Computer Views

UniVerse for *Windows*: Unicode Word Processing

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Like the Macintosh, a PC equipped with *Microsoft Windows* provides some excellent opportunities for multilingual word processing. Unfortunately, most *Windows* word processors are designed to support only Western European languages and the occasional use of non-Roman, left-to-right languages. Very few packages are capable, for example, of gracefully mingling English, Chinese and Sanskrit in a scholarly article on Buddhism. Enter Gamma Production's *UniVerse*—the complete multilingual word-processing system for *Microsoft Windows* 3.1.

UniVerse is not just another word processor with a few multilingual capabilities thrown in. Rather, it is one of the first applications to adopt the Unicode standard, a two-byte (sixteen bit) scheme, capable of encoding 65,536 characters.[1] By implementing this standard, *UniVerse* facilitates true, multilingual word process-

1. ASCII (American Standard Code for Information Interchange) is a standard system for assigning binary values (sequences of 0's and 1's) to *Roman* characters. In ASCII, each byte (eight bits) represents one letter (e.g., 01000001 = A). As an eight bit code, ASCII can handle 256 characters. This is enough to encode the Latin alphabet, numbers, punctuation and such things as tabs and carriage returns. However, this is not enough to encode a language like Japanese, with its 1,945 "common use" *kanji*, or Chinese, where 5-10,000 characters are needed by most users. Most multilingual programs for *Windows* (and Macintosh) computers work around the limitations of ASCII by mapping multiple fonts to the same set of numerical values. Developed by a number of leading companies including Microsoft, Apple, Lotus and IBM, Unicode provides a more comprehensive solution. It can assign a distinct numerical value to 65,536 different characters. This means that texts written in Unicode can be as easily transferred across platforms or sent via modem as ASCII texts.

ARC, The Journal of the Faculty of Religious Studies, McGill, 22, 1994, 103–134

ing (not just font substitution) in nearly 60 languages. With *UniVerse*, there is no need to have a separate Japanese *Windows*, Hebrew *Windows*, and if one could get it, Tibetan *Windows*. All of these languages can be entered (almost) as easily as English text.

UniVerse (here seen with *TwinBridge* installed) easily processes multiple languages.

Getting Started

Because it adopts a typical *Windows* interface, with pull-down menus and a tool bar, getting started is easy. In addition to the horizontal ruler, a vertical ruler is available for use with vertically-written languages such as Mongolian, Chinese or Japanese. The tool bar provides instant access to a number of formatting commands. For example, one can capture a text format like "bold, italic, classical Greek" and apply it elsewhere in a document. This is a particularly useful, quick-formatting feature.

The rather brief printed manual, written in a light-hearted style, will prove important even to veteran computer users. For example, although *UniVerse* excels at handling language direction, mastering this capability will not come easily without some instructions. The printed documentation is made even more important because Gamma provides installation support only. A larger manual with a more comprehensive index would be a welcome addition to future versions.

The installation process allows one to select required languages and an accompanying keyboard-entry scheme. With Russian, I had a choice of several indigenous keyboards and a phonetic keyboard. When I added French, I was prompted for my choice of the French or the Swiss-French keyboard. (The Swiss-French keyboard is much closer to our standard QWERTY keyboard.) It is also

possible to configure languages using the Latin alphabet to utilize the standard English keyboard.

The base package for *UniVerse* ships with high-quality, TrueType fonts in a wide variety of languages. These include: Arabic (Pashto, Persian, and Urdu), Hebrew, Greek, Cyrillic (Bulgarian, Byelorussian, Macedonian, Russian, Serbian and Ukranian), Western European languages (Danish, Dutch, English, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish and Swedish) and Eastern European languages (Albanian, Croatian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovak, Slovenian and Turkish). Additional font-sets are available from Gamma at $99.95US each. Registered users can choose a free, additional font from one of the following language families: Indian (Bengali, Gujarati, Hindi, Kannada, Marathi, Malayalam, Nepali, Punjabi, Sanskrit, Sinhalese, Telugu, and Tibetan), South East Asian (Burmese, Lao, Thai and Vietnamese), Armenian, Ethiopian, Georgian, IPA or Mongolian. Some of the Indian fonts are not yet available.

UniVerse supports Japanese and Chinese through the optional *TwinBridge* package. This third-party front-end processor enables text written in these languages to be entered in most *Windows* applications. Eventually, Gamma plans to introduce its own Unicode-compliant version of Chinese, Japanese and Korean.

Special Features

An important feature needed by some languages is contextual recognition of final and initial letters. For example, Hebrew, Arabic, and Greek have letters (such as the Greek sigma) which require distinct final forms. When entering text, *UniVerse* automatically chooses the correct form. This feature can be overriden should the need arise.

Some languages place diacritical marks or vowels in different positions relative to the base line, depending on the letter to which they are attached. In Hebrew, the *nikudot* (vowels) appear below the line with some letters and above the line with others. *UniVerse* is smart enough to handle the correct placement of these vowels.

If a language uses ligatures (letters composed of two other letters, such as "æ," the user inputs the two letters, in this case "a" and "e" and the ligature is created on the fly. This feature can be overridden, if desired. In order to ensure compatibility with other files, Unicode stores the ligature as the separate characters which compose it.

Some languages, like Arabic and those whose alphabets derive from the Devanagari script (for example, Hindi and Sanskrit), require the lengthening of connecting lines when justifying type. This is known as *kashideh*, an Arabic typesetting term. *UniVerse* supports *kashideh*, for any language requiring it, in a way that is completely transparent to the user.

Text can be searched in any language in which it has been entered. Text can also be displayed in different colours and printed in different colours (if your printer supports colour printing).

There is an alternate input system for the WingDing (symbol) font. If *UniVerse* is set to input WingDings as words, the YingYang symbol, for example, can

be entered simply by typing "yingyang" and pressing a function key. This is much easier than remembering that the right bracket key will enter this symbol, or consulting the *Windows* character map and entering a four-key sequence. This input system is included both as a convenience for typing WingDing characters and as a demonstration of how one might set up an input system for other non-alphabetic fonts.

One of the main strengths of *UniVerse* is its capacity to display left-to-right languages and right-to-left languages in one document. *UniVerse* keeps track of which direction it is writing in and offers the user a number of justification options. For example, mixing Arabic and English on one line can be accomplished without a fuss. You can also choose an option which enables you to display Chinese, Japanese or Mongolian vertically. You cannot, however, mix vertical and horizontal display in one document. To overcome this, vertically written text can be copied to the clipboard, placed inside a frame or table in another word processor, and displayed with the horizontally written text next to it.

With the appropriate spell checkers installed, *UniVerse* checks multiple languages in a single document simultaneously. It recognizes the language of every word and consults the appropriate dictionary. In order to make full use of this feature, however, it is necessary to enter languages in their native mode. (Do not, for example, enter French text while in English mode. This will cause *UniVerse* to interpret the French text as badly spelled English text.) The base package comes with an English spell-checking program. (The "Canada Package" contains English (UK) and French spell checkers.) Additional spell-checking dictionaries are available for $99.00US each. Fourteen languages are currently available.

A keyboard map can be displayed for any installed alphabetic language. The keyboard can be moved to different parts of the screen. I would find this feature more useful if the maps could be resized.

Importing and Exporting

UniVerse allows the user to import files created in ASCII format. Texts created in Hebrew *Windows* or Arabic *Windows* can also be imported seamlessly. Texts created in most Hebrew or Arabic DOS-based word processors cannot be imported (with the exception of *Multi-Lingual Scholar*, Gamma's own DOS-based word processor). Chinese text files which use either GB, the mainland encoding standard, or Big5, the encoding system used in Taiwan, can be easily imported into *UniVerse* (with *TwinBridge* installed).

Text can be saved or exported as *UniVerse* documents (.uv), bitmap images at screen or printer resolution (.bmp files), Unicode documents (.uni) or as documents which use the code page for one language only (.txt files).

UniVerse documents can be printed on any printer supported by *Windows* including PostScript typesetters.

Problems

Although many features found in *UniVerse* are not found in other word processing packages, there is a great deal of room for improvement in future releases. I was

disappointed by its inability to display text in columns. After all, this feature is highly desirable for creating bilingual texts. To get columns, one can copy text to another *Windows* word processor, but this is unnecessarily awkward. Furthermore, right-to-left text with vowels will not appear correctly unless the text is imported as a graphic.

While one may not expect *UniVerse* to have mail merge capabilities, it should strive to incorporate more of the features we have come to expect from the current generation of *Windows* word processors. For example, I would like to see a rudimentary drawing program, and options that give *UniVerse* a greater ability to work with graphic files. While it can export files using the .bmp format, only *UniVerse*, Unicode and ASCII text files can be imported. This means, for example, that language teachers cannot include supporting images and scholars cannot include a bitmapped file showing an original text (unless text is exported to another program such as a desktop publisher). Finally, support for automatic paragraph formatting, document templates and toolbar customization should be added.

As one might expect from an initial version, *UniVerse* runs more slowly than most popular *Windows* word processors. While I recognize that *UniVerse* is a significant technical achievement, the current version's sluggish performance is noticeable. While working with a long document in Chinese, I found myself spending a lot of time watching the screen redraw. To run *UniVerse* at an acceptable pace, I would recommend a fast 486-based system. (Those with slower, 386 systems should not shy away because Gamma Productions is hard at work on a speedier version.)

General Conclusions

The ease with which *UniVerse* handles multilingual documents leads one to consider all sorts of projects. Now there is no need to ignore the task of reconstructing Youtaihwa (the language that must have been spoken by the Jews of Kaifeng during the sixteenth century) or creating an Aramaic-Chinese glossary to accompany early Nestorian documents. What about a Burmese primer for Ukrainians or a Dutch-Mongolian document comparing dairy production techniques? Although the research on these tasks may be daunting, *UniVerse* can make the *multilingual* word processing easy.[1]

A Postscript

As this review went to press, Gamma announced *UniType*. This innovative and timely product promises to bring comprehensive Unicode support to *all standard*

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1. Product information is as follows:
Version Reviewed: 1.04; Price: $149.95US (base package). Call for combined *UniVerse/TwinBridge* packages; **Surface Address**: Gamma Productions, Inc., 710 Wilshire Blvd, Suite 609, Santa Monica, California, 90401, USA; **Phone**: (310) 394-8622; **Fax**: (310) 395-4214; **Internet Address**: 72567.1343@CompuServe.com; **System Requirements**: *Windows* 3.1. A "*Windows*-optimized," 486 system is highly recommended. **Notes**: For Chinese and Japanese support, the appropriate version of *TwinBridge* is required. A variety of optional TrueType font packages are also available.

Windows 3.1, NT or later applications (e.g., Microsoft Word, WordPerfect, Ami Pro, PageMaker, Harvard Graphics, Corel Draw, etc.). *UniType* provides support for 175 languages including, for example, Hieroglyphics, Sanskrit, Biblical Hebrew and Greek, Coptic, Arabic and Tibetan (original language and transliteration). In addition, it supports: multilingual spell checking in one pass; automatic contextual characters, ligatures and adjuncts; automatic diacritic and vowel positioning; easy language switching via Hot Keys; full virtual keyboard support; and optional foreign-language proofing tools and translation dictionaries. While we cannot comment on the success of this product's implementation (it was not available for this review), it seems that one will no longer have to give up their favourite word processor or desktop publisher to gain true multilingual (Unicode) support. This is a significant development.

PC Bible-Search Software for Scholarly Research

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Computers can greatly enhance the study of the biblical texts. With the right software one can quickly isolate words and phrases, compare translations, and perform thematic studies. Many programs instantly parse and define words in Greek and Hebrew.

Although PC Bible-search programs have been available for several years, a Graphical User Interface (GUI) such as *Microsoft Windows* can make these programs easier to use. A well-implemented GUI-based program may offer several advantages over command or menu-driven programs: (1) easier manipulation of search results; (2) tighter integration with word processors; (3) scalable Greek and Hebrew fonts that can be used by other programs; (4) parallel display of multiple versions; and (5) "point-and-select" searching, parsing and dictionary lookup.

Such programs, however, often have several weaknesses: (1) greater hardware requirements; (2) slower screen display; (3) less powerful searches, owing to the limitations of "point-and-select" searching; and (4) more restricted grammatical search capabilities.

This review compares three packages that run on DOS/*Windows* computers: *Bible Windows* 2.2.2 and *Bible Works for Windows* 2.2D which run under *Microsoft Windows*, and *TheWord Advanced Study System* 3.05, which uses a proprietary, DOS-based GUI. These programs include original-language biblical texts and search tools that are suitable for sophisticated scholarly research.[1]

Factors Affecting Search Results

Computer-based search programs often present themselves as neutral tools offering objective results. Even the same search can sometimes produce conflicting

1. Product information is as follows:
Product: *Bible Windows* 2.2.2; **Address**: Silver Mountain Software, 1029 Tanglewood, Cedar Hill, TX 75104-30019, USA; **Phone/Fax**: (214) 293-2920; **Internet**: john@ling.uta.edu; **Product**: *BibleWorks for Windows* 2.2D; **Address**: Hermeneutika, P.O. Box 98563, Seattle, WA 98198 USA; **Phone/Fax**: (206) 824-3927;(206) 824-7160; **Product**: *The Word Advanced Study System* 3.05, **Address**: WordSoft, A Division of Word, Inc., 5221 N. O'Connor Blvd., Suite 1000, Irving, TX 75039 USA; **Phone/Fax**: (214) 556-1900; (214) 401-2344. Call or fax for price information.

results with different programs. There are several factors that affect the accuracy of searches.

Bible texts. Obviously the results will be different if one program searches the NIV and another searches the RSV. More subtly, in some programs (such as Logos[1]), grammatical searching is based on the *Textus Receptus* Greek text, even if the NA26 or UBS Greek text is displayed.

Search assumptions. In *BWin*, search order matters for Greek and Hebrew grammatical searches, but not for command line word searches in Greek, Hebrew or English. For *BWorks* and *TheWord*, word order does not matter.

Inadequacies of search tools. For example, when searching for Greek genitive absolutes, *BWorks* and *TheWord* produced many more false hits than *BWin*, owing to their inability to force grammatical agreement in the search criteria.

Sensitivity to Greek and Hebrew diacritical marks. TheWord requires that Greek accents be entered in search expressions, which can miss some desired verses, in which accents are affected by context. For example, a search for δέ...δέ in *TheWord* missed a verse where the word is accented δε. Most other programs do not require accents in the search criteria.

Inadequately structured search requests. To find Greek genitive absolutes, for example, one must look for a combination of a genitive noun and genitive participle (in the same gender and number) in two orders: noun first and participle first. To be thorough, one must *also* search for pronouns and adjectives functioning as nouns.

Grammatical classification (tagging) methods in the texts. The grammatical tagging system used for Greek and Hebrew texts is one of the most important factors affecting search results. A tagged text attaches parsing, lemmas (dictionary forms) and sometimes word definitions to each Greek and Hebrew word in the biblical text. This allows sophisticated stylistic and grammatical searches that would be impossible with the biblical text alone. One can search a tagged text for all occurrences of a particular grammatical construction, such as the future perfect periphrastic (future of εἰμί near the perfect participle of another verb) or the Qal Perfect of ברא. A tagged text also simplifies word studies, for one can search for the lemma of a word, rather than the different spellings of various tenses and cases.

There are subtle and often unstated assumptions behind the tags used by the developer. As any first-year student knows, the function of a Greek word is indicated largely by its spelling (its "morphology"). At times, however, the function of a word must be determined by its relation to the context. There is always a tension between purely morphological analysis (description of word forms) and a more functional analysis (determination of word function based on its interaction with other words in the sentence). The more a tagging system tends toward the functional end of the spectrum, the more subjective the classifications become.

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1. For a review of *Logos Bible Study Software*, see Harry Hahne, "High-Tech Bible Study: PC Bible Programs with a Graphical User Interface," *Computer-Assisted Research Forum* 1, no. 3 (Spring/Summer 1993): 7–17. *Logos* is published by Logos Research Systems, 2117 200th Avenue West, Oak Harbor WA 98277. (800) 87-LOGOS.

For example, πονηρός is an adjective, yet in some instances it functions as a noun. A purely formal classification would always call this an adjective, but a more functional system might label it as a "substantive adjective" when it functions as a noun (Friberg text, used by *BWorks* and *TheWord*). Further, the gender of πονηροῦ could be neuter or masculine, depending on the context. The meaning of this word in Mt 6:13 is debated: Does the Lord's Prayer ask for deliverance from "evil" (neuter) or "the evil one" (masculine)? *BWin* and *Gramcord* (see below) classify πονηροῦ in Mt 6:13 as neuter and do not find the verse on a search for masculine adjectives. By contrast, *TheWord* and *BWorks* classify it as masculine and will not find the verse in a search for neuters! Only *BWorks* acknowledges that the word could be parsed as masculine or neuter.

There are three major morphologically-tagged Greek NT texts commonly used in Bible-search software:[1]

1. *Gramcord Text* (*Gramcord* and *Accordance*): This text tends toward morphological classification, though particles and conjunctions are classified functionally. The decisions made are largely outlined in the manual. In many instances, when a word could be understood in more than one way, both classifications are included and the results in the concordance are flagged to indicate this ambiguity.[2]
2. *Friberg Text* (*BWorks* and *TheWord*): Using discourse analysis, Friberg seeks to provide not only morphological information, but also functional classifications of words based on the context of the sentence and the larger discourse.[3] If someone uses a program based on the Friberg text and does not recognize that this text includes some functional classifications, the search results could be misleading or incomplete.
3. *CCAT Text* (University of Pennsylvania's Center for Computer Analysis of Texts, coordinated by Robert Kraft; used by *BWin* and *LBase*[4]): While this is based on the Friberg text, the tags were modified to be more consistent with the Septuagint (LXX) text produced by CCAT. Most of the discourse level analysis was removed and a primarily morphological classification scheme was used.

None of the manuals for the programs reviewed here discuss in detail the assumptions used in the classification of words. This is a serious oversight! Fortunately, those using *BWorks* or *TheWord* can consult the print edition of the Friberg

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1. This does not include the Strong's numbering system frequently used in popular programs (such as *Logos*), because this is not suitable for scholarly research.

2. Project Gramcord began in the late 1970s under the direction of Paul A. Miller. *Gramcord* (DOS) and *Accordance* (Macintosh) enable very sophisticated grammatical searches in the Greek NT. LXX and Hebrew Bible versions are under development. Contact the Gramcord Institute, 2218 N.E. Brookview Drive, Vancouver, WA 98686, (206) 576-3000.

3. The tagged text was originally created by Barbara and Timothy Friberg to provide the raw data for Timothy's linguistics dissertation on NT Greek word order. The Fribergs are currently revising their text, which will be made available to software developers sometime in 1994.

4. *LBase* is produced by Silver Mountain Software, the developer of *Bible Windows*.

text.[1] An appendix outlines the rationale for the decisions made by Friberg in tagging the text. In some instances, however, *TheWord* apparently deviates from Friberg tags without documenting these changes in the manual. Furthermore, the manuals for *BWorks* and *TheWord* do not indicate whether the programs retain Friberg's multiple classifications of ambiguous words. (*TheWord* programmers indicated that, in general, only Friberg's first classification was used.)

These grammatical classification systems can significantly affect search results. For example, ἀγαθός ("good") is classified in Mt 5:45 ("he makes the sun shine on the evil and *good*") by *BWin* (CCAT text) and *Gramcord* as an adjective, while *BWorks* and *TheWord* (Friberg text) classify it as a "substantive adjective." A search for adjectives in a particular type of construction must include both "adjectives" and "substantive adjectives" to obtain all relevant verses. Since the "substantive adjective" category is not widely used and its significance is not spelled out in the manual, it would be easy to miss many verses with ἀγαθός or similar adjectives. Similarly in 5 verses (Mt 18:20; Rom 4:15; 5:20; 1 Cor 16:6; 2 Cor 3:17), *BWorks*, *BWin* and *TheWord* follow Friberg's unusual classification of οὖ as a conjunction. Most scholars would agree with Bauer's lexicon which classifies the word as an adverb in these contexts. While Friberg may see a deeper semantic significance determined from the larger discourse, most users would be confused by this classification. Moreover, they may miss many important verses when performing a grammatical search.

One should not blindly use the results of a grammatical search with these programs, without understanding something about the assumptions of the texts underlying the programs.[2]

Bible Windows 2.2.2

General Design. Bible Windows 2.2.2 (*BWin*) is easy to learn and makes good use of the *Microsoft Windows* interface. It offers a movable icon bar, multiple windows for displaying different passages or Bible versions, and point-and-select grammatical searching. Those who are familiar with *Windows* will master this program very quickly.

BWin includes KJV, RSV (with Apocrypha) and NRSV English translations, morphologically-tagged Greek NT (UBS3/CCAT text), tagged Septuagint (LXX), tagged Hebrew Bible (BHS) and Latin Vulgate. It also includes the UBS Greek lexicon and a Hebrew lexicon based on Holladay and Brown-Driver-Briggs (BDB). Scalable Greek, Hebrew and Coptic fonts in TrueType and PostScript/ATM Type 1 format are included. An optional module includes the complete 1200-page text of Louw and Nida's innovative, two-volume *Greek-English Lexicon*

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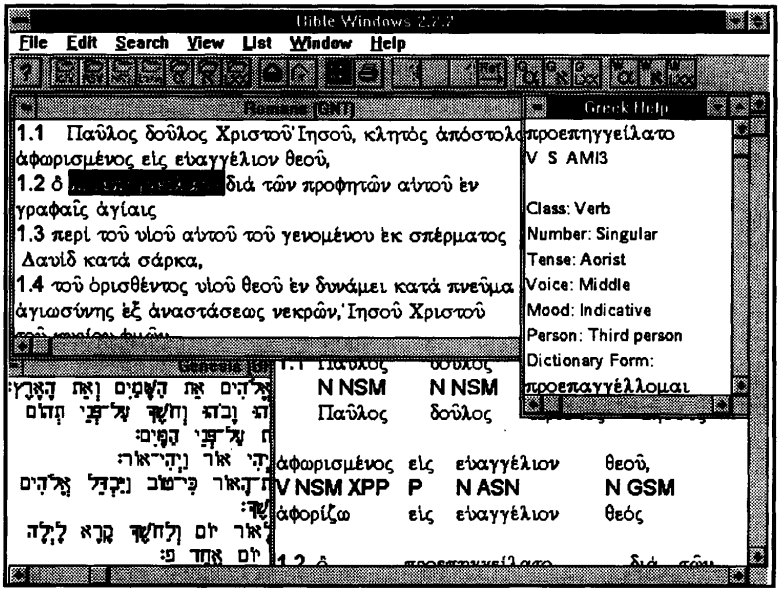
1. Barbara and Timothy Friberg, eds., *Analytical Greek New Testament* (Grand Rapids : Baker, 1981).

2. For a detailed discussion of how different tagging schemes and search assumptions affect Bible search results, see Harry Hahne, "Avoiding the Pitfalls of Computer-Assisted New Testament Grammatical Analysis." AIBI (Association Internationale Bible et Informatique) Conference on Bible and Computers, Amsterdam, August 14–18, 1994, to be published in *Bible and Computers: Desk and Discipline*, Tübingen: University of Tübingen Press.

of the New Testament Based on Semantic Domains.[1] Add-on "Workplace" modules allow one to search the *Thesaurus Linguae Graecae* and Packard Humanities Institute CD-ROMs, which include Greek classical texts and documentary papyri, Coptic biblical texts and Nag Hammadi texts.



Bible Windows 2.2.2 is an excellent environment for accelerated reading of biblical texts.

BWin displays multiple windows, each of which can contain a different version of the Bible or a different passage in the same version. One can link windows to scroll through several versions simultaneously. Unfortunately, one cannot set search results to link multiple versions automatically. One must open a window to the context of the matching verses, then link this window to a window with another Bible version. Greek, Hebrew and English screen-font sizes can each be set with a menu option. Bookmarks can be set simply by clicking on a menu item.

Even though the multiple-window interface is flexible and easy to use, there are several rough edges in the way that windows are displayed and manipulated. Because open windows can contain only a single biblical book, there is no way to browse through the whole Bible without opening a window for each biblical book. (The "Jump to Reference" option allows one to enter a chapter and verse, not a new book name.) Moreover, displayed text does not automatically wrap to fit a resized window. This leaves three options: (1) scroll horizontally to see part of the verse; (2) enlarge the window; or (3) change the font size.

When viewing search results in English, one can click on a reference and the verse will be shown in context. Clicking on a reference in the Greek or Hebrew

1. United Bible Societies: New York, 1989.

Search-Results window displays the verse in an interlinear display format, with encoded grammatical information beneath each word. For Greek and Hebrew searches, the matching term is highlighted in the interlinear-display format only. Highlighting is incomplete. If more than one term is included in the search, or there is more than one match in a verse, only the first matching term is highlighted.

To parse or look up the meaning of a word, simply click on it with the left mouse button, then click with the right button and select "Show Dictionary" or "Show Parsing" from the pop-up menu. This helpful feature would be improved if both parsing and dictionary information were in the same pop-up window. It would also be easier to use if double-clicking on a word automatically opened the lexicon and parsing window. For Hebrew words, all parts of the word (e.g., inseparable conjunctions, articles and prepositions) are listed separately in the dictionary and parsing windows. Because there is no LXX lexicon, looking up the meaning of a word in the LXX which is not also found in the NT simply results in a blank window, rather than a message indicating that no dictionary entry is available for the word. A lexicon of the LXX would be a welcomed addition.

Search Capabilities. BWin provided the most powerful Greek and Hebrew grammatical searching of the programs reviewed, yet it was the easiest to use. By clicking on a word in a Bible passage, the word and the grammatical information are inserted in the search dialog as search criteria. Parts of speech (verb, noun, etc.), grammatical elements (tense, voice, mood, case, gender, etc.), and lemmas (dictionary forms of words) are selected from list-boxes with the mouse. In grammatical searches, words cannot be typed in directly but must be selected from the word list. Wild cards and multiple lemmas are not allowed.

Searches can use Boolean AND, OR, NOT operators, but Greek and Hebrew searches cannot be grouped with parentheses. Agreement can be required between all words for any grammatical element. This allowed a search for Greek genitive absolutes (a construction that includes a genitive noun and a genitive participle agreeing in gender and number). This was the only program reviewed which could search for this basic Greek grammatical construction.

Searches do not require that one enter Greek accents or Hebrew vowel points, though these are displayed in the text. This makes searches simple to enter and prevents incomplete search results owing to accents which are changed by context. In this version, error checking has been improved to prevent impossible combinations such as a "present tense noun." Impossible combinations, such as a Hebrew "common noun" as a subclass of "verb," however, can still slip through. It would simplify grammatical searches if invalid menu options were dimmed or even removed.

Allowing the exclusion of specific words or grammatical forms between the search terms would open new search possibilities. None of the reviewed programs included this feature (though the *Gramcord* program for DOS allows this). At first glance, it appears that one could use the NOT option to exclude a word. This can produce, however, undesirable side-effects. For example, searching for a genitive absolute construction produces several false matches, for verbs sometimes occur between the genitive noun and participle. If one instructs *BWin* that the second

term must *not* be a verb, no matches are found, since all participles are verbs. With a true "Exclude Intervening Word" option, the item excluded is not a search term, but a specification about what must be absent for a search-result to qualify. It also would be helpful if the agreement option could be limited to specified search terms. This would allow one to search for the common Greek expression "article1 article2 noun2 noun1," where article1 and noun1 agree, and article2 and noun2 agree.

Searches may be limited to selected books of the Bible by clicking on the book names with the mouse. It is time-consuming to have to repeat this process for every search. It would be simpler to specify the search books in the "Search Preferences." Furthermore, English searches default to double wildcard searches, unless you specify word boundaries. This can lead to unexpected and confusing results, such as a search for "lock" finding references to "flock."

Greek and Hebrew search criteria can be saved. One must remember, however, to save the search criteria before beginning a search, because the previous search-criteria screen is cleared before a new one is entered. English search criteria cannot be saved.

Greek and Hebrew grammatical search speeds are fairly good and comparable to the other programs tested. Search speed in English though, was relatively slow.

An optional module available with *BWin* provides the full text of the Louw-Nida *Greek-English Lexicon of the New Testament Based on Semantic Domains*. This unique tool groups words according to related meanings, so shades of meanings of similar words can be compared. From within *BWin* you can click on any word to look it up in this reference tool. Because this uses the *Folio Views* search engine, it can be run separately as well. The full text of the book can be searched nearly instantly for any combination of Greek or English words or you can browse by topics. The major drawback is that Greek words are transliterated in search expressions and the word pick list. The text of the book, however, displays Greek in a Greek font. This powerful tool greatly increases the utility of *BWin* for a price comparable to that of the printed edition.

Concluding Observations. BWin cannot attach personal notes to verses of the Bible. It allows only rudimentary printing of single verses or highlighted verses, with no control on formatting. It may be preferable to paste verses into a word processor file, then arrange page layout before printing. The manual for *BWin* would be improved by including more examples, an index, and a discussion of the tagging philosophy used in the Greek and Hebrew texts.

While version 2.2.2 is more robust than previous versions, it still contains a few minor bugs and inconsistencies. Two windows opened to different books can be linked (e.g., Genesis and Matthew linked on the same chapter and verse). While clicking on a word apparently always selects it, the word is not always highlighted. The program allows a search without selecting any biblical books, resulting in no matches with no explanation.

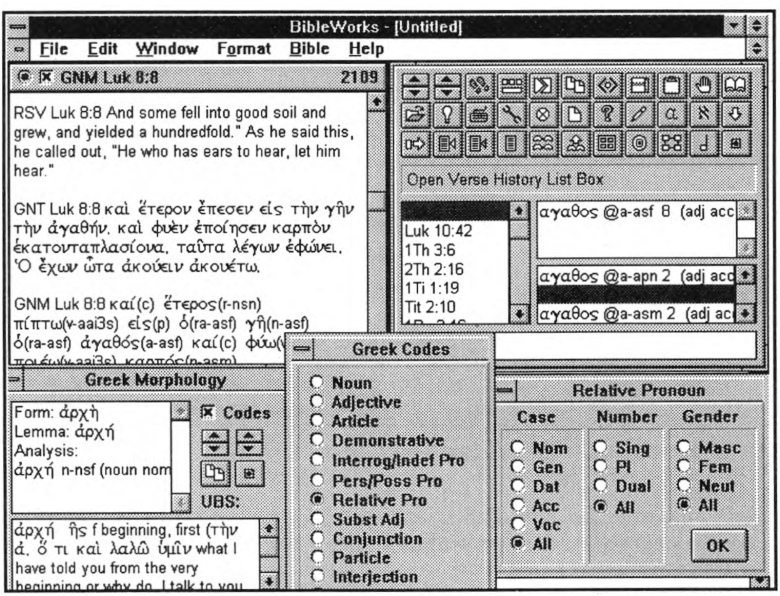
BWin has exceptional support for inserting Greek and Hebrew Bible passages into *Windows* and DOS word processing files. Verses can be pasted to any *Windows* word processor (including the multilingual *UniVerse*) through the clipboard or by using DDE. Greek and Hebrew texts can also be copied to DOS programs such as

WordPerfect (with the Greek module or *ScriptureFonts*) and *Nota Bene Lingua*. A supplemental program enables entering Hebrew in any *Windows* word processor, with right to left typing and proper word wrap. Thus *BWin* gives the added bonus of giving any *Windows* word processor multilingual capabilities for the biblical languages.

BibleWorks for Windows 2.2

General Design. *BibleWorks for Windows* 2.2 (*BWorks*) has a significantly different user interface than most other *Windows* programs. Once one adjusts to this way of working, however, *BWorks* proves to be a powerful tool which can easily reveal information that is difficult or impossible to find with other programs.

BWorks includes a good range of texts, including KJV, ASV and RSV English versions (some with Apocrypha), morphologically-tagged Greek NT (UBS3/Friberg text), tagged LXX (with Apocrypha), tagged Hebrew Bible (BHS, Westminster corrected BHS and Westminster tagged text) and Latin Vulgate. It also includes the UBS Greek lexicon, Englishman's-Strong's numbering and dictionary, and the *Treasury of Scripture Knowledge* (for cross-references and topical studies). Scalable Greek and Hebrew fonts in TrueType and PostScript/ATM Type 1 formats are included.



BibleWorks for Windows 2.2 presents powerful tools within a "non-standard" environment.

The screen is organized into three parts. The Command-Center window includes a command line for entering searches, a movable icon bar and a word list. It shows search statistics and a list of verse references matching the search criteria. The Results window displays the matching verses or a selected passage in several

Bible versions at the same time. The Editor window presents a powerful, multiple document, multilingual editor. There is great flexibility in the arrangement of the three windows. The Bible text window can display multiple Bible versions at once, automatically linked to display the same passages. This arrangement simplifies the linking problems that can occur with other programs which display Bible versions in separate windows. Version 2.2 adds the ability to display multiple Bible text and search result windows. This makes it easier to compare several passages such as NT citations of the Hebrew Scriptures. *Windows* can be easily synchronized to compare different translations to the original-language text.

The procedure for using *BWorks* is to run a search, then select a verse from the list of matching verses. The first verse in the list is automatically displayed in the selected versions. Browsing search results is easy. Simply click on a spin button or a verse number in the match list. To switch to the context of a verse, click on an icon button.

Search Capabilities. The easiest way to conduct a search is to double-click with the mouse on a word in the Bible text. All verses containing this word will be shown in the verse-list box. More powerful searches, however, are conducted from the command line. Enter a biblical reference and the passage will be shown in the Results window. One can also enter a Englishman's-Strong's number (KJV only) or a word. As the word is typed, all words that begin with the specified letters are listed in a pick list. One can select a word from the list with the mouse. Because there is no horizontal scroll bar on this list, one must change the font size or resize the window to view long entries. Multiple words can be selected by holding down the Shift key using the mouse. A search can be repeated by selecting it from a history list, which can store hundreds of search expressions. A miniature on-screen keyboard shows the positions of Greek and Hebrew keys, which simplifies entering Greek or Hebrew search expressions.

One of the most non-intuitive aspects of the command line is that most search expressions must begin with a period. The period indicates that the word or words which follow must be in the verse. Thus it functions as a logical AND even though it starts the expression. Similarly, to indicate a Boolean OR search, the command line must start with a "/". A more conventional command syntax would be easier to learn, i.e., one in which "AND" or "&" were used between terms.

One can conduct searches with the Boolean operators (AND, OR and NOT) and use parentheses to group search criteria (e.g., "(.God) (/man woman)" will find verses which include "God" *and either* "man" or "woman." Searches can include wild cards anywhere in a word. Searches can also specify an exact phrase. By default, the search context is one verse, but this can be changed to any number of verses for thematic analysis. For grammatical searches, it would also be useful to allow restricting context to a certain number of words or sentences. There is no provision to require a particular word order, so the search for δέ ... δέ failed to find verses in which δέ appears twice. There is no provision for forced grammatical agreement between words or the ability to exclude a lemma or grammatical form between search terms. Therefore, a search for genitive absolutes is not practical.

BWorks allows very powerful Greek and Hebrew grammatical searches using either a command line or a dialog box. The most flexible grammatical searches are

entered on the command line using terse, encoded commands. For example, ".ginomai@v-a?p???" searches for the "aorist participle of γίνομαι." The symbols * and ? are wild cards for grammatical elements. One can search for a specific word or use any combination of words with wild cards. When combined with Boolean operators and restricted search-context, extremely powerful searches are possible. Version 2.2 adds an optional pop-up dialog box that simplifies entering grammatical search expressions. Click on radio buttons to select the part of speech, tense, case, and other grammatical elements. The search criteria is automatically entered in the command line so it can be edited or combined with other grammatical elements. Unfortunately, searches with more than one grammatical element still require learning the command line syntax.

This grammatical search system is valuable for exploring how words are used in context and the various forms that occur. Entering a word on the command line brings up a list of all related forms with frequency statistics. To view all the verses with a particular form, simply click on the form in the list. One inconsistency is that Greek and Hebrew in grammatical searches must be transliterated, while they are entered in the original-language font for simple word searches. Words are displayed in Greek and Hebrew in the word list, but without Greek accents and breathing marks or Hebrew vowel points. Thus it is impossible to distinguish between similar words until one sifts through the search results.

Double-clicking with the right mouse button on a word in an original-language text displays its parsing, usage frequencies, the lemma and all forms that appear in the Bible. For Greek words, the UBS dictionary definition is also shown. The dictionary, however, only includes words that occur in the New Testament, so many words in the LXX have no dictionary entry. Hebrew and LXX Greek lexicons are planned for the future. If a word can have more than one parsing, the one appropriate to the current context is not identified, though this information can be determined from the morphologically-tagged text. If a morphology window lists more than one parsing, one can click on a parsing to see a list of other verses that use the word in this way. In Hebrew, one can select part of the word, such as an inseparable preposition.

One of the great strengths of *BWorks* is its search speed. Most searches take less than a second and even complex searches with multiple wild cards and grammatical constructions take only a few seconds. For example, searching for the Hebrew inseparable preposition -ב revealed a list of 10,153 verses (and 15,609 matches) in just three seconds!

In word searches all matching search terms are highlighted in the Bible text. Words are not highlighted, however, in grammatical Greek and Hebrew searches. This is a serious limitation for tags can be hard to find by scanning a verse.

Concluding Observations. An extensive icon bar provides access to most commands. While most commands are also available from the menus, many frequently used commands are hidden in sub-menus. This makes the program harder to learn because the meaning of some icons are not intuitive (e.g., a hand limits a range of books to search). Fortunately, if the mouse is passed over an icon, a message indicates the function of the button.

BWorks includes a note editor that handles Greek, Hebrew and Roman fonts.

While Hebrew can wrap from right to left, this is not automatically invoked when the Hebrew font is used. One can paste Bible verses in English and original languages, dictionary articles, word statistics or parsing information with the click of the mouse. Each note can be up to 32,000 lines long and over 1MB in size! Notes can be attached to chapters and verses or saved as separate files. Cut-and-paste from the editor or DDE can transfer multilingual notes, verses and grammatical notes to a word processor. Printing in *BWorks* is unusually flexible, for the page layout is controlled through this built-in editor.

Version 2.2 is reliable. (Occasionally the program had to be restarted owing to a *Windows* General Protection Fault.) The manual is fairly complete, but the explanations would be made clearer with more examples. The context-sensitive online help is excellent. It uses a hypertext system that displays a simulation of the program screen. You simply need to click with the mouse on the desired area and a window will display help on that topic.

TheWord Advanced Study System 3.0

General Design. TheWord Advanced Study System 3.0 (*TheWord*) uses a proprietary DOS-based GUI that integrates a variety of WordSoft modules.

TheWord Advanced Study System 3.0 presents an proprietary, DOS-based interface.

Numerous texts and tools are available, including KJV, NKJV, NRSV, *Englishman's-Strong's Dictionary*, morphologically-tagged Greek NT (UBS3/Friberg text) and morphologically-tagged Hebrew Bible. A morphologically-tagged LXX is planned for a future release. Future plans include other add-on modules, such as dictionaries, atlases and commentaries.

While *TheWord* will run on a 286 processor, screen drawing is painfully slow. A 486 is desirable for pleasant operation. Most commands can be executed without a mouse, though a mouse simplifies many operations. Most commands are assigned to buttons located around the edge of each window.

Table 1: Comparative Search Times in Seconds (386DX–25)

Search Criteria:	*BWin*	*BWorks*	*TheWord*
English (NT and OT)			
Single word: "kingdom"	34	1	6
Boolean: "god" AND "saviour"	48	2	6
Phrase: "in the beginning"	48	2	9
Greek			
Single grammatical form: future participle	9	9	3
Two words in specific order (same verse): δέ ... δέ	660	N/A	20
Two grammatical forms, one using a required lemma: future perfect periphrastic (future of εἰμί and a perfect participle of any verb within same verse)	11	27	90
Two grammatical forms with partial grammatical agreement: genitive absolute (genitive participle and genitive noun with agreement of gender and number)	40	N/A	N/A
Hebrew			
Single grammatical form, with a required lemma: בראׁ in Qal Perfect	20	2	19
Boolean: אשׁר AND שׁם	78	4	7

Up to ten windows may be open at once. Setting up windows is very awkward. *Windows* can be linked so that English translations and the text in an original language can be compared. Linked windows, however, will not redraw if even part of the window is overlapped by another window. Linking is not bi-directional, so one must scroll the master window to move the linked window. It is more difficult to link and unlink windows than most programs. The only way to unlink windows is to close them. This causes the window settings (e.g., the Bible version, colours and other parameters) to be lost. One can change links by opening new windows from scratch and linking them. It saves time to save window definitions to disk, but the process is still complicated.Linking can be awkward when working with Greek or Hebrew. Original-language texts come in three forms: normal Bible text, lexical-roots text, and a database of morphological tags. The recommended procedure is to link all three windows together. To perform a grammatical search that requires specific lemmas, one must search the roots text

as the master window. The main-text and morphology windows must be linked. This forces the text window to display the matching verse after the search is complete. Because linking is not bi-directional, however, browsing through the Bible text to view parsing and lemma-related data requires one to close all original-language windows (and any linked English windows), open and define new windows, and link them to the Greek Bible window. The linking must be changed again to search or browse the English text and compare it to the original-language text. This procedure is unnecessarily complex.

If the lemma and parsing windows are linked to the Greek NT window, when one clicks on a word, the corresponding word is highlighted in the other windows. The morphology is indicated in an encoded form (e.g., "vaai1s" means "verb, aorist, active, indicative, 1st person, singular"). There is no definition given in the roots window, but one can click on a word to get the word meaning from the Strong's dictionary (sold as a separate module).

Search Capabilities. TheWord possesses flexible search options. Boolean searches use AND, OR, NOT and XOR operators. Parentheses can be used to group search expressions, such as "God <AND> (man <OR> woman)." Wild cards can be placed at the beginning and end of words, but not in the middle. There is a limit of 300 matching words for wild cards. A search for an expression that results in too many matching words can crash the program without an error message! One can search for an exact phrase or specify that words must occur in a certain order, even if separated by other words. Search expressions can be saved.

An optional word list can be used when entering an expression. If one enters a word on the search command line which is not found, the list will highlight the most similar word. The list shows words in the original-language scripts and in the transliterated form. Unfortunately, the list is not sorted in Greek and Hebrew alphabetical order, but ASCII order. Thus accents and breathing marks affect the sort order. For example, ἄγνοια ("a)/gnoia") is not next to ἁγνός ("a(gno/j") but it is separated by several dozen words. One can type in a word, but it can sometimes take two to three minutes to find the word. It often takes longer to find the word in the list than to execute the Bible search!

A search is performed on the text in the currently active window. When a search is complete, the matching verses are displayed. Matching words are highlighted, even for grammatical searches. Occasionally, the highlighted word does not correspond to the search term, particularly with a complex grammatical search. One can change the window display to a verse list by changing the window parameters.

Greek and Hebrew grammatical search capabilities are very powerful. One can define up to ten grammatical elements. Each element consists of a part of speech, with optional aspects such as tense, voice, case and gender. These are selected by clicking on the appropriate items with a mouse. Once the elements are defined, they can be linked to a particular lemma, and one can combine them with other types of word, phrase and grammatical searches using Boolean operators. The grammatical elements defined with the point-and-click method are represented in the command line by a symbol such as <GRAM1>. These flexible provisions enabled *TheWord* to find Greek future perfect periphrastic constructions

(*BWin* could do this, but *BWorks* could not). There is no provision for forced grammatical agreement between words or the ability to exclude a lemma or grammatical form between search terms. Therefore, it was not possible to search for genitive absolutes.

A major weakness of Greek searches is that accents must be entered. Not only are accents difficult to remember for many users, but they are also affected by context, which can make search results incomplete. It would be helpful if search preferences could be set to use or ignore such diacritical marks. The process of entering searches is also made more difficult because all words must be transliterated and Hebrew words must be entered in reverse order. Thus υἱός τοῦ ἀνθρώπου must be entered as "ui(o\j tou= a)nqrw/pou" and בראשׁ must be entered as "BrX." Because the note editor allows Greek and Hebrew, these fonts could easily be used in search criteria.

On the whole, setting up grammatical searches is more intuitive than a pure command-line approach. *TheWord* has great search power, for the grammatical elements can be combined with Boolean logic. It would be simpler to create grammatical searches if a brief summary of each grammatical element were shown in the list of elements, so one would not have to open a window to see what <GRAM0> and <GRAM1> mean.

Searches are generally fast. A typical word search or simple single term grammatical search is completed in about two seconds. Once the search is complete, however, it takes four seconds or more to redraw the window and display the verses! For complex searches, a search progress window shows the percentage of text searched. Yet sometimes the search-progress message clears several seconds before the search results are displayed, making the computer appear to lock up.

Concluding Observations. Notes can be attached to any verse. The note editor includes Greek and Hebrew capabilities. Hebrew is entered from right to left, though the Hebrew does not properly wrap to the next line. Verses and notes can be printed and can include Greek and Hebrew fonts. There is little control over the page layout. Drivers are included for twenty-one dot matrix printers and the HP LaserJet series, but not Postscript printers. Verses can be exported to ASCII text files and WordSoft's *Scribe* program.

The biggest hindrance to the usability of *TheWord* is its slow and idiosyncratic GUI. Even on an average 386DX-based system, window redrawing accounts for a major part of the search time. *Windows* are frequently completely cleared and redrawn, sometimes two or three times. This is distracting. In addition, window manipulation is different than for most other GUIs. This makes *TheWord* harder to learn. The good news is that a *Windows* version of the program is under development.

Conclusions

Bible Windows blends ease-of-use with the most powerful Greek and Hebrew grammatical search capability of the programs reviewed. The ease of manipulating texts and obtaining accurate parsing and dictionary information simplifies reading of original-language texts. The ability to paste Greek and Hebrew verses into DOS and *Windows* word processors is exceptional. The program's greatest

limitations are relatively slow searches, lack of note-taking capability and limited English searches.

BibleWorks for Windows has impressive search speed. The creative use of word and grammatical lists makes basic lexical and grammatical searches easy and enjoyable. Word statistics, quick parsing and dictionary look-up based on good scholarly resources make this a valuable research tool. The multilingual note editor is a handy bonus that makes it easier to use this information. The dialog box approach makes entering grammatical search expressions easier in this version than in earlier versions. The obscure command line syntax, though, still makes most searches more difficult than necessary.

TheWord Advanced Study System allows flexible searches, with a combination of command line and point-and-select grammatical searches. The cumbersome and slow graphical interface, however, hinders a cleverly conceived and powerful program. When it becomes available in a *Windows* version, it should have broader appeal.

The variety of Bible-search programs can make the selection of a suitable program a difficult process. All of the programs reviewed here are creatively implemented and can open new doors for sophisticated scholarly research.

Table 2: Feature Comparison

Feature	*BWin*	*BWorks*	*TheWord*
Windows 3.0/3.1 required?	**Yes**	**Yes**	No
Manual	Fair	Fair	**Excellent**
Online help	**Excellent**	**Excellent**	**Excellent**
Customizability	Fair	**Excellent**	Fair
Available Texts			
KJV/NKJV	**Yes/No**	**Yes/No**	**Yes/Yes**
RSV/NRSV	**Yes/No**	**Yes/No**	**No/Yes**
NIV	No	No	No
Other English texts	**Yes**	**Yes**	No
Includes "Apocrypha"	**Yes**	**Yes**	No
Greek Textus Receptus	No	No	No
Greek UBS 3/Nestle-Aland 26	**Yes**	**Yes**	**Yes**
Septuagint	**Yes**	**Yes**	No[a]
Hebrew Scriptures (BHS)	**Yes**	**Yes**	**Yes**
Non-English translations	**Yes**[b]	No	No
Original-Language Support			
Greek/Hebrew fonts	**Excellent**	**Excellent**	Fair
Greek parsing information	**Excellent**	**Excellent**	**Excellent**
Greek dictionary[c]	**Yes**	**Yes**	**Yes**
Hebrew parsing information	**Excellent**	**Excellent**	**Excellent**

Table 2: Feature Comparison

Feature	*BWin*	*BWorks*	*TheWord*
Hebrew dictionary[d]	**Excellent**	Poor or N/A	Poor or N/A
Program Design			
Multiple Bible text windows	**Excellent**	**Excellent**	**Excellent**
Link versions when browsing	Fair	**Excellent**[e]	**Excellent**
Link search results	Fair	**Excellent**	**Excellent**
Interlinear display	**Excellent**	Poor or N/A	Poor or N/A
Matching words highlighted in verse	Fair	**Excellent**	**Excellent**
List of matching references	**Excellent**	**Excellent**	Fair
Screen fonts resizable	**Excellent**	Fair	Poor or N/A
Word Processor Integration			
Windows clipboard support	**Excellent**	**Excellent**	Poor or N/A
Export to word processor file	**Excellent**	Fair	Fair[f]
Navigation Features			
Open text at book	**Excellent**	**Excellent**	**Excellent**
Open text at reference	**Excellent**	**Excellent**	**Excellent**
Bookmarks	**Excellent**	**Excellent**	Poor or N/A
Cross-references	Poor or N/A	Poor or N/A	Poor or N/A
Browse whole Bible in one window	Poor or N/A	**Excellent**	**Excellent**
Word frequency lists	Poor or N/A	**Excellent**	Poor or N/A
Lexical Searching			
Word	**Excellent**	**Excellent**	**Excellent**
Word list	Fair	**Excellent**	Fair
All words searchable	**Excellent**	**Excellent**	**Excellent**
Search for Greek/Hebrew lemmas	**Excellent**	**Excellent**	**Excellent**
Phrase	**Excellent**	**Excellent**	**Excellent**
Approximate	Poor or N/A	Poor or N/A	Poor or N/A
Boolean AND, OR, NOT	**Excellent**	**Excellent**	**Excellent**
Boolean XOR	Poor or N/A	Poor or N/A	**Excellent**
Group across verse boundary	Poor or N/A	**Excellent**	**Excellent**
Multiple level nesting	Poor or N/A	**Excellent**	**Excellent**
Wild cards: begin/end of word	**Excellent**	**Excellent**	**Excellent**
Wild cards: middle of word	Poor or N/A	**Excellent**	**Excellent**
Set context by number of words	**Excellent**	Poor or N/A	Poor or N/A
Set context by number of verses	Poor or N/A	**Excellent**	Fair[g]
Limit search to selected books	**Excellent**	**Excellent**	Poor or N/A

Table 2: Feature Comparison

Feature	*BWin*	*BWorks*	*TheWord*
Grammatical Searching			
Greek/Hebrew	**Excellent**	**Excellent**	**Excellent**
Part of speech	**Excellent**	**Excellent**	**Excellent**
Noun/adj. characteristics	**Excellent**	**Excellent**	**Excellent**
Verb characteristics	**Excellent**	**Excellent**	**Excellent**
Other characteristics	Poor or N/A	**Excellent**	Poor or N/A
Agreement of grammatical feature	Fair[h]	Poor or N/A	Poor or N/A
Agreement of lemmas of two words	Poor or N/A	Poor or N/A	Poor or N/A
Specify lemma of gramm. element	**Excellent**	**Excellent**	**Excellent**
Exclude lemma of gramm. element	Poor or N/A	Poor or N/A	Poor or N/A
Search any part of speech	**Excellent**	**Excellent**	**Excellent**
Specify required order of elements	**Excellent**	Poor or N/A	**Excellent**
Allow any order of elements	Poor or N/A	**Excellent**	**Excellent**
Exclude lemma/form between words	Poor or N/A	Poor or N/A	Poor or N/A

a. This is planned for a future version.
b. The Latin Vulgate.
c. *BWin* and *BWorks*: Concise UBS dictionary; *TheWord*: Strong's dictionary.
d. *BWin*: Holliday/BDB; *TheWord*: Strong's dictionary.
e. Multiple versions of text and search results can be displayed as parallel text in the same window.
f. Exports to ASCII and Wordsoft's *Scribe* only.
g. Cannot search for phrase across a verse boundary.
h. Aggreement of all words in search expression.

Transparent Language: Language Learning Made Easy

Antony Dugdale

Antony Dugdale is a Ph.D. candidate in philosophy of religion at Yale University. He is also the owner and moderator of DIFTX-L, an ecumenical dialogue focussing on different "Christianities." His interests include Christian mysticism and anti-modern criticism, of which his obsessive participation on the Internet and his fascination with new technologies is a somewhat paradoxical part.

Transparent Language (*TL*) is a language-learning system designed to teach anglophones reading skills in one of five languages—French, German, Italian, Latin and Spanish. It works by linking literary selections to context-sensitive translation notes. I have used it as an essential tool in the sometimes onerous grad-student task of learning to read multiple languages in a short amount of time. Unlike many other grammar-oriented, language-learning programs, *TL* presents stories that keep you interested, breaking the monotony of dictionaries and grammars that so often spawn glazed eyes and fried brains.

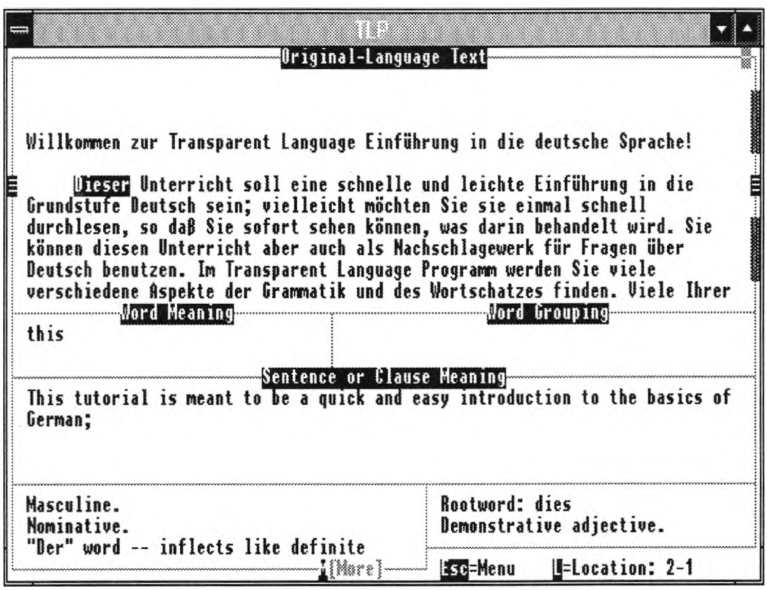
To see how *TL* works, load the Latin story *Rumpelstultulus*. The main display area presents the original Latin text. As you read, the cursor highlights a word (e.g., *pro*) and points out when it is part of a phrase (*pro hoc beneficio*). On other parts of the screen (PC and Macintosh screen arrangements differ slightly), two boxes present a translation of the word and of the entire clause/sentence, while two other boxes offer an explanation of the word group (e.g, prepositional phrase) and of other helpful tidbits (e.g., preposition governing the ablative). Learning is enhanced further through the inclusion of audiotapes of native readers.

The stories in the introductory package are rather short. Fortunately, *TL* continues to add to its original literary holdings, which include such gems as Augustine's *Confessions* and Kafka's short stories. The basic program (recently upgraded to version 2.0) works on the most obsolete machines and remains incredibly compact and simple. Fortunately, rather than producing "techno-overload," version 2.0 adds a number of features that make the process of learning a new language much easier!

For example, I can now practice my Latin on the bus by saving *Rumpelstultulus* to a file and printing out the text in my word processor. This process can be painfully slow, but most of the stories are not long enough to make it interminable. This is a significant improvement over version 1.0, when getting text off the screen required a computer science degree and a bit of hacking on the side. Unfortunately, there is still no way to print directly from *TL*.

Learning new words is one of the frustrations that graduate students experience when trying to learn a language in a short time. One of the most useful

changes is the addition of the "CheckWord" option. Whenever I come across an uncommon word, this option allows me to add the word and its translation to a list which I can dump into my word processor. I can then review the list before re-reading the story, or play "Vocabulous!" (see below). This gave a huge boost to my ability to master a given text and its vocabulary, moving my voracious appetite quickly to devour the next selection. No doubt *TL* is happy to keep feeding my newly-acquired language habit.



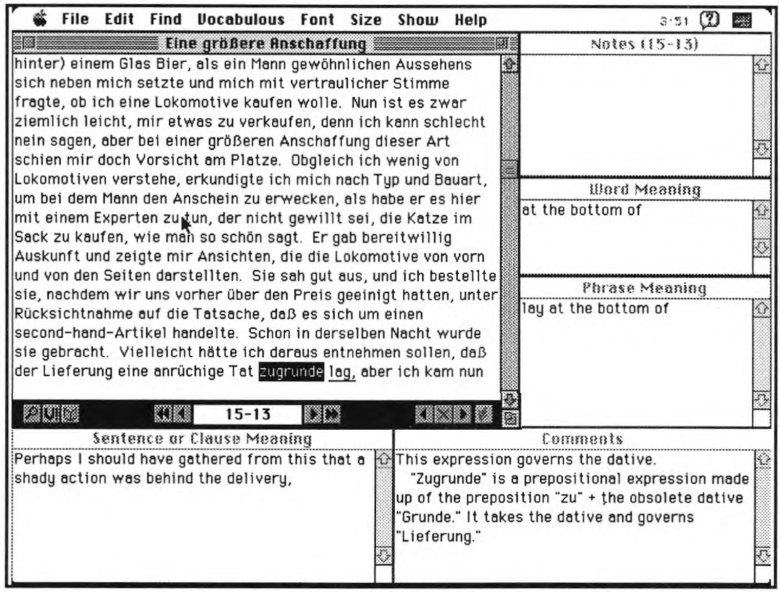
Transparent Language for the PC makes the most out of a text-mode environment.

Perhaps the most significant change with version 2.0 is the addition of the game "Vocabulous!" After a while, I got tired of staring at the screen and plodding through sentence after sentence. I wanted to play. With "Vocabulous!," the computer randomly picks words from the story you are reading, blanks them out, and prompts you to fill in the missing word. You have the context in the original and as many of the lower windows as you choose to leave unhidden. Best of all, by limiting the game to the "CheckWords" that you have chosen during your first few readings of the text, you can concentrate on the difficult words (although it prevents you from patting yourself on the back after every *la*, *les*, or *das*). It even insists that you include accents, tildes and cedillas, all available from the keyboard. Try to get twenty correct, but beware—three strikes and you are out! I tried it in Italian and was back in the dugout before you could say *introduzione*, but put me up to bat in Spanish and, well, I'll let you find out what happens when you win.

In their constant quest to keep you focused on the original text, rather than on the English translation, the developers have moved beyond the original "Hide/Unhide" option that allows you to cover certain windows. Version 2.0 allows you

to toggle instantly between the "simultaneous translation" display and the "just-the-story" display.

One other minor change has removed the need for pads of paper to accompany my perusal of the stories, for it is now possible to add your own notes to a given word. Did you forget that *als* always sends the verb to the end of the phrase? No problem, just add that sentence to the first instance of *als* and you'll be reminded each time you come across it.



Transparent Language for Macintosh presents a friendly point-and-click environment.

The list price of the introductory package is $139.00US. (Sale prices occasionally crop up.) With extra titles selling for an average of $15–20.00US, most people will return again and again to supplement their electronic library of *TL*-compatible foreign literature.

The number of Spanish and Latin titles have both topped 30, including such recent additions as the first chapters of Genesis in the Vulgate and Don Quixote's windmill adventure. One can even subscribe jointly to *TL* and the Spanish *Américas Magazine*. You get six issues of the magazine, a *TL* version of ¡Ojo!, and a *TL* translation of one full-length article in each issue, all for the low, low price of $149.95US! Individual articles of *Journal français d'Amérique* are also available (around $20.00US each). German and French both clock in with less than 20 titles each, but Italian pulls up the rear with a mere six titles. Considering the recent growth of the entire *TL* enterprise, however, I have little doubt that all of these areas will continue to grow rapidly as scholars realize they can make a quick buck by translating a few pages of literature.

Fortunately, *TL* now offers more than selections of literary texts. You can also order packages (less than $30.00US) that offer an introduction to the grammar,

spelling, and pronunciation of a selected language in *TL* format. Lessons are presented in the original language, with *TL*'s simultaneous translation below. In the Spanish introduction, the author continually repeats a few phrases (*a medida que*), reinforcing certain words for the beginner. In addition to these introductory packages, *TL* has added some beginner texts, filled with the limited vocabulary of children's stories. These tools make *TL* infinitely more accessible to the beginning language learner.

TL has become a professional package. The spiffy new newsletter advertising their available titles even includes such provocative questions as "Looking for a unique and thoughtful gift this season?" They are even kind enough to suggest an answer. Whatever one thinks of the "slick" packaging, one thing is clear: this program harnesses the computer's potential to enhance the language-learning process. I'm waiting for *TL* to combine the audiotape and script into a multi-media hypertext![1]

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1. Product information is as follows:
Version Reviewed: 2.0; **Price:** Program Packages are $139.00US. A variety of optional titles in five languages are available. Call for a complete price list; **Surface Address:** Transparent Language, 22 Proctor Hill Rd., P.O. Box 575, Hollis, NH, 03049, USA; **Phone:** (603) 465–2230; **Fax:** (603) 465–2779; **Internet Address:** 70541,3626@compuserve.com; **System Requirements:** Macintosh version requires any Macintosh. Fully compatible with System 6 and 7. The PC version requires DOS 2.1 or higher, 300K RAM, any monitor and any drive type.

Exploring the Internet: A Review and Commentary

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Internet Passport: NorthWestNet's Guide to Our World Online. By Jonathon Kochmer and NorthWestNet. Bellevue, Washington: NorthWestNet and Northwest Academic Computing Consortium, Inc., 1993 (4th edition). ISBN 0-9635281-0-6. Pp. xxxii+515.

Directory of Electronic Journals, Newsletters and Academic Discussion Lists. By Michael Strangelove and Diane Kovacs and The Directory Team, Kent State University Libraries. Ed. Ann Okerson. Washington, DC: Association of Research Libraries, Office of Scientific and Academic Publishing, 1993. ISSN 1057-1337. Pp. ii+355.

Although the Internet has become considerably more familiar to academic users during the past two years, travel to exotic lands and through uncharted realms of space still appears to be the metaphor of choice for books dealing with the vast and complex network of computer networks that now connects most parts of the geographical world. The travel motif is evident in the title of Jonathon Kochmer's new and useful guide to the resources available on the Internet.

Internet Passport

The *Internet Passport* is divided into six sections. Beginning with a simple but informative introductory section in which he explains what a computer network is in general and what the Internet is in particular, Kochmer progressively takes his reader in the second section through such basic Internet tools as electronic mail (e-mail), *telnet* and *File Transfer Protocol* (FTP). The author provides some glimpses into what goes on in the background when one sends an e-mail message from the West Coast to the East Coast of North America. He explains that a message may be divided into several packets of data and sent along many different lines of communication before being perfectly reassembled a fraction of a second later at the recipient's address. Although there are enough technical explanations to give the reader an elementary idea of how the Internet works, the principal focus of the *Internet Passport* is practical. It tells readers what they need to know, for example, to connect to remote computers using *telnet* or to transfer files from distant computers to one's own.

Section III, entitled "Community Forums," helps new Internet users expand their horizons from communicating with other individuals by e-mail to participating in electronic discussions in which many people share ideas. Forums of this kind include newsgroups, which are analogous to bulletin boards on which people can leave messages for others to read by using a special program known as a newsreader. Another kind of community forum is the *listserv*, an automated program that distributes messages to a list of subscribers. In describing what one must do to participate in these forums, Kochmer also offers valuable (if quixotic) reminders of the importance of courtesy and etiquette on the Internet.

While Section III deals with the relatively cozy chats and the occasionally caustic confrontations that take place on news groups and "listserved" discussion groups, Section IV delves into some more structured resources available on the Internet. In this section one will find discussions of refereed academic journals that are distributed electronically, electronic books and text archives, university on-line library catalogs that one can browse, and specialized bibliographies and databases to which free public access is possible (usually by *telnet*).

The Internet is such an overwhelmingly complex and loosely structured family of interconnected resources that even an experienced user may experience frustration in finding just the material that is needed for a particular purpose. In an attempt to help users find their way to what they need, computer experts have developed many programs that serve as utilities. Section V of *The Internet Passport* explains some of these tools and interfaces, which go by such droll names as Archie, Veronica and Gopher as well as by the omnipresent acronyms that make up most of the lexical items in computer jargon: WAIS (Wide Area Information Server), CWIS (Campus Wide Information Systems), and WWW (World Wide Web). Also in this Section, Kochmer includes a valuable chapter on how to use various directories of e-mail addresses that have begun to crop up in various sites on the Internet. (It is only fair to say that despite all the guidance provided in the *Passport*, finding a colleague's e-mail address is still about as difficult as finding a good sales clerk in a store that sells computer products.)

Directory of Electronic Journals

In his final section, called "Targeted Interests," Kochmer first discusses how the resources of the Internet might be used by teachers at the high-school level and then looks into the world of supercomputers, whose use is of interest primarily to scientific and technological researchers. Finally, the *Internet Passport* contains several appendices containing information on further technical resources on using and understanding the nature of the Internet.

While the *Internet Passport* provides valuable hints on where to begin looking for electronic discussion groups that may be of use to one's own research needs, for a more extensive survey of what is available one should turn to the *Directory of Electronic Journals, Newsletters and Academic Discussion Lists.* This directory is divided into four parts: (1) articles and bibliographies about electronic publishing; (2) electronic journals and newsletters, arranged alphabetically by title; (3) academic discussion lists and interest groups, arranged alphabetically within five broad disciplinary categories (social sciences and humanities, biological sciences,

physical sciences, business and miscellaneous academic, and computer science); and (4) index of keywords, titles and institutional affiliations. These broad headings are further subdivided by particular subject, so that under "Humanities and Social Sciences" one will find the subheading "Religious Studies," where over twenty-five e-mail discussion groups of potential interest to scholars in the field of religious studies are listed. For the most part this list is up-to-date, although it is natural that there will be omissions in any reference work that tries to keep track of anything as elusive and transient as electronic discussion groups. One will not, for example, find any reference to BUDDHA-L@ulkyvm.louisville.edu, a moderated discussion group that now has over 650 subscribers and enjoys a much better reputation among academics than BUDDHIST@jpntuvm0, a list that has only about 250 subscribers but is listed in the directory (although under an old *listserv* address that has not been used for at least two years).

The books reviewed here join Ed Krol's *The Whole Internet* and Brendan P. Kehoe's *Zen and the Art of the Internet* (both reviewed in the 1993 issue of *ARC*) as useful reference works for those who wish to explore the Internet. Common to all these guides and reference books is a clear presentation of how to use the Internet to get at its plentiful resources. Curiously, none of the books offer a frank evaluation of the *quality* of what is currently available on the Internet.

Puzzling Enthusiasm

Because of my own experiences using the Internet during the past year, I am still frankly puzzled by the enthusiasm the network has excited in some quarters of the academic world. Although the quality of discussion on e-mail discussion groups has improved very modestly during the past two years, I still have to find an e-mail discussion group that is consistently as stimulating as a good informal conversation with colleagues or one's better students. Moreover, what little advantage one might get from electronic discussions is too often offset by the rude and unpleasant verbal behaviour that so many people seem to feel free to engage in when no one can look them in the eye. Not since I played contact sports in high school and underwent the hazing rituals of male adolescent warriors have I seen as much gratuitous verbal abuse as one sees on many electronic forums.

The world of the newsgroup provides an even more sobering glimpse into the abyss of our new electronic democracy. One wonders whether these newsgroups are a harbinger of what we can expect to find on the "Information Super Highway" that is being hailed with such feverish anticipation in certain white houses on this continent. If so, we can look forward to a sort of disquisitional traffic jam where everyone will feel free to express any idea that comes to the fingertips (evidently without passing through the mind on the way there) and then to send it out to as many as several hundred thousand potential readers. While preparing to write this review, I read approximately two hundred messages posted in about thirty different news groups. About half of the messages were so inarticulate as to be nearly undecipherable (even to a veteran of undergraduate essays), and about a quarter of the total were expressed in such strident and violent language as to make reading them almost as unpleasant as watching commercial television for an hour.

There is little doubt that the Internet has some potential to be a useful resource tool for a few scholars in those areas of the humanities in which the art of pushing around pieces of raw information at high velocities has come to replace scholarship. In those areas of the humanities, however, in which critical thinking still plays a central role, the Internet is unlikely ever to be as productive a stimulus for serious thought as a medium-sized tree filled with a few songbirds.

"The public has an insatiable curiosity to know everything. Except what is worth knowing."

Oscar Wilde