bibliographical database:
2 \AddxmlBibResource{bibdata.xml}
3
4 % Declare A. Drakenborch as source:
5 \DeclareSource{Drak}{\emph{Drakenborch}}

```

Finally, an extract of Silius Italicus' *Punica*, Book 9, ll. 30-2 follows (`.tex` source file, PDF output and TEI output files):—

```

1 % Preamble:
2 \usepackage[style=oxnotes]{biblatex}
3 \addbibresource{bibdata.bib}

```

⁷⁶. To the author's knowledge, Zotero (<https://www.zotero.org>) provides excellent TEI `xml` output from Bib(L)A_{TeX} input files.

⁷⁷. See above on page 10.

```

4
5 \usepackage[teixport=tidy]{ekdosis}
6
7 % basename of the .xml bibliographical database:
8 \AddxmlBibResource{bibdata.xml}
9
10 % Witnesses:
11 \DeclareWitness{L}{L}{Laurentianus, plut, XXXVII, cod. 16}[
12     origDate=s. XV]
13 % Other witnesses [...]
14
15 % Sources:
16 \DeclareSource{Drak}{\emph{Drakenborch}}
17 % Alternatively, use BibLaTeX for the rendition:
18 % \DeclareSource{Drak}{\citename{Drak}{editor}}
19 % Other sources [...]
20
21 % Document:
22 \begin{ekdosis}
23   \begin{ekdverse}
24     Sed uos, quorum oculos atque ora humentia uidi,\
25     uertere cum consul terga et remeare iuberet,\
26     \app{
27       \lem[source=Drak, type=emendation]{ne morem}
28       \rdg[wit={L, F}]{me morem}
29       \rdg[wit={O, V}]{memorem}
30     } et pugnae signum exspectate petendae:\
31   \end{ekdverse}
32 \end{ekdosis}

```

PDF output:—

Sed uos, quorum oculos atque ora humentia uidi,	30
uertere cum consul terga et remeare iuberet,	31
ne morem et pugnae signum exspectate petendae:	32

32 ne morem *Drakenborch*] me morem L F memorem O V

TEI xml output file produced by ekdosis (narrowed down to the <text> element):—

```

1 <text>
2   <body>
3     <lg>
4       <l>Sed uos, quorum oculos atque ora humentia uidi,</l>
5       <l>uertere cum consul terga et remeare iuberet,</l>
6       <l>
7         <app>
8           <lem source="#Drak" type="emendation">ne morem</lem>
9           <rdg wit="#L #F">me morem</rdg>
10          <rdg wit="#O #V">memorem</rdg>
11          </app>et pugnae signum exspectate petendae:</l>
12        </lg>
13      </body>
14    <back>

```

```

15 <listBibl>
16   <biblStruct type="book" xml:id="Drak">
17     <monogr>
18       <title level="m">Punicorum libri septemdecim</title>
19       <author>
20         <forename>Tiberius Catius</forename>
21         <surname>Silius Italicus</surname>
22       </author>
23       <editor>
24         <forename>Arnold</forename>
25         <surname>Drakenborch</surname>
26       </editor>
27       <imprint>
28         <pubPlace>Utrecht</pubPlace>
29         <publisher>Trajecti ad Rhenum</publisher>
30         <date>1717</date>
31       </imprint>
32     </monogr>
33   </biblStruct>
34 </listBibl>
35 </back>
36 </text>

```

12.8 Citation Commands

ekdosis can also convert into TEI `xml` references to cited works. Depending on the optional arguments used in the citation command, references will be converted into `<ptr>` or `<bibl>` elements with the appropriate identifier supplied by means of the `target` or `corresp` attributes.

Of course, for this mechanism to work, Bib_{TEX} or BibLa_{TEX} must be used and connected to some `.bib` bibliographical database file. Additionally, this `.bib` file must have been converted into a TEI `xml`-compliant file where all the Bib(La)TEX entries that are used in the document are found within `<biblStruct>` elements.⁷⁸ Finally, this `.xml` bibliographical database must have been connected to the `.tex` source file by means of `\AddxmlBibResource` described above in [sect. 12.7 on page 70](#).

As an example, the following `sample.bib` file is used:—

```

@Book{ReynoldsWilson1991,
  author = {Reynolds, L. D. and Wilson, N. G.},
  title = {Scribes and Scholars},
  year = {1991},
  subtitle = {A Guide to the Translation of Greek and Latin
    Literature},
  edition = {3},
  publisher = {Clarendon Press},
  location = {Oxford}
}

```

It has been converted into `sample.xml` as follows:—

78. See above n. 76 on page 71 for information on how to do this.

```
<?xml version="1.0" encoding="UTF-8"?>
<listBibl xmlns="http://www.tei-c.org/ns/1.0">
  <biblStruct type="book" xml:id="ReynoldsWilson1991">
    <monogr>
      <title level="m">Scribes and Scholars</title>
      <author>
        <forename>L. D.</forename>
        <surname>Reynolds</surname>
      </author>
      <author>
        <forename>N. G.</forename>
        <surname>Wilson</surname>
      </author>
      <edition>3</edition>
      <imprint>
        <pubPlace>Oxford</pubPlace>
        <publisher>Clarendon Press</publisher>
        <date>1991</date>
      </imprint>
    </monogr>
  </biblStruct>
</listBibl>
```

Once both files have been prepared, inserting references and exporting them into the TEI xml output file can be achieved in a straightforward way. (The full `sample.tex` is provided below.)—

```
\documentclass{article}

\usepackage[telexport=tidy]{ekdosis}
\AddxmlBibResource{sample.xml}

\usepackage[style=oxnotes]{biblatex}
\addbibresource{sample.bib}

\begin{document}
\begin{ekdosis}
  On textual criticism, see \cite[207--241]{ReynoldsWilson1991}.
\end{ekdosis}
\end{document}
```

PDF output:—

- 1 On textual criticism, see L. D. Reynolds and N. G. Wilson, *Scribes and Scholars: A*
- 2 *Guide to the Translation of Greek and Latin Literature* (3rd edn., Oxford: Clarendon Press,
- 3 1991), 207–41.

TEI xml output narrowed down to the contents of the `<text>` element:—

```
<text>
  <body>
    <p>On textual criticism, see
    <bibl corresp="#ReynoldsWilson1991">
      <biblScope>207--241</biblScope>
    </bibl>.</p>
  </body>
```

```

<back>
  <listBibl>
    <biblStruct type="book" xml:id="ReynoldsWilson1991">
      <monogr>
        <title level="m">Scribes and Scholars</title>
        <author>
          <forename>L. D.</forename>
          <surname>Reynolds</surname>
        </author>
        <author>
          <forename>N. G.</forename>
          <surname>Wilson</surname>
        </author>
        <edition>3</edition>
        <imprint>
          <pubPlace>Oxford</pubPlace>
          <publisher>Clarendon Press</publisher>
          <date>1991</date>
        </imprint>
      </monogr>
    </biblStruct>
  </listBibl>
</back>
</text>

```

At the time of writing, the following citation commands are converted into TEI `xml` by `ekdosis`:—

- (a) `\icite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`⁷⁹
- (b) `\cite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (c) `\Cite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (d) `\cite*[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (e) `\parencite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (f) `\Parencite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (g) `\parencite*[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (h) `\footcite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (i) `\footcitetext[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (j) `\textcite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (k) `\Textcite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (l) `\smartcite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (m) `\Smartcite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (n) `\autocite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (o) `\Autocite[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (p) `\autocite*[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`
- (q) `\Autocite*[⟨prenote⟩][⟨postnote⟩]{⟨key⟩}`

The next release of `ekdosis` will include all citation commands with the exception of so-called “qualified citation lists”.

13 Future Work

A short, un-commented list of what is planned in the versions of `ekdosis` to come follows:—

⁷⁹ From the `icite` package. `\icite` can be used in place of almost any standard citation command. See Alessi, *The Icite package* (cf. n. 71).

- (a) Very short-term (weeks):—
 - (a) Text structure: milestone elements.
 - (b) Marginal edition texts: It may happen that the marginalia of manuscripts contain texts worth editing in addition to and along the main text to which they are linked by reference signs.
- (b) Short-term (months):—
 - (a) Poetry: `ekdosis` is now able to load and use the facilities provided by the `verse` package. Refined options will be added, such as metrical analysis. Arabic poetry through the environments and commands provided by the `arabluatex` package will also be supported. Other packages will also be considered for inclusion, such as `poetry` or `teubner`. In the end, `ekdosis` will provide a way for the typesetting of poetry which will allow for more flexibility and compatibility with `TEI xml`.
 - (b) Correspondence and alignment, segmentation: The functions are being tested at the time of writing and will be included in `ekdosis`.
- (c) Medium-term: Indexing, commands and environments for specific modules of the `TEI`.

14 GNU Free Documentation License

Version 1.3, 3 November 2008

Version 1.3, 3 November 2008

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16 Sample: C. J. Caesar, *Gallic War*, VI, XIII.1

16.1 .tex Source File

```

1  \documentclass[12pt]{article}
2  \usepackage{fontspec}
3  \usepackage[latin.classic,french,english]{babel}
4  \babelfont{rm}{Old Standard}
5  \babelfont{sf}{NewComputerModernSans10}
6  \babelfont{tt}{NewComputerModernMono10}
7
8  \usepackage{nextpage}
9  \usepackage{xltabular}
10
11 \usepackage[telexport=tidy]{ekdosis}
12 \DeclareApparatus{default}[
13     delim=\hskip0.75em,
14     ehook=.]
15
16 \FormatDiv{2}{.}{.}
17
18 \SetAlignment{
19     tcols=3,
20     lcols=1,
21     texts=latin[xml:lang="la"];
22     english[xml:lang="en"];
23     french[xml:lang="fr"],
24     apparatus=latin,
25     segmentation=auto}
26
27 \AtBeginEnvironment{latin}{\selectlanguage{latin}}
28 \AtBeginEnvironment{english}{\sloppy\selectlanguage{english}}
29 \AtBeginEnvironment{french}{\sloppy\selectlanguage{french}}
30
31 \DeclareWitness{A}{A}{\emph{Bongarsianus} 81}[

```



```

32         msName=Bongarsianus,
33         settlement=Amsterdam,
34         idno=81,
35         institution=University Library,
36         origDate=s. IX--X]
37 \DeclareHand{A1}{A}{A\textsuperscript{1}}[\emph{Emendationes}
38 scribe ipsius}]
39 \DeclareWitness{M}{M}{\emph{Parisinus Lat.} 5056}[
40 origDate={s. XII}]
41 \DeclareWitness{B}{B}{\emph{Parisinus Lat.} 5763}[
42 origDate={s. IX--X}]
43 \DeclareWitness{R}{R}{\emph{Vaticanus Lat.} 3864}[
44 origDate={s. X}]
45 \DeclareWitness{S}{S}{\emph{Laurentianus} R 33}[
46 origDate={s. X}]
47 \DeclareWitness{L}{L}{\emph{Londinensis} Br. Mus. 10084}[
48 origDate={s. XI}]
49 \DeclareWitness{N}{N}{\emph{Neapolitanus} IV, c. 11}[
50 origDate={s. XII}]
51 \DeclareWitness{T}{T}{\emph{Parisinus Lat.} 5764}[
52 origDate={s. XI}]
53 \DeclareWitness{f}{f}{\emph{Vindobonensis} 95}[
54 origDate={s. XII}]
55 \DeclareWitness{U}{U}{\emph{Vaticanus Lat.} 3324}[
56 origDate={s. XI}]
57 \DeclareWitness{l}{l}{\emph{Laurentianus} Riccard. 541}[
58 origDate={s. XI--XII}]
59 \DeclareShorthand{a}{\alpha}{A,M,B,R,S,L,N}
60 \DeclareShorthand{b}{\beta}{T,f,U,l}
61
62 \begin{document}
63
64 \begin{xltabular}[c]{0.75\linewidth}{lXl}
65 \caption*{\textbf{Conspectus siglorum}\label{tab:conspectus-siglorum}}\
66 \multicolumn{3}{c}{\emph{Familia} \ getsiglum{a}}\
67 \SigLine{A}\
68 & \ getsiglum{A1} \emph{Emendationes scribe ipsius} & \
69 \SigLine{M}\
70 \SigLine{B}\
71 \SigLine{R}\
72 \SigLine{S}\
73 \SigLine{L}\
74 \SigLine{N}\
75 \multicolumn{3}{c}{\emph{Familia} \ getsiglum{b}}\
76 \SigLine{T}\
77 \SigLine{f}\
78 \SigLine{U}\
79 \SigLine{l}\
80 \end{xltabular}
81
82 \cleartoevenpage
83
84 \begin{alignment}
85 \begin{latin}
86 \ekddiv{head=XIII, depth=2, n=6.13, type=section}

```

```

87 In omni Gallia eorum hominum qui \app{
88   \lem[wit=a]{aliquo}
89   \rdg[wit=b, alt=in al-]{in aliquo}}
90 sunt numero atque honore genera sunt duo. Nam plebes paene
91 seruorum habetur loco, quae \app{
92   \lem[wit={A,M}, alt={nihil audet (aut et \getsiglum{A1})
93     per se}]{nihil audet per se}
94   \rdg[wit=A1,nordg]{nihil aut et per se}
95   \rdg[wit={R,S,L,N}]{nihil habet per se}
96   \rdg[wit=b]{per se nihil audet}}, \app{
97   \lem[wit=a]{nullo}
98   \rdg[wit=b]{nulli}} adhibetur \app{
99   \lem{consilio}
100   \rdg[wit={T, U}, alt=conc-]{concilio}}.
101 \end{latin}
102 \begin{english}
103   \ekddiv{head=XIII, depth=2, n=6.13, type=section}
104   Throughout all Gaul there are two orders of those men who are of
105   any rank and dignity: for the commonality is held almost in the
106   condition of slaves, and dares to undertake nothing of itself,
107   and is admitted to no deliberation.
108 \end{english}
109 \begin{french}
110   \ekddiv{head=XIII, depth=2, n=6.13, type=section}
111   Partout en Gaule il y a deux classes d'hommes qui comptent et qui
112   sont considérés. Quant aux gens du peuple, ils ne sont guère
113   traités autrement que des esclaves, ne pouvant se permettre aucune
114   initiative, n'étant consultés sur rien.
115 \end{french}
116 \end{alignment}
117
118 \end{document}

```

16.2 TEI xml Output

```

1 <?xml version="1.0" encoding="utf-8"?>
2 <TEI xmlns="http://www.tei-c.org/ns/1.0">
3   <teiHeader>
4     <fileDesc>
5       <titleStmt>
6         <title>
7           <!-- Title -->
8         </title>
9         <respStmt>
10          <resp>
11            <!-- Edited by -->
12          </resp>
13          <name>
14            <!-- Name -->
15          </name>
16        </respStmt>
17      </titleStmt>
18      <publicationStmt>

```

```

19      <istributor>
20        <!-- Distributor name -->
21      </istributor>
22    </publicationStmt>
23    <sourceDesc>
24      <listWit>
25        <witness xml:id="A">
26          <abbr type="siglum">A</abbr>
27          <emph>Bongarsianus</emph>81
28        <msDesc>
29          <msIdentifier>
30            <settlement>Amsterdam</settlement>
31            <institution>University Library</institution>
32            <idno>81</idno>
33            <msName>Bongarsianus</msName>
34          </msIdentifier>
35          <physDesc>
36            <handDesc hands="1">
37              <handNote xml:id="A1">
38                <abbr type="siglum">A
39                <hi rend="sup">1</hi></abbr>
40                <p>
41                  <emph>Emendationes scribae ipsius</emph>
42                </p>
43              </handNote>
44            </handDesc>
45          </physDesc>
46          <history>
47            <origin>
48              <origDate>s. IX--X</origDate>
49            </origin>
50          </history>
51        </msDesc></witness>
52        <witness xml:id="M">
53          <abbr type="siglum">M</abbr>
54          <emph>Parisinus Lat.</emph>5056
55        <msDesc>
56          <msIdentifier />
57          <history>
58            <origin>
59              <origDate>s. XII</origDate>
60            </origin>
61          </history>
62        </msDesc></witness>
63        <witness xml:id="B">
64          <abbr type="siglum">B</abbr>
65          <emph>Parisinus Lat.</emph>5763
66        <msDesc>
67          <msIdentifier />
68          <history>
69            <origin>
70              <origDate>s. IX--X</origDate>
71            </origin>
72          </history>
73        </msDesc></witness>

```

```

74      <witness xml:id="R">
75      <abbr type="siglum">R</abbr>
76      <emph>Vaticanus Lat.</emph>3864
77      <msDesc>
78        <msIdentifier />
79        <history>
80          <origin>
81            <origDate>s. X</origDate>
82          </origin>
83        </history>
84      </msDesc></witness>
85      <witness xml:id="S">
86      <abbr type="siglum">S</abbr>
87      <emph>Laurentianus</emph>R 33
88      <msDesc>
89        <msIdentifier />
90        <history>
91          <origin>
92            <origDate>s. X</origDate>
93          </origin>
94        </history>
95      </msDesc></witness>
96      <witness xml:id="L">
97      <abbr type="siglum">L</abbr>
98      <emph>Londinensis</emph>Br. Mus. 10084
99      <msDesc>
100        <msIdentifier />
101        <history>
102          <origin>
103            <origDate>s. XI</origDate>
104          </origin>
105        </history>
106      </msDesc></witness>
107      <witness xml:id="N">
108      <abbr type="siglum">N</abbr>
109      <emph>Neapolitanus</emph>IV, c. 11
110      <msDesc>
111        <msIdentifier />
112        <history>
113          <origin>
114            <origDate>s. XII</origDate>
115          </origin>
116        </history>
117      </msDesc></witness>
118      <witness xml:id="T">
119      <abbr type="siglum">T</abbr>
120      <emph>Parisinus Lat.</emph>5764
121      <msDesc>
122        <msIdentifier />
123        <history>
124          <origin>
125            <origDate>s. XI</origDate>
126          </origin>
127        </history>
128      </msDesc></witness>

```

```

129      <witness xml:id="f">
130      <abbr type="siglum">
131        <emph>f</emph>
132      </abbr>
133      <emph>Vindobonensis</emph>95
134      <msDesc>
135        <msIdentifier />
136        <history>
137          <origin>
138            <origDate>s. XII</origDate>
139          </origin>
140        </history>
141      </msDesc></witness>
142      <witness xml:id="U">
143      <abbr type="siglum">U</abbr>
144      <emph>Vaticanus Lat.</emph>3324
145      <msDesc>
146        <msIdentifier />
147        <history>
148          <origin>
149            <origDate>s. XI</origDate>
150          </origin>
151        </history>
152      </msDesc></witness>
153      <witness xml:id="l">
154      <abbr type="siglum">
155        <emph>l</emph>
156      </abbr>
157      <emph>Laurentianus</emph>Riccard. 541
158      <msDesc>
159        <msIdentifier />
160        <history>
161          <origin>
162            <origDate>s. XI--XII</origDate>
163          </origin>
164        </history>
165      </msDesc></witness>
166    </listWit>
167    </sourceDesc>
168  </fileDesc>
169  <encodingDesc>
170    <variantEncoding method="parallel-segmentation"
171      location="internal" />
172  </encodingDesc>
173 </teiHeader>
174 <text>
175   <body>
176     <div xml:id="div-latin_1" xml:lang="la">
177       <div type="section" n="6.13">
178         <head>XIII</head>
179         <p>In omni Gallia eorum hominum qui
180         <app>
181           <lem wit="#A #M #B #R #S #L #N">aliquo</lem>
182           <rdg wit="#T #f #U #l">in aliquo</rdg>
183         </app>sunt numero atque honore genera sunt duo. Nam

```

```

184         plebes paene seruorum habetur loco, quae
185         <app>
186             <lem wit="#A #M">nihil audet per se</lem>
187             <rdg wit="#A1">nihil aut et per se</rdg>
188             <rdg wit="#R #S #L #N">nihil habet per se</rdg>
189             <rdg wit="#T #f #U #l">per se nihil audet</rdg>
190         </app>,
191         <app>
192             <lem wit="#A #M #B #R #S #L #N">nullo</lem>
193             <rdg wit="#T #f #U #l">>nulli</rdg>
194         </app>adhibetur
195         <app>
196             <lem>consilio</lem>
197             <rdg wit="#T #U">concilio</rdg>
198         </app>.</p>
199     </div>
200 </div>
201 <div xml:id="div-english_1" xml:lang="en">
202     <div type="section" n="6.13">
203         <head>XIII</head>
204         <p>Throughout all Gaul there are two orders of those men
205         who are of any rank and dignity: for the commonality is
206         held almost in the condition of slaves, and dares to
207         undertake nothing of itself, and is admitted to no
208         deliberation.</p>
209     </div>
210 </div>
211 <div xml:id="div-french_1" xml:lang="fr">
212     <div type="section" n="6.13">
213         <head>XIII</head>
214         <p>Partout en Gaule il y a deux classes d'hommes qui
215         comptent et qui sont considérés. Quant aux gens du
216         peuple, ils ne sont guère traités autrement que des
217         esclaves, ne pouvant se permettre aucune initiative,
218         n'étant consultés sur rien.</p>
219     </div>
220 </div>
221 </body>
222 </text>
223 </TEI>

```

17 Arabic Sample File

arabic-sample.tex:—

```

% Instructions:
% 1. Compile this file three times.
%    - Open arabic-sample.pdf and arabic-sample-tei.xml and see the
%      result.
% 2. Compile arabic-sample_out.tex three times.
%    - Open arabic-sample_out.pdf and arabic-sample-out-tei.xml and
%      see the result.
%

```

```

\documentclass{article}

% The following three lines are only needed by the
% 'arabic-sample_out.tex' that arabluatex is instructed to produce:
\usepackage{babel}
\babelprovide[onchar=fonts]{arabic}
\babelfont[*arabic]{rm}{Amiri}

% instruct ekdosis to output TEI xml (arabic-sample-tei.xml):
\usepackage[telexport=tidy]{ekdosis}

% instruct arabluatex to output sample-arabic_out.tex with Unicode
% Arabic strings in place of arabtex ASCII scheme:
\usepackage[fullvoc,export]{arabluatex}

\begin{document}

\begin{arabexport} % export arabtex strings to Unicode Arabic
  \begin{ekdosis}
    \begin{arab}
      'inna 'abI kAna mina
      \app{
        \lem{'l-muqAtilaTi}
        \rdg{'l-muqAtilIna}
      }
      wa-kAnat 'ummi min `u.zamA'i buyUti 'l-zamAzimaTi.
    \end{arab}
  \end{ekdosis}
\end{arabexport}
\end{document}

```

18 Implementation

ekdosis relies on Lua functions and tables. Read the .lua files that accompany ekdosis for more information.

```
1 \RequirePackage{iftex}
```

Of course, ekdosis requires Lua^AT_EX. Issue an error if the document is processed with another engine.

```
2 \RequireLuaTeX
```

Set global options:—

```

3 \RequirePackage{expkv-opt}
4 \RequirePackage{expkv-def}
5 \newif\if@pkg@float
6 \newif\if@pkg@footins
7 \newif\if@pkg@keyfloat
8 \newif\if@pkg@fitfloat
9 \newif\if@pkg@ekddivs
10 \newif\if@parnotesroman
11 \newif\if@pkg@parnotes
12 \newif\iftei@export
13 \newif\if@pkg@poetry@verse
14 \ekvdefinekeys{ekdosis}{

```

```

15 choice layout = {float = {\@pkg@floattrue},
16   footins = {\@pkg@floatfalse\@pkg@footintrue},
17   keyfloat = {\@pkg@floatfalse\@pkg@keyfloattrue},
18   fitfloat = {\@pkg@floatfalse\@pkg@fitfloattrue}},
19 initial layout = float,
20 unknown-choice layout = \PackageError{ekdosis}{unknown
21   layout=#1}{`layout' must be either `float' or `footins'.},
22 choice divs = {ekdosis = {\@pkg@ekddivstrue},
23   latex = {\@pkg@ekddivsfalse
24     \AtBeginDocument{\luadirect{ekdosis.setekddivsfalse()}}}},
25 initial divs = ekdosis,
26 unknown-choice divs = \PackageError{ekdosis}{unknown divs=#1}{`divs'
27   must be either `ekdosis' or `latex'.},
28 choice poetry = {verse = {\@pkg@poetry@versetrue}},
29 unknown-choice poetry = \PackageError{ekdosis}{unknown
30   poetry=#1}{`poetry' must be `verse' for now.},
31 choice parnotes = {false = {},
32   true = {\@pkg@parnotetrue},
33   roman = {\@pkg@parnotetrue\@parnotesromantrue}},
34 default parnotes = true,
35 unknown-choice parnotes = \PackageError{ekdosis}{unknown
36   parnotes=#1}{`parnotes' must be either `true', or `false' or
37   `roman'.},
38 choice teiexport = {false = {},
39   true = {\@pkg@telexporttrue
40     \AtBeginDocument{\luadirect{ekdosis.openteistream()}}%
41     \AtEndDocument{\luadirect{ekdosis.closeistream()}}},
42   tidy = {\@pkg@telexporttrue
43     \AtBeginDocument{\luadirect{ekdosis.openteistream()}}%
44     \AtEndDocument{\luadirect{ekdosis.closeistream("tidy")}}}},
45 default teiexport = true,
46 unknown-choice teiexport = \PackageError{ekdosis}{unknown
47   teiexport=#1}{`telexport' must be either `true', `false' or
48   `tidy'.}
49 }
50 \ekvoProcessLocalOptions{ekdosis}
51 \newif\ifekd@memoir@loaded
52 \ifclassloaded{memoir}{%
53   \ekd@memoir@loadedtrue\@pkg@poetry@versetrue}{%

```

Required Packages In addition to iftex, expkv-opt and expkv-def, a list of the packages that are required by ekdosis follows:—

```

54 % \RequirePackage{iftex} % already loaded above
55 % \RequirePackage{expkv-opt} % already loaded above
56 % \RequirePackage{expkv-def} % already loaded above
57 \RequirePackage{luacode}
58 \RequirePackage{paracol}
59 \RequirePackage{etoolbox}
60 \RequirePackage{lineno}
61 \if@pkg@float
62   \RequirePackage{trivfloat}
63   \trivfloat{ekdapparatus}
64 \fi
65 \if@pkg@keyfloat
66   \RequirePackage{keyfloat}

```



```

67 \def\ekd@keyparopts#1{%
68   \def\ekd@insert@keyparapp{%
69     \keyparbox[!b]{#1}{\ekd@insert@apparatus}}
70 \ekd@keyparopts{ }
71 \fi
72 \if@pkg@fitfloat
73   \RequirePackage{tcolorbox}
74   \tcbuselibrary{fitting,skins}
75 \fi
76 \RequirePackage{refcount}
77 \RequirePackage{zref-user}
78 \RequirePackage{zref-abspage}
79 \RequirePackage{ltxcmds}
80 \RequirePackage{pdftexcmds}
81 \RequirePackage{ifoddpage}
82 \if@pkg@poetry@verse
83   \RequirePackage{verse}
84 \fi
85 \if@pkg@parnotes
86   \RequirePackage{parnotes}
87 \fi

```

Lua Here begins the real work: load `ekdosis.lua`:—

```

88 \luadirect{dofile(kpse.find_file("ekdosis.lua"))}
89 \AtEndDocument{
90   \luadirect{ekdosis.closestream()}
91 }

```

Setup

`\ekdsetup` `\ekdsetup` is used to specify options that affect the general behavior of `ekdosis`. It is a preamble-only command.

```

92 \ekvdefinekeys{ekd@setup}{
93   bool showpagebreaks = \ifekd@showpb,
94   store spbm = \ekd@spbm,
95   initial spbm = spb,
96   store hpbm = \ekd@hpbm,
97   initial hpbm = hpb,
98 }
99 \NewDocumentCommand{\ekdsetup}{m}{\ekvset{ekd@setup}{#1}}
100 \@onlypreamble\ekdsetup

```

`\SetHooks` `\SetHooks` is used to set hooks meant to be shared by all declared apparatuses, such as the font size, the format of numerals, *&c.* This command can be used in the preamble or at any point of the document.

```

101 \ekvdefinekeys{ekd@hooks}{
102   store appfontsize = \ekd@appfontsize,
103   store refnumstyle = \ekd@refnumstyle,
104   store postrefnum = \ekd@postrefnum,
105   store lemmastyle = \ekd@lemmastyle,
106   store readingstyle = \ekd@readingstyle,
107   code keyparopts = \if@pkg@keyfloat\ekd@keyparopts{#1}\fi,
108   dimen appheight = \ekd@appheight,
109   initial appheight = .5\textheight,

```

```

110 choice fitalgorithm = {fontsize = \def\ekd@fit@algorithm{fontsize},
111   hybrid = \def\ekd@fit@algorithm{hybrid},
112   areasize = \def\ekd@fit@algorithm{areasize},
113   squeeze = \def\ekd@fit@algorithm{squeeze}},
114 initial fitalgorithm = fontsize,
115 unknown-choice fitalgorithm = \PackageError{ekdosis}{unknown
116   fitalgorithm=#1}{`fitalgorithm' must be either `fontsize',
117   `hybrid', `areasize' or `squeeze'.},
118 code initialrule = \def\ekd@initial@rule{#1\NLS},
119 default initialrule = \rule{0.4\columnwidth}{0.4pt},
120 noval noinitialrule = \undef\ekd@initial@rule,
121 initial appfontsize = \footnotesize,
122 initial refnumstyle = \bfseries,
123 initial postrefnum = ~,
124 initial lemmastyle = {},
125 initial readingstyle = {}
126 }
127 \NewDocumentCommand{\SetHooks}{m}{\ekvset{ekd@hooks}{#1}}

```

Build and process the list of witnesses and hands:—

```

128 \ekvdefinekeys{ekd@witness}{
129   store settlement = \settlement@value,
130   store institution = \institution@value,
131   store repository = \repository@value,
132   store collection = \collection@value,
133   store idno = \idno@value,
134   store msName = \msName@value,
135   store origDate = \origDate@value,
136   store locus = \locus@value
137 }

```

\DeclareWitness **\DeclareWitness** is a preamble-only command. It takes three mandatory arguments and one optional argument. It is meant to collect data related to witnesses to be used in the edition text. Data are stored in Lua tables and are used to encode the <listWit> part of the TEI header as well as the Conspectus Siglorum in the edition in print.

```

138 \NewDocumentCommand{\DeclareWitness}{m m m O{}}{%
139   \bgroup
140   \ekvset{ekd@witness}{#4}
141   \luadirect{ekdosis.newwitness(
142     \luastringN{#1},
143     \luastringN{#2},
144     \luastringN{#3},
145     \luastringO{\settlement@value},
146     \luastringO{\institution@value},
147     \luastringO{\repository@value},
148     \luastringO{\collection@value},
149     \luastringO{\idno@value},
150     \luastringO{\msName@value},
151     \luastringO{\origDate@value},
152     \luastringO{\locus@value})}
153   \egroup
154 }
155 \@onlypreamble\DeclareWitness

```

\DeclareHand As **\DeclareWitness**, **\DeclareHand** is a preamble-only command meant to collect data and store them in Lua tables. It takes three mandatory arguments and one optional

argument. The second argument is used to connect the hand to a declared witness it is related to. Then the table in which this witness is recorded can be fed with new data.

```

156 \NewDocumentCommand{\DeclareHand}{m m m +O{}}{
157   \luadirect{ekdosis.newhand(\luastringN{#1},
158     \luastringN{#2},
159     \luastringN{#3},
160     \luastringN{#4})}
161 }
162 \@onlypreamble\DeclareHand

```

Build and process the list of scholars:—

```

163 \ekvdefinekeys{ekd@scholar}{
164   store rawname = \rawname@value,
165   store forename = \forename@value,
166   store surname = \surname@value,
167   store addname = \addname@value,
168   store note = \note@value
169 }

```

\DeclareScholar **\DeclareScholar** is used to build a list of persons within the <listPerson> element. It takes two mandatory arguments to specify consecutively a unique identifier and the rendition to be used in the apparatus criticus in print, and one optional argument used to collect the name parts components and further items of information from key-value ‘named’ arguments.

```

170 \NewDocumentCommand{\DeclareScholar}{m m O{}}{%
171   \bgroup
172   \ekvset{ekd@scholar}{#3}
173   \luadirect{ekdosis.newscholar(
174     \luastringN{#1},
175     \luastringN{#2},
176     \luastringO{\rawname@value},
177     \luastringO{\forename@value},
178     \luastringO{\surname@value},
179     \luastringO{\addname@value},
180     \luastringO{\note@value})}
181   \egroup
182 }
183 \@onlypreamble\DeclareScholar

```

\DeclareSource There is also a table in which are collected data related to sources to be used in the apparatus criticus. **\DeclareSource** is a preamble-only command and takes two mandatory arguments: a unique id and a shorthand (preferably a Bib(L)A_{TeX} label) to be used in the apparatus criticus which can be extracted from a bibliographic database.

```

184 \NewDocumentCommand{\DeclareSource}{m m}{
185   \luadirect{ekdosis.newsources(\luastringN{#1},
186     \luastringN{#2})}
187 }
188 \@onlypreamble\DeclareSource

```

\DeclareShorthand **\DeclareShorthand** is a preamble-only command that can be used to record manuscript families or any kind of shorthand to be used to refer to previously declared ids, for example the shorthand **codd** can be used to point to all declared witnesses. This command takes three mandatory arguments: a unique id, its rendition in print and a csv-list of previously declared ids.

```

189 \NewDocumentCommand{\DeclareShorthand}{m m m}{
190   \luairect{ekdosis.newshorthand(\luastringN{#1},
191     \luastringN{#2},
192     \luastringN{#3})}
193 }
194 \@onlypreamble\DeclareShorthand

```

\getsiglum `\getsiglum{<csv list>}` takes a comma-separated list of declared ids by means of `\DeclareWitness`, `\DeclareHand`, `\DeclareShorthand` or `\DeclareSource` and returns their respective renditions.

```

195 \NewDocumentCommand{\getsiglum}{m}{%
196   \luairect{tex.sprint(ekdosis.getsiglum(\luastringN{#1}))}%
197 }

```

\SigLine `\Sigline{<unique id>}` takes the unique id of any declared witness by means of `\DeclareWitness` as argument and returns a line ready to be inserted in a table set to print a Conspectus Siglorum. `\SigLine` returns three fields separated by the symbol `&` that is used in tables as follows: the siglum referring to the witness, the contents of the `description` field and the contents of the optional `origDate` field.

```

198 \NewDocumentCommand{\SigLine}{m}{%
199   \luairect{tex.sprint(ekdosis.basic_cs(\luastringN{#1}))}
200 }

```

TEX to TEI xml Here follow the key-value options to be used by `\SetTEIxmlExport` below:—

```

201 \ekvdefinekeys{tei@settings}{
202   choice autopar = {true = \luairect{ekdosis.setteiautopar("yes")},
203     false = {\luairect{ekdosis.setteiautopar("no")}}},
204   initial autopar = true,
205   unknown-choice autopar = \PackageError{ekdosis}{unknown
206     autopar=#1}{`autopar' must be either `true' or `false'.}
207 }

```

\SetTEIxmlExport `\SetTEIxmlExport` collects the settings to be applied to TEI xml export. For now, there is only one option. This command can be used at any point of the document, except inside environments meant to receive an apparatus criticus.

```

208 \NewDocumentCommand{\SetTEIxmlExport}{m}{
209   \unless\ifekd@state\ekvset{tei@settings}{#1}\fi
210 }

```

The following three commands can be used to instruct `ekdosis` how to convert unknown or unusual (L)TeX commands into TEI xml equivalents.

\TeXtoTEI `\TeXtoTEI{<cname>}{<TEI element>}[<TEI attribute(s)>]` takes two mandatory arguments and one optional argument, namely: the control sequence name to be converted, the TEI element it is to be converted into and any additional xml attributes to be appended to the opening TEI element:—

```

211 \NewDocumentCommand{\TeXtoTEI}{m m O{}}{%
212   \luairect{ekdosis.newcmdtotag(\luastringN{#1},
213     \luastringN{#2},
214     \luastringN{#3})}
215 }

```

`\teidirect` `\teidirect[$\langle xml\ attributes \rangle$]{ $\langle xml\ element \rangle$ }{ $\langle code \rangle$ }` does nothing in L^AT_EX. Its only use is to insert elements in the TEI `xml` output file.

```
216 \NewDocumentCommand{\teidirect}{0}{mm}{\ignorespaces}
```

`\EnvtoTEI` `\EnvtoTEI(*){ $\langle env\ name \rangle$ }{ $\langle TEI\ element \rangle$ }[$\langle TEI\ attribute(s) \rangle$]` instructs how to convert L^AT_EX environments into TEI `xml` equivalents. It takes two mandatory arguments and one optional argument, namely the name of the L^AT_EX environment to be converted, the TEI element it is to be converted into and any additional attributes to be appended to the TEI opening element. `\EnvtoTEI*` is restricted to TEI elements that must never appear within `<p>` elements, such as `<div>`, `<lg>` and the like.

```
217 \NewDocumentCommand{\EnvtoTEI}{s m m O{}}{%
218   \IfBooleanTF{#1}{%
219     \luadirect{ekdosis.newenvtotag(\luastringN{#2},
220       \luastringN{#3},
221       \luastringN{#4},
222       "yes")}{%
223   }{%
224     \luadirect{ekdosis.newenvtotag(\luastringN{#2},
225       \luastringN{#3},
226       \luastringN{#4})}{%
227   }
228 }
```

`\TeXtoTEIPat` Finally, the more flexible—and more delicate to handle—`\TeXtoTEIPat{ $\langle TEX\ pattern \rangle$ }{ $\langle TEI\ pattern \rangle$ }` uses pattern matching to instruct ekdosis how to convert (L^A)T_EX commands into TEI equivalents.

```
229 \NewDocumentCommand{\TeXtoTEIPat}{m m}{%
230   \luadirect{ekdosis.newpatttotag(\luastringN{#1}, \luastringN{#2})}{%
231 }
```

`\SetTEIFilename` `\SetTEIFilename{ $\langle basename \rangle$ }` is a preamble-only command. It is used to set the base name of the TEI `xml` output file, to which the suffix `.xml` is appended. By default, the base name is `\jobname-tei`:—

```
232 \NewDocumentCommand{\SetTEIFileName}{m}{%
233   \luadirect{ekdosis.setteifilename(\luastringN{#1})}{%
234 }
235 \onlypreamble\SetTEIFileName
```

`\AddxmlBibResource` This is a preamble-only command. If a base name (either suffixed with `.xml` or not) for a TEI `xml`-compliant bibliographical database file be provided with `\AddxmlBibResource{ $\langle basename\ or\ name.xml \rangle$ }`, ekdosis will use it and insert formatted data in the back matter section of its own TEI `xml` output file, as `<biblStruct>` elements within a `<listBibl>` section.

```
236 \NewDocumentCommand{\AddxmlBibResource}{m}{%
237   \luadirect{ekdosis.addxmlbibresource(\luastringN{#1})}{%
238 }
239 \onlypreamble\AddxmlBibResource
```

`\ekd@test@lang` `\ekd@test@lang` is used internally by ekdosis. This command returns `\ekd@lang@pkgtrue` if either `babel` or `polyglossia` be used so that `\language` can be inserted when and where needed in the apparatus criticus.

```
240 \newif\ifekd@lang@pkg
241 \NewDocumentCommand{\ekd@test@lang}{}{%
242   \ltx@ifpackageloaded{babel}{\ekd@lang@pkgtrue}{}%
243   \ltx@ifpackageloaded{polyglossia}{\ekd@lang@pkgtrue}{}%
244 }
```

Multiple-layer apparatuses `ekdos` must know if an entry is to be processed in a single- or multiple-layer context:—

```
245 \newif\ifekd@mapps
```

Now the key-value options can be defined:—

```
246 \ekvdefinekeys{ekd@newapp}{
247   choice direction = {LR = \def\direction@val{LR},
248                      RL = \def\direction@val{RL}},
249   unknown-choice direction = \PackageError{ekdos}{unknown
250     direction=#1}{`direction' must be either `LR' or `RL'.},
251   store rule = \rule@val,
252   nmeta norule = {rule=none},
253   code delim = \def\delim@val{\unexpanded{#1}},
254   store sep = \sep@val,
255   store bhook = \bhook@val,
256   store ehook = \ehook@val,
257   store maxentries = \limit@val,
258   store lang = \lang@val,
259   store notelang = \notelang@val,
260   initial direction = LR,
261   initial delim = {},
262   initial ehook = {\csname ekd@end@apparatus\endcsname}
263 }
```

\DeclareApparatus `\DeclareApparatus{<apparatus name>}[<options>]` is a preamble-only command. As a mandatory argument, it takes the name of the new layer of notes to be inserted in the apparatus block. Then, the following seven key-value options can be used to lay out the layer: `direction=LR|RL`, `rule`, `delim` (the delimiter between entries), `sep` (the separator between lemma part and readings or notes), `bhook` (L^AT_EX code inserted as the layer begins), `ehook` (L^AT_EX code inserted as the layer ends), `maxentries` (if set and `maxentries >= 10`, the number of entries at which a `\pagebreak` is issued):—

```
264 \NewDocumentCommand{\DeclareApparatus}{m O{}}{
265   \newbool{subsqq@unit@#1}
266   \booltrue{subsqq@unit@#1}
267   \unless\ifekd@mapps\global\ekd@mappstrue\fi
268   \bgroup
269   \ekvset{ekd@newapp}{#2}
270   \luadirect{ekdos.newapparatus(
271     \luastringN{#1},
272     \luastring{\direction@val},
273     \luastringO{\rule@val},
274     \luastringO{\delim@val},
275     \luastringO{\sep@val},
276     \luastringO{\bhook@val},
277     \luastringO{\ehook@val},
278     \luastringO{\limit@val},
279     \luastringO{\lang@val},
280     \luastringO{\notelang@val}
281   )}
282   \egroup
283 }
284 \@onlypreamble\DeclareApparatus
```

\addentries If `maxentries` be set for a given layer of critical notes, `\addentries[<layer>]{<n>}`, where `<n>` is an integer, can be used to add `<n>` to—or remove it from if `<n>` be negative—the

number of accepted entries on the current page. `\addentries` operates on the default layer of notes, but any other declared layer can be specified in the optional argument of the command.

```
285 \NewDocumentCommand{\addentries}{0{\ekdan@type} m}{%
286   \luadirect{ekdosis.addto_bagunits(\luastringO{#1}, \luastringN{#2})}%
287   \ignorespaces
288 }
```

`\ekdpb` `\ekdpk[⟨page no⟩]{⟨line no⟩}` is used to insert conditional page breaks by specifying that the page break should occur only on a given line and optionally a given page. If the specified conditions be met then this command triggers `\pagebreak`.

```
289 \newcounter{ekdpb}
290 \globalcounter{ekdpb}
291 \NewDocumentCommand{\ekdpb}{s o m}{%
292   \IfBooleanTF{#1}
293   {\ifekd@showpb\marginpar{\ekd@hpbmk}\fi
294     \pagebreak}
295   {%
296     \def\@tmpoarg{#2}%
297     \def\@tmpmarg{#3}%
298     \stepcounter{ekdpb}%
299     \linelabel{ekdpb:\theekdpb}%
300     \def\tmp@ln{%
301       \getrefnumber{ekdpb:\theekdpb}}%
302     \def\tmp@pg{%
303       \getpagerefnumber{ekdpb:\theekdpb}}%
304     \IfNoValueTF{#2}
305     {\ifnum
306       \pdfstrcmp{\@tmpmarg}{\tmp@ln} = 0
307       \ifekd@showpb\marginpar{\ekd@spbmk}\fi
308       \pagebreak
309       \else
310       \ifekd@showpb\marginpar{[\ekd@spbmk]}\fi
311       \fi}
312     {\ifnum
313       \pdfstrcmp{\@tmpoarg}{\tmp@pg} = 0
314       \ifnum
315       \pdfstrcmp{\@tmpmarg}{\tmp@ln} = 0
316       \ifekd@showpb\marginpar{\ekd@spbmk}\fi
317       \pagebreak
318       \else
319       \ifekd@showpb\marginpar{[\ekd@spbmk]}\fi
320       \fi
321       \fi
322     }%
323   }\ignorespaces
324 }
```

Apparatus-related settings and functions. Some booleans to check if an apparatus should be inserted and what is the current environment.

```
325 \newbool{do@app}
326 \newif\ifekd@state
327 \newif\ifekd@isinapp
328 \newif\ifekd@isinlem
329 \newif\ifekd@appinapp
```

The next boolean is shared with `arabluatex`. `\LRnum` is used internally to ensure that numerals referring to line spans are displayed in the right order.

```

330 \providebool{al@rlmode}
331 \ifpackageloaded{arabluatex}{\%
332   \def\setRL{\booltrue{al@rlmode}\pdir TRT\textdir TRT}
333   \def\setLR{\boolfalse{al@rlmode}\pdir TLT\textdir TLT}
334 }
335 \protected\def\LRnum#1{\bgroup\textdir TLT#1\egroup}

```

Set counter referring to line numbers and make it global.

```

336 \newcounter{ekd@lab}
337 \globalcounter{ekd@lab}

```

This command inserts words in the apparatus criticus without checking if both `ekd@isinapp` and `ekd@state` are set to `true`.

```

338 \NewDocumentCommand{\unconditional@appin}{o m}{%
339   \IfNoValueTF{#1}
340   {\luadirect{ekdosis.appin(\luastring0{#2})}}
341   {\luadirect{ekdosis.appin(\luastring0{#2}, \luastring0{#1})}}}%
342 }

```

`\blfootnote` `\blfootnote{<footnote>}` is used internally to insert the apparatus in the footnote block should the global optional argument `layout` be set to `footins`. Therefore, it is not documented.

```

343 \def\blfootnote{\gdef\@thefnmark{\relax}\@footnotetext}
344 % \def\blfootnote{\gdef\@thefnmark{}\@blfootnotetext}
345 \long\def\@blfootnotetext#1{\insert\footins{%
346   \reset@font\footnotesize
347   \interlinepenalty\interfootnotelinepenalty
348   \splittopskip\footnotesep
349   \splitmaxdepth \dp\strutbox \floatingpenalty \@MM
350   \hsize\columnwidth \@parboxrestore
351   \protected@edef\@currentlabel{%
352     \csname p@footnote\endcsname\@thefnmark
353   }%
354   \color@begingroup
355   \@makeblfntext{%
356     \rule{z@footnotesep}{\ignorespaces#1\@finalstrut\strutbox}%
357   }%
358   \color@endgroup}}%
359 \newcommand\@makeblfntext[1]{%
360   \parindent 1em%
361   \noindent
362   \hb@xt@0em{\hss\@makefnmark}#1}

```

Single-layer apparatus The following commands are for general settings. All of them can be used in the preamble or at any point of the document. The keys to be used follow:—

```

362 \newif\ifrtl@app
363 \edef\ekdsep{ }
364 \ekvdefinekeys{default@app}{
365   choice direction = {LR = \rtl@appfalse,
366     RL = \rtl@apptrue},
367   unknown-choice direction = \PackageError{ekdosis}{unknown
368     direction=#1}{`direction' must be either `LR' or `RL'.},
369   code sep = \edef\ekdsep{#1},
370   store bhook = \ekd@begin@apparatus,

```



```

371 initial bhook = {},
372 store ehook = \ekd@end@apparatus,
373 initial ehook = {},
374 store delim = \ekd@unit@delim,
375 initial delim = {},
376 store rule = \ekd@default@rule,
377 initial rule = \rule{0.4\columnwidth}{0.4pt},
378 noval norule = \def\ekd@default@rule{\mbox{}},
379 store lang = \ekd@singleapp@lang,
380 initial lang = \ltx@ifpackageloaded{babel}{\language}{%
381   \ltx@ifpackageloaded{polyglossia}{\language}{}},
382 store notelang = \ekd@singleapp@note@lang,
383 initial notelang = \ltx@ifpackageloaded{babel}{\language}{%
384   \ltx@ifpackageloaded{polyglossia}{\language}}{}
385 }

```

`\SetApparatus` All settings can also be defined as **key-value** options within the argument of `\SetApparatus`:—

```

386 \NewDocumentCommand{\SetApparatus}{m}{
387   \ekvset{default@app}{#1}
388 }

```

`\SetLTRapp` `\SetLTRapp` and `\SetRTLapp` are two argument-less commands to set the direction of single-layer apparatus criticus, either LTR or RTL:—

```

389 \NewDocumentCommand{\SetRTLapp}{}{\rtl@appttrue}
390 \NewDocumentCommand{\SetLTRapp}{}{\rtl@apppfalse}

```

`\SetSeparator` `\SetSeparator{<separator>}` allows to change the separator between lemma texts and variant readings, which is by default a closing square bracket followed by a space (`]`):—

```

391 \NewDocumentCommand{\SetSeparator}{m}{\edef\ekdsep{#1}}

```

`\SetBeginApparatus` `\SetBeginApparatus{<characters>}` can be used to append characters at the beginning of the apparatus block. By default, nothing is appended:—

```

392 \NewDocumentCommand{\SetBeginApparatus}{m}{\edef\ekd@begin@apparatus{#1}}

```

`\SetEndApparatus` `\SetEndApparatus{<characters>}` can be used to append characters at the end of the apparatus block—such as a period, as it is customary in some editions. By default, nothing is appended:—

```

393 \NewDocumentCommand{\SetEndApparatus}{m}{\edef\ekd@end@apparatus{#1}}

```

`\SetUnitDelimiter` `\SetUnitDelimiter{<delimiter>}` can be used to set the delimiter between entries in the apparatus criticus. By default, there is no delimiter except a simple space. `\SetUnitDelimiter` can be used to insert a broad space (with `\hskip` for instance, as in the OCT series) or the divider-sign (`||`, as in the Budé series):—

```

394 \NewDocumentCommand{\SetUnitDelimiter}{m}{\def\ekd@unit@delim{#1}}

```

`\SetApparatusLanguage` `\SetApparatusLang{<language>}` can be used when it is needed to apply in the apparatus criticus a language different from the one that is selected in the edition text.

```

395 \NewDocumentCommand{\SetApparatusLanguage}{m}{%
396   \def\ekd@singleapp@lang{#1}}

```

`\SetApparatusNoteLanguage` `\SetApparatusNoteLang{<language>}` can be used when it is needed to apply in entries introduced by the `\note` command a language different from the one that is selected in the edition text.

```

397 \NewDocumentCommand{\SetApparatusNoteLanguage}{m}{%
398   \def\ekd@singleapp@note@lang{#1}}

```

`\footnoteruletrue` As `ekdos` takes care of drawing a rule separating the main text from the apparatus block as well as layers of notes from each other inside this block, it may not be desirable to have the standard L^AT_EX “`footnoterule`” printed on every page of the edition text. `\footnoterulefalse` removes it while `\footnoteruletrue` leaves it untouched. The latter is set by default.

```

399 \newif\iffootnoterule
400 \footnoteruletrue
401 \let\dflt@footnoterule\footnoterule
402 \let\dflt@pcol@footnoterule\pcol@footnoterule
403 \renewcommand\footnoterule{%
404   \iffootnoterule
405     \dflt@footnoterule%
406   \fi
407 }
408 \renewcommand\pcol@footnoterule{%
409   \iffootnoterule
410     \dflt@pcol@footnoterule%
411   \fi
412 }

```

`\SetDefaultRule` By default, `ekdos` draws separating rules the definition of which is `\rule{0.4\columnwidth}{0.4pt}`. This can be changed in the preamble or at any point of the document with `\SetDefaultRule{<rule definition>}`. Leaving this argument empty as in `\SetDefaultRule{}` removes the rule.

```

413 \NewDocumentCommand{\SetDefaultRule}{m}{%
414   \def\@tempa{#1}
415   \ifx\@tempa\empty\def\ekd@default@rule{\mbox{}}}%
416   \else%
417     \def\ekd@default@rule{#1}%
418   \fi}

```

`\NLS` `\NLS` was previously adapted from a snippet written by Heiko Oberdiek. It is used by `ekdos` internally to prevent page breaks between separating rules and subsequent notes. Therefore, it is not documented.

```

419 \newcommand*{\NLS}{%
420   \nobreak\@normalcr\relax
421   % \par
422   % \nobreak
423   % \vspace{-\parskip}%
424   % \leavevmode
425   % \noindent
426   % \ignorespaces
427 }

```

This boolean is used to test if a given entry is to be preceded by a numeral referring to the line of the edition text.

```

428 \newif\ifsubsq@unit
429 \subsq@unittrue

```

`\add@apparatus` inserts the apparatus block on a given page either in the footnote floating block or in a float of its own, depending on the value set in the `layout` global option. As some commands need to know whether they are called from inside the apparatus criticus, a conditional is first defined.

```

430 \newif\ifekd@inside@app

```

Then `\ekd@fitapp` is defined for `layout=fitapp`:—

```

431 \if@pkg@fitfloat
432   \newtcboxfit{\ekd@fitapp}{%
433     blankest,
434     fit basedim = \f@size pt,
435     fit fontsize macros,
436     fit height from=0pt to \ekd@app@height,
437     fit algorithm = \ekd@fit@algorithm,
438     float=!b}
439 \fi

```

Finally two commands are used to actually insert the apparatus depending on the value set in the `layout` global option.

```

440 \long\def\ekd@insert@apparatus{%
441   \unless\ifekd@mapps
442     \ifrtl@app\pardir TRT\leavevmode\textdir TRT\else
443       \pardir TLT\leavevmode\textdir TLT\fi
444   \fi
445   \if@pkg@parnotes
446     \if@parnotesroman
447       \renewcommand*{\theparnotemark}{\roman{parnotemark}}\fi
448     \parnoteclear\fi
449     \ekd@inside@aptrue
450     \ekd@appfontsize
451     \ifekd@mapps
452       \ifdefined\ekd@initial@rule
453         \ekd@initial@rule
454       \fi
455     \fi
456     \apparatus\unless\ifekd@mapps\ekd@end@apparatus\fi
457     \ekd@inside@appfalse
458   \if@pkg@parnotes\parnotes\parnotereset\fi
459 }%
460 \def\add@@apparatus{%
461   \if@pkg@parnotes\parnotes\else\fi
462   \if@pkg@footins
463     \bgroup
464     \unless\ifekd@mapps
465       \ifrtl@app\pardir TRT\leavevmode\textdir TRT\else
466         \pardir TLT\leavevmode\textdir TLT\fi
467     \fi
468     \blfootnote{%
469       \if@pkg@parnotes
470         \if@parnotesroman
471           \renewcommand*{\theparnotemark}{\roman{parnotemark}}\else\fi
472         \parnoteclear\else\fi
473         \ekd@inside@aptrue
474         \ekd@appfontsize
475         \ifekd@mapps
476           \ifdefined\ekd@initial@rule
477             \ekd@initial@rule
478           \fi
479         \fi
480         \apparatus\unless\ifekd@mapps\ekd@end@apparatus\fi
481         \ekd@inside@appfalse
482       \if@pkg@parnotes\parnotes\parnotereset\else\fi

```

```

483 }%
484 \egroup
485 \fi
486 \if@pkg@float
487 \begin{ekdaparatus}[!b]%
488   \ekd@insert@apparatus
489 \end{ekdaparatus}%
490 \fi
491 \if@pkg@keyfloat
492   \ekd@insert@keyparapp
493 \fi
494 \if@pkg@fitfloat
495   \ekd@fitapp{\ekd@insert@apparatus}%
496 \fi
497 }

```

Before inserting any new entry, `\add@apparatus` calls `\test@apparatus` to decide whether a new apparatus block must be created on a given page.

```

498 \def\add@apparatus{%
499   \test@apparatus%
500   \ifbool{do@app}{\subsq@unitfalse\add@@apparatus}{}%
501 }

```

`\append@app` inserts a bare (sub)entry in the apparatus...

```

502 \NewDocumentCommand{\append@app}{o +m}{%
503   \ifekd@isinapp%
504     \ifekd@state%
505     \IfNoValueTF{#1}%
506       {\luairect{ekdosiss.appin(\luastringO{#2})}}%
507       {\luairect{ekdosiss.appin(\luastringO{#2}, \luastringO{#1})}}%
508     \fi%
509   \fi}

```

while `\append@ln@app` inserts a (sub)entry possibly preceded by a line number.

```

510 \NewDocumentCommand{\append@ln@app}{o +m}{%
511   \IfNoValueTF{#1}
512   {\luairect{tex.sprint(ekdosiss.mdvappend(\luastringO{#2}))}}
513   {\luairect{tex.sprint(ekdosiss.mdvappend(\luastringO{#2},
514     \luastringO{#1}))}}

```

Lineation Settings

`\outerlinenumbers` ekdosis does not use the “pagewise” numbering mode that is provided by `lineno`. Therefore, `\outerlinenumbers` and `\innerlinenumbers` are defined in addition to `\rightlinenumbers` and `\leftlinenumbers`.

```

515 \def\outerlinenumbers{%
516   \def\makeLineNumberRunning{%
517     \checkoddpge
518     \ifoddpge
519       \linenumfont\hskip\linenumbersep\hskip\textwidth
520       \hbox to\linenumwidth{\hss\LineNumber}\hss
521     \else
522       \hss\linenumfont\LineNumber\hskip\linenumbersep
523     \fi
524   }%
525 }

```

```

526 \def\innerlinenumbers{%
527   \def\makeLineNumberRunning{%
528     \checkoddpages
529     \ifoddpages
530       \hss\linenumberfont\LineNumber\hskip\linenumbersep
531     \else
532       \linenumberfont\hskip\linenumbersep\hskip\textwidth
533       \hbox to\linenumberwidth{\hss\LineNumber}\hss
534     \fi
535   }%
536 }

```

The keys to be used for lineation settings follow. A conditional is defined beforehand so that `ekdos` may know whether the numbering should start afresh at the top of each page.

```

537 \newif\ifekd@pagelineation
538 \newif\ifekd@pagevlineation
539 \NewDocumentCommand{\ekdatbegshihook}{}{%
540   \ifekd@pagelineation\resetlinenumber\fi
541 }
542 \AddToHook{shipout/before}{\ekdatbegshihook}
543 \newif\ifekd@elidednumbers
544 \ekvdefinekeys{ekd@lineation}{
545   choice lineation = {page = \ekd@pagelineationtrue,
546     document = \ekd@pagelineationfalse,
547     none = \ekd@pagelineationtrue
548       \renewcommand\thelinenumbers{}}},
549   unknown-choice lineation = \PackageError{ekdos}{unknown
550     lineation=#1}{`lineation' must be either `page' or `document'.},
551   choice vlineation = {page = \ekd@pagevlineationtrue,
552     document = \ekd@pagevlineationfalse},
553   unknown-choice vlineation = \PackageError{ekdos}{unknown
554     vlineation=#1}{`vlineation' must be either `page' or `document'.},
555   code modulonum = \chardef\c@linenumbermodulo#1\relax,
556   noval modulo = \modulolinenumbers,
557   code vmodulo = \ifekd@memoir@loaded\linenumberfrequency{#1}
558     \else\ifpkg@poetry@verse\poemlines{#1}\fi\fi,
559   initial vmodulo = 1,
560   default vmodulo = 5,
561   bool continuousvnum = \if@continuous@vnum,
562   choice numbers = {elided = \ekd@elidednumberstrue,
563     full = \ekd@elidednumbersfalse},
564   unknown-choice numbers = \PackageError{ekdos}{unknown
565     numbers=#1}{`numbers' must be either `elided' or `full'.},
566   initial numbers = elided,
567   choice margin = {right = \rightlinenumbers,
568     left = \leftlinenumbers,
569     inner = \innerlinenumbers,
570     outer = \outerlinenumbers},
571   unknown-choice margin = \PackageError{ekdos}{unknown
572     margin=#1}{`margin' must be either `left', `right', \MessageBreak
573     `inner' or `outer'},
574   choice vmargin = {
575     right = \ifpkg@poetry@verse\verselinenumbersright\fi,
576     left = \ifpkg@poetry@verse\verselinenumbersleft\fi},
577   unknown-choice vmargin = \PackageError{ekdos}{unknown
578     vmargin=#1}{`margin' must be either `left' or `right'}

```

579 }

`\SetLineation` Then `\SetLineation{<options>}` can be used in the preamble or at any point of the document to set lineation preferences. Its argument processes the **key-value** options that are defined just above.

```
580 \NewDocumentCommand{\SetLineation}{m}{%
581   \ekvset{ekd@lineation}{#1}
582 }
```

Use `\normalfont` for line numbers:—

```
583 \renewcommand{\linenumberfont}{\normalfont\footnotesize}
```

`\SetDefaultApparatus` By default, `ekdos` defines one layer of critical notes which is called **default**. This name can be changed at any point of the document with `\SetDefaultApparatus{<name>}`.

```
584 \ekvdefinekeys{appnote}{%
585   store type = \ekdan@type,
586   initial type = default
587 }
588 \NewDocumentCommand{\SetDefaultApparatus}{m}{%
589   \ekvset{appnote}{type=#1}}
```

`\app` `\app[type=<type>]{<apparatus entries>}` takes one mandatory argument and accepts one optional argument. `type=` refers to the layer the note must go into and `<apparatus entries>` contains command used to insert the entries, either `\lem`, `\rdg` or `\note{<*>}`:—

```
590 \NewDocumentCommand{\app}{0} > { \TrimSpaces } +m}{%
591   \leavevmode
592   \begingroup
593   \ekvset{appnote}{#1}%
594   \ifekd@isinapp\ekd@appinapptrue\fi
595   \ekd@isinapptrue
596   \stepcounter{ekd@lab}%
597   \zlabel{ekd:\theekd@lab}%
598   \luadirect{ekdosis.storeabspg(
599     \luastring{\zref@extract{ekd:\theekd@lab}{abspage}})}%
600   \ifekd@state\add@apparatus\fi
601   \luadirect{tex.sprint(ekdosis.removeesp(\luastringN{#2}))}%
602   \ekd@isinappfalse
603   \ekd@appinappfalse
604   \endgroup}
```

`\current@ref@arg` is used outside `\app` by `\note`. It takes two mandatory arguments: the beginning line label and the ending line label—which are manually inserted—and returns the formatted reference to be inserted in the apparatus criticus.

```
605 \def\current@ref@arg#1#2{%\textdir TLT%
606   \unexpanded\expandafter{\ekd@refnumstyle}%
607   \ifnum%
608     \pdf@strcmp{\getpagerefnumber{#1}}{\getpagerefnumber{#2}}
609     =
610     0
611     \ifnum%
612       \pdf@strcmp{\getrefnumber{#1}}{\getrefnumber{#2}}
613       =
614       0
615       %
```

```

616 \ifekd@maps%
617 \ifbool{subsq@unit@ekdan@type}{%
618   \ifnum%
619     \pdf@strcmp{\getrefnumber{#1}}{%
620       \getrefnumber{\luairect{tex.sprint(ekdosis.getprevnotelab())}}
621     =
622     0
623   \else
624     \LRnum{\getrefnumber{#1}}\unexpanded\expandafter{\ekd@postrefnum}% issue the no
625   \fi%
626 }%
627 {\LRnum{\getrefnumber{#1}}\unexpanded\expandafter{\ekd@postrefnum}}% issue the no
628 \else
629 \ifsubsq@unit%
630 %
631 \ifnum%
632 \pdf@strcmp{\getrefnumber{#1}}{%
633   \getrefnumber{\luairect{tex.sprint(ekdosis.getprevnotelab())}}
634 =
635 0
636 \else
637 \LRnum{\getrefnumber{#1}}\unexpanded\expandafter{\ekd@postrefnum}% issue the no
638 \fi
639 %
640 \else
641 \LRnum{\getrefnumber{#1}}\unexpanded\expandafter{\ekd@postrefnum}% issue the no
642 \fi
643 \fi
644 %
645 \else
646 \ifekd@elidednumbers
647 \luairect{tex.sprint(ekdosis.numrange(\luastring{\getrefnumber{#1}},
648   \luastring{\getrefnumber{#2}}))}%
649   \unexpanded\expandafter{\ekd@postrefnum}% issue the nos
650 \else
651 \LRnum{\getrefnumber{#1}}--%
652 \LRnum{\getrefnumber{#2}}\unexpanded\expandafter{\ekd@postrefnum}% issue the nos
653 \fi
654 \fi%
655 \else
656 \ifboolexpr{bool {ekd@pagelineation} or bool {ekd@pagevlineation}}
657   {\LRnum{\getrefnumber{#1}}--%
658   \LRnum{\getpagerefnnumber{#2}}.%
659   \LRnum{\getrefnumber{#2}}\unexpanded\expandafter{\ekd@postrefnum}% issue pg and ln nos
660   {\LRnum{\getrefnumber{#1}}--%
661   \LRnum{\getrefnumber{#2}}\unexpanded\expandafter{\ekd@postrefnum}% issue the nos
662   \fi%
663   \ifekdn@forcenum
664     \LRnum{\getrefnumber{#1}}\unexpanded\expandafter{\ekd@postrefnum}% force the no
665   \fi
666 }%
667 }

```

`\current@ref` is pretty much the same as `\current@reg@arg`, but takes no argument. It is used by commands such as `\lem` when references to page and line numbers can be returned by Lua.

```

668 \def\current@ref{%\textdir TLT%
669 \unexpanded\expandafter{\ekd@refnumstyle}%
670 \ifnum%
671 \pdf@strcmp{%
672 \getpagerefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
673 {\getpagerefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}
674 =
675 0
676 \ifnum%
677 \pdf@strcmp{%
678 \getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
679 {\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}
680 =
681 0
682 %
683 \ifekd@apps%
684 \ifbool{subs@unit@ekdan@type}{%
685 \ifnum%
686 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
687 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevlnlab())}-b}}
688 =
689 0
690 %%%begin
691 \ifnum%
692 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}%
693 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevlnlab())}-e}}
694 =
695 0
696 \ifekd@appinapp
697 \ifnum%
698 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
699 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevprevlnlab())}-b}}
700 =
701 0
702 \else
703 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
704 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
705 \fi
706 \fi
707 \else
708 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
709 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
710 \fi
711 %%% end
712 \else
713 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
714 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
715 \fi%
716 }{\LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
717 \unexpanded\expandafter{\ekd@postrefnum}}% issue the no
718 \else
719 \ifsubs@unit%
720 %
721 \ifnum%
722 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%

```



```

723 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevlnlab())}-b}}
724 =
725 0
726 %%%begin
727 \ifnum%
728 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}%
729 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevlnlab())}-e}}
730 =
731 0
732 \ifekd@appinapp
733 \ifnum%
734 \pdf@strcmp{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
735 {\getrefnumber{\luairect{tex.sprint(ekdosis.getprevprevlnlab())}-b}}
736 =
737 0
738 \else
739 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
740 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
741 \fi
742 \fi
743 \else
744 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
745 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
746 \fi
747 %%% end
748 \else
749 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
750 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
751 \fi
752 %
753 \else
754 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}%
755 \unexpanded\expandafter{\ekd@postrefnum}% issue the no
756 \fi
757 \fi
758 %
759 \else
760 \ifekd@elidednumbers
761 \luairect{tex.sprint(ekdosis.numrange(
762 \luastring{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}},
763 \luastring{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}))}%
764 \unexpanded\expandafter{\ekd@postrefnum}% issue the nos
765 \else
766 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}--%
767 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}%
768 \unexpanded\expandafter{\ekd@postrefnum}% issue the nos
769 \fi
770 \fi%
771 \else
772 \ifboolexpr{bool {ekd@pagelineation} or bool {ekd@pagevlineation}}
773 {\LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}--%
774 \LRnum{\getpagerefernumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}.}%
775 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}%
776 \unexpanded\expandafter{\ekd@postrefnum}}% issue pg and ln nos
777 {\LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}--%

```

```

778 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-e}}}%
779 \unexpanded\expandafter{\ekd@postrefnum}}}% issue the nos
780 \fi%
781 \ifekdl@forcenum
782 \LRnum{\getrefnumber{\luairect{tex.sprint(ekdosis.getlnlab())}-b}}}%
783 \unexpanded\expandafter{\ekd@postrefnum}}}% force the no
784 \fi
785 }%
786 }

```

Define keys to be used by the optional arguments of `\lem` and `\rdg`:—

```

787 \newif\ifekdl@forcenum
788 \newif\ifekdl@nonum
789 \ekvdefinekeys{lem}{
790   code wit = \def\ekdlr@wit{#1},
791   code source = \def\ekdlr@source{#1},
792   code resp = \def\ekdlr@resp{#1},
793   code alt = \def\ekdlr@alt{#1},
794   code pre = \def\ekdlr@pre{#1},
795   code post = \def\ekdlr@post{#1},
796   code prewit = \def\ekdlr@prewit{#1},
797   code postwit = \def\ekdlr@postwit{#1},
798   store type = \ekdlr@type,
799   store sep = \ekdl@sep,
800   noval nonum = \ekdl@nonumtrue,
801   noval num = \ekdl@forcenumtrue,
802   bool nolem = \ifekdl@nolem,
803   bool nosepl = \ifekdl@nosepl,
804   initial sep = \ekdsep
805 }
806 \ekvdefinekeys{rdg}{
807   code wit = \def\ekdlr@wit{#1},
808   code source = \def\ekdlr@source{#1},
809   code resp = \def\ekdlr@resp{#1},
810   code alt = \def\ekdlr@alt{#1},
811   code pre = \def\ekdlr@pre{#1},
812   code post = \def\ekdlr@post{#1},
813   code prewit = \def\ekdlr@prewit{#1},
814   code postwit = \def\ekdlr@postwit{#1},
815   store type = \ekdlr@type,
816   bool nordg = \ifekdr@nordg
817 }

```

`\rdgGrp` `\rdgGrp[option]{<lemma and/or readings>}` may be used to group readings so as to indicate subvariation in apparatus entries. This command is expected inside `\app{}`, and takes as argument readings to be grouped introduced by means of `\lem` and/or `\rdg` commands. It further accepts `type` as an optional key-value argument to describe the type of grouping.

```

818 \NewDocumentCommand{\rdgGrp}{0{ } > {\TrimSpaces } m}{%
819   \luairect{tex.sprint(ekdosis.removeesp(\luastringN{#2}))}%
820 }

```

`\app@lang` `\app@lang` is used internally by `\lem` and `\rdg` to set the language for apparatus entries.
`\app@note@lang` `\note` uses `\@note@lang`.

```

821 \def\app@lang{%

```

```

822 \ifekd@mapps
823 \luadirect{tex.sprint(ekdosis.getapplang(\luastring{\ekdan@type}))}%
824 \else
825 \ekd@singleapp@lang
826 \fi
827 }
828 \def\app@note@lang{%
829 \ifekd@mapps
830 \luadirect{tex.sprint(ekdosis.getappnotelang(\luastring{\ekdan@type}))}%
831 \else
832 \ekd@singleapp@note@lang
833 \fi
834 }

```

`\lem` `\lem[<options>]{<lemma text>}` inserts *<lemma text>* both in the edition text and in the apparatus criticus by default, preceded by the reference to the line number or a space if it is the same number as the one of the previous entry. This command accepts the optional key-value arguments just defined above.

```

835 \NewDocumentCommand{\lem}{0{} m}{%
836 \ekd@isinlemtrue%
837 \luadirect{ekdosis.dolnlab(\luastringN{#2})}%
838 \null
839 \bgroup%
840 \ekdl@forcenumfalse
841 \ekdl@nonumfalse
842 \ekvset{lem}{#1}%
843 \ekd@test@lang
844 \ifekd@mapps%
845 \ifnum%
846 \luadirect{tex.sprint(ekdosis.get_bagunits(\luastring0{\ekdan@type}))}
847 = 1
848 \boolfalse{subs@unit@\ekdan@type}%
849 \fi%
850 \luadirect{ekdosis.increment_bagunits(\luastring0{\ekdan@type})}%
851 \def\ekd@munit@delim{%
852 \luadirect{tex.sprint(ekdosis.getappdelim(\luastring0{\ekdan@type}))}%
853 \luadirect{tex.sprint(ekdosis.limit_bagunits(\luastring0{\ekdan@type}))}%
854 \fi%
855 \ifekdl@nolem\edef\lem@app{%
856 % \hspace .75em
857 \ifekd@mapps
858 \ifbool{subs@unit@\ekdan@type}%
859 {\ekd@munit@delim}{}%
860 \else%
861 \ifsubs@unit\unexpanded\expandafter{\ekd@unit@delim}\fi%
862 \fi%
863 \unless\ifekdl@nonum\current@ref\fi}%\hspace .25em}%
864 \else%
865 \ifbool{al@rlmode}{%
866 \edef\lem@app{%
867 % \hspace .75em
868 \ifekd@mapps
869 \ifbool{subs@unit@\ekdan@type}%
870 {\ekd@munit@delim}{}%
871 \else%

```

```

872 \ifsubsq@unit\unexpanded\expandafter{\ekd@unit@delim}\fi%
873 \fi%
874 \unless\ifekdl@nonum\current@ref\fi%\hskip .25em
875 \ifdefined\ekdlr@alt%
876 \ifdefined\ekdlr@post%
877 \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
878 {\textdir TRT\unexpanded\expandafter{\ekd@lemmastyle}%
879 \unexpanded\expandafter{\ekdlr@alt}}%
880 \ifdefined\ekdlr@pre%
881 \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
882 \else
883 \ifdefined\ekdlr@post%
884 \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
885 {\textdir TRT\unexpanded\expandafter{\ekd@lemmastyle}%
886 \unexpanded{#2}}%
887 \ifdefined\ekdlr@pre%
888 \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
889 \fi
890 \ifdefined\ekdlr@postwit%
891 \space\unexpanded\expandafter{\ekdlr@postwit}\else\fi
892 \ifdefined\ekdlr@resp\space\getsiglum{\ekdlr@resp}\else\fi
893 \ifdefined\ekdlr@source\space\getsiglum{\ekdlr@source}\else\fi
894 \ifdefined\ekdlr@wit\space\getsiglum{\ekdlr@wit}\else\fi
895 \ifdefined\ekdlr@prewit%
896 \space\unexpanded\expandafter{\ekdlr@prewit}\space\else\fi
897 \ifekdl@nosep\else\unexpanded\expandafter{\ekdl@sep}\fi
898 }%
899 }%
900 {%
901 \edef\lem@app{%
902 % \hskip .75em
903 \ifekd@mapps
904 \ifbool{subsq@unit@\ekdan@type}%
905 {\ekd@munit@delim}{}%
906 \else%
907 \ifsubsq@unit\unexpanded\expandafter{\ekd@unit@delim}\fi%
908 \fi%
909 \unless\ifekdl@nonum\current@ref\fi%\hskip .25em
910 \ifdefined\ekdlr@alt%
911 \ifdefined\ekdlr@pre%
912 \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
913 \ifbool{ekd@lang@pkg}%
914 {\unexpanded\expandafter{\ekd@lemmastyle}%
915 \noexpand\selectlanguage{\app@lang}%
916 \unexpanded\expandafter{\ekdlr@alt}}%
917 {\unexpanded\expandafter{\ekd@lemmastyle}%
918 \unexpanded\expandafter{\ekdlr@alt}}%
919 \ifdefined\ekdlr@post%
920 \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
921 \else
922 \ifdefined\ekdlr@pre%
923 \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
924 \ifbool{ekd@lang@pkg}%
925 {\unexpanded\expandafter{\ekd@lemmastyle}%
926 \noexpand\selectlanguage{\app@lang}%

```

```

927         \unexpanded{#2}}}{%
928         {\unexpanded\expandafter{\ekd@lemmastyle}\unexpanded{#2}}}%
929         \ifdefined\ekdlr@post%
930         \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
931     \fi
932     \ifdefined\ekdlr@prewit%
933     \space\unexpanded\expandafter{\ekdlr@prewit}\space\else\fi
934     \ifdefined\ekdlr@wit\space\getsiglum{\ekdlr@wit}\else\fi
935     \ifdefined\ekdlr@source\space\getsiglum{\ekdlr@source}\else\fi
936     \ifdefined\ekdlr@resp\space\getsiglum{\ekdlr@resp}\else\fi
937     \ifdefined\ekdlr@postwit%
938     \space\unexpanded\expandafter{\ekdlr@postwit}\else\fi
939     \ifekdl@nosep\else\unexpanded\expandafter{\ekdl@sep}\fi
940 }%
941 }%
942 \fi%
943 \ifekd@mapps%
944 \append@ln@app[\ekdan@type]{\lem@app}%
945 \else%
946 \append@ln@app{\lem@app}%
947 \fi%
948 \egroup%
949 \ekd@isinlemfalse%
950 \subs@unittrue%
951 }

```

`\rdg` `\rdg[⟨options⟩]{⟨variant reading⟩}` inserts *⟨variant reading⟩* in the second part of the entry, after the lemma text and the separator, in the apparatus criticus. This command accepts the optional key-value arguments defined above.

```

952 \NewDocumentCommand{\rdg}{0{} m}{%
953     \bgroup%
954     \ekvset{rdg}{#1}%
955     \ekd@test@lang
956     % \ifekdr@nordg\append@app{}\else% do we need \append@app{} here? If
957     %                                     % so, keep in mind \ifekd@mapps,
958     %                                     like so:
959     \ifekdr@nordg%
960         \ifekd@mapps%
961         \append@app[\ekdan@type]{}%
962         \else%
963         \append@app{}%
964         \fi%
965     \else%
966     \ifbool{al@rlmode}{%
967         \edef\rdg@app{%
968             \ifdefined\ekdlr@alt%
969             \ifdefined\ekdlr@post%
970             \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
971             {\textdir TRT\unexpanded\expandafter{\ekd@readingstyle}%
972             \unexpanded\expandafter{\ekdlr@alt}}}%
973             \ifdefined\ekdlr@pre%
974             \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
975         \else
976             \ifdefined\ekdlr@post%
977             \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi

```

```

978         {\textdir TRT\unexpanded\expandafter{\ekd@readingstyle}%
979         \unexpanded{#2}}}%
980     \ifdefined\ekdlr@pre%
981         \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
982 \fi
983 \ifdefined\ekdlr@postwit%
984     \space\unexpanded\expandafter{\ekdlr@postwit}\else\fi
985 \ifdefined\ekdlr@resp\space\getsiglum{\ekdlr@resp}\else\fi
986 \ifdefined\ekdlr@source\space\getsiglum{\ekdlr@source}\else\fi
987 \ifdefined\ekdlr@wit\space\getsiglum{\ekdlr@wit}\else\fi
988 \ifdefined\ekdlr@prewit%
989     \space\unexpanded\expandafter{\ekdlr@prewit}\space\else\fi
990 }%
991 }%
992 {%
993 \edef\r dg@ app{%
994     \ifdefined\ekdlr@alt%
995         \ifdefined\ekdlr@pre%
996             \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
997         \ifbool{ekd@lang@pkg}%
998             {\unexpanded\expandafter{\ekd@readingstyle}%
999             \noexpand\selectlanguage{\app@lang}%
1000             \unexpanded\expandafter{\ekdlr@alt}}}%
1001             {\unexpanded\expandafter{\ekd@readingstyle}%
1002             \unexpanded\expandafter{\ekdlr@alt}}}%
1003         \ifdefined\ekdlr@post%
1004             \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
1005     \else
1006         \ifdefined\ekdlr@pre%
1007             \space\unexpanded\expandafter{\ekdlr@pre}\space\else\fi
1008         \ifbool{ekd@lang@pkg}%
1009             {\unexpanded\expandafter{\ekd@readingstyle}%
1010             \noexpand\selectlanguage{\app@lang}\unexpanded{#2}}}%
1011             {\unexpanded\expandafter{\ekd@readingstyle}\unexpanded{#2}}}%
1012         \ifdefined\ekdlr@post%
1013             \space\unexpanded\expandafter{\ekdlr@post}\space\else\fi
1014     \fi
1015     \ifdefined\ekdlr@prewit%
1016         \space\unexpanded\expandafter{\ekdlr@prewit}\space\else\fi
1017     \ifdefined\ekdlr@wit\space\getsiglum{\ekdlr@wit}\else\fi
1018     \ifdefined\ekdlr@source\space\getsiglum{\ekdlr@source}\else\fi
1019     \ifdefined\ekdlr@resp\space\getsiglum{\ekdlr@resp}\else\fi
1020     \ifdefined\ekdlr@postwit%
1021         \space\unexpanded\expandafter{\ekdlr@postwit}\else\fi
1022 }%
1023 }%
1024 \ifekd@mapps%
1025     \append@ app[\ekdan@type]{\r dg@ app}%
1026 \else%
1027     \append@ app{\r dg@ app}%
1028 \fi%
1029 \fi%
1030 \egroup%
1031 }

```

Define keys to be used by the optional argument of `\note` when this command is found outside `\app`:—

```

1032 \newif\ifekdn@forcenum
1033 \ekvdefinekeys{note}{
1034   store type = \ekdan@type,
1035   store lem = \ekdn@lem,
1036   code labelb = \def\ekdn@labelb{#1},
1037   code labelc = \def\ekdn@labelc{#1},
1038   store sep = \ekdn@sep,
1039   bool nosep = \ifekdn@nosep,
1040   initial type = default,
1041   initial sep = \ekdsep,
1042   bool nonum = \ifekdn@nonum,
1043   noval num = \ekdn@forcenumtrue
1044 }

```

`\note@noapp` is used internally when a `\note` command is found outside `\app`. This command is mostly used to insert short comments or references to texts quoted or cited in the edition text to go into additional layers of the apparatus criticus, e.g. the *apparatus testium*. It accepts the optional key-value arguments just defined above. It must be noted that `labelb` must be specified; otherwise `ekdos` will issue an error message.

```

1045 \NewDocumentCommand{\note@noapp}{0{} +m}{%
1046   \leavevmode
1047   \bgroup%
1048   \ekvset{note}{#1}%
1049   \ekd@test@lang
1050   \stepcounter{ekd@lab}%
1051   \zlabel{ekd:\theekd@lab}%
1052   \luadirect{ekdos.storeabspg(
1053     \luastring{\zref@extract{ekd:\theekd@lab}{abspage}})}%
1054   \ifekd@state\add@apparatus\fi%
1055   \ifekd@mapps%
1056     \ifnum%
1057       \luadirect{tex.sprint(ekdos.get_bagunits(\luastring{\ekdan@type}))}
1058       = 1
1059       \boolfalse{subsq@unit@\ekdan@type}%
1060     \fi%
1061   \luadirect{ekdos.increment_bagunits(\luastring{\ekdan@type})}%
1062   \def\ekd@munit@delim{%
1063     \luadirect{tex.sprint(ekdos.getappdelim(\luastring{\ekdan@type}))}}%
1064   \luadirect{tex.sprint(ekdos.limit_bagunits(\luastring{\ekdan@type}))}%
1065   \fi%
1066   \ifdefined\ekdn@labelb%
1067     \luadirect{tex.sprint(ekdos.setnotelab(\luastring{\ekdn@labelb}))}%
1068     \ifdefined\ekdn@labelc\else\def\ekdn@labelc{\ekdn@labelb}\fi%
1069   \else\PackageError{ekdos}{missing labelb}{`labelb' must be
1070     set.}\fi%
1071   \ifbool{al@rlmode}%
1072   {\edef\note@contents{%
1073     % \hskip .75em
1074     \ifekd@mapps
1075       \ifbool{subsq@unit@\ekdan@type}%
1076       {\ekd@munit@delim}{}}%
1077   \else%
1078     \ifsubsq@unit\unexpanded\expandafter{\ekd@munit@delim}\fi%

```



```

1079 \fi%
1080 \unless\ifekdn@nonum\current@ref@arg{\ekdn@labelb}{\ekdn@labelc}\fi%\hskip .25em
1081 \ifdefined\ekdn@lem%
1082 {\textdir TRT\unexpanded\expandafter{\ekd@lemmastyle}%
1083 \unexpanded\expandafter{\ekdn@lem}}%
1084 \unless\ifekdn@nosep
1085 \unexpanded\expandafter{\ekdn@sep}\fi
1086 \else\fi%
1087 {\textdir TRT\unexpanded{#2}}}%
1088 {\edef\note@contents{%
1089 % \hskip .75em
1090 \ifekd@mapps
1091 \ifbool{subsq@unit@ekdan@type}%
1092 {\ekd@munit@delim}{}}%
1093 \else%
1094 \ifsubsq@unit\unexpanded\expandafter{\ekd@unit@delim}\fi%
1095 \fi%
1096 \unless\ifekdn@nonum\current@ref@arg{\ekdn@labelb}{\ekdn@labelc}\fi%\hskip .25em
1097 \ifdefined\ekdn@lem
1098 \ifbool{ekd@lang@pkg}%
1099 {{\unexpanded\expandafter{\ekd@lemmastyle}%
1100 \noexpand\selectlanguage{\app@lang}%
1101 \unexpanded\expandafter{\ekdn@lem}}}%
1102 {\unexpanded\expandafter{\ekd@lemmastyle}%
1103 \unexpanded\expandafter{\ekdn@lem}}}%
1104 \unless\ifekdn@nosep
1105 \unexpanded\expandafter{\ekdn@sep}\fi
1106 \else\fi%
1107 \ifbool{ekd@lang@pkg}%
1108 {{\noexpand\selectlanguage{\app@note@lang}\unexpanded{#2}}}{%
1109 {\unexpanded{#2}}}}}%
1110 \ifekd@mapps%
1111 \unconditional@appin[\ekdan@type]{\note@contents}%
1112 \else%
1113 \unconditional@appin{\note@contents}%
1114 \fi%
1115 \luadirect{ekdosis.setprevnotelab(\luastring0{\ekdn@labelb})}%
1116 \egroup
1117 \subsq@unittrue
1118 \ignorespaces
1119 }

```

Define keys to be used by the optional argument of `\note` when this command is found inside `\app`:—

```

1120 \ekvdefinekeys{ekd@note}{
1121   store pre = \pre@value,
1122   store post = \post@value
1123 }

```

The following three commands, `\note@app`, `\ekd@note` and `\ekd@note@star` are used internally when a `\note` command is found inside `\app`. These commands are used to insert short comments after the lemma text or after any variant reading in the apparatus criticus. `\note@app` and subsequently `\ekd@note` and `\ekd@note@star` accept the optional key-value arguments just defined above.

```

1124 \NewDocumentCommand{\ekd@note}{0{ } m}{%
1125   \bgroup%

```



```

1126 \ekvset{ekd@note}{#1}%
1127 \edef\note@contents{%
1128   \ekvifdefinedNoVal{ekd@note}{pre}{-}{-}%
1129   \unexpanded\expandafter{\pre@value}}%
1130   {\unexpanded{#2}}}%
1131   \ekvifdefinedNoVal{ekd@note}{post}{-}{-}%
1132   \unexpanded\expandafter{\post@value}}%
1133 }%
1134 \ifekd@mapps%
1135 \append@app[\ekdan@type]{\note@contents}%
1136 \else%
1137 \append@app{\note@contents}%
1138 \fi%
1139 \egroup%
1140 }
1141 \NewDocumentCommand{\ekd@note@star}{0{} m}{%
1142   \bgroup
1143   \ekvset{ekd@note}{#1}%
1144   \edef\note@contents{%
1145     \ekvifdefinedNoVal{ekd@note}{pre}{-}{-}%
1146     \unexpanded\expandafter{\pre@value}}%
1147     \if@pkg@parnotes
1148     \unskip\noexpand\parnote{\unexpanded{#2}}}%
1149     \else
1150     \unskip\noexpand\footnote{\unexpanded{#2}}}%
1151     \fi
1152     \ekvifdefinedNoVal{ekd@note}{post}{-}{-}%
1153     \unexpanded\expandafter{\post@value}}%
1154   }%
1155   \ifekd@mapps
1156   \append@app[\ekdan@type]{\note@contents}%
1157   \else
1158   \append@app{\note@contents}%
1159   \fi
1160   \egroup
1161 }
1162 \NewDocumentCommand{\note@app}{s 0{} +m}{%
1163   \ifbool{al@rlmode}{%
1164     \IfBooleanTF{#1}{\ekd@note@star[#2]{%
1165       {\textdir TRT#3}}}%
1166       {\ekd@note[#2]{\textdir TRT#3}}}%
1167   }{%
1168     \IfBooleanTF{#1}{\ekd@note@star[#2]{#3}}
1169     {\ekd@note[#2]{#3}}}%
1170   }%
1171 }

```

`\note` Finally, `\note` is a simple command designed to check whether `\note` itself is called inside or outside `\app`. Then, unless it is found inside `\lem`, it calls `\note@app` in the former case and `\note@noapp` in the latter case:—

```

1172 \NewDocumentCommand{\note}{s 0{} +m}{%
1173   \ifekd@state%
1174   \ifekd@isinapp%
1175   \ifekd@isinlem%
1176     \note@noapp[#2]{#3}%

```

```

1177     \else%
1178         \IfBooleanTF{#1}{\note@app*{#2}{#3}}{\note@app{#2}{#3}}%
1179     \fi%
1180     \else%
1181         \note@noapp{#2}{#3}%
1182     \fi%
1183 \fi%
1184 }

```

Emendations and Conjectures Here follows the key-value options to be used by `\SetCritSymbols` below:—

```

1185 \ekvdefinekeys{ekd@corr}{
1186     store suppbeg = \suppb@value,
1187     store suppend = \suppe@value,
1188     store delbeg = \delb@value,
1189     store delend = \dele@value,
1190     store sicbeg = \sicb@value,
1191     store sicend = \sice@value,
1192     store gapmark = \gapm@value,
1193     initial suppbeg = \ifbool{al@rlmode}{>}{<},
1194     initial suppend = \ifbool{al@rlmode}{<}{>},
1195     initial delbeg = \ifbool{al@rlmode}{\}{\},
1196     initial delend = \ifbool{al@rlmode}{\}{\},
1197     initial sicbeg = \dag,
1198     initial sicend = \dag,
1199     initial gapmark = ***
1200 }

```

`\supplied` `\supplied{<text>}` takes as mandatory argument the text added or supplied by conjecture.

```

1201 \NewDocumentCommand{\supplied}{m}{%
1202     \ifekd@inside@app
1203     #1%
1204     \else
1205     \suppb@value #1\suppe@value
1206     \fi
1207 }

```

`\surplus` `\surplus{<text>}` takes as mandatory argument the text considered by the editor to be inauthentic, but nevertheless retained between braces in the edition text as it is transmitted by all witnesses.

```

1208 \NewDocumentCommand{\surplus}{m}{%
1209     \ifekd@inside@app
1210     #1%
1211     \else
1212     \delb@value #1\dele@value
1213     \fi
1214 }

```

`\sic` `\sic{<text>}` takes as mandatory argument the text deemed by the editor to be readable but not understandable. `\sic` insert `<text>` between cruces while `\sic*` prints only one crux before `<text>`.

```

1215 \NewDocumentCommand{\sic}{s m}{%
1216     \ifekd@inside@app
1217     #2%

```

```

1218 \else
1219 \IfBooleanTF{#1}
1220   {\sicb@value #2}
1221   {\sicb@value #2\sice@value}%
1222 \fi
1223 }

```

`\gap` `\gap{<options>}` indicates that some amount of text has fallen away from the entire tradition. It takes as mandatory argument a comma-separated list of options that can be used to further specify the reason for omission, the unit of measurement, the quantity and extent.

```

1224 \NewDocumentCommand{\gap}{m}{%
1225   \gapm@value
1226 }

```

`\SetCritSymbols` `\SetCritSymbols{<csv list of options>}` is used to change the symbols that `ekdosis` uses by default for representing emendations, lacunae, omissions, gaps and editorial deletions.

```

1227 \NewDocumentCommand{\SetCritSymbols}{m}{
1228   \ekvset{ekd@corr}{#1}
1229 }

```

`\apparatus` is used internally by `ekdosis` to print the apparatus at the bottom of pages. Therefore, it is not documented, but this may change in the future for it will be possible to have apparatuses printed at other places.

```

1230 \NewDocumentCommand{\apparatus}{}{%
1231   \luairect{tex.sprint(ekdosis.appout())}

```

The following two commands call Lua functions to check whether an apparatus should be printed on a given page and to store the current column id.

```

1232 \NewDocumentCommand{\test@apparatus}{}{%
1233   \luairect{tex.sprint(ekdosis.testapparatus())}
1234 \NewDocumentCommand{\ekd@storecol}{}{%
1235   \luairect{ekdosis.storecurcol(\luastring{thecolumn})}%
1236 }

```

Start and stop `ekdosis`:

```

1237 \NewDocumentCommand{\EkdosisOn}{}{%
1238   \ekd@statetrue}
1239 \NewDocumentCommand{\EkdosisOff}{}{%
1240   \ekd@statefalse%
1241 }

```

Neutralize unwanted commands provided by `lineno` within the `ekdosis` environment:—

```

1242 \def\ekd@setlineno{%
1243   \let\setpagewiselinenumbers\relax%
1244   \let\pagewiselinenumbers\relax%
1245   \let\endpagewiselinenumbers\relax%
1246   \let\runningpagewiselinenumbers\relax%
1247   \let\realpagewiselinenumbers\relax%
1248 }

```

`ekdosis` Finally comes the `ekdosis` environment meant to receive the edition text equipped with an apparatus criticus. This environment collects its contents and delivers it to Lua functions if a TEI `xml` output file be desired.

```

1249 \NewDocumentEnvironment{ekdosis}{+b}{%
1250   \ekd@setlineno%

```

```

1251 \runninglinenumbers
1252 \EkdsisOn#1}{%
1253 \EkdsisOff
1254 \endrunninglinenumbers%
1255 \iftei@export
1256 \luadirect{ekdsis.exporttei(\luastringN{\par #1\par })}\fi}

```

Alignment What follows is to arrange texts in parallel columns either on single pages or on facing pages.

Define keys to be used by the `alignment` environment:—

```

1257 \ekvdefinekeys{ekd@align}{
1258   store tcols = \tcols@num,
1259   store lcols = \lcols@num,
1260   store texts = \texts@value,
1261   store apparatus = \apparatus@value,
1262   bool paired = \ifekd@paired,
1263   choice lineation = {page = \ekd@pagelineationtrue,
1264                      document = \ekd@pagelineationfalse},
1265   unknown-choice lineation = \PackageError{ekdsis}{unknown
1266     lineation=#1}{`lineation' must be either `page' or `document'.},
1267   choice segmentation = {auto = \def\segmentation@val{auto},
1268                          noauto = \def\segmentation@val{noauto}},
1269   unknown-choice segmentation = \PackageError{ekdsis}{unknown
1270     segmentation=#1}{`segmentation' must be either `auto' or
1271     `noauto'.},
1272   bool flush = \ifekd@flushapp,
1273   initial tcols = 2,
1274   initial lcols = 1,
1275   initial texts = edition;translation,
1276   initial apparatus = edition,
1277   default segmentation = auto
1278 }

```

`\SetAlignment` `\SetAlignment{<settings>}` can be used either in the preamble or at any point of the document to set or modify the keys-value settings just defined above.

```

1279 \NewDocumentCommand{\SetAlignment}{m}{
1280   \ekvset{ekd@align}{#1}
1281 }

```

Patch `paracol` to insert a hook in `\pcol@nextpage`. This hook is used to reset line numbers on new pages.

```

1282 \patchcmd{\pcol@nextpage}{%
1283   \endgroup}{%
1284   \ifekd@pagelineation\resetlinenumber\fi
1285   \endgroup}{-}{-}

```

`\EkdsisColStart` and `\EkdsisColStop` initialize columns meant to receive edition texts. These commands are used internally by `ekdsis`.

```

1286 \NewDocumentCommand{\EkdsisColStart}{-}{%
1287   \ekd@setlineno%
1288   \runninglinenumbers
1289   \ekd@storecol%
1290   \stepcounter{ekd@lab}%
1291   \zlabel{ekd:\theekd@lab}%
1292   \luadirect{%

```

```

1293     ekdosis.storeabspg(\luastring{\zref@extract{ekd:\theekd@lab}{abspage}},
1294     "pg_i"))}%
1295 \ifekd@pagelineation
1296   \luadirect{tex.sprint(ekdosis.checkresetlineno())}
1297 \fi
1298 }
1299 \NewDocumentCommand{\EkdosisColStop}{-}{%
1300   \stepcounter{ekd@lab}%
1301   \zlabel{ekd:\theekd@lab}%
1302   \luadirect{%
1303     ekdosis.storeabspg(\luastring{\zref@extract{ekd:\theekd@lab}{abspage}},
1304     "pg_ii"))}%
1305   \endrunninglinenumbers%
1306 }

```

alignment `\begin{alignment}[\langle options \rangle]...\end{alignment}` can be used as it is provided to typeset a standard critical edition text on the left-hand pages accompanied with a translation on the right-hand pages. To that effect, it provides by default two new environments, **edition** and **translation**, to be used to typeset both texts. (Either whole texts or texts entered by paragraphs alternately.) The optional argument of **alignment** accepts the exact same key-value options as `\SetAlignment` described above. One may contrast these options with those accepted by `\SetAlignment` as “local settings”.

```

1307 \NewDocumentEnvironment{alignment}{0-}{
1308   {
1309     \ekvset{ekd@align}{#1}%
1310     \luadirect{ekdosis.mkenvdata(
1311       \luastring{\texts@value},
1312       "texts"
1313     )}
1314     \ifekd@flushapp
1315       \luadirect{ekdosis.newalignment("set")}
1316     \fi
1317     \luadirect{ekdosis.mkenvdata(
1318       \luastring{\apparatus@value}, "apparatus"
1319     )}
1320     \setrunninglinenumbers
1321     \luadirect{tex.sprint(ekdosis.mkenv())}
1322     \ifekd@paired
1323       \begin{paracol}[\lcols@num]{\tcols@num}
1324     \else
1325       \begin{paracol}[\lcols@num]*{\tcols@num}
1326     \fi
1327   }
1328   {\end{paracol}
1329     \iftei@export\luadirect{ekdosis.export_coldata_totei()}\fi
1330     \ifekd@flushapp
1331       \luadirect{ekdosis.newalignment("reset")}
1332     \fi
1333     \luadirect{ekdosis.flushenvdata()}
1334     \luadirect{ekdosis.flushcolnums()}
1335   }

```

Headers and Footers `ekdosis` provides a mechanism of its own for headers and footers as follows. Most of it is handled by Lua functions.

`\ekd@storemark` `\ekd@storemark` is used internally by the `mark` optional argument of `\ekddiv` described below to store marks to be printed at specific places in headers or footers.

```

1336 \NewDocumentCommand{\ekd@storemark}{m}{%
1337   \stepcounter{ekd@lab}%
1338   \label{ekd:\theekd@lab}%
1339   \luadirect{ekdosis.storehfmak(
1340     \luastring{\getpagerefnumber{ekd:\theekd@lab}},
1341     \luastringN{#1})}%
1342 }
```

`\endmark` By default, `\ekdmark` described below prints the first mark that is emitted on a given page and ignores the mark corresponding to any portion of text that may be printed between the top of the page and the point where the first mark is called. `\endmark` is an argument-less command that can be used just at the end of that portion of text to instruct `ekdosis` to print the last-emitted mark of the preceding page instead of the first-emitted mark of the current page.

```

1343 \NewDocumentCommand{\endmark}{}{%
1344   \stepcounter{ekd@lab}%
1345   \label{ekd:\theekd@lab}%
1346   \luadirect{ekdosis.storehfmak(
1347     \luastring{\getpagerefnumber{ekd:\theekd@lab}},
1348     "", "endmk")}%
1349   \ifdefined\xspace\xspace\fi
1350 }
```

`\ekdmark` `\ekdmark` is an argument-less command called in commands used to make headers and footers where the marks stored by means of the `mark` optional argument of `\ekddiv` are to be printed.

```

1351 \NewDocumentCommand{\ekdmark}{}{%
1352   \luadirect{tex.sprint(ekdosis.gethfmak(\luastring{\thepage}))}%
1353 }
```

`\ekdprintmark` `\ekdprintmark{<selector>}{<signpost>}` The signposts printed in headers and footers must be passed as second argument of `\ekdprintmark` so that `ekdosis` can remove them on pages where printing them is not desirable. `<selector>` refers to three symbolic letters where the first can be either H or F—for header or footer—, the second E or O—for odd or even—and the third L, C or R—for left, center or right:—

```

1354 \ekvdefinekeys{ekd@marks}{
1355   choice mark = {HEL = \def\ekd@mk{HEL},
1356     HEC = \def\ekd@mk{HEC},
1357     HER = \def\ekd@mk{HER},
1358     HOL = \def\ekd@mk{HOL},
1359     HOC = \def\ekd@mk{HOC},
1360     HOR = \def\ekd@mk{HOR},
1361     FEL = \def\ekd@mk{FEL},
1362     FEC = \def\ekd@mk{FEC},
1363     FER = \def\ekd@mk{FER},
1364     FOL = \def\ekd@mk{FOL},
1365     FOC = \def\ekd@mk{FOC},
1366     FOR = \def\ekd@mk{FOR}},
1367   unknown-choice mark = \PackageError{ekdosis}{unknown mark=#1}{`mark'
1368     must be either `HEL', `HEC', `HER', `HOL', `HOC', `HOR', `FEL',
1369     `FEC', `FER', `FOL', `FOC' or `FOR'.}
1370 }
```

```

1371 \NewDocumentCommand{\ekdprintmark}{m m}{%
1372   \bgroup
1373   \ekvset{ekd@marks}{mark = #1}%
1374   \luadirect{tex.sprint(ekdosis.printmark(\luastringN{#2},
1375     \luastringO{\ekd@mk}))}%
1376   \egroup
1377 }

```

`\ekdnohfmarks` Once the signposts are marked with `\ekdprintmark`, `\ekdnohfmarks` has the same effect as the L^AT_EX standard command `\thispagestyle{empty}`.

```

1378 \NewDocumentCommand{\ekdnohfmark}{}{}%
1379   \luadirect{ekdosis.nohfmark()}%
1380 }

```

`\ekdresethfmarks` `\ekdresethfmarks` can be used in rare cases when it is needed to reset headers and footers to their original, viz. printable state.

```

1381 \NewDocumentCommand{\ekdresethfmarks}{}{}%
1382   \luadirect{ekdosis.resethfmark()}%
1383 }

```

Divisions of the Body `ekdosis` can convert `\book`, `\part`, `\chapter`, `\section`, `\subsection` and `\subsubsection` into corresponding TEI ‘numbered’ `<divn>` elements, where $1 \leq n \leq 6$.

`\MkBodyDivs` `\MkBodyDivs` is used to let `ekdosis` know which sectional commands are actually being used in an edition text. This command takes six mandatory arguments. For example, if `\section` and `\subsection` are the only sectional commands being used, `\MkBodyDivs{section}{subsection}{-}{-}{-}{-}` will have `\section` and `\subsection` converted into `<div1>` and `<div2>` respectively.

```

1384 \NewDocumentCommand{\MkBodyDivs}{mmmmmm}{
1385   \luadirect{ekdosis.mkdivdepths(
1386     \luastringN{#1},
1387     \luastringN{#2},
1388     \luastringN{#3},
1389     \luastringN{#4},
1390     \luastringN{#5},
1391     \luastringN{#6}
1392   )}
1393 }
1394 }

```

Divisions specific to `ekdosis`. Define keys to be used by `\ekddiv`:—

```

1395 \ekvdefinekeys{ekd@div}{
1396   code type = \def\type@value{#1},
1397   code n = \def\n@value{#1},
1398   code head = \def\head@value{#1},
1399   code barehead = \def\barehead@value{#1},
1400   store depth = \depth@value,
1401   code mark = \ekd@storemark{#1},
1402   choice toc = {book = \def\toc@value{book},
1403     part = \def\toc@value{part},
1404     chapter = \def\toc@value{chapter},
1405     section = \def\toc@value{section},
1406     subsection = \def\toc@value{subsection},

```

```

1407         subsubsection = \def\toc@value{subsubsection},
1408         paragraph = \def\toc@value{paragraph},
1409         subparagraph = \def\toc@value{subparagraph}},
1410   unknown-choice toc = \PackageError{ekdosis}{unknown toc=#1}{`toc'
1411     must be either `book', `part', `chapter', `section', `subsection',
1412     \MessageBreak `subsubsection', `paragraph' or `subparagraph'.},
1413   initial depth = 1
1414 }

```

`\FormatDiv` `\FormatDiv{<n>}{<code before>}{<code after>}` is used to lay out the heading of the title. It takes three mandatory arguments: *n*, namely the number referring to the particular depth of the division, and then some L^AT_EX formatting commands to go before and after the heading itself:—

```

1415 \NewDocumentCommand{\FormatDiv}{m m m}{
1416   \luadirect{ekdosis.fmtdiv(\luastring{#1},
1417     \luastringN{#2},
1418     \luastringN{#3})}
1419 }

```

`\ekd@getfmtdiv` gets the formatting commands that have been stored by `\FormatDiv`.

```

1420 \NewDocumentCommand{\ekd@getfmtdiv}{m m}{%
1421   \luadirect{tex.sprint(ekdosis.getfmtdiv(\luastring0{#1},
1422     \luastringN{#2}))}%
1423 }

```

`\ekddiv` `\ekddiv{<key-value arguments>}` is the standard command provided by `ekdosis` to meet the requirements of classical and literary texts the divisions of which depend on many different received traditions. It takes one mandatory argument in which the key-value arguments defined above are accepted, and converts the divisions into TEI ‘un-numbered’ `<div>` elements.

```

1424 \NewDocumentCommand{\ekddiv}{m}{
1425   \begingroup
1426   \ekvset{ekd@div}{#1}%
1427   \ifdefined\head@value
1428     \bgroup
1429     \ekd@getfmtdiv{\depth@value}{b}%
1430     \head@value
1431     \ekd@getfmtdiv{\depth@value}{e}%
1432   \egroup
1433   \ifdefined\toc@value
1434     \ltx@ifpackageloaded{hyperref}{\phantomsection}{}%
1435     \ifdefined\barehead@value
1436       \addcontentsline{toc}{\toc@value}{\barehead@value}%
1437     \else
1438       \addcontentsline{toc}{\toc@value}{\head@value}%
1439     \fi
1440   \fi
1441 \fi
1442 \endgroup
1443 }

```

Poetry Settings

`ekdverse` `ekdverse` provides an implementation of poetry lines. It is set to use either the `lineno` or the `verse` package depending on the value that is passed to the global option `poetry`.

`\test@vpnum` `\test@vpnum` is used internally when `ekdosis` needs to know whether two subsequent lines are printed on the same page or not.

```

1444 \newif\ifekd@test@vpnum
1445 \newcounter{ekd@vpnum}
1446 \globalcounter{ekd@vpnum}
1447 \NewDocumentCommand{\test@vpnum}{-}{%
1448   \ifekd@test@vpnum
1449     \edef\@tempa{\theekd@vpnum}%
1450     \stepcounter{ekd@vpnum}%
1451     \label{vpnum:\theekd@vpnum}%
1452     \ifnum
1453       \pdfstrcmp{\getpagerefnumber{vpnum:\@tempa}}%
1454       {\getpagerefnumber{vpnum:\theekd@vpnum}}
1455       = 0
1456     \else
1457       \resetvlinenumber
1458     \fi
1459   \else
1460     \label{vpnum:\theekd@vpnum}%
1461     \global\ekd@test@vpnumtrue
1462   \fi
1463 }
```

A small patch is applied to the `verse` package, then `ekdverse` is defined:—

```

1464 \if@pkg@poetry@verse
1465 \patchcmd{\start@vline}{%
1466   \ifaltindent}{%
1467     \ifekd@pagevlineation\test@vpnum\fi
1468     \ifaltindent}{-}{-}
1469 \ekvdefinekeys{ekd@verse}{
1470   dimen width = \vwidth@val,
1471   initial width = \linewidth,
1472   code type = \def\type@value{#1},
1473 }
1474 \ifekd@memoir@loaded
1475   \linenumberfont{\normalfont\footnotesize}
1476 \else
1477   \verselinenumfont{\normalfont\footnotesize}
1478 \fi
1479 \setcounter{poemline}{1}
1480 \NewDocumentEnvironment{ekdverse}{!O{}}{%
1481   \ekvset{ekd@verse}{#1}%
1482   \if@continuous@vnum\setverselinenums{\thelinenumber}{0}\fi
1483   \nolinenums
1484   \let\linelabel\label
1485   \ifekd@memoir@loaded
1486     \refstepcounter{verse}%
1487   \else
1488     \stepcounter{verse@envctr}%
1489   \fi
1490   \addtocounter{poemline}{-1}\refstepcounter{poemline}%
1491   \setcounter{vslineno}{1}%
1492   \let\@vscentercr
1493   \list{}{\itemsep \z@
1494     \itemindent -\vindent%
```

```

1495      \listparindent\itemindent
1496      \parsep      \stanzaskip
1497      \setlength{\itemsep}{0pt}%
1498      \setlength{\topsep}{0pt}%
1499      \setlength{\partopsep}{0pt}%
1500      \ifdim\vwidth@val < \linewidth
1501          \rightmargin      \z@
1502          \setlength{\leftmargin}{\linewidth}%
1503          \addtolength{\leftmargin}{-\vwidth@val}%
1504          \addtolength{\leftmargin}{-0.5\leftmargin}%
1505      \else
1506          \rightmargin      \leftmargin
1507      \fi
1508      \addtolength{\leftmargin}{\vindent}}%
1509  \item[]\ifekd@pagevlineation\test@vpnum\fi%
1510 }
1511 {\endlist
1512  \if@continuous@vnum\resetlinenumber[\thepoemline]\fi}

```

Finally, this is the standard **verse** environment:—

```

1513 \else
1514 \newlength{\ekdverseindentlength}
1515 \setlength{\ekdverseindentlength}{\parindent}
1516 \NewDocumentEnvironment{ekdverse}{!0{\ekdverseindentlength}}{
1517   \begin{list}{}{
1518     \setlength{\leftmargin}{\#1}
1519     \setlength{\itemsep}{0pt}
1520     \setlength{\topsep}{0pt}
1521     \setlength{\partopsep}{0pt}
1522   }
1523   \item[]
1524 }{\end{list}}
1525 \fi

```

\resetvlinenumber This command is the equivalent of **\resetlinenumber** for lines of poetry. It takes an integer as optional argument, which is 1 by default.

```

1526 \NewDocumentCommand{\resetvlinenumber}{0{1}}{%
1527   \if@pkg@poetry@verse
1528     \setverselinenums{\#1}{0}%
1529   \fi
1530 }

```

ekdstanza **ekdstanza** is needed when lines are grouped into stanzas, which can be further named by means of the **type** optional argument:—

```

1531 \ekvdefinekeys{ekdstanza}{
1532   code type = \def\type@value{\#1}
1533 }
1534 \NewDocumentEnvironment{ekdstanza}{!0{}}{%
1535   \leavevmode\unskip
1536   \ekvset{ekdstanza}{\#1}%
1537   \ignorespaces
1538 }{}

```

ekdpar When **autopar** is set to **false** by means of **\SetTeXmlExport**, **ekdpar**—or any other environment set to be inserted within **<p>** elements—must be used so that **ekdosis** can be informed of paragraph boundaries.

\@pkg@ekddivstrue ..	22	arabxex (package)	52	\dflt@pcolor@footnoterule	
\@pkg@fitfloattrue ..	18	\AtBeginDocument	24, 40, 43	.....	402, 410
\@pkg@floatfalse	16, 17, 18	\AtBeginEnvironment	..	direction (option)	.. 33, 35
\@pkg@floattrue	15	\AtEndDocument	.. 41, 44, 89	\direction@val	
\@pkg@footintrue ...	16	autopar (option)	64	.....	247, 248, 272
\@pkg@keyfloattrue ..	17			divs (option)	6
\@pkg@parnotesttrue	32, 33			\dp	349
\@pkg@poetry@versettrue		B		E	
.....	28, 53	babel (package)		edition (environment) ..	29
\@tempa	414, 415, 1449, 1453	..	34, 50, 51, 67, 97	edition (environment)	25, 121
\@theftmark	343, 344, 352	barehead (option)	56	edition*	(environment) 25
\@tmpmarg ..	297, 306, 315	\barehead@value		\edkmark	1351
\@tmpoarg	296, 313	..	1399, 1435, 1436	ehook (option)	33, 35
\@vscentercr	1492	\bfseries	122	\ehook@val	256, 277
\\	1492	bhook (option)	33, 35	\ekd@app@height ..	108, 436
\{	1195, 1196	\bhook@val	255, 276	\ekd@appfontsize	
\}	1195, 1196	\blfootnote	343, 468	.....	102, 450, 474
		\boolfalse	333, 848, 1059	\ekd@appinappfalse .	603
A		\booltrue	266, 332	\ekd@appinappttrue ...	594
\add@@apparatus ..	460, 500	C		\ekd@begin@apparatus .	
\add@apparatus		\c@linenumbermodulo	555	.....	370, 392
....	498, 600, 1054	\chardef	555	\ekd@default@rule ...	
\addcontentsline		\checkoddpage ...	517, 528	.	376, 378, 415, 417
.....	1436, 1438	collection (option)	9	\ekd@elidednumbersfalse	
\addentries	60, 285	\collection@value	132, 148	.....	563
addname (option)	11	\color@begingroup ...	354	\ekd@elidednumbertrue	
\addname@value ..	167, 179	\color@endgroup	357	.....	562
\addtocounter	1490	\columnratio	30	\ekd@end@apparatus ..	
\AddToHook	542	\columnwidth	119, 350, 377	.	372, 393, 456, 480
\addtolength		continuousvnum (option)	49	\ekd@fit@algorithm	110,
..	1503, 1504, 1508	\csname	262, 352	.....	111, 112, 113, 437
\AddxmlBibResource	70, 236	\current@ref		\ekd@fitapp	432, 495
alignment (environment)		.	668, 863, 874, 909	\ekd@getfmtdiv	
.....	25, 1307	\current@ref@arg ....		..	1420, 1429, 1431
alignment (environment)		...	605, 1080, 1096	\ekd@hpbm k	96, 293
..	25, 27–31, 48,	D		\ekd@initial@rule ...	
54, 62, 64, 120, 121		\dag	1197, 1198	.....	118, 120,
alt (option)	14, 15	\DeclareApparatus	34, 264	.....	452, 453, 476, 477
\app	13, 590	\DeclareHand	9, 156	\ekd@insert@apparatus	
\app@lang ...	821, 915,	\DeclareScholar ..	11, 170	..	69, 440, 488, 495
.....	926, 999, 1010, 1100	\DeclareShorthand	11, 189	\ekd@insert@keyparapp	
\app@note@lang ..	821, 1108	\DeclareSource ...	10, 184	.....	68, 492
apparatus	456, 480, 1230	\DeclareWitness ...	8, 138	\ekd@inside@appfalse .	
apparatus (option)	28	\delb@value ..	1188, 1212	.....	457, 481
\apparatus@value		delbegin (option)	22	\ekd@inside@appttrue .	
.....	1261, 1318	\dele@value ..	1189, 1212	.....	449, 473
\append@app	502,	delend (option)	22	\ekd@isinappfalse ..	602
.....	956, 961, 963,	delim (option)	33, 35	\ekd@isinappttrue ...	595
.....	1025, 1027, 1135,	\delim@val	253, 274	\ekd@isinlemfalse ..	949
.....	1137, 1156, 1158	depth (option)	56	\ekd@isinlemtrue ...	836
\append@ln@app		\depth@value		\ekd@keyparopts	67, 70, 107
.....	510, 944, 946	..	1400, 1429, 1431	\ekd@lang@pkgtrue	242, 243
appfontsize (option) ..	31	\dflt@footnoterule ..		\ekd@lemmastyle	
appheight (option)	32	.....	401, 405	.....	105, 878,
arablutext (package) ...					

885, 914, 917, 925,	823, 830, 846, 848,	\ekdnohfmarks 59
928, 1082, 1099, 1102	850, 852, 853, 858,	ekdosis (environment) .
\ekd@mapstrue 267	869, 904, 944, 961,	. . . . . 13 , 1249
\ekd@memoir@loadedtrue 53	1025, 1034, 1057,	ekdosis (environment) 5,
\ekd@mk 1355,	1059, 1061, 1063,	13, 41, 48, 62, 64, 119
1356, 1357, 1358,	1064, 1075, 1091,	ekdosis (package) 2–13,
1359, 1360, 1361,	1111, 1135, 1156	15–19, 21, 22, 25,
1362, 1363, 1364,	\ekdatbegshihook 539, 542	27, 28, 30–41, 43,
1365, 1366, 1375	\ekddiv 56, 1424	46, 48–51, 53, 54,
\ekd@munit@delim	\ekdl@forcenumfalse 840	56, 58–73, 75, 76,
.. 851, 859, 870,	\ekdl@forcenumtrue .. 801	91–93, 96–98,
905, 1062, 1076, 1092	\ekdl@nonumfalse 841	102, 104–106,
\ekd@note 1124, 1166, 1169	\ekdl@nonumtrue 800	115, 119–124, 126
\ekd@note@star	\ekdl@sep .. 799, 897, 939	\EkdsosisColStart .. 1286
.. 1141, 1164, 1168	\ekdlr@alt 793,	\EkdsosisColStop ... 1299
\ekd@pagelineationfalse	810, 875, 879,	\EkdsosisOff .. 1239 , 1253
. 546, 1264	910, 916, 918, 968,	\EkdsosisOn ... 1237 , 1252
\ekd@pagelineationtrue	972, 994, 1000, 1002	ekdpar (environment) ..
.. 545, 547, 1263	\ekdlr@post 795,	. . . . . 64 , 1539
\ekd@pagevlineationfalse	812, 876, 877, 883,	ekdpar (environment) ..
. 552	884, 919, 920, 929,	. . . . . 64, 70, 126
\ekd@pagevlineationtrue	930, 969, 970,	\ekdpb 60, 289
. 551	976, 977, 1003,	\ekdpb* 60
\ekd@postrefnum	1004, 1012, 1013	\ekdprintmark ... 59, 1354
.. 104, 624, 627,	\ekdlr@postwit 797, 814,	\ekdresethfmarks 59, 1381
637, 641, 649, 652,	890, 891, 937, 938,	\ekdsep 15, 363 ,
659, 661, 664, 704,	983, 984, 1020, 1021	369, 391, 804, 1041
709, 714, 717, 740,	\ekdlr@pre .. 794, 811,	\ekdsetup 7, 92
745, 750, 755, 764,	880, 881, 887, 888,	ekdstanza (environment)
768, 776, 779, 783	911, 912, 922, 923,	. . . . . 43 , 1531
\ekd@readingstyle ...	973, 974, 980, 981,	ekdstanza (environment)
.. 106, 971, 978,	995, 996, 1006, 1007	. . . . . 41, 43, 126
998, 1001, 1009, 1011	\ekdlr@prewit 796, 813,	ekdverse (environment)
\ekd@refnumstyle	895, 896, 932, 933,	. . . . . 41 , 1444
. 103, 606, 669	988, 989, 1015, 1016	ekdverse (environment) 7,
\ekd@setlineno	\ekdlr@resp . 792, 809,	39, 41, 43, 124, 125
.. 1242, 1250, 1287	892, 936, 985, 1019	\ekdverseindentlength
\ekd@singleapp@lang .	\ekdlr@source 791, 808,	.. 1514, 1515, 1516
. 379, 396, 825	893, 935, 986, 1018	\ekvdefinekeys ... 14,
\ekd@singleapp@note@lang	\ekdlr@type 798, 815	92, 101, 128, 163,
. 382, 398, 832	\ekdlr@wit .. 790, 807,	201, 246, 364,
\ekd@spbm 94,	894, 934, 987, 1017	544, 584, 789,
307, 310, 316, 319	\ekdmark 58, 1351	806, 1033, 1120,
\ekd@statefalse ... 1240	\ekdn@forcenumtrue 1043	1185, 1257, 1354,
\ekd@statetrue 1238	\ekdn@labelb ... 1036,	1395, 1469, 1531
\ekd@storecol . 1234, 1289	1066, 1067, 1068,	\ekvifdefinedNoVal ..
\ekd@storemark 1336 , 1401	1080, 1096, 1115	. . . . . 1128,
\ekd@test@lang	\ekdn@labele ... 1037,	1131, 1145, 1152
240 , 843, 955, 1049	1068, 1080, 1096	\ekvoProcessLocalOptions
\ekd@test@vpnumtrue 1461	\ekdn@lem . . . . .	. . . . . 50
\ekd@unit@delim	1035, 1081, 1083,	\ekvset 99, 127,
.. 374, 394, 861,	1097, 1101, 1103	140, 172, 209, 269,
872, 907, 1078, 1094	\ekdn@sep 1038, 1085, 1105	387, 581, 589, 593,
\ekdan@type 285,	\ekdnohfmarks 1378	842, 954, 1048,
585, 617, 684,	\ekdnohfmark 1378	1126, 1143, 1228,

[illegible]

<code>\ifekdn@nonum</code>	<code>\lang@val</code> 258, 279	M
.. 1042, 1080, 1096	<code>\language</code>	<code>\makeLineNumberRunning</code>
<code>\ifekdn@nosep</code> 380, 381, 383, 384 516, 527
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