

A selection of images related to my books or packages or to code I have helped develop. For some great examples of images created using LaTeX, have a look at the [TikZ and PGF gallery](#) on [texample.net](#), or for some examples of what can be done with TeX have a look at [The TeX showcase](#).

Paulo Cereda's cool automation tool [arara](#) is being upgraded to version 4.0 and with it comes some new localisation! Here are some screenshots. (That's [Broad Norfolk](#), in case you're confused.)

glossaries

These are some sample glossary styles created using the [glossaries](#) package. All these examples use dummy lorem ipsum text, one of them uses the sample images files provided by the [mwe](#) package, which is available on both MiKTeX and TeX Live, and one of them uses the sample bibliography file `xampl.bib`, which should be readily available in your TeX distribution. Make sure you have an up-to-date version of the glossaries package if you want to try any of these examples.

There are also some [samples of each of the predefined styles on a separate page](#).

The purpose of this section of the gallery is to illustrate various styles that can be created with the glossaries package. If you want to know how to do something not illustrated here or you want to know how to adapt one of these examples, please post your query to an appropriate site such as [TeX on StackExchange](#) or [The LaTeX Community Forum](#).

Click on the images below for details of the example.

Brief Descriptions

Glossary

| | |
|----------------------------|--------------------------------|
| ac nunc 1 | mauris nam 1 |
| accumsan eleifend 1 | mi congue 1 |
| adipiscing elit 1 | mollis ac nulla 1 |
| aenean faucibus 1 | morbi tristique 1 |
| amet consectetur 1 | nonummy eget 1 |
| arcu libero 1 | nulla et 1 |
| auctor semper 1 | orci dignissim 1 |
| augue eu neque 1 | pellentesque habitant 1 |
| bibendum ultrices 1 | placerat ac 1 |
| consectetur id 1 | praesent eget 1 |
| curabitur gravida 1 | |

Long Descriptions

Glossary

aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris. 1

cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. 1

donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. 1

integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. 1

lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. 1

Multi-Paragraph Descriptions

Glossary

lorem 1–2

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultrices et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris. [1](#)

lorem 3–4

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec

Symbols Glossary

Symbols

| | | | |
|---------|--|------------|---|
| alpha | Quisque ullamcorper placerat ipsum. | α | 1 |
| beta | Cras nibh. | β | 1 |
| chi | Sed a turpis eu lacus commodo facilisis. | χ | 1 |
| delta | Lorem ipsum dolor sit amet, consectetur adipiscing elit. | δ | 1 |
| epsilon | In hac habitasse platea dictumst. | ϵ | 1 |
| eta | Etiam facilisis. | η | 1 |
| gamma | Morbi vel justo vitae lacus tincidunt ultrices. | γ | 1 |
| iota | Aenean placerat. | i | 1 |
| kappa | Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. | κ | 1 |
| lambda | Nunc vitae tortor. | λ | 1 |
| mu | Proin tempus nibh sit amet nisl. | μ | 1 |
| nu | Vivamus quis tortor vitae risus porta vehicula. | ν | 1 |
| omega | Mauris tempor ligula sed lacus. | ω | 1 |
| phi | Nulla facilisi. | ϕ | 1 |
| pi | Vestibulum luctus nibh at lectus. | π | 1 |

Images in Glossary

Glossary

aliquam lectus Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.



Etiam ac leo a risus tristique nonummy. Donec dignissim tincidunt nulla. Vestibulum rhoncus molestie odio. Sed lobortis, justo et pretium lobortis, mauris turpis condimentum augue, nec ultricies nibh arcu pretium enim. Nunc purus neque, placerat id, imperdiet sed, pellentesque nec, nisl. Vestibulum imperdiet neque non sem accumsan laoreet. In hac habitasse platea dictumst. Etiam condimentum facilisis libero. Suspendisse in elit quis nisl aliquam dapibus. Pellentesque auctor sapien. Sed egestas sapien nec lectus. Pellentesque vel dui vel neque bibendum viverra. Aliquam porttitor nisl nec pede. Proin mattis libero vel turpis. Donec rutrum mauris et libero. Proin euismod porta felis. Nam lobortis, metus quis elementum commodo, nunc lectus elementum mauris, eget vulputate ligula tellus eu neque. Vivamus eu dolor.

cras dapibus Aenean interdum nibh sed wisi. Praesent sollicitudin vulputate dui. Praesent iaculis viverra augue. Quisque in libero. Aenean gravida lorem vitae sem ullamcorper cursus. Nunc adipiscing rutrum ante. Nunc ipsum massa, faucibus sit amet, viverra vel, elementum semper, orci. Cras eros sem, vulputate et, tincidunt id, ultrices eget, magna. Nulla varius ornare odio. Donec accumsan mauris sit amet augue. Sed



Hierarchical Entries

Glossary

aliquam et augue 1
at nunc pellentesque ullamcorper 1
duisnibh convallis ut 1
duisnisl laoreet suscipit 1

condimentum at nisl 1
maecenas at nibh 1

non convallis lectus orci ut nibh 1
nonummy quis egestas id 1
sedlorem massa 1
nunc nisl vitae 1
feugiat massa 1
libero sed consequat 1
porta eros in eleifend 1
varius erat leo rutrum dui 1

rutrum id, enim 1
nulla nulla elit, molestie non 1
phasellus odio 1

Homograph Entries

Glossary

| | |
|--------------------------------|---------------------------------|
| class aptent taciti 1 | non risus morbi non felis 1 |
| 1) ad litora 1 | 1) ac libero 1 |
| 2) sociosqu 1 | 2) vulputate fringilla 1 |
| 3) torquent per conubia 1 | nostra per inceptos hymenaeos 1 |
| consectetuer mauris 1 | 1) mauris condimentum nulla 1 |
| 1) leo justo 1 | 2) morbi dapibus 1 |
| 2) quis egestas 1 | |
| cum sociis natoque penatibus 1 | scelerisque at 1 |
| 1) dis parturient montes 1 | 1) sem leo 1 |
| 2) et magnis 1 | 2) tellus et tortor 1 |
| | 3) nec, enim 1 |
| eleifend sit amet faucibus 1 | 4) sit amet 1 |

Citations in Glossary

Glossary

aenean tincidunt. (See [4]) 1

aenean consecetuer justo in pede. (See [6]) 1

aliquam sagittis elementum dolor. (See [7]) 1

aliquam purus turpis, aliquam id. (See [9]) 1

cras id justo quis nibh scelerisque dignissim. (See [5]) 1

cras qui libero eu ligula bibendum tempor. (See [14]) 1

curabitur ullamcorper ligula nec orci. (See [8]) 1

donec lacinia auctor libero. (See [17]) 1

donec vitae ligula eu ante pretium varius. (See [12]) 1

fusce suscipit cursus sem. (See [1]) 1

Cross-References

Glossary

aenean tincidunt. [1](#), [2](#)

aenean consecetuer justo in pede. [1](#), [2](#)

aliquam sagittis elementum dolor. [1](#)

See also [aenean](#).

aliquam purus turpis, aliquam id. [1](#)

See also [aenean consecetuer](#), [curabitur ullamcorper](#) & [maecenas luctus](#).

cras id justo quis nibh scelerisque dignissim. [1](#)

See also [aenean](#) & [vivamus](#).

curabitur ullamcorper ligula nec orci. [1](#), [2](#)

fusce suscipit cursus sem. [1](#)

See also [vivamus](#).

imperdiet varius, faucibus quis, leo. [1](#)

See also [vivamus](#).

maecenas luctus porta lorem. [1](#), [2](#)

ornare vitae porttitor non, wisi. [1](#)

See also [aenean consecetuer](#).

URLs in Glossary

Glossary

aenean adipiscing auctor est. 1

<http://uk.tug.org/>

duis mattis. 1

<http://www.tug.org/>

morbi quam arcu, malesuada sed, volutpat et, elementum sit amet, libero. 1

<http://www.ctan.org/>

phasellus arcu (catcode change). 1

<http://theoval.cmp.uea.ac.uk/%7Enlct>

phasellus arcu (uses \%). 1

<http://theoval.cmp.uea.ac.uk/%7Enlct>

phasellus arcu (uses \glspercentchar). 1

<http://theoval.cmp.uea.ac.uk/%7Enlct>

Abbreviations (No Descriptions)

Acronyms

| | |
|------|-----------------------------|
| AEU | adipiscing elit ut 1 |
| AFM | aenean faucibus morbi 1 |
| AMD | a magna donec 1 |
| ANP | ac nunc praesent 1 |
| ATG | amet tortor gravida 1 |
| AVF | adipiscing vitae felis 1 |
| | |
| CAS | curabitur auctor semper 1 |
| CDG | curabitur dictum gravida 1 |
| CEA | congue eu accumsan 1 |
| CIV | consectetuer id vulputate 1 |
| | |
| DIA | duis eget orci 1 |
| DNM | dolor nulla malesuada 1 |
| DNMC | duis nibh mi congue 1 |
| DRN | dignissim rutrum nam 1 |
| | |
| EII | est iaculis in 1 |
| ENE | et netus et 1 |
| EPA | eu pulvinar at 1 |
| ESO | eleifend sagittis quis 1 |

Abbreviations (With Descriptions)

Acronyms

aliquam tincidunt urna (ATU)

nulla ullamcorper vestibulum turpis 1

donec aliquet (DA)

tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi 1

morbi ac orci (MAO)

et nisl hendrerit mollis 1

morbi auctor lorem (MAL)

non justo 1

nam dui ligula (NDL)

fringilla a, euismod sodales, sollicitudin vel, wisi 1

name lacus libero (NLL)

pretium at, lobortis vitae, ultricies et, tellus 1

pellentesque a nulla (PAN)

cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus 1

pellentesque cursus luctus mauris (PCLM)

Abbreviations (With Translations)

See also the [glossaries-extra version of this example](#) below.

1 Sample

First use:

lorem ipsum (LI, English: love itself). nulla pariat (NP, English: produces none). sunt in culpa (SIC, English: blame belongs). excepturi sint obcaecati cupiditat (ESOC, English: blinded by desire). nulla malesuada risus ut urna (NMRUU). dui iaculi (DI).

Next use:

LI. NP. SIC. ESOC. NMRUU. DI.

Acronyms

| | |
|-------|---|
| DI | dui iaculi 1 |
| ESOC | excepturi sint obcaecati cupiditat (English: blinded by desire) 1 |
| LI | lorem ipsum (English: love itself) 1 |
| NMRUU | nulla malesuada risus ut urna 1 |
| NP | nulla pariat (English: produces none) 1 |
| SIC | sunt in culpa (English: blame belongs) 1 |

Mixed Glossary

1 First Use

Regular entries: ac, accumsan, amet, bibendum, consectetur, diam.

Acronyms: adipiscing elit ut (AEU), aenean faucibus morbi (AFM), ac nunc praesent (ANP), curabitur auctor semper (CAS), curabitur dictum gravida (CDG), congue eu accumsan (CEA), dui eget orci (DIA).

2 Next Use

Regular entries: ac, accumsan, amet, bibendum, consectetur, diam.

Acronyms: AEU, AFM, ANP, CAS, CDG, CEA, DIA.

Glossary

| | |
|------------------------------|---------------------------------|
| ac nunc. 1 | CAS curabitur auctor semper. 1 |
| accumsan eleifend. 1 | CDG curabitur dictum gravida. 1 |
| AEU adipiscing elit ut. 1 | CEA congue eu accumsan. 1 |
| AFM aenean faucibus morbi. 1 | consectetur id. 1 |
| amet consectetur. 1 | DIA dui eget orci. 1 |
| ANP ac nunc praesent. 1 | diam dui. 1 |
| bibendum ultrices. 1 | |

Mixed Glossary with Emphasis

1 First Use

Regular entries: *ac*, *accumsan*, *amet*, *bibendum*, *consectetuer*, *diam*.

Acronyms: *adipiscing elit ut* (AEU), *aenean faucibus morbi* (AFM), *ac nunc praesent* (ANP), *curabitur auctor semper* (CAS), *curabitur dictum gravida* (CDG), *congue eu accumsan* (CEA), *duis eget orci* (DIA).

2 Next Use

Regular entries: *ac*, *accumsan*, *amet*, *bibendum*, *consectetuer*, *diam*.

Acronyms: AEU, AFM, ANP, CAS, CDG, CEA, DIA.

Full form: *adipiscing elit ut* (AEU).

Glossary

ac nunc. 1

accumsan eleifend. 1

AEU adipiscing elit ut. 1

AFM aenean faucibus morbi. 1

amet consectetuer. 1

ANP ac nunc praesent. 1

bibendum ultrices. 1

CAS curabitur auctor semper. 1

CDG curabitur dictum gravida. 1

CEA congue eu accumsan. 1

consectetuer id. 1

DIA duis eget orci. 1

diam duis. 1

glossaries-extra

The [glossaries-extra](#) package is an extension to the glossaries package. It provides better abbreviation handling.

Initialisms

The dots in the abbreviations in this example are automatically inserted through the use of category attributes. The sentence terminator following commands like \gls can be automatically discarded for those entries.

Contents

| | |
|-----------------|----------|
| 1 Sample | 1 |
| Glossary | 1 |

1 Sample

First use: **e.g.** (for example) and **S.I.** (sample initials) (dots inserted) and **hypertext markup language (HTML)** (no dots).

Next use: **e.g.** and **S.I.** (dots) and **HTML** (no dots).

End of sentence: **e.g.** (Trailing period has been discarded.)

End of sentence: **S.I.** (Spacefactor has also been adjusted.)

Glossary

e.g. for example **1**

HTML hypertext markup language **1**

S.I. sample initials **1**

Abbreviations With Translations

An alternative to the [earlier glossaries.sty example](#) this example uses the more convenient glossaries-extra settings.

1 Sample

First use:

lorem ipsum (LI, English: love itself). nulla pariat (NP, English: produces none). sunt in culpa (SIC, English: blame belongs). excepturi sint obcaecati cupiditat (ESOC, English: blinded by desire). nulla malesuada risus ut urna (NMRUU). dui iaculi (DI).

Next use:

LI. NP. SIC. ESOC. NMRUU. DI.

Abbreviations

| Notation | Description |
|----------|---|
| DI | dui iaculi 1 |
| ESOC | excepturi sint obcaecati cupiditat (English: blinded by desire) 1 |
| LI | lorem ipsum (English: love itself) 1 |
| NMRUU | nulla malesuada risus ut urna 1 |
| NP | nulla pariat (English: produces none) 1 |
| SIC | sunt in culpa (English: blame belongs) 1 |

Mixing Styles

This rather colourful example isn't encouraging garish documents, but is illustrating how you can apply different styles to entries according to their category and category attributes. With just the basic glossaries.sty package, different styles may only be applied per glossary type, whereas in this example all entries are in the same glossary.

| | | |
|---------------------|---|-------------|
| ångström (Å) | non-SI unit of length. | Pages: 2, 3 |
| Broccoli | vegetable with heads of small green or purple flower buds. | Page: 2 |
| <i>C. botulinum</i> | <i>Clostridium botulinum</i> . | Page: 2 |
| Cabbage | vegetable with thick green or purple leaves. | Page: 2 |
| Corundum | crystalline form of aluminium oxide. | Page: 2 |
| DANTE e.V. | Deutschsprachige Anwendervereinigung T _E X e.V. (Translation: German Speaking T _E X User Group). | Pages: 2, 3 |
| Duck | a waterbird with webbed feet. | Page: 2 |
| GUTenburg | Groupe francophone des utilisateurs de T _E X (Translation: French T _E X user group). | Pages: 2, 3 |
| HTML | hypertext markup language. | Page: 2 |
| laser | light amplification by stimulated emission of radiation. | Page: 2 |
| lorem ipsum | dummy text. | Page: 2 |
| ohm (Ω) | unit of electrical resistance. | Pages: 2, 3 |
| <i>P. putida</i> | <i>Pseudomonas putida</i> . | Page: 2 |
| Parrot | mainly tropical bird with bright plumage. | Page: 2 |
| π | ratio of a circle's circumference to its diameter (pi). | Pages: 2–4 |
| Quartz | hard mineral consisting of silica. | Page: 2 |
| scuba | self-contained underwater breathing apparatus. | Page: 2 |
| SVG | scalable vector graphics. | Page: 2 |

Adjusting Parenthetical Style

This example adjusts the user parenthetical style so that only the long form is displayed on first use and the short form on subsequent use. Both the long and short form are emphasized.

First use: *Clostridium botulinum*, *Pseudomonas putida*.
Next use: *C. botulinum*, *P. putida*.

Glossary

C. botulinum *Clostridium botulinum* 1

P. putida *Pseudomonas putida* 1

Abbreviations with Footnotes Sample

This example compares the footnote and postfootnote styles (using the small-caps variant).

1 short-sc-footnote style

Websites use **HTML**¹, often in combination with **CSS**², to markup the page content.

2 short-sc-postfootnote style

Websites use **HTML**³, often in combination with **CSS**⁴, to markup the page content.

Glossary (short-sc-footnote)

CSS style sheet language describing the document presentation (cascading style sheets). 1

HTML standard system for tagging files used in web pages (hypertext markup language). 1

Glossary (short-sc-postfootnote)

CSS style sheet language describing the document presentation (cascading style sheets). 1

HTML standard system for tagging files used in web pages (hypertext markup language). 1

Adjusting the altree Style

The altree style is redefined by the glossaries-extra-stylemods package to make it more flexible. This example uses the commands provided by this package to adjust the style. The location list and associated image are placed in the right margin and the entry name is on the left.

Glossary

Aliquam lectus

Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tor-
tor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum,
magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu
et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in,
placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

Etiam ac leo a risus tristique nonummy. Donec dignissim tincidunt nulla. Vestibu-
lum rhoncus molestie odio. Sed lobortis, justo et pretium lobortis, mauris turpis
condimentum augue, nec ultricies nibh arcu pretium enim. Nunc purus neque, plac-
erat id, imperdiet sed, pellentesque nec, nisl. Vestibulum imperdiet neque non sem
accumsan laoreet. In hac habitasse platea dictumst. Etiam condimentum facilisis
libero. Suspendisse in elit quis nisl aliquam dapibus. Pellentesque auctor sapien.
Sed egestas sapien nec lectus. Pellentesque vel dui vel neque bibendum viverra. Ali-
quam porttitor nisl nec pede. Proin mattis libero vel turpis. Donec rutrum mauris et
libero. Proin euismod porta felis. Nam lobortis, metus quis elementum commodo,
nunc lectus elementum mauris, eget vulputate ligula tellus eu neque. Vivamus eu
dolor.

(Image file: example-image-a.)

ii, 2

A

Cras dapibus

Aenean interdum nibh sed wisi. Praesent sollicitudin vulputate dui. Praesent iaculis
viverra augue. Quisque in libero. Aenean gravida lorem vitae sem ullamcorper
cursus. Nunc adipiscing rutrum ante. Nunc ipsum massa, faucibus sit amet, viverra
vel, elementum semper, orci. Cras eros sem, vulputate et, tincidunt id, ultrices eget,
magna. Nulla varius ornare odio. Donec accumsan mauris sit amet augue. Sed
ligula lacus, laoreet non, aliquam sit amet, iaculis tempor, lorem. Suspendisse eros.
Nam porta, leo sed congue tempor, felis est ultrices eros, id mattis velit felis non
metus. Curabitur vitae elit non mauris varius pretium. Aenean lacus sem, tincidunt
ut, consequat quis, porta vitae, turpis. Nullam laoreet fermentum urna. Proin iaculis
lectus.

Sed mattis, erat sit amet gravida malesuada, elit augue egestas diam, tempus
scelerisque nunc nisl vitae libero. Sed consequat feugiat massa. Nunc porta, eros
in eleifend varius, erat leo rutrum dui, non convallis lectus orci ut nibh. Sed lorem

x, 10

Golden
ratio

Abbreviation Styles

This example demonstrates the predefined abbreviation styles.

```
long-short: long form (short).
long-short-sc: long form (SHORT).
long-short-sm: long form (short).
long-short-em: long form (short).
long-em-short-em: long form (short).
long-short-user: long form (short, user text).
short-long: short (long form).
short-sc-long: SHORT (long form).
short-sm-long: short (long form).
short-em-long: short (long form).
short-em-long-em: short (long form).
short-long-user: short (long form, user text).
short-footnote: short1.
short-postfootnote: short.2
short-sc-footnote: SHORT3.
short-sc-postfootnote: SHORT.4
short-sm-footnote: short5.
short-sm-postfootnote: short.6
short-em-footnote: short7.
short-em-postfootnote: short.8
short-nolong: short.
short-sc-nolong: SHORT.
short-sm-nolong: short.
short-em-nolong: short.
long-noshort: long form.
long-noshort-sc: long form.
```

Aliases

This example demonstrates the use of the alias key.

Glossary

B

Napoleon Bonaparte French military and political leader (15th July 1769–5th May 1821). [1](#)

D

Duke of Wellington *see* [Arthur Wellesley, 1st Duke of Wellington](#)

H

Heracles divine hero in Greek mythology. [1](#)

Hercules Roman adaptation of Greek hero, *see* [Heracles](#)

N

Napoleone di Buonaparte *see* [Napoleon Bonaparte](#)

W

Arthur Wellesley, 1st Duke of Wellington Anglo-Irish soldier and statesman (1st May 1769–14th September 1852). [1](#), [2](#)