CHAPTER SIX

## *Use of the CATSS database with the* Accordance *program*

### 1. *Background*

The CATSS database, as well as the MT and LXX 'text panes,' can be accessed with the aid of the Macintosh *Accordance* program,[1] as of 1998 without col. b of the Hebrew, and without the linkage with the CATSS files of morphological analysis of the Greek and Hebrew words. Nevertheless, the internal morphological analysis of *Accordance* allows the user access to many of the data which otherwise would have been obtained by a linkage between the main file of parallel data and the morphological analyses of the CATSS database. Complete listings of individual Greek and Hebrew words can now be provided with the aid of the internal *Accordance* predetermined lemmas (morphologically and lexically tagged) and can be displayed accordingly with or without the context of the verse. In this way all the individual words of the Hebrew and Greek Bible can be concorded with their equivalents in the other language. Furthermore, the grammatical analysis and the search possibilities of *Accordance* allow bilingual grammatical searches.

At the word level alone, the new type of concordingretrieves much more information than HR, as that tool does not include all the Hebrew and Greek words. Thus, the user now has access to all the equivalents of such Greek particles as dev and ajllav and of all the Greek pronouns,and in these cases the Hebrew parallel data are available as well. The *Accordance* program further avoids the various pitfalls of HR's recording system (cf. *TCU*, 90–99), and it can execute searches of parts of Hebrew or Greek words, such as Hebrew prefixes and suffixes and Greek preverbs.[2] Beyond HR, *Accordance* enables searches of combinations of words and of grammatical categories (see below). In the MT and LXX 'text panes' of *Accordance* (but not in the MT/LXX file) searches can be executed on any text unit in the LXX or the Hebrew Bible (all of the LXX, one or more biblical books, or any combination of verses). Searches can also be conducted on the comments in CATSS in the Greek and

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[1] Thanks are expressed to Roy Brown, the programmer of *Accordance,* and to F. Polak for improving my description of this tool.

[2] Words prefixed by -ב are searched for in the MT/LXX tool with the use of a 'wild card' according to the sequence of the Hebrew as: ? <within 2 words> ב.

Hebrew text relating to translation technique, the relation to the Qumran scrolls, and underlying Hebrew variants.

*Accordance* furthermore provides the user with brief standard equivalents (not always reliable) in English of all the words in the Hebrew and Greek texts. This information is provided in the text files by placing the pointer on the text word. The lexical box at the bottom of the screen provides the Hebrew or Greek text word together with the lemma word and its brief morphological analysis (thus by clicking on rmayw in MT, the lexical box provides the different English equivalents of rma as well as their morphological analysis). More extensive lexical information can be culled from entries in LSJ and the LXX lexicon of Lust-Eynikel-Hauspie[3] for the Greek words and in BDB for the Hebrew words. This information is provided by first selecting the word in MT, and by subsequently selecting a lexical source (BDB, LSJ, or the LXX lexicon) in the Amplify Palette, usually on the right side. The program usually makes the correct connection between the text word in the running text of MT and the entries in BDB. Thus if תוצא in ותוצא is selected, the relevant entry of יצא in BDB is displayed. This search can also be applied to the MT/LXX text, but as the Hebrew in that text is not connected with an underlying morphological analysis, often the wrong entry from BDB is displayed.

In *Accordance*, lexical searches can be executed on the Greek (LXX1) or Hebrew (HMT) text panes separately or on the MT/LXX tool (= CATSS). The principles guiding these searches in the text files are:

a. Words can be selected from the text and placed in the search box.

b. Words can be defined in the search box.

c. Words can be called up from the list of predetermined words, in the Options box in the main menu, under Enter Lexical Forms (e.g. הרג) or Inflected Forms (e.g., הרגתי).

d. Complex searches can be performed in the Construct window.

The principles for these searches are more or less identical when searching in MT, LXX, or the combined MT/LXX tool, but in the latter text (treated by *Accordance* as a tool, rather than a text) the options are more limited as it is not linked with the list of predetermined lemmas.

The following files may be opened:

a. the MT/LXX tool (the parallel alignment of CATSS without col. b) by selecting the appropriate item from the New Window Palette, usually on the upper right side. Alternatively this text can also be opened by clicking on the 'Open...' item in the Edit menu.

b. MT (HMT), reflecting codex L.

c. the LXX (LXX1), reflecting the edition of Rahlfs.

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[3] J. Lust, E. Eynikel, and K. Hauspie, *A Greek-English Lexicon of the Septuagint*, I-II (Stuttgart 1992, 1996).

d. any combination of these text panes, or a combination with one of the English translations, SP, or the Vulgate. Within *Accordance* all these texts are linked, so that they can be scrolled down together, always showing the same verse in Hebrew/Greek, Hebrew/English, MT/SP, etc. as the first item on the screen. Also dissimilar texts can be linked with the 'Tie To' command. Any second text can be added to the first one by selecting the appropriate file in the menu File, New Text Pane (e.g., HMT + SP or HMT + MT/LXX) or by selecting them separately. Subsequently the 'Tie To' command in the Windows menu should be invoked in order to link these dissimilar files.

The texts are presented as complete verses, and not as individual words as in the CATSS database. The combination of the MT (HMT) and LXX (LXX1) text panes is very significant in the perusal of *Accordance*, as the separate Hebrew and Greek files allow for more search possibilities than the MT/LXX tool.

Beyond the general equivalents of verses in the MT and LXX text panes, *Accordance* also provides equivalents at the level of individual words (lines in the CATSS database), by using the MT/LXX tool. The sophistication of *Accordance* allows the user many possibilities short of a full morphological analysis, so that the lack of the CATSS morphological analysis of Greek and Hebrew is felt less. Furthermore, by using the 'Tie To' command, the HMT and MT/LXX text panes can be combined, so that the morphological analysis of the HMT text pane can be used in order to show the complete MT/LXX contexts in the parallel window. The same possibility also exists in the reverse direction: single equivalents can be called up in the MT/LXX tool, while the full context can be viewed in the parallel window in the text pane of either the HMT or LXX.

2. *Principles of search in the lemmatized Hebrew and Greek texts*

i. *Word searches*

The principles of searching words or forms in the two types of text files differ, because the text panes of MT (HMT in *Accordance*) and LXX (LXX1) use predetermined lemmas (morphologically and lexically tagged), while the MT/LXX tool is not lemmatized, and hence its search options are limited.

Searches in the HMT and LXX1 text panes are executed by opening these texts and by filling in the word in the search box as described above (the Search mode itself is activated by first clicking on Mode). In this search Hebrew vocalization and Greek accents are disregarded, so that the results refer to the Hebrew consonants or Greek letters only. A simple search thus often produces more items than asked for. This limitation pertains to nouns, adjectives, and particles, and to a lesser degree to verbs. However, by combining data from different sets of

information within *Accordance*, specific searches can nevertheless usually be performed, with the exception of the search for some homographs (Hebrew words belonging to the same grammatical category, such as דָּבֵר and דָּבָר). Thus a search[4] for the three consonantsrbd can be accompanied by the definition Noun in the Tags menu(in this case referring to both דָּבֵר and דָּבָר, but in most other cases referring only to a single noun[5]) or Verb. In the case of Greek homographs, en can be defined as either Preposition (producing a list of occurrences of ἐν) or Adjective (producing a list of occurrences of ἑν). This amplified description is obtained by combining the regular search with the possibilities provided by the Tags menu. In this way tailor-made searches can be conducted for specific verbs or nouns.Thus present tense forms of levgw can be searched for as λέγω@[VERB present]. The optimum for this search is obtained by opening both the HMT and LXX1 text panes (with the aid of the New Text Pane menu). This procedure enables the scrolling down together of the two text panes. The combination of these two text panes is needed, as the MT/LXX tool cannot be used directly with the grammatical tags.

An example of a complex search of data which cannot be accessed with the extant printed research tools is the search for any combination of two or more words such as **על פי** (**על פה**).[6]

The following issues should be considered as well:

1. Searches for the Greek base forms, such as κύριος for the noun or e[rcomai for the verb automatically list all inflected forms as well, thus including kurivou, etc. for κύριος and such forms as ἐλεύσῃ and ἤλθοσαν for ἔρχομαι.

2. Searches can be conducted on any combination of Hebrew and Greek characters, including 'wild cards,' as explained in the *Accordance* manual. Wild cards for *single* characters are indicated by '?'. Thus in the LXX text pane a search for ot? will produce listings for both ὅτι and ὅτε. Likewise, a wild card in the middle of word refers to any single letter. Thus **ב?ר** will list any Hebrew word starting with a *beth* and ending with a *resh*, with a single letter in the middle. The slash separating between morphemes in the database itself (e.g., ה/ל) is disregarded in this search.[7]

3. The wild card * refers to any number of letters. The search of *ercom* (with a star at both ends) provides all the inflected forms of

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[4] The search alphabet is based on the transcription alphabet of the CATSS database. Thus in Hebrew א = A, ב = B, ג = G, etc., and in Greek, α = A, β = B, γ = G, etc.

[5] In this search, Accordance provides the results for the following items under **דבר**, which cannot be distinguished: word, plague, pasture, Debir, Debar.

[6] This search yields the following results for the LXX: διὰ ῥήματος (3 x), διὰ προστάγματος (8 x), διὰ φωνῆς (10 x), ἐκ (1 x), ἐπί (6 x), ἐπὶ στόματος (4 x), ἐπὶ στόμα (1 x), ἐπὶ τῷ στόματι (2 x), καθάπερ (1 x), κατά (3 x), κατὰ τὰ εἰρημένα (1 x), κατὰ stovma (1 x), μετά (1 x).

[7] This implies, for example, that for this type of search **בריתוי** consists of four letters only when the search refers to ת[בר or [ברי.

that verb, including preverbs (ἐξέρχομαι, προσέρχομαι, etc.), and including inflected forms which have no consonants in common with ercom, such as ἀπελεύσῃ and διήλθωμεν.

4. In the Construct panel the same results can be obtained without the use of stars: When the Greek text is displayed, one should select in the File menu New Construct, Greek. LEX is placed in the bottom left window, together with ercomai from the list of lexical forms. The search is then started after the two windows are first linked with LINK in the Options menu under Enter Commands. In the same way all infinitives of this verb can be listed by listing 'infinitive' in the space under the Greek verb, or all non-infinitive forms by selecting the NON box for the infinitives. In a similar way all occurrences of הלך can be concorded in the Hebrew construct window, starting with the bottom right window. Or, all forms of the type [snb are concorded in the New Construct window as a combination of the LEX form ב and VERB, inf. constr., combined by the command WITHIN 1-1 words.

5. Combined searches can be extended to more than one item (commands: AND, NOT, FOLLOWED BY, PRECEDED BY, OR). Thus, use of the AND command (Options: Commands) allows the user to find all verses in which λέγω and κύριος occur together, or all verses in which forms of levgw are immediately FOLLOWED BY κύριος. The same pertains to more complex searches such as οὕτως <WITHIN 2 Words> λέγω <WITHIN 2 Words> κύριος.

6. *Secondary* searches on the results of initial searches can be executed with the aid of the CONTENTS command in the OPTIONS menu. In the last mentioned example in paragraph 4, many equivalents of the combination of b and the inf. constr. are provided, which can be tabulated further. If from this list the equivalent ὅτι is singled out, the following procedure needs to be followed after the initial results have been concorded: another search menu needs to be opened (FILE, NEW, SEARCH WINDOW). In this search window, write 'ὅτι <AND> [CONTENTS SEARCH],' both to be selected from the OPTIONS, COMMANDS.

ii. *Grammatical searches*

*Accordance* includes an analysis of all the Greek and Hebrew words defining each of these words grammatically (e.g., for דְּבָרֵי: noun, plural, masculine, construct). The program allows for a search of all the words belonging to a specific grammatical category. Thus the user can ask for all nouns, or more in detail, all plural nouns, or in still greater detail, all plural masculine nouns, or all plural masculine construct nouns (such as דִּבְרֵי), etc. These searches can be executed with or without the equivalents in the other language. After the Hebrew or Greek text is chosen, the search can be performed on any of the

grammatical categories listed in the Tags menu. At a second stage the parallel Hebrew or Greek text can be linked to the results of this search, so that all the bilingual contexts are presented.

The Hebrew tagging allows, i.a., for a specialized search of forms with a directional *he*, paragogic *he* (both under 'suffix' in the Tags menu), infinitive absolute forms of the Hebrew verb, construct nouns, dual forms of nouns, relative and interrogative pronouns, suffixes, conjugations of the Hebrew verb, etc. Tagging of the Greek allows for similar searches, such as a specific tense or aspect of the Greek verb. Thus, the frequency of the aorist optative can be researched in this way.

Special searches can be executed by combining specific Greek or Hebrew words with grammatical categories. In the Construct window these searches can be combined with various commands such as NOT (under the word searched, not next to it), WITHIN, INTER, AGREE (all in the central box). In this way one can list, for example, proseuvcomai FOLLOWED BY 'Noun' in order to examine the *rectio* of that verb. The subjunctive forms of the verb not preceded by ouj or mhv can be listed in this way (Accordance User's Guide, 9.8).[8] The construction ἐν + infinitive (actually = ἐν + τῷ + inf.) can also be concorded in this way, with or without elements intervening between ἐν and τῷ (*Accordance* User's Guide, 9.9). The latter search is executed by writing ἐν in the left box, followed by 'VERB, infinitive' in the adjacent box and below WITHIN (1-2 words) in the central box. In another instance, examples of qeov" without an article within five words before the noun are listed (Accordance User's Guide, 9.14).[9] By the same token all entries of rma or rbd which are NOT verbs can be concorded.

### 3. *Principles of search for the unlemmatized MT/LXX tool*

Words in the unlemmatized MT/LXX tool (= CATSS) cannot be accessed with the same sophistication as the separate LXX and MT text panes. However, some simple searches can be executed by searching for strings of letters in either language.

These searches are executed in the MT/LXX tool by locating equivalents either in the context of a complete verse or as individual lines of the CATSS database. For this purpose, in the MT/LXX tool, the box Entry is opened and either 'Hebrew' or 'Greek' is selected in this box. Subsequently a Hebrew or Greek word or combination of letters in the text is selected and copied in the search box. Alternatively any combination of letters can be written in the search box. Subsequently, the results are displayed in lists of individual equivalents in the

[8] Central box WITHIN, left bottom box οὐ, μή, crossed out by NOT, and adjacent box: VERB, subjunctive.

[9] Central box WITHIN, left bottom box 'art.' crossed out by NOT, and adjacent box θεός.

MT/LXX tool or of lists of such equivalents within their context of the complete verse. For the first line on each screen the text reference is provided in the reference box. The results of the search for על includes such forms as י/על, יך/על, but not בעל or נעל, so that the results form a reasonable basis for research, although inferior to the results obtained in the separate LXX or MT text panes. On the other hand, the results include the parallel elements in the other language.

In the Hebrew text in the MT/LXX tool, the different morphemes are separated by a slash. These slashes are treated as word separators, so that a search for יברא/ו should be phrased as

יברא <WITHIN 2 WORDS> ו.

In the MT/LXX tool, the results are listed for the database as a whole, and cannot be subdivided into individual books of the Bible.

i. *Special searches and notations*

Special searches include an analysis of all paragraph divisions in the MT text (p or s) which can be searched in the HMT text pane.
In the CATSS database, special notations refer to select categories in translation technique and other data. Searches of these notations can be made on all the special notations in the Hebrew and Greek columnsof the CATSS database, relating to the translation character of the LXX and its relation to the Qumran scrolls, as well as textual variations. These searches can be executed in the MT/LXX tool, in the 'Entry' box under Comments. A search for '?' lists all these commentsaccording to the sequence of the text. Specific details which can be searched for include:

| | |
|---|---|
| c = {c} | conjectures in the Greek text |
| d = {d} | doublets |
| d = {..d} | distributive use in the translation |
| p = {p}, {..p} | difference between MT and LXX in particle/ preposition |
| r = {..r} | element repeated in the translation |
| s = {s} | superlative |
| t = {t} | transcriptions |
| nd, ad ,nad, v, etc. | subdivisions in the renderings of inf. constr. denoted as {!}nd, etc. |
| sp = <sp> | agreement between the LXX and SP against MT |
| q = <q4b> | agreements with Qumran scrolls, in this case relating to 4QNum$^{b}$ |
| .yw | interchange between *yod* (MT) and *waw* (LXX), etc. |
| .m | metathesis |
| .y- | the LXX omits a *yod* |
| .j | the LXX joins two words |

At this stage the following important components of the CATSS base elements cannot be searched for: . { --- --+ !. The next release of *Accordance* will address these issues.

ii. *Special display*

The Amplify Palette in the top right corner of the text panes allows for special presentations of the search results:

1. The 'Plot' option provides a graphic chart displaying the results of the search data according to book and chapter. For example, this presentation enables the user to see graphically in which chapters in Genesis the *hiph'il* forms of the verb are found, and in which chapters and books in the Torah עדה occurs. The 'Table' option provides the actual numbers of occurrences in each of the biblical books.

2. The 'Analysis' box, to be used in conjunction with the 'Analysis display' in the Options menu, lists the individual searches alphabetically, a feature which is of help in grammatical analyses.

3. Under 'Parsing' the morphological information for each of the words is provided.

4. The box 'Old Testament' provides parallels from the books of the Hebrew Bible, if extant.

5. The box 'Speech' activates the speech representation of any element on the screen, in English, Greek, or Hebrew, including the recitation of the complete Bible text, or the parallel alignment of CATSS.