

## Adding Links to the Bible

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**Abstract:** For generations cross-references in the Bible have been a valuable study aid for students of God's word. Modern computer technology enables us to extend the concept of a "cross-reference" to be a link from a location in the Bible to virtually any resource.

This paper describes various types of links that may be useful, and which should be considered for future electronic Bible study tools.

**Keywords:** Bible, cross-reference, hyperlink.

### Introduction

With the advent of the World Wide Web and the ubiquity of web browsers and hypertext, people have become used to the concept of *hyperlinks*, that is, links from one object to a related object. To users of Wikipedia this is especially obvious, since that encyclopaedia relies extensively on hyperlinks.

Generations of Christians have become accustomed to using Bibles with cross references, which are links from one Bible passage to a related passage. When using electronic versions of the Bible, implementing cross references as hyperlinks is an obvious choice.

But hyperlinks in an electronic Bible can be used for so much more. The links can go not just to another Bible passage, but to other books or documents; or the link could take the user to videos, maps, sermons, word lists etc. that may shed some light on the Biblical text.

In this document I will describe the types of hyperlinks implemented in *Bible Online Learner*, and I will propose additional uses of hyperlinks.

### Bible Online Learner

Bible Online Learner (Bible OL) is a web-based application giving access to the Hebrew and Greek texts of the Bible. The text is annotated with grammatical information, and the application can generate grammar exercises for students of the languages.

Bible Online Learner can be tried at <https://bibleol.3bmoodle.dk>, and the source code is freely available under an MIT license at <https://github.com/EzerIT/BibleOL>. The Hebrew text was kindly provided by the *Eep Talstra Centre for Bible and Computer*. The Greek text is in the public domain.

Currently, Bible OL provides three types of hyperlinks:

- Links from a Bible verse to a picture in the *EuroPLOT Resources* database.
- Links from a Bible verse to a URL.
- Links from a Hebrew lexeme to a URL.

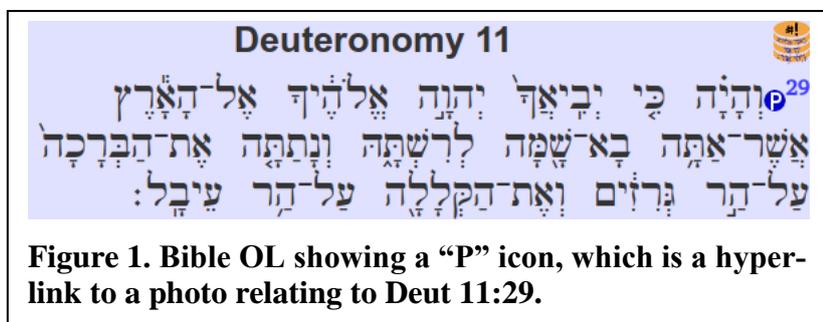
A URL (Uniform Resource Locator) is a web address such as <http://www.something.com>.

### Links from a Verse to the EuroPLOT Resources

The *EuroPLOT Resources* are a collection of photos from the Middle East, with emphasis on images that are relevant to the Bible. The EuroPLOT Resources can be seen at <https://resources.3bmoodle.dk>. Currently, the captions for the photos are mostly in Danish, although English captions are available for some pictures.

At regular intervals, Bible OL scans the image captions looking for Bible references, and when one is found, a hyperlink is generated from the referenced Bible passage to the image.

Consider, for example, Deuteronomy 11:29 as it is displayed in Bible OL (Figure 1). An icon with the letter “P” (for “photo”) is shown next to the verse. If the user clicks on the icon, one or more photos from the EuroPLOT Resources containing the reference “Deut 11:29” will be displayed (Figure 2).



**Figure 1. Bible OL showing a “P” icon, which is a hyperlink to a photo relating to Deut 11:29.**



**Figure 2. The EuroPLOT Resources showing a photo of Mount Gerizim and Mount Ebal, mentioned in Deut 11:29.**

Deuteronomy 11:29 reads “... you shall set the blessing on Mount Gerizim and the curse on Mount Ebal.” The photo shows Mount Gerizim and Mount Ebal.

### Links from a Verse to a URL

A system administrator can manually create hyperlinks from a Bible verse to any URL. The hyperlink is displayed in a manner similar to the “P” icon in Figure 1, but the icon letters can be “D” for “document”, “V” for “video”, or “U” for a non-descript “URL”.

### Links from a Hebrew Lexeme to a URL

In Bible OL a system administrator can add up to three hyperlinks to a Hebrew lexeme. These hyperlinks will be displayed whenever a user views grammatical information about word derived from that lexeme. A number of different icons can be associated with the links.

Consider, for example, the lexeme identifying the Hebrew place name כַּרְמֶל (“Carmel”). If a user views 1 Kings 18:19 in Bible OL and clicks on the word כַּרְמֶל, the system will show grammatical information about that word (Figure 3). At the bottom of that information there is a hyperlink with an

icon showing a small globe. This indicates a map reference, and if the user clicks on the globe, the web browser will show the location of Mount Carmel in Google Maps (Figure 4).

Word	
Text	כַּרְמֶל
<b>Form in text:</b>	
Lexical stem	כַּרְמֶל
<b>Lexeme:</b>	
Lexeme (with variant)	III כַּרְמֶל
Lexeme (transliterated)	karmel
English	(Mount) Carmel
Part of speech	Proper noun
Phrase dependent part of speech	Proper noun
Lexical set	None
Verb class	N/A
Link	<a href="#">🌐</a>

**Figure 3. Part of the information that Bible OL shows about the word כַּרְמֶל. At the bottom, a hyperlink with a globe icon can be seen.**



**Figure 4. Google Maps showing the location of Mount Carmel. (The word “CLOSED” indicates that the tourist site is not currently open to the public.)**

Linking from a Lexeme to a URL is also useful for linking to lexical or morphological information about a word.

## The Anatomy of a Link

In traditional Bible references, links go from one Bible passage to another. Using hyperlink terminology, links are said to go from an “anchor” to a “destination”.

Traditionally, the anchor can be one or more words, a verse, or a collection of verses. The destination is a verse or a collection of verses. Both the anchor and the destination are located within the same Bible.

Table 1 gives examples of the different anchor and destination types. Of course, it would make sense for the first example in the table to be simply a link from the words “In the beginning” of Genesis to the identical words of John, making the destination a collection words, but this is not customary in traditional Bible references.

**Table 1. Examples of anchor and destination types**

Anchor	Destination	Example
Word or words	Verse	The words “In the beginning” of Genesis 1:1 could link to John 1:1 (“In the beginning was the Word, and the Word was with God, and the Word was God”).
Verse	Verse	Psalms 22:19 (“they divide my garments among them, and for my clothing they cast lots”) could link to Matthew 27:35 (“And when they had crucified him, they divided his garments among them by casting lots”).
Collection of verses	Collection of verses	Matthew 16:13-20 (Peter's confession) could link to the parallel passage in Luke 9:18-20}.

## Anchors

### *Extending Anchors*

A natural implementation of an anchor is similar to the way hyperlinks are used on many web sites, Wikipedia being typical of this usage.

There is little reason to extend the concept of an anchor beyond what is used in traditional Bible references. However, the following extended anchors could be considered:

- A non-contiguous collection of words.
- A non-continuous collection of verses.
- A chapter.
- A book.

The first one of these has an obvious use in the case of a split sentence. For example, in John 1:13 (“who were born, not of blood nor of the will of the flesh nor of the will of man, but of God”) you might want to use the non-contiguous words “who were born ... of God” as an anchor.

Apart from this, there is probably not much to be gained by extending the concept of an anchor.

### *Anchor Types*

Traditionally, an anchor is a location in the Bible. However, as described above, Bible OL also supports the use of Hebrew lexemes as anchors, regardless of their location in the Hebrew text.

Similarly, proper names – personal names or names of geographical locations – are obvious candidates for anchors. The example above, where the Hebrew place name כַּרְמֶל (“Carmel”) links to a map showing the location of Mount Carmel, would be just as useful in a non-Hebrew translation of the Bible.

One might also consider genre-specific anchors, providing a link from, say, any piece of poetry to a description of Hebrew poetry in another book.

### *Version-specific Anchors*

Traditional Bible cross references are almost always written as part of a specific physical Bible.

There are, however, some collections of cross references that are not tied to a specific Bible. R. A. Torrey's *Treasury of Scripture Knowledge* (Torrey, c. 1930) is a popular and very large collection of cross references.

But in some cases, an anchor is only relevant in a particular version of the Bible. For example, in a Hebrew or Greek text a link between two different uses of similar words might be relevant, but it might not be relevant in a translation into English or some other language.

## Destinations

### *Extending Destinations*

Whereas extending anchors beyond the traditional cross reference style may not be worthwhile, extending destinations could be very useful.

Obviously, the destination of a link need not be part of the same document where the anchor is located. The following list gives a few examples of hyperlinks to non-traditional destinations:

- Bible references to a specific Bible version. (This could, for example, be a link from a verse in a Hebrew OT to a verse in a Greek NT.)
- Bible commentaries.
- Pictures.
- Maps.
- Sermons.
- Scientific papers.
- Videos.
- Dictionaries.
- Websites.
- Articles.
- Music.

And so on. The list is virtually endless.

Many of these resources can be identified through a URL (a link to a website), but this is not always the case, and sometimes the link may simply lead to a text containing, for example, a reference to a physical book.

## The Provenance of Links

Who creates links? The possibilities include:

- Manual entry.
- One-time harvesting.
- Continuous harvesting.

### Manual Entry

With *manual entry* a person manually enters the anchor and the destination of each link. This requires an appropriate user interface; and although manual entry is tedious work, this is undoubtedly the mechanism that will provide the most useful links, given a knowledgeable and skilled author.

### One-time Harvesting

With *one-time harvesting* a pre-existing collection of links (such as the one found in the *Treasury of Scripture Knowledge* mentioned above) is read by once a program and entered into the system.

### Continuous Harvesting

*Continuous harvesting* is similar to one-time harvesting, except that the source material is read repeatedly because it is likely to change over time. This is how Bible OL creates links to the EuroPLOT Resources.

A more extensive continuous harvesting could consist of automatically searching online publications for relevant anchors and destinations.

### Storage

The mechanism for storing links should be the subject for extensive discussion and is beyond the scope of this document; but a few things can be noted.

For traditional Bible references from one location in the Bible to another, *Emdros* provides a simple mechanism. Emdros (<https://emdros.org>) is a text database engine for analysed or annotated text. It is frequently used to store the text of the Bible, and Bible OL uses it extensively. In Emdros, the constituent atomic parts of a text (typically the words) are identified by an integer known as a *monad*. Thus each word in the Bible has a unique number, and collections of words (such as clauses, sentences, verses, chapters) are identified by a collection of numbers. With Emdros, a Bible reference thus becomes simply two collections of monads: One for the anchor and one for the destination.

Using collections of monads for anchors can also be used when the destination is not in the Bible. But if the anchor is something other than text – if, for example, the anchor is a lexeme or a proper name – some other mechanism is required.

### References

Torrey, R.A. Circa 1930. “Treasury of Scripture Knowledge.” <https://www.biblestudytools.com/concordances/treasury-of-scripture-knowledge>.