

# Making Hobbes's Bible in the English Political Works Machine-Readable: A TXM-Based Workflow

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During the elaboration of his political theory, the materialist philosopher Thomas Hobbes (1588-1679) developed an increasingly close relationship with the Bible. Although he credited himself with the scientific foundation of politics, Hobbes used more and more scriptural evidence in support of his arguments in *The Elements of Law* (1640), *De Cive* (1642, 1647), and the English and Latin *Leviathan* (1651, 1668). Hobbes's growing reliance on the sacred text thus raises the question of how his citational and exegetical practice developed between 1640 and 1668 and for what purposes.

Yet, determining how the philosopher's knowledge and use of the Scriptures evolved over time does not come without difficulty, to the extent that the affair has come to be known as "the problem of Hobbes and the Bible" (Jones 1984). As Harold Whitmore Jones pointed out as far back as 1984, the hundreds of biblical quotations sprinkled throughout the political works, Hobbes's simultaneous use of multiple scriptural sources, and his inconsistent handling of the source texts make it arduous to manually account for the nature and evolution of the philosopher's treatment of the Bible. That is why, despite the recent rise in interest in Hobbes's religion, the philosopher's knowledge and use of the Scriptures seems, as yet, never to have formed the object of a systematic inquiry. Even the most ground-breaking investigations (Jones 1984; Pacchi et al. 1988; Somos 2015; Davis 2018) have not ventured beyond specific case studies, sample surveys, general overviews, or methodological recommendations.

However, if the scholarly community has made only limited progress towards "the problem of Hobbes and the Bible", it is now generally agreed that its solution would foster a better understanding of the philosopher's biblical exegesis but also of his works at large. Hence the interest in actualizing Jones's pioneering undertaking, by exploring the opportunities made possible in the digital turn by a collaboration between computational linguistics and intellectual history.

Based on ongoing research in the framework of the *Digital Theological Hobbes* (DTH) project, this long presentation aims to display the benefits of a textometric approach to the challenges that hindered the success of the enquiries conducted so far: a comprehensive inspection and analysis of heterogeneous scriptural data. Since it is not possible to ascertain how Hobbes's knowledge and use of the Scriptures evolved without reconstituting the philosopher's Bible from the numerous references and citations scattered in his works, this presentation illustrates the workflow developed to turn text (i.e., Hobbes's explicit biblical references

and quotations) into computable data. To do so, it presents a case study based on TXM, a Text Encoding Initiative (TEI) and Natural Language Processing (NLP) oriented, free and open-source software platform implementing textometry (Heiden 2010), and on EEBO-TCP XML-TEI P5 diplomatic transcriptions of Hobbes's English political works (Kichuk 2007), automatically lemmatized by the MorphAdorner software (Burns 2013).

After a brief introduction of the historical-philosophical problem that lies at the roots of the DTH project, the first part of the presentation focuses on the construction of the case study envisaged to elaborate a machine-readable model of Hobbes's Bible in the English political works. Special attention is paid to the building of a TXM-based corpus of the EEBO-TCP XML-TEI P5 diplomatic transcriptions of such works: the published treaties composing the 1640 manuscript *The Elements of Law* (*Humane Nature* and *De Corpore Politico*), the English translation of *De Cive* (*Philosophicall Rudiments concerning Government and Society*), and the 1651 edition of *Leviathan*. It is, indeed, the shared analogous philological and linguistic enrichments of these transcriptions that allow for a unified, systematic, and reproducible method for the processing of Hobbes's explicit biblical references and quotations.

The second part of the presentation introduces the workflow developed to model, retrieve, annotate, and operationalize Hobbes's explicit biblical references and quotations as they appear in the EEBO-TCP XML-TEI P5 diplomatic transcriptions (see Figures 1-3).



Figure 1. Concordance of the 946 matches produced by the surface query for Hobbes's biblical references (corresponding to multiple book-chapter-verse and verse patterns) in the corpus of the English political works. This screenshot nicely illustrates the efficacy of the query, able to retrieve different formats of isolated verses (like "ver. 8.", "verse 10.", "ver. 11, 12."), isolated book chapters (like "Mat. 10."), standard references (like "Mat. 19. 28.", "2 Cor. 1. 24."), composite references (like "Mat. 18. 15, 16, 17" and "1 Cor. 5. 3, 4 & 5"), but also references made up of several kinds of abbreviations (like "1 Epist. chap. 2. ver. 13, 14, 15" or "1 Cor. 5. ver. 9, 10, &c."). However, despite its overall efficacy, the query misses some references (silence) and matches some false references (noise).

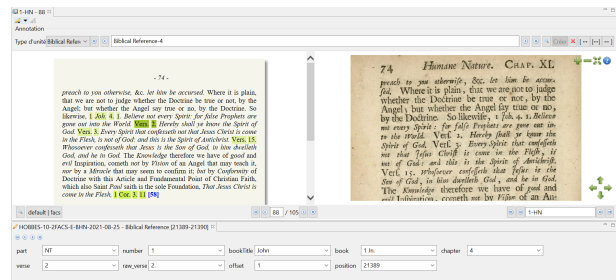


Figure 2. The screenshot illustrates the results of the "Annotate-Hobbes-Biblical-References" script in the corpus of the English political works. First of all, the script automatically creates as many URS biblical reference units (here underlined in green) as are the verse or chapter numbers found in the matches of the query for Hobbes's biblical references. Secondly, it performs an automatic

annotation of these units by projecting the constitutive elements of each biblical reference (the abbreviated book title and eventual number as well as the chapter and verse numbers) into a set of predetermined URS annotation fields as their properties. By applying a table of correspondence between the biblical book abbreviations and their full titles and the part of the Bible they belong to, the script further fills in annotation fields that will be later used for the retrieval and analysis of the URS units. Finally, every time it finds an isolated biblical verse, the script projects the attributes of the “book”, “book Title”, “number” and “part” fields of the preceding URS biblical reference unit into the URS unit corresponding to the incomplete reference. Here “Vers. 2” (displayed in dark green) is automatically annotated as the second verse of the fourth chapter of the first letter of John.

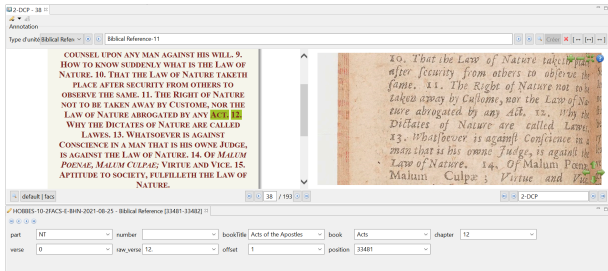


Figure 3. This screenshot exemplifies the query result verification method. In order to reduce the noise produced by the query for Hobbes’s biblical references, the automatic annotation of the URS units is followed by their manual correction. Here, the URS biblical reference unit “Act. 12” is manually deleted once shown as false by its contextualisation through the synoptic edition.

To this end, it illustrates how TXM originally combines the potential of a systematic search of word sequence patterns formulated in the CQL query language of the CQP search engine with that of information annotation through the Unit-Relation-Schema (URS) annotation TXM extension (Heiden, 2018). It shows, as a result, how TXM ensures a full indexation of Hobbes’s diplomatic biblical references (see Figure 4), the complete extraction of the adjacent quotations and a textometric analysis of their lexicon.

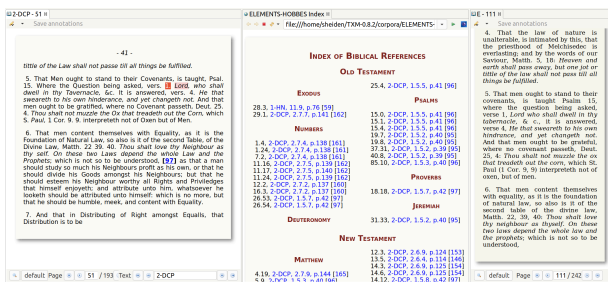


Figure 4. The screenshot shows the dynamic index of the biblical reference annotations occurring in the Humane Nature and De Corpore Politico sub-corpus. Two sets of hyperlinks (displayed in blue in the middle of the figure) allow to navigate to, respectively, the diplomatic and critical edition page of occurrence of each index entry. By clicking on the [Psalms 15.1.] 2-DQP, 1.5.5, p.41 hyperlink, the synoptic edition of Hobbes’s De Corpore Politico opens on page 41, in correspondence of the reference to the first verse of the fifteenth Psalm (on the left). By clicking on the [96] hyperlink, it is Tönnies’s critical edition of The Elements of Law that opens in correspondence of the reference to the same verse, on page 96, for comparison purposes (on the right).

The third part of the presentation displays the workflow developed to model, annotate, and operationalize the micro-interpretations elaborated by the main modern critical editors of Hobbes’s English political works: Ferdinand Tönnies, Howard Warrender and Noel Malcolm. As Hobbes’s diplomatic biblical references are often incomplete, omitted, or erroneous, a new layer of complexity needs to be added for the machine-readable model of Hob-

bes’s Bible to be exhaustive and, therefore, useful for the advancement of scholarship. This part thus shows how TXM allows, via the URS TXM extension and its tools, not only for the thorough indexation and analysis of Hobbes’s critical biblical references but also for the calculation of the ‘editorial delta’, i.e., the variation between the diplomatic and critical information encoded in the texts (see Figure 5).

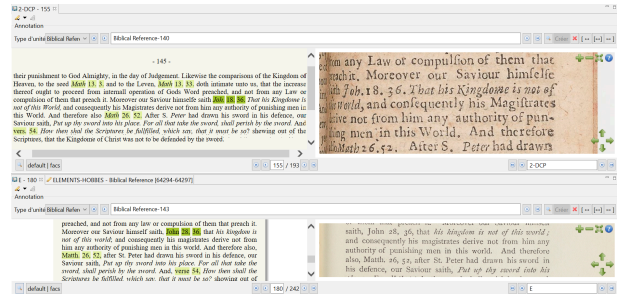


Figure 5. By comparing the indexes of biblical references of our two corpora, the diplomatic edition of Humane Nature and De Corpore Politico and Tönnies’s critical edition of The Elements of Law, some discordances appear. Sometimes, they reveal the positive impact of editorial work: for instance, when Tönnies amends the base text of Hobbes’s printed editions of Humane Nature and De Corpore Politico on the basis of the Harley MS 4235 (MS A) witness. In other cases, discordances may reveal residual typos or inaccuracies of the critical edition itself. This screenshot provides an example of such discrepancies. The reference to the Gospel of John has a different chapter number in De Corpore Politico (upper section) and Tönnies’s edition (lower section): in De Corpore Politico it is the eighteenth chapter that is referred to, while in The Elements of Law the reference points to the twenty-eighth chapter.

In conclusion, the presentation critically evaluates the results obtained and outlines further developments towards the textometric detection of Hobbes’s reuse of his most likely main biblical source, the King James Bible or Authorised Version (1611), in comparison with the principal competing Early Modern English translations available at the time: the Calvinist Geneva Bible of 1557-1560 and the Catholic Rheims-Douay Bible of 1582-1610.

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