The Digital Hill Project
Sources on the Revolt of Samos

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Abstract: This article covers the work done for the Digital Hill project of the Alexander von Humboldt Chair of Digital Humanities at Leipzig University. After a short introduction about the book on which the project is based and the arrangement of the chosen chapter in this book the goals of the project are presented, which are the creation of EpiDoc TEI compatible XML files for the sources, the production of treebank annotations and text alignments and the provision of the results on a web page. The paragraphs concerning treebank annotations and text alignments present working with the interfaces of Arethusa and Alpheios in the Perseids platform. Users can interact with the web page. For that reason jQuery scripts have been written, whose functionality is explained in the visualization paragraph. Some issues on the creation of the EpiDoc files are presented there as well as the applied solutions.

1. Introduction

"Digital Hill" is a project of the Alexander von Humboldt Chair of Digital Humanities at Leipzig University engaged in the production of a digital edition of the *Sources for Greek History between the Persian and Peloponnesian Wars* edited by G. F. Hill in 1897.[1] This volume is a collection of sources encompassing the fifty years of Greek history (Pentekontaetia) between the end of the Persian Wars and the beginning of the Peloponnesian War (479–431 BC). A revised edition of Hill's book was published by R. Meiggs and A. Andrewes in 1951.[2] We decided to work on the original version of Hill not only because it is out of copyright, but also because it still represents a fundamental work for establishing a new digital comprehensive guide to the Pentekontaetia and the Peloponnesian War.[3] Another point for working on this edition is that we are interested in collections of heterogeneous sources, and not only in isolated authors.

Within the topics addressed by Hill in his edition, we chose to work with the sources on the Athenian suppression of the revolt of Samos (441–439 BC) since they are a good test case for

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1   The repository of the project is on GitHub at http://digitalhill.github.io. The printed edition of the book is freely available at https://archive.org/details/sourcesforgreekh00hilluoft.

2   Meiggs/Andrewes (1951).

3   On the fragmentary state of most of the sources concerning the Pentekontaetia, see Martin/Berti (forthcoming).

showing the tools that we have been using and the methodology that we have been devising for establishing a possible model for producing a digital version of the whole collection.[4]

2. The Sources on the Revolt of Samos (441-439 BC)

The sources on the Pentekontaetia collected by G. F. Hill are arranged by topic in eight chapters starting with the origin and organization of the Athenian confederacy and ending with the Western Greeks.[5] The sources on the revolt of Samos are printed in chapter 3 – which is about the external history of Athens, her allies, and colonies – and include both literary and epigraphic texts.[6]

The project is focussed on three main goals: 1) to produce XML files of the sources on the revolt of Samos following the EpiDoc TEI XML subset;[7] 2) to produce linguistic annotations of the literary sources on the revolt of Samos according to the Ancient Greek and Latin Dependency Treebank 2.0 guidelines;[8] 3) to produce translation alignments of the literary sources on the revolt of Samos using the Alpheios alignment editor.[9]

In order to produce these annotations, the first part of the work is devoted to listing the sources on the revolt of Samos collected by Hill and to checking which were already available in an XML format in the Perseus Digital Library.[10] The sources are constituted by Greek and Latin literary texts and inscriptions, and they have been arranged into a spreadsheet.[11] The spreadsheet includes different pieces of information: 1) editions used by Hill (when this is referred to by the editor);[12] 2) links to the XML files in the Perseus Digital Library or in other available repositories; 3) links to treebank and text alignment files that have been created as part of the

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4   For a study of the fragmentary sources on the revolt of Samos with bibliography, see Berti (2013), 269–288. For a synoptical representation of the primary sources on the revolt of Samos, see http://demo.fragmentarytexts.org/en/revolt-of-samos.html. For further information about the revolt and its chronology see Pritchard (2012), 39, Phillips (2010), 2 and Fornara/Lewis (1979), 7–10. For the dating see also the text-alignment of Thuc I. 115, 2 and Schol. in Arist. Vesp. 283 (http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=15868), and the treebank files of Plut. Per. 28 (http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=10&doc=11142) and Schol. in Arist. Vesp. 283 (http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=2&doc=10318 and http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=8&doc=10318).

5   The revised edition by Meiggs and Andrewes has a different internal structure, because sources are printed in alphabetical order, but arranged by topic in rich and detailed indices at the end of the book.

6   Hill (1897), 137–146.

7   http://sourceforge.net/p/epidoc/wiki/Home/

8   https://github.com/PerseusDL/treebank_data/blob/master/AGDT2/guidelines/Greek_guidelines.md

9   http://alpheios.net/

10   The sources not available in a digital format have been digitized and manually annotated.

11   We chose a Google Drive spreadsheet for no particular reason. The same results could have been achieved with Open Source software like Davros for the storage and EtherCalc for the spreadsheet. This spreadsheet is accessible at https://docs.google.com/spreadsheets/d/1dDuAS9vXrrvMczAIja8oUhmPhU-nHQ7lPsTT3wDsVdg/edit

12   Hill, for example, in his collection doesn't print the text of Thucydides, Xenophon, and the Aristotelian *Athenaion Politeia* for reason of space and "because they can best be supplied from the shelves of those who are likely to consult this work" (Hill (1897), vi).

project (see below);[13] 4) portions of the source texts left out by Hill;[14] 5) links to the EpiDoc files that were manually produced as part of the project; 6) additional notes and a legend explaining the meaning of the coloured cells.

3. Linguistic Annotations of the Sources on the Revolt of Samos

One of the main goals of the project was the production of morphosyntactic annotations of the sources on the revolt of Samos. In order to produce these annotations, we followed the Ancient Greek and Latin Dependency Treebank 2.0 guidelines[15] and the Arethusa interface openly available through Perseids, which is a collaborative platform for editing and annotating ancient source documents.[16]

Fig. 1: Screenshot from the Arethusa treebank file creation mask (Diod. XII.27.2.1).

Fig. 1 shows an example of a treebank file of Diod. XII.27.2.1 using the Arethusa interface. The language has been automatically set up to Greek and the 'Smyth Greek Grammar Tag Set' provides morphological, syntactic, and semantic annotations. After setting up these options, the 'Edit' button allows to create the treebank file shown in fig. 2.

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13   The column of the spreadsheet containing links to the translation alignment files is split into two separate columns: one contains the actual link to the file, the other one contains information about the type of alignment (for example, if it is a partial or a full alignment and, in the case of a full alignment, which translation has been used).

14   When collecting sources, Hill prints only the passage of text which is relevant to the event he is dealing with, and sometimes he leaves out parts of the text. This left out text was added in a specific column of the spreadsheet.

15   See note 9 for the guidelines. The guidelines are based on Herbert Smyth's Greek grammar (http://www.perseus.tufts.edu/hopper/text?doc=Smyth+grammar+1&fromdoc=Perseus%3Atext%3A1999.04.0007).
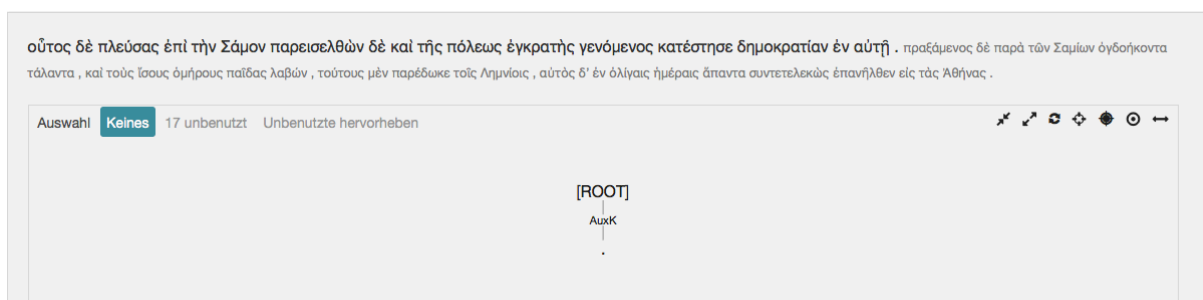
16   http://perseids.org

οὗτος δὲ πλεύσας ἐπὶ τὴν Σάμον παρεισελθὼν δὲ καὶ τῆς πόλεως ἐγκρατὴς γενόμενος κατέστησε δημοκρατίαν ἐν αὐτῇ . πραξάμενος δὲ παρὰ τῶν Σαμίων ὀγδοήκοντα τάλαντα , καὶ τοὺς ἴσους ὁμήρους παῖδας λαβών , τούτους μὲν παρέδωκε τοῖς Λημνίοις , αὐτὸς δ' ἐν ὀλίγαις ἡμέραις ἅπαντα συντετελεκὼς ἐπανῆλθεν εἰς τὰς Ἀθήνας .

Auswahl | Keines | 17 unbenutzt | Unbenutzte hervorheben

[ROOT]
AuxK
.

Fig. 2: Detailed screenshot from Arethusa treebank file edit mask (Diod. XII.27.2.1).

When the tool has finished processing, the edit mask automatically opens and the passage is ready to be treebanked. Using the mouse and the drag function, it is possible to toggle a word and align it to other words depending on the ROOT-node. On the top right side of the interface there are several buttons which provide services like saving, downloading the XML file, several other options, or switching the language (they are not shown in the screenshots). Below those buttons there is a menu-bar that provides several tabs necessary for the annotation of the words (fig. 3).
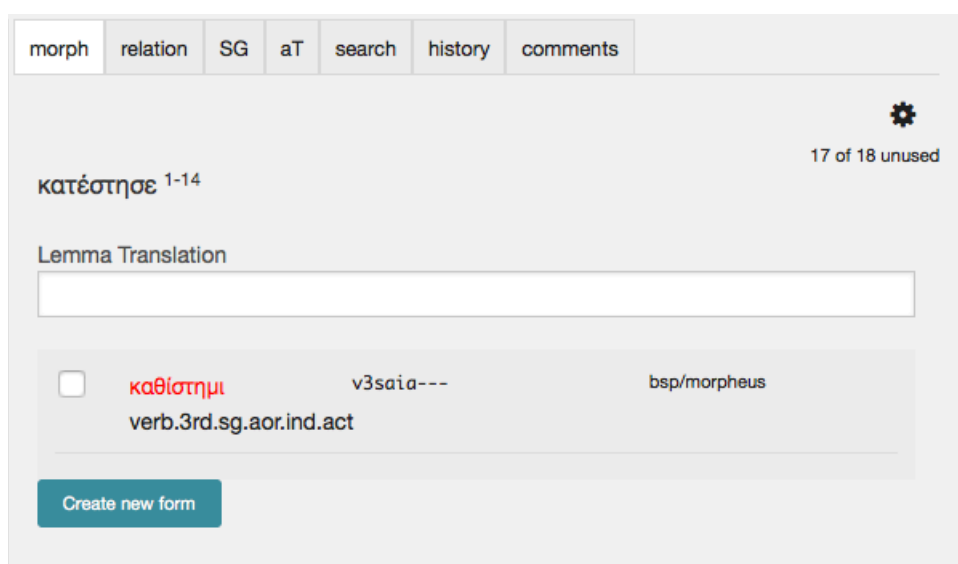
| morph | relation | SG | aT | search | history | comments |

17 of 18 unused

κατέστησε ¹⁻¹⁴

Lemma Translation

☐ καθίστημι v3saia--- bsp/morpheus
verb.3rd.sg.aor.ind.act

Create new form

Fig. 3: Detail of the Arethusa menu-bar with a toggled word.

When a word is toggled, it is possible to annotate its morphological layer in the 'morph'-tab, the syntactic layer in the 'relation'-tab, and the semantic layer in the 'SG'-tab. The 'aT'-tab enables users to add elliptical nodes that help to annotate according to the guidelines, for example in sentences where the main verb is missing. In the interface, words are coloured depending on their morphological function.[17] Once the annotation is done, this feature allows to visualize the morphological layer very clearly (see fig. 5).

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17   For example, verbs are displayed in red, nouns in green, pronouns in violet, adverbs in orange, etc.
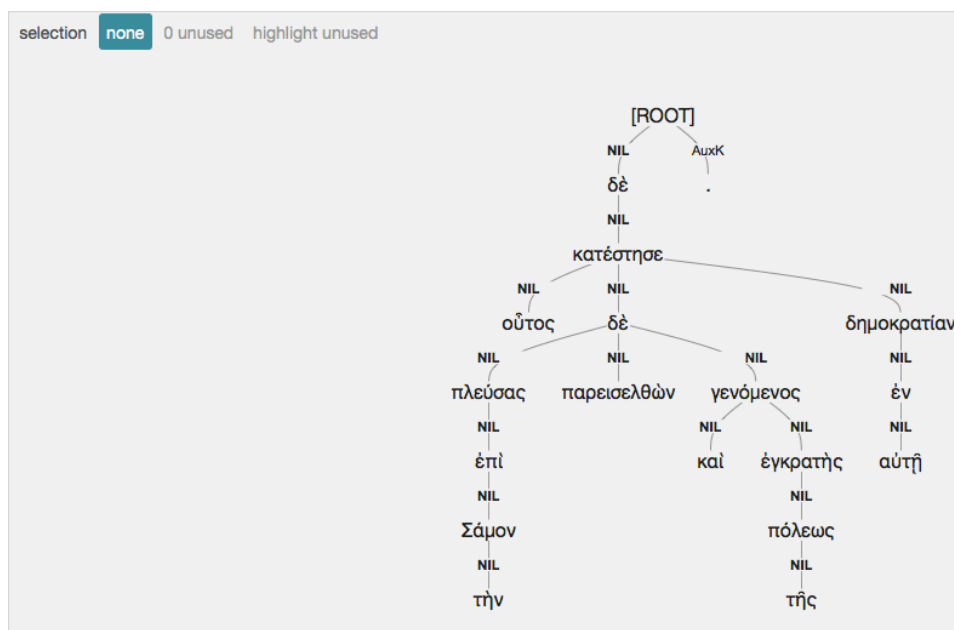
**Fig. 4: A sentence before the annotation
of the morphological layer
(see fig. 5 for the annotation).**

In order to add the morphological annotation, a word has to be selected by clicking on it. Then either one of the proposed words has to be chosen or a new word has to be added with the 'create new form' function. A new form needs additional information depending on its part of speech. Nouns need different types of information than verbs or numerals. The interface provides drop-down-menus for all the required pieces of information. When all the information is gathered, the new form is added by using the 'Save'-button. The selection of a word is undone using the 'esc'-key or by clicking on the word it depends on.[18] It is necessary to undo the selection of a word in order to continue the annotation, otherwise the former selected word would become annotated to the next selected word, and the sentence tree would become messed up. Fortunately, it is pretty easy to correct this mistake should it occur by either selecting again the correct node or using the 'undo'-button. It is possible to add to the morphological layer a lemma translation in a letterbox (see fig. 3). The guidelines deal with the way this translation should be done.

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18   In the example, the word Σάμον would not be selected anymore when the user clicks on ἐπὶ.
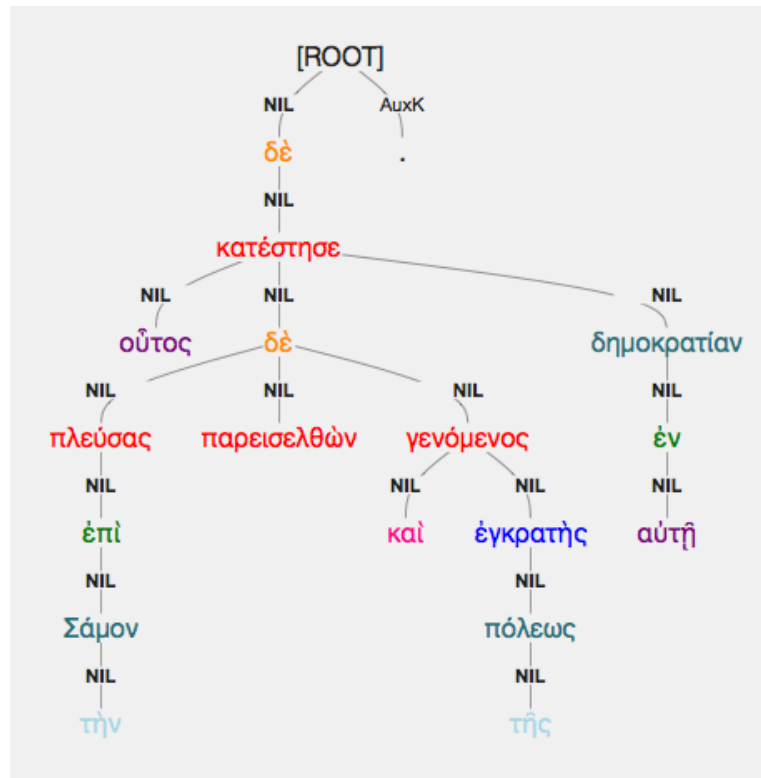
**Fig. 5: The same sentence of fig. 4
after annotation of the morphological layer.**

Once the morphological layer is annotated, the syntactic layer may be added. To add this layer, a word has to be selected and the tab 'relation' has to be chosen. A drop-down menu presents various choices for this layer, and the word may be annotated according to the guidelines. This layer may be annotated without another layer previously annotated.[19]

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19 The semantic layer, on the other hand, may only be annotated once the morphological layer has been finished since it depends on the former.
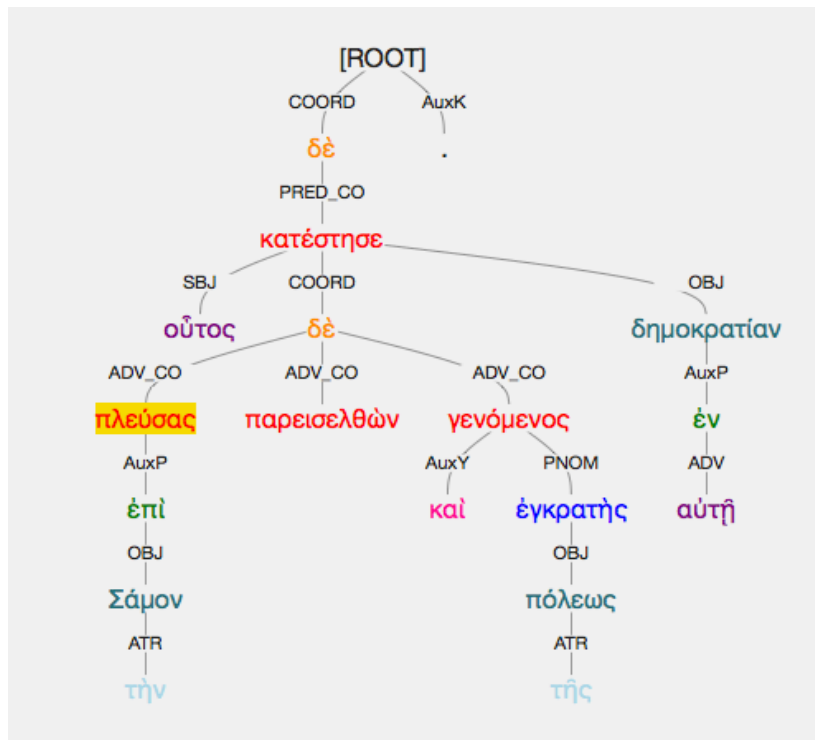
Fig. 6: The same sentence of fig. 5 after annotation of the semantic layer.

The next step is the annotation of the semantic layer. To annotate this layer, a word has to be toggled again and the tab 'SG' has to be chosen. Depending on the choice, the morphological layer allows different options. The favoured option may be chosen using the drop-down menu. Examples for those drop-down menus are given in fig. 7–8. The numbers next to the words refer to the sentence of the passage and the number of the word in it. For example, 1–14 stands for sentence 1 and word 14, 1–15 stands for sentence 1 and word 15, and so on.
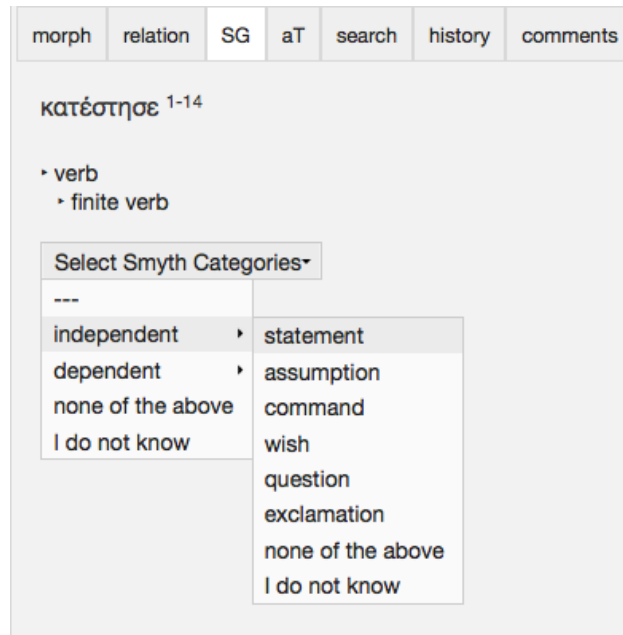
Fig. 7: Drop-down menu for the word κατέστησε treated as a verb in the morphological layer.
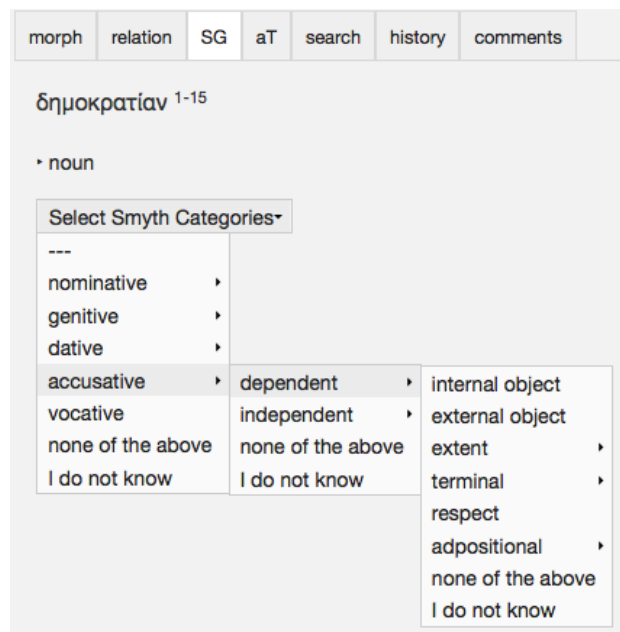

Fig. 8: Drop-down menu for the word δημοκρατίαν treated as a noun in the morphological layer.

Morphosyntactic and semantic annotations are important and useful for different linguistic analyses and interpretations. We will show the example of the sentence displayed in the next

figures, taken from Diod. XII.27.2.1: οὗτος (sc. Pericles) δὲ πλεύσας ἐπὶ τὴν Σάμον[20] παρεισελθὼν δὲ καὶ τῆς πόλεως ἐγκρατὴς γενόμενος κατέστησε δημοκρατίαν ἐν αὐτῇ. According to the syntactic layer, the second particle δέ and the conjunction καί coordinate the second part of the sentence with the first one. The main verb and predicate of the sentence is κατέστησε, which is labelled as PRED_CO. The dependent subject is οὗτος and is labelled as SBJ. The adverbial phrases πλεύσας, παρεισελθὼν and γενόμενος depend on the predicate and are coordinated by the conjunction καί, which is thus labelled as COORD, the particle δέ is labelled as AuxY, and have their own dependencies in ἐπὶ τὴν Σάμον and τῆς πόλεως ἐγκρατὴς respectively. The object of the main sentence is δημοκρατίαν, which is complemented by the adverbial phrase ἐν αὐτῇ and labelled as OBJ. The subject οὗτος refers to a previous sentence and stands for Pericles. All the particles may be treated as temporal particles and present a sequence; they are therefore labelled as ADV or ADV_CO. Appositions are always labelled as AuxP, and articles as ATR. The words following the appositions are treated as adverbial phrases of places and thus labelled as ADV. Only the full stop is automatically labelled as AuxK as this is the common label for final punctuation. Since ἐγκρατής is dependent on the copulative verb γενόμενος, it is labelled as PNOM with πόλεως as its argument, which was thus labelled as OBJ.

The number of choices for dependent nominatives is quite limited – actually there is only one possibility – and thus, it is only annotated as a dependent nominative. On the other hand, the number of choices for verbs is quite numerous. The only finite verb in the sentence of Diodorus is the predicate, thus, it has to be independent. Given that the sentence places a statement, the predicate is treated as such and its object is annotated as an external object. Both δέ are annotated as particles. As already mentioned, the participles are annotated as temporal sequences and the words following an apposition are annotated as a terminal accusative and a dative of place. According to the guidelines, predicate nominals are annotated as dependent nominatives and ἐγκρατής is accordingly annotated.

There is no semantic annotation for conjunctions, appositions, and articles. With all these pieces of information a translation of the sentence might be as follows: And after sailing to Samos, after reaching and after mastering the city, he (*sc*. Pericles) established democracy in it.

In order to get consistent work when treebanking, sometimes it has been necessary to add technical nodes, which are called 'elliptical nodes', that would act as predicate forms (PRED), as the sentences do not contain a finite verb that would serve this function.[21] Yet the other parts of the sentence are dependent on this predicate form – except for the coordinating conjunctions or particles, in the most cases δέ. It is possible to download the XML-file that is the foundation of each treebank file. If the file has been created by retrieving the text, it contains a CTS-URN, should the source contain such an URN.[22]

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20 The text provided by Hill shows two asterisks here to indicate a possible lacuna after Σάμον. Unfortunately there is no way to deal with lacunas in Arethusa, yet. For that reason, the text has been treated as it is, without that lacuna, to present one way, how issues like that may be treated.

21 See http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=9&doc=11140 for an example. Those nodes are recognisable due to the fact that they are displayed smaller than the other words of the sentence.

22 Since the treebank files for this project were produced manually and not by retrieving text automatically, they do not contain a CTS-URN. It would not have been possible to retrieve the text for all the sources anyway, since Hill does not always quote the edition that he used. In the future, it may be considered to use texts containing a CTS-URN, for example, by using the capiTains API, available at http://cts.perseids.org/.

3.1 Translation Alignment of the Sources on the Revolt of Samos

The interface used for creating translation and textual alignments is called Alpheios and it is part of the Perseids annotation environment.[23] It allows to align two texts in two different languages or in the same language as well. Fig. 9 shows the mask for aligning the Greek text of the sentence of Diod. XII.27.2.1 (see previous paragraph) with its English translation.

Fig. 9: Creation mask for text-alignments in Perseids (Diod. XII.27.2.1).

After pasting, retrieving or putting the relevant URI of the two texts that have to be aligned in the two boxes of the interface, it is possible to select the respective languages and start the alignment by pressing the 'Align'-button on the right side (see fig. 10).

Fig. 10: The alignment interface for Greek and English (Diod. XII.27.2.1).

Not aligned words are displayed in orange, aligned words in black. Selected words have a purple box around them. Words are aligned by clicking on them and then clicking on the corresponding word in the other text. It is possible to align more than one word to one single word and vice versa. One word is aligned to several other words when it is aligned to a word that is already aligned to those words. In this example οὗτος is aligned to 'he', δέ is aligned to 'and', πλεύσας to 'after sailing', ἐπί to 'to', Σάμον to 'Samos', παρεισελθών to 'after reaching', the καί to 'and', τῆς to 'the', πόλεως to 'city', ἐγκρατής and γενόμενος to 'after mastering', κατέστησε to 'established', δημοκρατίαν to 'democracy', ἐν to 'in' and αὐτῇ to 'it'. The article before Σάμον (which is τήν) and the second δέ could not be aligned. One word, πόλεως, is

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23   http://perseids.org/. For a description of Alpheios see also http://alpheios.net/.

aligned to two words, since its case demands that apposition in English. For translation issues, ἐγκρατής and γενόμενος were aligned to the same two words and not to one single word each at a time.

Fig. 11: One of the phases of the text-alignment (Diod. XII.27.2.1).

Fig. 12: Final text-alignment (Diod. XII.27.2.1).

The interface also allows to show the alignment as 'interlinear text' and the result of the alignment can be exported both in HTML (the actual display of the interface) or in an XML file (fig. 13).

Given that there are no guidelines for aligning texts, some additional notes have to be given here in order to keep the work consistent and to explain how to work with texts in different languages.[24] Even if it is possible to work with text passages containing more than 100 characters, the interface presents several sentences as one big block. In the XML file of the translation alignment, each sentence is treated separately. As part of the Digital Hill project, several Greek-English and Greek-German alignments have been created. Moreover, given that we have different ancient sources dealing with the same event concerning the revolt of Samos, we have also been producing Greek-Greek and Greek-Latin alignments.

A word-by-word alignment between ancient Greek texts and their modern translations is not possible in most cases. One reason is that word endings in ancient Greek contain information that in many modern languages is translated with personal pronomina. For example δοκοῦσιν is translated into English with 'they seem', and so a word-by-word alignment is not possible. The same happens with tense forms for verbs and with articles accompanying personal names in ancient Greek (e.g., ὁ Περικλῆς, which is only 'Pericles' in the English translation).

Fig. 13: Extract from the XML-view provided by Perseids.

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24   One of the purposes of producing translation alignments of the sources on the revolt of Samos has been not only to try to analyse textual evidence on this historical event with digital tools, but also to provide a rich set of test cases for building in the future translation alignment guidelines.

Furthermore, it is possible that two words are contracted together in one language and not in the other (e.g., the German 'in dem' that may become 'im'). These are just very few examples, but it is important to keep them in mind when trying to create word-by-word-alignments.

The XML files resulting from the alignment and the HTML visualization in Perseids do not display punctuation except for full stops.[25] This depends on the fact that at the beginning only texts up to 100 characters could be processed by Perseids.[26] Considering the limitations resulting from not visualizing punctuation, the visualization of the alignments in the GitHub webpage of the project provides texts with punctuation.[27]

There are also grammatical differences that have to be taken into account when working with translation alignments. For example different languages may use different cases for expressing the same conditions and there are many particles in ancient Greek that cannot be translated into modern languages.

To make the problems more explicit, here is a concrete example from a passage of Arist., *Rhet*. 1411a1:[28]

> τῶν δὲ μεταφορῶν τεττάρων οὐσῶν εὐδοκιμοῦσι μάλιστα αἱ κατ᾽ ἀναλογίαν, ὥσπερ Περικλῆς ἔφη τὴν νεότητα τὴν ἀπολομένην ἐν τῷ πολέμῳ οὕτως ἠφανίσθαι ἐκ τῆς πόλεως ὥσπερ εἴ τις τὸ ἔαρ ἐκ τοῦ ἐνιαυτοῦ ἐξέλοι.

Here are three different translations of this passage:

> *- Of the four kinds of metaphor the most popular are those based on proportion. Thus, Pericles said that the youth that had perished during the war had disappeared from the State as if the year had lost its springtime.*[29]
> *- Of the metaphors, which are four, those about proportions seem most popular, as for example, when Pericles said, that the youth, who had been killed during the war, had been stolen from the city in this way as if someone had taken away the spring from the year.*[30]
> *- Und von den Metaphern, es sind vier, erscheinen die über Proportionen besonders gut, zum Beispiel sagte Perikles, dass die Jugend der im Krieg Gefallenen auf diese Weise so aus der Stadt geraubt wurde, als ob irgendwer den Frühling aus dem Jahr entfernte.*[31]

Freese's translation is pretty free, as it is possible to see in the first part of the sentence which is treated as a single isolated one. An accurate sentence alignment is not possible because we have one Greek sentence opposed to two English ones. Yet it is possible to align those sentences as the algorithm does not divide text blocks according to full stops, unlike the algorithm of Arethusa for treebanking. Both English sentences are now seen as one block. Furthermore, some words have been omitted, as for example τις, or added, as for example 'kinds' in the first part of the sentence.[32] The genitive μεταφορῶν at the beginning of the sentence is a genitive of the divided whole and for that reason contains the condition which is expressed with the preposition 'of'.[33] αἱ is treated as the subject of the sentence and the translation could be 'of the four

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25   The semicolon may be used too, as it corresponds to a question mark in Ancient Greek.

26   This limitation does not exist anymore, at least in the instance of the alignment tool provided by the Perseids web page http://sosol.perseids.org. There is still a limitation in the instance provided by http://alpheios.net/.

27   http://digitalhill.github.io/

28   This passage is mentioned among other passages in Hill, No. 267.

29   The translation is by Freese: Freese (1926).

30   Translated by Marcel Mernitz.

31   Translated by Marcel Mernitz.

32   See http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=15904 for the alignment.

33   http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=1&doc=15901 shows the treebank file of this sentence.

metaphors those that ...'. In this translation μεταφορῶν has to be aligned to two words ('kinds' and 'metaphors'). The annotation tree in Arethusa would have a different shape as well.

In the second translation, the genitive μεταφορῶν is treated as a genitive of connection, stating a remark,[34] dependent to εὐδοκιμοῦσι.[35] The participle οὐσῶν is translated as an attribute to μεταφορῶν in this translation with τεττάρων as its predicate nominal, but it could be translated as 'the metaphors, being four, about proportions seem very good' as well to almost provide a word-by-word alignment. Here κατά is aligned to 'about'. Furthermore, it is not possible to translate εὐδοκιμοῦσι as a single word, so a word-by-word alignment becomes impossible. If such an alignment were be pursued, ὥσπερ would just have to be translated as 'as'. Although in this case, the coordinating particle δέ has not been translated, as it is not needed for the right speech flow in English, it might as well be translated due to a word-by-word alignment. The Accusativus cum Infinitivo, short A.c.I., that follows ἔφη, is introduced by 'that' in the translation, yet the Greek original has no need for it. The modal adverbial οὕτως can be translated with more than one word as 'in this way', by which the Greek word would have to be aligned to three words, but also simply as 'so'.[36]

In the German translation, a word-by-word alignment is pursued, but it is evident that this is also impossible. The A.c.I. is introduced by a conjunction in the German translation as well, which is not needed in the Greek version. The predicate cannot be displayed as one word, either, and also, an adjectival translation would make no difference, as a verb would still be needed (e.g., 'sind wohlscheinend'). In addition, it does not seem desirable to switch the word type, if a word-by-word alignment is pursued. Although it is possible to express the modal verb with one word in German, it appears more prominent if the expression contains three words. The problem regarding the melted article has already been mentioned above.[37]

It is not always necessary to align the entire text block. This is especially the case with ancient texts that deal with the same topic, such as for alignments of Greek-Greek or Greek-Latin texts. In these cases, partial alignments can help to highlight the similarities. We are going to show an example aligning two extracts from the *Timotheus* of Cornelius Nepos and the *De Permutatione* of Isocrates:

> - *in quo oppido oppugnando superiore bello Athenienses mille et ducenta talenta consumpserant, id ille sine ulla publica impensa populo restituit.*[38]
> - μετὰ δὲ ταύτας τὰς πράξεις ἐπὶ Σάμον στρατεύσας ἣν Περικλῆς ἀπὸ διακοσίων νεῶν καὶ χιλίων ταλάντων κατεπολέμησε.[39]

Both passages deal with the costs of the Samian war.[40] As the aim of this alignment is to highlight similarities, the words that should be aligned are *mille* with χιλίων, *talenta* with ταλάντων, and *consumpserant* with κατεπολέμησε.[41] An interesting fact is that Nepos speaks of 1200 talents, which were spent by the Athenians for the siege, while Isocrates states that

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34 Since our reference grammar is Smyth, the work is based on his grammar. Cfr. Smyth (1956): SG 1381 (genitive of connection).

35 http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=1&doc=12115 shows the sentence tree of this variation.

36 The text alignment looks like this:
    http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=15903.

37 Here, the text alignment is as follows:
    http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=15902.

38 Corn. Nep., *Timoth*. I, 2 = Hill, No. 259.

39 Isocrat., *De Perm*. 111 = Hill, No. 253.

40 See also ML-55 = IG I3 363 = CIA I 177.

41 Here is the text-alignment:
    http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=12406.

they spent an amount of 1000 talents for conquering the Samians. In this case, the matter is not a translation, so a word-by-word alignment would not be too useful. Furthermore, Nepos reports that Timotheus was able to conquer Samos later without any expenses for the Athenean people. Isocrates on the other hand reports that, in addition to the expenses of 1000 talents, the Athenians maintained 200 ships for the siege. Diodorus only reports the payment of a fee of 200 talents, which occurred during the siege:

- κολάσας δὲ τοὺς αἰτίους ἐπράξατο τοὺς Σαμίους τὰς εἰς τὴν πολιορκίαν γεγενημένας δαπάνας, τιμησάμενος αὐτὰς ταλάντων διακοσίων.[42]

In this passage it is not mentioned how the persons responsible for the riot (τοὺς αἰτίους) were punished. The payment of 200 talents is inflicted to all the Samians (τοὺς Σαμίους). In addition to this payment, Diodorus reports a penalty that the Samians had to pay during the first Athenian invasion combined with the provision of hostages. They had to provide 80 hostages and as many talents.[43] Combined with the amount they had to pay, the total is 280 talents. The difference between this amount and the amount in Nepos' report is 920 talents and the difference from Isocrates' report is 200 ships and 720 talents, that would have been spent for the remaining war. Diodorus only estimates these as 280 talents for the first invasion, in which Samos seemed not to have resisted, and the second invasion and the accompanying siege.[44] Plutarch tells of reports according to which the hostages had to pay a talent each, but he rejects those reports as propaganda. Yet Plutarch reports that a part of the penalty had to be paid immediately and the rest - which is not clarified – had to be paid by a stated time (ἐν χρόνῳ ῥητῷ). In addition, the Samians would have to provide hostages again.[45] The *Corpus Inscriptionum Atticarum* (CIA) I 177[46] states an amount up to 1404 talents paid by three Ἑλληνοταμίαι[47], while another

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42   Diod. XII. 28, 3 = Hill, No. 238.

43   Diodorus varies here from the report of Thucydides. According to Thucydides, the Samians had to provide 100 hostages, 50 children and men at a time. For the text alignment of the two passages, see http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=15880. Diodorus also conceals the construction of a garrison, but he reports the payment of 80 talents.

44   Cfr. Legon (1972), 149. See also http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=6&doc=10318 for the treebank file of Schol. in Arist. Vesp. 283 in which a certain Carystion warned the Athenians about the Samian warcraft and earned the Athenian civil right in this way. According to this account, the Samians were resisting though.

45   See http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=1&doc=11142 for the treebank file of Plut. Per. 28. A scholion, that reports the blackmail of money during the Samian campaign, is intercessional for the provision of hostages. See therefore http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=1&doc=11094 for the treebank file of Schol. in Arist. Pax 697.

46   See https://github.com/DigitalHill/EpiDoc-files/blob/master/cia_i_177_epidoc.xml for the EpiDoc-file.

47   See CIA I 177 = IG I³ 363 (FR. A). There are three different amounts that are mentioned in the inscriptions: 128 talents (line 5), 368 talents (line 12) and at last 908 talents (line 17). In line 19, the total amount is up to 1400 talents, but this line is utterly mutilated and barely readable, so it depends on interpretation. The three amounts sum up to 1404 talents. Cfr. also Gabrielsen (2008), p. 46-73 and Fornara/Lewis (1979), 9–11. In Isocrates, Nepos and Diodorus, the siege represents the entire war, but they leave out the first invasion, so they ignore the first amount. During this invasion, democracy had been established and had probably been secured for another two or three months. The expenditures for that would be displayed by the first amount. Pericles landed with 40 triremes. At maintenance costs of one talent a month, they would add up to 40 talents, for three months they would add up to 120 talents. The remaining eight could have been used to secure the political change, cfr. also Fornara/Lewis (1979), 11f. According to Gabrielsen the first amount represents the expenditures for the first invasion and the following two the expenditures for the siege of Samos, so he starts his calculations for the monthly expenditures at 1276 talents and adds up to 2, 3 talents per ship a month. Cfr. Gabrielsen (1994), 115. Pritchard ignored the first invasion as well and determined the expenditures at 1276 talents: cfr. Pritchard (2012), 39. Ἑλληνοταμίαι were the Greek treasurers who organized the Athenian expenses. Given that they were in charge for one year, Fornara and Lewis saw their assumption about the duration of the war confirmed, as three different treasures are mentioned. Cfr. Pritchard (2012), 41 and Fornara/Lewis (1979), 12.

inscription mentions Ἑλλενοταμίαι who received 57 talents and 1000 drachmas of Samos.[48] Thucydides mentions only that the Samians had to pay an agreed sum within a certain time, but he does not mention the amount of this levy and whether it also contained the toll of ships.[49] Apparently Samos was not punished in another fashion as other revolting members of the League. The island was only required to provide hostages and to host an Athenian garrison. This is probably due to the fact that the Samians hardly resisted during the first invasion and in fact they could keep their exceptional position, that is the fleet, walls, and freedom from tributes.[50]

A comparison of these war expenses shows additionally that literary sources (independently from their authors and temporal distance, and topics) derive from the inscriptions.[51] This short passage clearly shows that working with text alignments is very useful to produce and answer historical questions.

We also aligned the passages of Harpocration concerning Aspasia (s. v. Ἀσπασία) and the entry about the *demopoietos* from Suidas (s. v. Δημοποίητος):

- Harp: δοκεῖ δὲ καὶ ἐξ αὐτῆς ἐσχηκέναι ὁ Περικλῆς τὸν ὁμώνυμον αὐτῷ Περικλέα τὸν νόθον ὡς ἐμφαίνει καὶ Εὔπολις ἐν τοῖς Δήμοις.
- Suid: ὅμως γε μὴν ἀντιβολοῦντος καὶ δεκάσαντος τοὺς ἐντεῦθεν ζῶντας ὀψὲ καὶ μόλις τὸν νόθον οἱ παῖδα τὸν ἐξ Ἀσπασίας τῆς Μιλησίας ἐποίησε δημοποίητον.

These passages are not translations of each other, thus a word-by-word alignment would not be too useful. The words that should be aligned are τὸν νόθον and τὸν νόθον with παῖδα, as well as ἐξ αὐτης ἐσχηκέναι and ἐξ Ἀσπασίας.[52] Aligning the verb ἐσχηκέναι is considered heavy alignment, since it has no equivalent in the second sentence, yet I think it needs to be aligned, since it carries the meaning that is implemented in the genitive in the passage of Suidas. This example clearly shows that it is not possible to provide a word-by-word alignment. It is also not always necessary that the cases in Greek-Greek alignments are constantly the same. An alignment of Photius and Aelian clearly points this out.

- Photius: οἱ δὲ ὅτι Ἀθηναῖοι μὲν τοὺς ληφθέντας ἐν πολέμῳ Σαμίους ἔστιζον γλαυκὶ Σάμιοι δὲ τοὺς Ἀθηναίους τῇ σαμαίνῃ ὅ ἐστι πλοῖον δίκροτον ὑπὸ Πολυκράτους πρῶτον παρασκευασθὲν τοῦ Σαμίων τυράννου ὡς Λυσίμαχος ἐν β Νοστῶν·
- Aelian: τούς γε μὴν ἁλισκομένους αἰχμαλώτους Σαμίων στίζειν κατὰ τοῦ προσώπου καὶ εἶναι τὸ στίγμα γλαῦκα καὶ τοῦτο Ἀττικὸν ψήφισμα.

The aligned words are τοὺς and τοὺς, ληφθέντας ἐν πολέμῳ and ἁλοσκομένους αἰχναλώτους, Σαμίους and Σαμίων as well as γλαυκί and γλαῦκα.[53]

Is it always possible to align a part of speech to the exact same part of speech? The answer is no, this is not always possible. Sometimes participles and adjectives have to be substantivized in translations. The following sentence should serve as an example. The Greek passage is once again taken from the speech of Isocrates mentioned above.

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48 See CIA I 188 = IG I² 304. For the text included in an EpiDoc file see:
https://github.com/DigitalHill/EpiDoc-files/blob/master/cia_i_188_epidoc.xml.

49 See Thuc. I. 117, 3.

50 Cfr. Legon (1972), 150 and 153f. for establishing a garrison. See also
http://www.perseids.org/tools/arethusa/app/#/perseids?chunk=10&doc=10318 for the treebank file of Schol. in Arist. Vesp. 283.

51 This is probably due to the preference of the authors for round numbers. The inscriptions on the other hand provide solid information. Cfr. Burrer/Müller (2008), 10.

52 The text-alignment looks like this:
http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=12404.

53 See http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=12550 for the text alignment.

- μετὰ δὲ ταύτας τὰς πράξεις ἐπὶ Σάμον στρατεύσας ἦν Περικλῆς ἀπὸ διακοσίων νεῶν καὶ χιλίων ταλάντων κατεπολέμησε.

- Und nach diesen Taten zog er gegen Samos, das Perikles mit zweihundert Schiffen und tausend Talenten unterwarf.[54]

These are the words that have been aligned: μετὰ - nach, δὲ - und, ταύτας τὰς - diesen, πράξεις - Taten, ἐπὶ - gegen, Σάμον - Samos, στρατεύσας - zog er, ἦν - das, Περικλῆς - Perikles, ἀπὸ - mit, διακοσίων - zweihundert, νεῶν - Schiffe, καὶ - und, χιλίων - tausend, ταλάντων - Talente, κατεπολέμησε - unterwarf. The coordinating δέ could be aligned to a conjunction, as well as the prepositions μετά and ἐπί could be aligned to prepositions and the nouns πράξεις and Σάμον, as well as the nouns of the second part of the sentence could be aligned to nouns. This is also the case for the relative pronoun ἦν, the noun that serves as subject Περικλῆς, and the numerals. The verb could be aligned to one word as well, as the subject is expressed by a word on its own. The pronoun ταύτας and the article τάς have been aligned to the pronoun 'diesen', since it already contains the demonstrative function of the pronoun. Also the participle στρατεύσας has been aligned to two words, namely a verb and a pronoun, which is already contained in the Greek word. A translation as close to the original as that one provides a text alignment with the same parts of speech. An example for a less close translation is the following one by Norlin:[55]

- After these exploits he led an expedition against Samos which Pericles reduced with a fleet of two hundred ships and the expenditure of a thousand talents.

In this case, the aligned words are as follows:[56] μετὰ - after, δὲ - /, ταύτας τὰς - these, πράξεις - exploits, ἐπὶ - against, Σάμον - Samos, στρατεύσας - he led an expedition, ἦν - which, Περικλῆς - Pericles, ἀπὸ - with, διακοσίων - two hundred, νεῶν - ships, καὶ - and, χιλίων - a thousand, ταλάντων - talents, κατεπολέμησε - reduced. This time, it was not been possible to align all of the words, so the Greek δέ has no equivalent and on the English side 'a fleet of' and 'the expenditure of' can not find any partners as well. In the translation, the numerals have been split into two words each. Aligned to the participle is the phrase „he led an expedition". Still, prepositions could be aligned to prepositions, nouns to nouns and conjunctions to conjunctions. As in the German example, ταύτας τὰς is to be aligned to a single word that contains both the demonstrative function and the function of the article. A word-by-word alignment could not be achieved in any of these examples.

3.2 Visualizing the sources on the Revolt of Samos

After producing morphosyntactic analyses and translation alignments of the sources on the revolt of Samos, the last part of the project has been devoted to the creation of a HTML-page for the visualization of the alignments of the sources (alignments between ancient languages and bilingual alignments), combining these results with treebank data.

The aim of the HTML-page is to provide a rather slim HTML-body with processing and design taking place in outsourced files. We have done that for two reasons. First, the page should be loaded very quickly and without causing too much traffic, which is achieved by sourcing out the processing files. Second, sourcing out those files enables easy recycling of the functions and designs in other files, and it also provides an easy way to apply changes to all files using

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54   Translated by Marcel Mernitz.

55   The text has been taken from http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0144%3As-peech%3D15%3Asection%3D111, last visited on 21.05.2015 at 13:41.

56   This is the link for the text-alignment:
      http://sosol.perseids.org/alpheios/app/align-editsentence-perseids.xhtml?s=1&numSentences=1&doc=12875.

these functions and designs. All design information is contained in one stylesheet that is encoded within the header section as well as the used jQuery scripts that grant the interaction. Each script has been programmed to start operating once the page has been completely loaded. This has been achieved by writing the script code as a function of this command between the curly brackets:

$(document).ready(function() {});[57]

After a short introduction, the HTML document contains several <h2>-elements, one for each chapter including the preface and the table of contents. After each of those elements, there are <div>-elements that contain the subchapters of the chapter as <h3>-elements.[58] These subchapters are divided into bilingual and ancient alignments inside one <div>-element that has two <h4>-elements, one for the bilingual alignments and one for the ancient ones. After a short <p>-element that contains the introduction and interactive buttons, the content of the subchapter can be found inside a <div>-element. This content is presented in various tables, one for each source mentioned by Hill without the inscriptions that are introduced by a <p>-element right before each table[59]. There are also some tables to display the results for the Greek-German alignments. The reason for this nesting is that the user should be allowed to hide content that is not of interest to her or him. When the page is loaded, all chapters, subchapters and tables are hidden. The <div>-elements contain 'id'-attributes as well as the <h2>-elements and all the tables, whereas the <h3>-, <h4>- and the <p>-elements which appear before each table contain 'class'-attributes. Those attributes are used to hide or show their content using jQuery scripts. In most scripts, whenever an id or a class is used, they are stored in a variable which is referenced to further steps of the scripts. Both the name of the variable and the name of the id or class are arbitrary, yet they need to be consistent for the script to work.
To illustrate that the buttons are interactive, the cursor changes its appearance when the user hovers the mouse over it. This is achieved by a jQuery file by the command:

$('#chap3 .rosmore .rosamore').css('cursor', 'pointer');[60]
before the lines that have been written for the remaining processing.

Most of the words within the tables have been marked up by enclosing them with <span>-tags. These tags contain the attributes 'class' and 'title'. According to their class, the words would get a new color when the user clicks on one of the three buttons.
It does not matter, if the user first chooses a passage and then changes the appearance of the aligned words by clicking on one of the pencil-buttons or vice versa. These words are colored according to their color in Arethusa. Changing the colors can be achieved by adding or removing a class to the marked up words. The user may mark up all the words or only nouns or verbs. Since it is possible to click the buttons before selecting a passage, a note is written in the console to check if the buttons are operational. That note will not be noticed by most users.

When clicking on a passage from the list, the passage is presented twice, once in Ancient Greek or Latin and once in English or German. Above the text, an abbreviation may be found to

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57   The programming code is written to be as easy to read as possible by humans.

58   By the time of the writing of this article, the only content available is in chapter 3.

59   Instead of tables <div>-blocks could have been used as well and would have operated in a similar way.

60   There is a similar line for the pen-buttons in another script. The first bracket contains one id and 2 classes, using '#' for the id and '.' for the classes.

specify the language in the column's headline.[61] Instead of the passage's name, the list provides the text 'undo selection'. Once you click on this button, the passage is hidden again and the name of the passage is displayed again in the list. How does this work? Each of the tables is cached in a variable according to its own unique identification string, similar to the <div>-elements earlier. From then on, the tables are only referenced by this variable. This table is then immediately hidden using the hide()-function. The selector of each passage is marked up in the HTML file as a link and thus written inside an <a>-tag, that has its own class. This class bears no further information, yet it allows the jQuery file to work with each tag in a different way. Depending on the link and thus on the referring class, another passage is shown. If the class is being hidden, it is slowly faded in, if it is displayed it slowly fades out by the command 'fadeToggle('slow')'. The name of the passage in the list is cached in the variable $link. Then an if-else-loop checks the content of the link and changes the text either to 'undo selection', if the passage was hidden, or back to the name of the passage, if the passage was shown. To prevent reloading the page and thus jumping to its top and causing traffic, the standard function of the link was disabled with this command:

```
return false;
```
It is possible to select several passages.

Clicking on the button to mark up the words, every passage is marked up. Sometimes several words of the same part of speech are standing next to each other. Because of that, it is not always clear on the first sight which word of the translation is aligned to which word in the original passage. For that reason, another jQuery file has been written and implemented into the head section that adds the class, that is called 'highlight', to the aligned words. This class adds a new background color to the words when the user hovers the cursor over it. It has been necessary to add a title to the span that surrounds each aligned word for this jQuery file to work. Hovering above a span will first cache the spans 'title'-attribute. Afterwards if-loops check this value and add the class to the respective <span>-tags. It does not matter which side of the table is hovered over, because the programme is functional on both sides. In this way, all other spans with the same title would be highlighted. Some words in the translation have been titled the same, so all of them would be highlighted when hovered over. The problem with this code is, that words in other passages would be highlighted as well, which would only cause confusion. Thus, it should not be aimed at. For this cause, another variable had to be added. The programme runs through the document object model and looks for the ancestors of the span, that are called 'table' according to this code:

```
var $elementTable = $(this).parents('table');
```

The next step has been to check if this code works, and so we have written an if-loop that should write the 'id' of the table-tag and the 'title' of the span-tag into the console. Then, in the console two lines containing the values of the 'title' of the span and the unique identification string of the table are shown. Since this id is unique, no span from another table will be highlighted, once the user hovers above a span with the same title. The following lines of source code are responsible for the programme to do what it is supposed to do. Depending from the 'title'-attribute, all spans with the same 'title' are searched within the table and then they receive the class 'highlight' as long as the cursor hovers over the word. As mentioned above, the semantic layer could not be applied to articles, and thus, sometimes nouns have been aligned

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61   In an earlier version of this page, the passage and its translation had been loaded into the HTML document into two <div>-blocks. Unfortunately, only one passage can be selected at a time, and once another passage has been chosen, the former selection is undone.

to several words. After this has been done, the remaining layout of the page has been adapted according to the other pages of the fragmentary texts.[62]

For all the sources mentioned by Hill, EpiDoc files have been created. After the XML-declaration, a processing instruction that introduces a schema and the embracing <TEI>-tag which contains the namespace as its attribute, all files contain a TEI header that provides information about the title of the project and its contributor in the title statement, about the license, the publisher and the filename in the publication statement, about Hill's work and the edition he used in the two <bibl>-tags of the source description and finally some information about the file itself in the encoding description. If possible, CTS-links have been added as attributes to <author>- and <title>-tags of the second <bibl>-tag. The header follows the TEI guidelines.[63] After this header, the text of the source has been written in a simple XML file. Whenever Hill leaves out text, this text has been written in the file, but marked as a comment with a specific tag. If the XML file already existed, it has been copied without any changes to its tagset. The optional <profileDesc>-, <xenoData>- and <recisionDesc>-elements have been left out.

During the creation of the files for the inscriptions, we dealt with issues concerning Greek lowercase letters that are used in modern editions instead of uppercase ones that appear in the original epigraphic sources. Moreover, editions used aspiration and stress marks that don't occur in the original inscriptions, except for the rough breathing which is displayed either as H or later as Ⱶ.[64] The inscriptions mentioned here belong to the type of inscription that is called στοιχηδόν. A special feature of these inscriptions is that letters are written in vertical and horizontal lines next to or above each other. There are no spaces between single words, and the stonecutters did not care for union of words or syllables, thus it may occur that words are continued in the following line. In this case, the separation of words is not always a simple task, especially if the inscription is mutilated.[65]

In modern editions, inscriptions are conventionally transcribed in lowercase letters with accents, which is a problem for our EpiDoc files. An example for that may be the word οἷς, that is written in the inscription as HOIΣ, in Hill as ʽοῖς, and 'usually' as οἷς. This problem was solved in the EpiDoc files using a <choice>-tag. We used lowercase letters for inscriptions following the method of Hill. Such a tag looks as follows:

```
<choice>
        <orig>&#x0371;οις</orig>[66]
        <reg source="#hill">ʽοῖς</reg>
        <reg resp="#berti">οἷς</reg>[67]
</choice>.[68]
```

Yet these tags have only been used for articles and for words containing aspiration marks or accents, for which no ASCII code is available, as for example, an omicron or an epsilon with a circumflex accent. Aspiration marks were applied to words that start with a rho, as well, as

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they demand a rough breathing, which were omitted by Hill always. Yet, these changes have only been applied on words, where those characteristics occur.

Most of the inscriptions are quota-lists. They contain the fees and tributes of the members of the Delian League in amounts of drachmas and obols. Due to those lists, it is obvious that there are difficulties to display those combined amounts. One of the problems is that the symbol that acts as the unit for 'drachma' also contains the worth of one drachma amidst the amount. An amount of 36 drachmas and four obols is displayed in the inscription as ΔΔΔΓⱵIIII. At first, it has been considered if it is useful to treat the amounts separately, thus at first, the amount of drachmas would be gathered in an own <num>-tag, and then, the amount of obols would be gathered in an own <num>-tag as well. The result of this version for the given example would be as follows:

> <num value="36">ΔΔΔΓ<g type="drachma">Ⱶ</g></num>
> <num value="4">IIII</num>.

Another concern has been to display the amount as a value. As result for the example the following would be expected:

> <measure type="currency" unit="drachma" value="36.67">.

Yet, none of the versions is very satisfying. Thus a combination of both versions has been applied, as the value should not be treated separately and the symbol that indicates the unit should be marked. The solution for the example above looks as follows:

> <measure type="currency" unit="drachma" value="36.67">ΔΔΔΓ
> <g type="drachma">Ⱶ</g>IIII</measure>.

In two instances, the numbers used by Hill could not be confirmed. These instances are CIA I 177, line 19 and CIA I 240 (IG I³ 272, IG I³ 279), column two, line 27. The line in the first instance (CIA I 177) is missing and, when it was double checked in the IG (= IG I³ 363) and in the edition of Meiggs and Lewis (= ML 55), it was noticed that the editors used different symbols that indicate the unit of talents. Those symbols were included as a comment in the EpiDoc file. No ASCII code could be confirmed for the symbol in the second instance.[69] The symbol resembles the Greek acrophonic Hermionian fifty: Ͷ.[70]
Treebank files were created according to the passages quoted by Hill, even though he sometimes leaves out text passages or even entire sentences. Also, no treebank files have been created for inscriptions and quota-lists. The fragment of Duris has insofar an exceptional position, as it provides the text of Harpocration, which has been treated separately, and thus, no treebank file for Duris has been created. Furthermore, no EpiDoc files have been created for the passages of Thucydides, since files for these were already existing.[71]

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[69] The symbol was changed to Ͷ in the EpiDoc file, which represents 50. I preferred that symbol to H, which represents 100, due to the context. Whenever this symbol occurs in combination with H it always follows H and stands before Δ. My interpretation is also supported by the similarity of the symbol of the acrophonic Hermionian fifty mentioned below. The amount of the tax in this instance would thus be 283 drachmas and four obols, a number that is confirmed by Larfeld (1898), 29.

[70] The difference between the two symbols is that the symbol found in Hill and the CIA as well has a closing line on its top. The unicode number for the acrophonic Hermionian fifty is 10168.

[71] For the complete list of EpiDoc files see https://github.com/DigitalHill/EpiDoc-files.

4. Conclusion

Producing morphosyntactic annotations and translation alignments of literary sources is a good exercise for achieving different results, such as detecting recurring syntactic features and textual reuses in ancient sources, exploring and highlighting the vocabulary concerning a specific historical event (in this case the revolt of Samos), and providing users with different translations of the same terms and expressions in ancient sources and in modern editions. In this case, the alignment of inscriptions is less useful – unless one wants to show similar inscription patterns – and, for that reason, no alignments of inscriptions were produced.[72]

As mentioned before, in many cases print and editorial reasons obliged Hill to shorten the text of the sources he quotes. We adopted a different criterion, given that we worked in a digital environment and we decided to reproduce the complete text of the sources with links to the whole works.

The Digital Hill is an ongoing project and the aim is to extend the work to other chapters of the book and to add more digital resources addressing computational and textual issues. The final goal is to provide users with a sort of companion to the book with external digital resources and visualization tools for many different possible linguistic, historical, and computational outputs.

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72   The EAGLE project provides an interesting approach on aligning inscriptions. See http://www.eagle-network.eu/ for further information about the project.

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