# SyrCOM-99

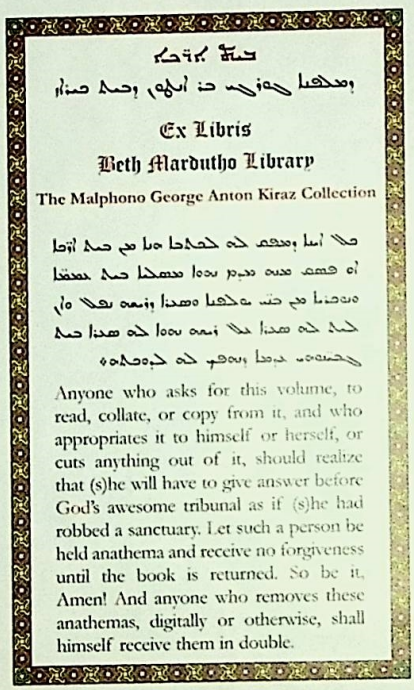
## Proceedings of the Third International Forum on Syriac Computing

(in association with Syriac Symposium III)

**June 18, 1999**
**University of Notre Dame, Indiana**

Edited by
GEORGE ANTON KIRAZ
Bell Laboratories

Published by the Syriac Computing Institute


ܟܬܒ ܚܢ
ܡܫܘܚܐ ܕܒܝܬ ܡܪܕܘܬܐ ܕܒܝܬ ܡܕܢ

Ex Libris

Beth Mardutho Library

The Malphono George Anton Kiraz Collection

ܟܠ ܐܢܫ ܕܢܒܥܐ ܕܗ ܟܬܒܐ ܕܢܩܪܐ ܘܢܫܘܚ ܘܢܬܐ
ܐ ܡܢ ܗܘ ܕܢܫܬܡܫ ܒܗ ܢܬܚܫܒ ܠܗ ܐܝܟ ܕܐܢ ܗܘ
ܓܢܒ ܡܩܕܫ ܐܠܗܐ ܗܘ ܕܢܗܘܐ ܚܝܒ ܠܩܒܠ ܕܝܢ
ܡܢ ܐܠܗܐ ܘܠܐ ܢܫܒܘܩ ܠܗ ܚܛܗܘܗܝ ܥܕ ܕܢܗܦܟ
ܠܗ ܟܬܒܐ ܗܘ ܐܡܝܢ ܘܟܠ ܡܢ ܕܡܚܝ ܗܠܝܢ ܚܪܡܐ
ܐ ܒܓܘܫܡܐ ܘܒܪܘܚܐ ܢܬܚܫܒ ܠܗ ܐܝܟ ܕܐܢ ܗܘ

Anyone who asks for this volume, to read, collate, or copy from it, and who appropriates it to himself or herself, or cuts anything out of it, should realize that (s)he will have to give answer before God's awesome tribunal as if (s)he had robbed a sanctuary. Let such a person be held anathema and receive no forgiveness until the book is returned. So be it, Amen! And anyone who removes these anathemas, digitally or otherwise, shall himself receive them in double.

# SyrCOM-99

# Proceedings of the Third International Forum on Syriac Computing

(in association with Syriac Symposium III)

**June 18, 1999**
**University of Notre Dame, Indiana**

Edited by
GEORGE ANTON KIRAZ
Bell Laboratories

Published by the Syriac Computing Institute

First Printing (June 1999)

URL: *http://syrcom.cua.edu*

# Preface

**GEORGE ANTON KIRAZ**

*Conference Chair*

It is my pleasure to present this volume containing the papers and demonstration abstracts prepared for the Third International Forum on Syriac Computing, held on 18 June 1999 at The Summer Syriac Institute of the University of Notre Dame, Indiana. This form was held as part of Syriac Symposium III on the Aramaic Heritage of Syria.

Organized by the Syriac Computing Institute, the series of SyrCOM forums started in 1995 at the Catholic University of America, Washington D.C., in association with Syriac Symposium II. The second forum was held at Uppsala University in 1996 in conjunction with VIIum Symposium Syriacum.

The papers are arranged here according to the Forum Program to allow participants take notes during the presentations.

I would like to take this opportunity to thank the SyrCOM-99 Reviewing Committee: Dr. Gary Anderson, Dr. James Coakley, and Dr. Bonnie G. Stalls. Special thanks are due to Standing Committee of the Syriac Symposium, especially Dr. Joseph Amar, Organizer of this year's symposium for their generosity in accepting SyrCOM-99 as part of Syriac Symposium III. Thanks are also due to those who helped in chairing the SyrCOM-99 sessions.

# Author Index

# Table of Contents

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 6-11

# TAG: A Multilingual Desktop Publishing Program for Users of Hebrew, Syriac, and other Typefaces

**MICHAEL SOKOLOFF**

*sokoloff@sunray.cs.biu.ac.il*
*Bar Ilan University*
*Ramat Gan, Israel*

A special problem is faced by authors who need to employ in their publications a large number of native Semitic fonts, especially when these fonts involve alphabets in which the letters are physically connected and have positional variants. While various commercial solutions exist for particular cases when only two languages are involved (e.g. Syriac and English or Arabic and English), the problem is much more difficult from a practical point of view when more than two languages are involved. To this one may add the particular problems encountered by authors who also write articles in Hebrew and use this language as their major language in their publications.

A solution to these problems is now provided by a desktop publishing program developed in Israel by D. Weissman (programmer) and S. Guttmann (font designer) called TAG. This program was developed several years ago in order to prepare bilingual Hebrew and English manuscripts for publication in which the Hebrew texts contained both vocalization signs and Masoretic cantillation points. The advantages of this program over the most popular program in Israel (viz. Word) lie in its ability to control all parameters connected with the preparation of a manuscript in an exact manner, including the placement of diacritics exactly where they are desired above and below letters.

The present speaker became interested in the program when he had to prepare for publication two works which contain a large number of native fonts, viz. the volumes of the Corpus of Christian Palestinian Aramaic Texts from the Old Period (together with Ch. Müller-Kessler) and his A Dictionary of Jewish Babylonian Aramaic. In addition to the standard Hebrew and English fonts required for these works, the following additional ones were required:

Greek.

Vocalized Syriac.

Christian Palestinian Aramaic.

Babylonian upper vocalization of Hebrew and Aramaic words.

Clearly, there was no available wordprocessor which could solve this problem. Additionally, many of the fonts which were commercially available did not meet the esthetic requirements needed for publication of books of a high quality.

In the earlier days of desktop publishing authors generally prepared their manuscripts in their favorite wordprocessor which was then imported into a desktop publishing program from which the published version was then produced. Since the development of Windows based wordprocessing programs these two functions have been generally combined into one program. Unfortunately, when multilingual wordprocessing is involved, this solution may not always be the most effective one. While the following description may sound like a throwback to the earlier days of personal computing, in actual fact it has proved for this researcher at least to be the most efficient and least expensive manner in which to produce the books mentioned above.

The production is achieved by a two-staged process:

## 1. Input of the multilingual text

While TAG can be and is employed by many users as a wordprocessing program, the present writer did not find it to be efficient for this task. For many years previous to the development of TAG, the speaker had employed for all his work the DOS-based wordprocessing program Nota Bene in its Israeli version known as "Shapirit." This version which was developed in Israel for the needs of authors who write in both Hebrew and English and who need to use the other language in their work was probably the first successful bilingual wordprocessor of its type when introduced in the mid 1980's. Significantly, this version of the program had all of the advantages of Nota Bene of the time including especially the ability of the user to customize the program either by means of the XPL programming language or by introducing changes into ASCII files which controlled features of the program. From the multilingual point of view the program had the ability of displaying on the screen simultaneously over 3,000 characters by means of the Hercules+ video card and since the user could define a large number of keyboards accessible simply by hitting a key sequence (e.g. CTRL-1) it was easy both to input and display multilingual files on the screen. The speaker designed his own Syriac and Arabic screen fonts and was even able to print them through a program called Letterix, although the results were certainly not of publishable quality.

Eventually the Note Bene program was developed into a multilingual program called Lingua which was designed primarily for biblical scholars, and it had the ability to prepare manuscripts with multilingual Latinized signs, vocalized Hebrew, and Greek. With the chamgeover to VGA and SVGA screens the Hercules+ card became obsolete. Unfortunately, however, the ATI card which was employed with the program could simultaneously display on the screen about 500 characters a clear recession from the Hercules+ card. Additionally, the programmers opted for a more compiled version of the program and the ability to customize the program by editing the ASCII files was essentially eliminated. Clearly, while the program had all of the traditional advantages of Nota Bene (e.g. speed) it was not amenable to customization as easily as its earlier versions and there was no way of incorporating additional fonts such as Syriac.

As was pointed out above, the Shapirit version of the program had the ability of being able to input and to display over 3,000 characters. It was also possible to add customized fonts which went from right to left in the Hebrew registers and to input them easily into a text. Additionally, using a font design program for the Hercules+ card, there was no problem in designing vocalization and diacritic points as screen fonts, although on screen these appeared after and not over or below the intended letter. In short, the customized Shapirit version had the ability to input every needed character for a multilingual bilingual wordprocessor including Syriac, Arabic, and vocalization. What was missing was the ability to print the input in a proper and esthetically pleasing fashion.

## 2. Transfer of the files into TAG

Windows-based programs, of course, have the great advantage over DOS-based programs of being able to print TrueType fonts exactly as they appear on the screen. Thus, with the introduction of this operating system a new option was now available, viz. to print the files produced by the Nota Bene wordprocessor by means of a Windows based desktop publishing program.

In order to understand how the printing solution was achieved, I will describe in brief the structure of a TAG file and how the program operates:

There are two essential elements in the program, viz. the typesetting commands within the text file and the style file. The typesetting commands are codes made up of two letters or numbers or a combination of the two proceeded by the @-sign which are inserted into the wordprocessing file. The codes are related to the features which govern the program, e.g. page size, fonts and sizes, etc. which are all defined by the user in a style sheet. There are no limits on the number of style sheets one can use and they can be designed as required for each article or book. Additionally, the program has the ability of preparing extremely sophisticated kerning tables which can control not only the relative position of adjacent letters but which can also control the exact positioning of both vowel signs and cantillation points. This last feature gives TAG much power also with regard to the positioning of vocalization signs and diacritical points in Syriac

as we shall soon see.

It was a fortunate coincidence that the internal structure of the Nota Bene files was quite similar to that of the TAG files. Thus, an italicized word is indicated internally as <<MDRV>>italics<<MDNM>> [i.e. italics], a Syriac word as <<MDMN>> ܟܬܒ <<MDHN>> [i.e.ܟܬܒ]. In TAG, italics can be indicated simply as @it and Syriac as @sy. All that is then needed is a preprocessing program which will take a Nota Bene file and change it into a TAG file. Additionally, since Syriac is represented in the Nota Bene file by one ASCII sign for each letter, these signs had to be changed into their proper positional variants in order to give correct Syriac. Finally, the program had to place the vocalization signs and diacritics in their proper positions.

These goals were achieved in the following way: A preprocessing program was written to change the Nota Bene codes into TAG codes. This is of course a simple search and replace operation. However, since in a multilingual wordprocessor many of the same ASCII codes must be employed for the different fonts the programmer - using a C Program - had to utilize the imbedded codes to selectively change the Nota Bene codes into those used by TAG for each font. The program also contained a routine to change the Syriac codes into their proper positional variants depending on whether the letter occurs at the beginning, middle, or end of the word and which letters follow it. Following the preprocessing program which takes only a few seconds to run, the reworked file is imported into TAG in the usual fashion using the style sheet.

One of the fine features of TAG is its ability to kern both letters and accents exactly as desired. This is clearly one of the problems encountered by other programs used to print Syriac. A recent example of a book printed with improper placement of vocalization signs and diacritics is T. Muraoka's recent Classical Syriac, A Grammar and Chrestomathy (Wiesbaden 1997) in which the author employs an Estrangelo font and the eastern Syriac vocalization signs. A glance at this book will show that not only is the kerning of the letters extremely defective (e.g. many of them touch each other) but the vowel signs are improperly positioned in many cases (e.g. zeqfa together with seyame; qushaya together with upper vocalization; etc.). Additionally, this program apparently has to set a fixed height for each vocalization sign and does not take into consideration the relative height of each Syriac letter in order to place the vocalization sign slightly above or below it to give a more esthetically pleasing text.

The handout provided with this paper shows the ability of TAG to print:

1. Vocalized Syriac
2. Vocalized Hebrew with cantillation points
3. Hebrew vocalized with Babylonian upper vocalization
4. Greek
5. Christian Palestinian Aramaic
6. All of the above combined in the same file

In sum, this paper has had a "back to the future" aspect about it, viz. that in order to produce a better multilingual text including Syriac I still use a DOS-based wordprocessor from several generations ago. This is indeed true, but reflects my personal preferences and personl computer development. Indeed, a user of the program can employ his favorite wordprocessor and then input the text or employ TAG itself as the wordprocessor. The results combined with the extraordinary features of TAG and the high quality of its fonts have provided the speaker with the ability to produce a result which is both exact and esthetic.

**Document A**

recto

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]

verso

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]
11. [illegible]
12. [illegible]
13. [illegible]
14. [illegible]
15. [illegible]
16. [illegible]
17. [illegible]
18. [illegible]
19. [illegible]
20. [illegible]
21. [illegible]
22. [illegible]
23. [illegible]
24. [illegible]
25. [illegible]
26. [illegible]
27. [illegible]
28. [illegible]
29. [illegible]
30. [illegible]
31. [illegible]

witnesses

1. [illegible]
2. [illegible]
3. [illegible]

## ספר בראשית

פרק א

א. בְּרֵאשִׁית בָּרָא אֱלֹהִים אֵת הַשָּׁמַיִם וְאֵת הָאָרֶץ:
ב. וְהָאָרֶץ הָיְתָה תֹהוּ וָבֹהוּ וְרוּחַ אֱלֹהִים מְרַחֶפֶת עַל־פְּנֵי הַמָּיִם:
ג. וַיֹּאמֶר אֱלֹהִים יְהִי אוֹר וַיְהִי־אוֹר:
ד. וַיַּרְא אֱלֹהִים אֶת־הָאוֹר כִּי־טוֹב וַיַּבְדֵּל אֱלֹהִים בֵּין הָאוֹר וּבֵין הַחֹשֶׁךְ:
ה. וַיִּקְרָא אֱלֹהִים לָאוֹר יוֹם וְלַחֹשֶׁךְ קָרָא לָיְלָה וַיְהִי עֶרֶב וַיְהִי־בֹקֶר יוֹם אֶחָד:

**********

## תרגום אונקלוס – ספר בראשית

פרק א

(א) בַּקַדמִין בְּרָא יוי יָת שְׁמַיָּא וְיָת אַרעָא
(ב) וְאַרעָא הָוַת צְדְיָא וְרוֹקנְיָא וְחֶשׁוֹכָא עַל אַפֵּי תְהוֹמָא וְרוּחָא מִן קֳדָם יוי מְנַשבָא עַל אַפֵּי מַיָּא.
(ג) וְאֲמַר יוי יְהֵי נְהוֹרָא וְהֲוָה נְהוֹרָא.
(ד) וְחָזָא יוי יָת נְהוֹרָא אֲרֵי טָב וְאַפְרֵישׁ יוי בֵּין נְהוֹרָא וּבֵין חֶשׁוֹכָא.
(ה) וּקרָא יוי לִנְהוֹרָא יְמָמָא וְלַחֶשׁוֹכָא קְרָא לֵילְיָא וַהֲוָה רַמְשׁ וַהֲוָה צַפַּר יוֹם חַד.

**********

## ΓΕΝΕΣΙΣ

Chapter 1

1. Εν ἀρχῇ ἐποίσεν ὁ θεὸς τὸν οὐρανὸν καὶ τὸν γῆν.
2. ἡ δὲ γῆ ἦν ἀόθρατος καὶ ἀκατασκεύαστος καὶ σκότος ἐπάνω τῆς ἀβύσσου και πνεῦμα θεοῦ ἐπεφέρετο ἐπάνω ὕδατος
3. καὶ εἶπεν ὁ θεός Γενηθήτω φῶς καὶ εγένετο φῶς
4. καὶ εἶδεν ὁ θέος τὸ φῶς ὅτι καλόν και διεχώρισεν ὁ θεὸς ἀνὰ μέσον τοῦ φωτὸς καὶ ἀνὰ μέσον τοῦ σκότους

*AZ* 28a(29); 2) w. imp.: איזיל אנא לגביה I shall go to him *Yom* 87a(48); איעול אנא I will enter *Ḥag* 5b(40); אנא איחות לארעא I shall go down to the field *BM* 15b(37); אסייך אנא I shall heal you *BQ* 85a(51); *BB* 6b(42); 3) w. part.: אנא קאמינא I am standing *Ket* 2b(1); אנא פליגנא אמגוזי I shall distribute nuts (to the children) *BM* 60a(40); אנא מסינא נפשאי I will heal myself *BQ* 85a(53); לית אנא פתחא לכון I will not open for you *Bo* 76:4; 4) w. pass.part.: אנא שכיחנא בגו ביתא I am usually [lit. found] at home *Ket* 67b(40); *San* 5a(6); c. in casus pendens: אנא קביעא תשמשאי ואת לא קביעא my usage is not established *BB* 2b(36); אנא הכי שמיע לי I have heard it so [i.e. have a tradition] *Ber* 10a(37); אנא כתלמידי דרב סבירא לי I am of the same opinion as the students of PN *Pes* 103a(34); אנא חד סהדא אית לי I have one witness *Švu* 31a(17); *Men* 29b(37); אנא פרה דידך אויקתן your cow caused me damage *BQ* 46b(31); d. in cleft sentences: אנא הוא דקיימא לי שעתא it is I whom the moment favors *Tan* 21a(14); לאו אנא דיהבתיה לך it is not I who gave it to you *Bek* 36b(15); e. after preps.: ↓ כגון prep., mng. I.a, כי prep. mng. 1b

Lit.: Satzlehre 11• (as copula). In the phrase אנא ל *Er* 3a(14) this pron. seems to be exceptionally used as an acc. form; however, this is prob. a corruption of דלאן• [i.e. ל (imper. of √דלי pa.) w. 1sg. acc. pron. [↓ √דלי pa.]; cf. Ma דאליאן Nöld, MG 285:5] which was misinterpreted as ל• אנא > ל אנא. Voc: אנא HPP 235:21; Y: אָנָא *Ber* 2b(51).

**אנבא** n.m. tick (etym. unkn.; ↓ אינבא) sg. *OHP Pes* 141:7

Gaon. expl.: והוא רמש כגון אנבא שנושכין בכשר בהמה וחם קטנים ואינן נפרדין מסנה אלא בעשיית חבורה ... ובלשון ערבי קורין לתולעת קִרְדָּאן, i.e. قُرَّاد.

**אנבג** n.m. liquid measure (later P form < ↓ נבגא, אנפקא 1#) sg. אנפק *BB* 58b(15)

Lit.: Shaked, ILW (forthcoming); Y: אָנְבָּג *ib.*

**אנבגא** n.m. wine (later P form < ↓ אנפק 2#) sg. לישתי מר אוג(נ)בגא will you drink wine? *Qid* 70a(41) [O³: אנבג]

Lit.: Geig, AAC 35; Shaked, ILW (forthcoming); Shaked, Food (forthcoming).

**אנדיסקא** n.m. state official (< MP **handēsak* Geig, AAC 36; cf. Mlr *des(ag)* form, appearance CPD 26) pl. *BB* 55a(19)

Lit: Y.A. Solodukho, Sovyetskoe Vostovedenie 5(1948) 65; Shaked, ILW (forthcoming); Y: אַנְדִיסְקֵי *ib.*

**אנדיפא** n.m. temple (etym. unkn.; ↓ אפותא) sg. ומחיתיה באנדיפי' ומית (the hornet) stung him on his temple and he died *Šab* 80b(31)

Gaon. expl.: ואנדיפי בלשון ישמעאל אגדג והוא מקום מקצוע הפנים OHP Šab 39:24, i.e. أَصْدَغ temples; Lehnw 64 suggests a Gr etym.

**אנדראטא, אַנְדְרָטָא** n.m. statue, bust (< ἀνδριάς, -άντος Lehnw 65; Sy ܐܢܕܪܝܐܛܐ LS 28, Pal אדרט PAT 335, DNWSI 20) sg. חזא אנדראטא וסגיד ליה he saw a statue and bowed down to it *San* 61b(38) // אינדרטא *Šab* 72b(30) // אנדרטא *Kar* 3a(56); ההוא בי כנישתא דשף ויתיב בנהרדעא דאוקימו בה אנדרטא a certain synagogue of ... in GN in which they set up a statue *RH* 24b(37) // *AZ* 43b(27); pl. אתעקרו כל אנטרדיא all the statues were pulled down *MQ* 25b(39)

Note that as in Pal, the assimilation *-nt-* > *-tt-* occurs; Y: אַנְדְרָטָא *RH ib.*

**אָנוֹסָא** n.m. violent person (↓ √אנס *qātōl*-form) sg. ואתא אָנוֹסָא ואנסיה a violent person came and attacked him *HP* 208:13(HPP 310:18); סתם גוי אנוסא הוא any gentile is (considered) a violent person *TGAs29* 35:19; *TGAs42* 24:4; pl. ושמעי אנוסי ואולי אנסי ליה the violent people will hear (about him), will go, and attack him *Ara* 16a(9; MGL 383:16); *TGAs42* 23:10; *ib.* 18; 20; *TGHark* 118:18; *Geon* 267:4

**אנתא, אנותא** n.f. type of jar (perh. < Akk *unūtu* utensil AHw 1422) sg. אנותא דמישחא an '-jar of oil *Bo* 125:11 [// מנא דמשחא ib. 112:10]; אנתא דמשחא *Men* 78a(20; V¹⁰)

Lit.: Ch. Müller-Kessler, JSS 43(1999) xx. The traditional expl. as a loaf of congealed oil [cf. Ar שַמַן קִרְוש עגל כמין לחם היינו שמן לחם AC 1:162; v. Eps, Stl 37] should now be rejected.







**אנה** vb. to sigh (↓ תנחא; Sy ܐܢܚ pe., etpe. LS 28, Ma אנה etpa. MD 26) **Itpe.:** כי מטא האי פסוק' איתנח when he came to that verse he sighed *Sab* 152a(44); *Ber* 58b(9); *ib.* 13; נגיד איתנח רב חסדא PN wailed and sighed *Ber* 58b(8) [cf. Ma נאגיד ומיתאנא Gs 49:18]; בהדי דקא שקיל ליה נגיד ואיתנח אמ' ליה אמאי קא מיתנחת while he was cutting his hair, he wailed and sighed. He said to him: "Why are you sighing?" *Meg* 16a(20); *BM* 66a(12); *San* 39a(17)

Gaon. expl.: תנהורו(ר)א OHP Ber 106.9, i.e. تَنَهَّد (בּ VII).

**אֲנַחְנָא** pron. we (archaic and dialectal; ↓ אנן; BA אַנְחְנָא HAL 1669, TA אַנְחְנָא TO Gen 43:8) a. in writs: אנחנא שהדי חתימנא על מחקא we, the witnesses, signed on the erasure *BB* 164a(10); וכתבנא לה אנחנא שהדי גט מיאון דנן we, the witnesses wrote this annulment document for her *SSHai* 13a(13); *ib.* 15a(15); 17a(15); ועיינא אנחנא ורבנן דהוו יתבי קדמנא we and the Rabbis who were sitting before us looked into the matter *Dec* 9:7; *TGHark* 117:15; *SSSad* 230:23; *ib.* 204:8; b. in Gaonic texts: לא שמיע לנא אנחנא we have not heard it *TGHark* 38:27; *ib.* 101:27; 277:6; 159:11; 195:33; *TGAs29* 99:10; *TGAs42* 52:18; *Geon* 230:27; ולאו מן בני דבוסתנאי אנחנא we are not from the sons of PN *ISGF* 93:1; *ib.* 51:23; 60:15; אנחנא כתבנא we have written *Bo* 1:14

**אנטל** n.m. a bucket (< ἀντλίον Lehnw 71) sg. *BB* 58b(15) [contains 1/4 log]

Not to be connected w. ↓ נטלא (v. Nöld apud Fr, AF 66).

**אניגרא** n.m. a type of coin (etym. unkn.) sg. דינרא ניקא ואניגרא a *n.*-dinar and a ... *BM* 46b(25)

Lit.: Lehnw 63, s.v. אנגרא.

**אניגרון** interj. (word in a charm formula) *Sab* 109b(34)

**אֲנִין** adj. (cf. Sy ܐܢܺܝ to sigh LS 27) sg.f., only in phrase **אנא אנינא דעתאי fastidious:** I am fastidious *Ber* 24b(24); *Yom* 30a(20); *ib.* 22; *Suk* 29a(13; M²); *BB* 23a(9; Es); *Ḥul* 112a(25) Y: אֲנִינָא *Ḥul ib.*(Mo 239).

**אניסכא** n.m. woven material (↓ √נסך, 1#נסכא) sg. *Šab* 59b(11) [of a wreath; ≠ ↓ ארוקתא]; *ib.* 15; 38

Rall: תשין מלשון מסכת; Y: אֲנִיסְכָא *ib.*

**אניש** ↓ **אנש**

**אנך** ↓ **הנך**

**אֲנָא** n.m. tin (Akk *annaku* CAD A/2 127, Sy ܐܢܟܐ LS 29, Ma אנכא MD 27, > Arab قَلْع Fr, AF 153) sg. *Bo* 78:11; כתוב על טסא דאנכא write on a plate of tin *ḤM* 83:23

**אֲנַן** pron. we (JPA אנן DJPA 66, Ma אנין, MD 27, Sy ܐܢܚܢ LS 28) a. in nominal phrases: 1) subj.: אינהו בדלא ואנן בשפלא it was in the high position, and we were in the low position *HH* 73b(25; HP²); אינהו בי תלתה ואנן בי תרי they are three and we are two *San* 93a(44); אנן סהדי we are witnesses *Ber* 17b(39); אנן פועלי דיממא we are day laborers *Er* 65a(39); *Ara* 10b(24); אנן מעלינן מניכו we are better than you *Pes* 87b(42); *Bek* 8b(11); *BM* 83a(29); *San* 28b(35); 2) pred.: אנן יד העניים אנן we are agents of the poor *HQ* 36b(39); אנן כי הדדי אנן we are all alike *Ber* 45b(46); *Suk* 10b(16); *San* 33a(17); 3) after כגון: כגון אנן דשכיחא לן בישרא וחמרא like us who frequently (eat) meat and wine *Šab* 119a(42); *Tan* 14b(16); b. in verbal phrases: 1) w. pf.: אנן תנן we learnt *Šab* 65a(35); *ib.* 93a(25); אנן נמי מחריפתא דנהרא תפיסנא we also seized (it) from the swift current of the river *Ket* 85a(7); אנן אגרנו(י)ה מיניה we rented it from him *BB* 29a(34); 2) w.

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 12-18

# Encoding Syriac in ISO/IEC 10646 (Unicode)

**SARGON HASSO**
*shasso@lucent.com*
*Lucent Technologies*

**GEORGE KIRAZ**
*gkiraz@research.bell-labs.com*
*Bell Labs, Lucent Technologies*

**PAUL NELSON**
*paulnel@microsoft.com*
*Microsoft Corporation*

***Abstract***

We present a description of a proposal submitted to Unicode, Inc. to encode Syriac scripts in ISO/IEC 10646. The goal is to produce a uniform Syriac character-encoding scheme that provides a standard method for writing current Syriac and a common means for the electronic storage and interchange of manuscript data. The languages and dialects that employ the Syriac scripts in one form or another, and either currently or sometimes during the past include, among others: Literary Syriac, Neo-Aramaic, Garshuni, and Christian-Palestinian Aramaic. This proposal encodes most characters used in Syriac texts that encompass three major scripts: Estrangela, Serto or West Syriac, and East Syriac scripts. This proposal can also serve as a specification document for implementers interested in developing a multi-lingual software systems, e.g., word processing, desktop publishers, database systems, dictionaries, and others.

## I. INTRODUCTION

This paper describes a proposal that we submitted to Unicode Consortium to include the Syriac scripts in the Unicode Standards. This proposed assignment for Syriac characters was created by merging a previous proposal worked on by Sargon Hasso, Rick McGowan, and Michael Everson with a proposal created by George Anton Kiraz and Paul Nelson. The proposal of characters to use has been derived from characters currently used in writing the Syriac language and characters commonly found in a broad range of manuscripts used for study. The desire is to be able to not only provide a standard method for writing current Syriac, but also a common means for the electronic storage and communication of manuscripts and various textual data. The previous proposals deemed incomplete for approval as a standard. Therefore, the current proposal augmented previous attempts in the following areas:

Vowel, overstrike, and punctuation marks were added to allow for the proper writing of languages which employ the Syriac type styles.

Additional characters were added to allow for the writing of non-Syriac languages that employ Syriac type styles, e.g. Christian Palestinian Aramaic (also known as Palestinian Syriac), Garshuni (Arabic written in Syriac type styles) and various modern Neo-Aramaic dialects.

Joining rules. Letters were classified into joining classes (e.g., which letters connect to their neighboring letters and in which manner). Special joining rules for the Alaph were indicated.

Ligature rules were added to show how Syriac should handle the combining of letters into ligatures.

Abbreviation rules were stated to show how the Syriac abbreviation is implemented.

In section II we discuss very briefly the Unicode Standard and its relation to the International Standard ISO/IEC 10646. To better appreciate what the proposal is about, we give in section III a brief overview of the Syriac Language, its various dialects, and the Syriac scripts it uses. In section IV, we examine in some details the contents of the proposal. The proposal is published on the World Wide Web (Nelson, Kiraz, Hasso: 1998).

## II. The Unicode Standard and ISO/IEC 10646

The Unicode Consortium is a standards organization body that was incorporated in 1991 and run under the name Unicode, Inc. Its purpose is to promote a unified standard, to aid in its implementation, and to maintain control over its future maintenance. The Unicode Standard is a universal character encoding scheme for character representation in computer processing and information exchange. It is based on the widely common ASCII encoding scheme but has the potential to encode almost all the written scripts in the word. It accomplishes this by assigning a unique 16-bit wide number to each character in every script.

Each and every character in the Unicode Standard has a unique identification number referred to as code value, and a unique character name that serves as its definition, referred to as name. Code values are specified in hexadecimal number format following the designation "U". For example, the SYRIAC LETTER Kaph, has code value U+071F (1823 in decimal format). The Unicode Standard does not concern itself of what the representational form these characters have. Technically, the character code serves as an abstract unit, and its representation form is called a glyph. Information processing applications deal internally with codes. When they display information, they map these codes to their glyphs. The Unicode standard also provides some additional information that help application developers implement these encoding schemes especially those applications that handle complex multilingual scripts. Thus application software will be able to process multilingual textual information with ease by referring to character encoding databases.

The Unicode Consortium encourages the submissions of new scripts for possible inclusion in the Unicode Standard. Our work on Syriac script over the past few years has culminated in a fairly complete standard document nearing its full approval as part of the growing Unicode Standard. The Unicode Standard is fully compatible, code-for-code, with International Standard ISO/IEC 10646 (Unicode 1996).

## III. The Syriac Language and Syriac Scripts

The Syriac language belongs to the Aramaic family of languages. The earliest datable Syriac writing is in the form of inscriptions from Birecik, dating A.D. 6 (Maricq 1962, Pirenne 1963). Three legal documents from the third century (dated 28 Dec 240, 1 Sept 242 and 243, respectively) were discovered in the Euphrates valley (Brock 1991, Drijvers 1972). The earliest literary Syriac manuscript is dated November A.D. 411 (Hatch, 1946) with an unbroken tradition of writing till the modern time.

Today, Syriac is the active liturgical language of many communities in the Middle East (Syrian Orthodox, Assyrian, Maronite, Syrian Catholic and Chaldaean) and Southeast India (Syro-Malabar and Syro-Malankara). It is also (in various dialectical forms written using the Syriac scripts) the native language of a million or two (although no reliable statistics can be found). Syriac is widely used among its natives in their native lands, as well as the diaspora in Europe, the Americas and Australia. Additionally, Syriac is the subject of study for many Western scholars who publish texts in the Syriac scripts, e.g., the monumental ca. 230-volume Scriptores Syri of the CSCO series.

Syriac is divided into two dialects. West Syriac is used by the Syrian Orthodox, Maronites and Syrian Catholics. East Syriac is used by the Assyrians (i.e., Ancient Church of the East) and Chaldaeans. The two dialects are very similar in grammar and vocabulary. They differ, however, in phonology (i.e., pronunciation) which has no impact on this work. However, each of the two dialects has its own script, each script with its own idiosyncrasies.

There are a number of other languages and dialects that employ the Syriac script in the modern time in one form or another. These are:

Literary Syriac. The primary usage of Syriac scripts.

Neo-Aramaic dialects. "Modern Aramaic languages," Hobermann notes "have been written with the Syriac, Hebrew, Cyrillic, and Roman scripts, but only the Syriac script has gained widespread use." (Hobermann, 1996, p. 504). To this category of languages belong a number of Eastern Modern Aramaic dialects known as Swadaya (also called 'vernacular Syriac', 'modern Syriac', 'modern Assyrian' etc., spoken mostly by the Assyrians and Chaldaeans of Iraq, Turkey and Iran), and the Central Aramaic dialect of Turoyo (spoken mostly by the Syrian Orthodox of the Tur Abdin region in Southeast Turkey). These formerly "spoken" dialects have become literary in the past hundred years or so (see Murre-van den Berg,

1994). They employ the Syriac scripts in addition to overstrike marks to indicate sounds not found in, but similar to, Syriac ones (Maclean 1971).

Garshuni, i.e., Arabic written in the Syriac script. This mode of writing is currently used for writing Arabic liturgical texts amongst the Syriac-speaking Christians. A large corpus of manuscripts ranging from the 8th century till the modern day exists in Garshuni (Mingana 1933). Garshuni employs two additional letters and the Arabic set of vowels and overstrike marks.

Christian Palestinian Aramaic (known also as Palestinian Syriac) employs the Syriac scripts with one additional letter, the reversed Pe (Schulthess, 1979). This dialect is no longer spoken, but there has been recent scholarly interest in publishing its texts, e.g. (Müller-Kessler and Sokoloff, 1996 and 1997).

Other languages. The Syriac scripts were used at various historical periods for writing Armenian and some Persian dialects. Syriac-speakers employed them for writing Arabic, Ottoman Turkish, and Malayalam. Manuscripts written in this manner survive and are the subject of study by Western scholars. Syriac-speaking peoples wrote Ottoman Turkish in the Syriac scripts as late as the beginning of this century (e.g., Al-Intibah newspaper published in New York by immigrants in the 1900s-1920s). They continue to write Arabic in this manner (see under Garshuni above).

Syriac texts employ the following scripts:

Estrangela script. Estrangela (a word derived from Greek strongulos meaning 'rounded') is the oldest script. Ancient manuscripts use this writing style exclusively. Estrangela has seen a revival in the twentieth century (it has seen an earlier revival in the 10th century whence it has been defunct for a hundred years, as we are told by the historian Bar Ebroyo, (Hatch 1946, p. 26). Estrangela is used today in West and East Syriac texts for writing headers, titles and subtitles. It is also used in cards, engravings, etc. Most importantly, this script is the current standard in writing Syriac texts amongst Western scholarship, almost exclusively.

Serto or West Syriac script (also misnamed "Jacobite"). This script is the most cursive of all. It emerged around the 8th century (Healey 1990) and is used today in West Syriac texts, as well as Turoyo (Central Neo-Aramaic) and Garshuni.

East Syriac script (also misnamed "Nestorian"). Its early features appear as early as the sixth century; it developed into its own script by the 12th or 13th centuries (Healey 1990). It is used today for writing East Syriac texts, as well as Swadaya (Eastern Neo-Aramaic). It is also used today in West Syriac texts for headers, titles and subtitles alongside the Estrangela script.

Christian Palestinian Aramaic. Manuscripts of this dialect employ a script that is akin to Estrangela. Indeed, it can be considered a sub-category of Estrangela.

This proposal provides for usage of the scripts mentioned above. Additionally, it provides for letters and diacritics used in Neo-Aramaic languages, Christian Palestinian Aramaic, and Garshuni languages.

## IV. A Closer Look at the Syriac Proposal Contents

In this section we examine briefly some of the contents of this proposal. This can serve as an introduction to the understanding of the complete proposal. The Unicode Standard has three basic design principles in which any character set must have (Unicode 1999):

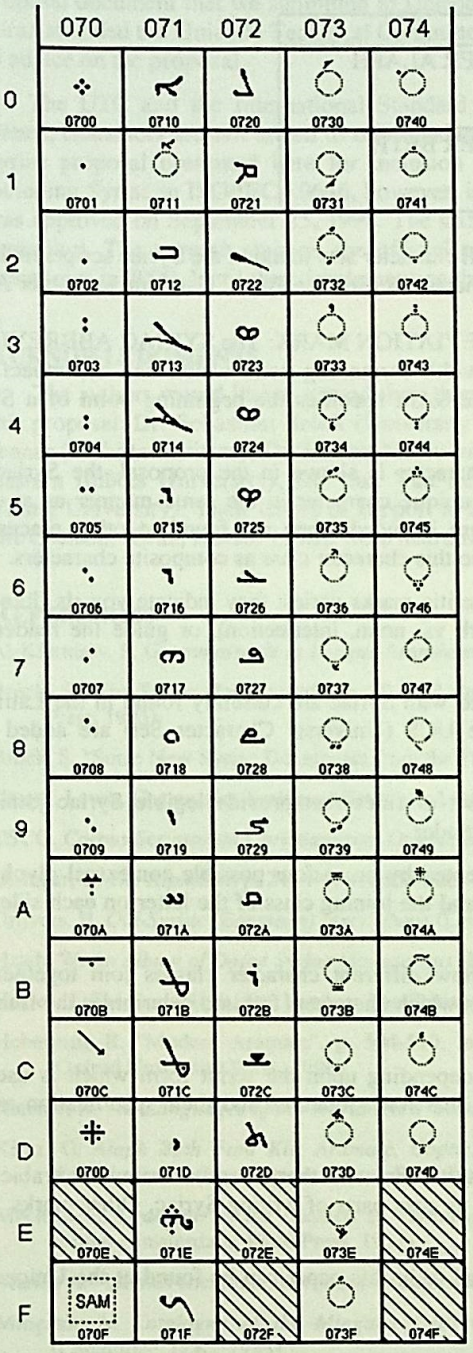
define the smallest useful elements of text to be encoded,

assign a unique code to each elements, and

provide basic rules for encoding and interpreting text so that programs can successfully read and process text.

Our proposal satisfies all of these design requirements. Additionally, we felt that we needed to address issues about the Syriac scripts not explicitly examined elsewhere. With this in mind, we hope we can serve the Syriac-speaking communities, publishers, scholars, and information processing experts with all the information they need to use, store, and exchange Syriac textual information in electronic or paper-published form. The Unicode Standard groups related characters in code blocks. Each code block is

represented by its code chart. The complete code chart for Syriac script looks like this (characters are in Estrangela script):




The code for each character is computed by appending the column heading numerical value with the character's row designation. For example, the code of Alaph is 0710 (071 is the column value and 0 is the row value) and the code of Taw is 072D. For ease of usage, the codes are specified in each entry in the above chart.

The Unicode standard also requires, as was mentioned previously, character names that serve as their definitions. Here is a sample of the Syriac name chart:

| Glyph | Unicode | Name |
|---|---|---|
| ܐ | U+0710 | SYRIAC LETTER ALAPH |
| ܒ | U+0712 | SYRIAC LETTER BETH |

The code chart and its companion name chart cover all character sets found in the Syriac scripts including:

1. *Letters of the Alphabet.* These are the base characters used for Syriac, Garshuni and other Aramaic dialects.

Syriac Control Character - The SYRIAC ABBREVIATION MARK: The SYRIAC ABBREVIATION MARK (SAM) U+070F is a user-selectable zero-width formatting code which has no impact on the shaping process of Syriac characters. The use of the SAM specifies the beginning point of a SYRIAC ABBREVIATION.

Combining Characters. Only one combining character is shown in the proposal--the Syriac Letter Yudh-He, U+071E. This combination is used as a unique character in the same manner as an "æ". A number of combining diacritics unique to Syriac are included when not found at other places in the Unicode Standard. The Unicode Standard also refers to this character class as composite characters.

Diacritic Marks/Vowels. The function of the diacritic marks varies: they indicate vowels (like Arabic and Hebrew), mark grammatical attributes (e.g., verb vs. noun, interjection), or guide the reader in the pronunciation/reading of the given text.

Punctuation Marks. Most punctuation marks used with Syriac are currently found in the Latin-1 and Arabic blocks. Punctuation marks not found in the UCS (Universal Character Set) are added to this proposal.

The proposal document provides a minimum set of rules that provide legible Syriac joining and ligature substitution behavior. These specifications include:

Joining Classes. Each Syriac character is represented by up to four possible contextual glyph forms. The form used is determined by the its joining class and the joining class of the letter on each side. These classes are identical to those outlined for Arabic.

Joining Rules. These rules specify explicitly how different character classes join together when rendered (displayed) visually. Naturally, the context in which characters fall into determines the final glyph form.

Ligature Classes. Ligatures are valid in Syriac depending upon the script form which is used. The proposal lists most common character combinations that form ligatures and their specification as either optional or mandatory for rendering purposes.

The proposal contains a chart that specifies which characters that are used from the Arabic block: punctuation marks, tatweel and the shaddah are used as core parts of writing Syriac. Other marks, mainly diacritics, are used in Garshuni.

The complete proposal with all the charts referred to in this paper can be found at the Unicode Inc., World Wide Web site (Nelson, Kiraz, Hasso: 1998).

## V. Conclusion

The Unicode Standard is worldwide character encoding scheme that covers just about all the written world scripts. Unicode allows for all textual elements to be encoded in a universal, efficient, uniform, and unambiguous manner. It uses 16-bit numbers that has the capacity to encode over 65,000 characters. The Unicode Standard, Version 2.0 contains 38,885 character codes. Many world scripts are being submitted

and reviewed for possible inclusion in the standard.

Our work, with assistance of many of our colleagues over the past few years, has culminated in a proposal document that we submitted to Unicode in 1998. On February 27, 1998, Paul Nelson and George Kiraz attended the Unicode Technical Committee (UTC) meeting, held at Microsfot's Offices in California, to advice on the proposal.

The UTC and the International Standard Organization (ISO) collaborate in assigning code points. Hence, characters are not added to one standard without being approved for the other. UTC approved the Syriac proposal presented here for inclusion in Unicode on February 27, 1998. The ISO process for including Syriac in ISO/IEC 10646, however, is much slower and consists of seven stages. The fifth stage was approved on September 25, 1998. The sixth stage is holding a final ballot (and at this stage is a mere formality). The seventh stage is the official publication of the proposal. This is expected to take place sometimes in 2000. Until then, implementing the Syriac block of Unicode is at implementers risk!

## Acknowledgments

The authors would like to extend their thanks to a number of people who reviewed and commented on this proposal: Dr. Sebastian Brock (University of Oxford), Dr. J. Coakley (Harvard University), Dr. K.D. Jenner (Peshitta Institute), Dr. Heleen Murre-van den Berg (Leiden University), Dr. Edward Odisho (North Eastern Illinois University), Dr. Luk Van Rompay (Leiden University) and Dr. Jan Wilson (Brigham Young University). Their letters of support to the Unicode Consortium, which are available from the Web site (Nelson, Kiraz, Hasso: 1998), were instrumental in getting the proposal through.

## References

Al-Kfarnissy, P. *Grammaire de la Langue Araméenne Syriaque* (Beyrouth, 2nd edition, 1962).

Brock, S. "The Syriac Background", p. 30, n. 2. In Lapidge, M. (ed.), *Archbishop Theodore* (Cambridge University Press, 1995).

Brock, S. "Some New Syriac Documents from the Third Century AD", Aram 3 (1991), pp. 259-67.

Costaz, Lewis, *Grammaire Syriaque* (Beyrouth: Librairie Orientale, 1955).

CSCO. *Corpus Scriptorum Christianorum Orientalium. Scriptores Syri* (Lovanii: 1904-1998).

Diringer, D. *The Alphabet*, p. 218 (New York: Funk & Wagnalls, 1968).

Drijvers, H. *Old-Syriac (Edessean) Inscriptions* (Leiden: Brill, 1972).

Hatch, W. *An Album of Dated Syriac Manuscripts* (Boston: The American Academy of Arts and Sciences, 1946).

Healey, J. *The Early Alphabet* (London: The British Museum, 1990).

Hoberman, R. "Modern Aramaic", p. 504-510. In Daniels, P. and Bright, W. (eds) *The World's Writing Systems* (Oxford University Press, 1996).

Katzner, K. *The Languages of the World* (New York: Funk & Wagnalls, 1975).

Kiraz, G. *Alaph Beth Font Kit: Aramaic, Coptic, Hieroglyphic, North Semitic, Phoenician, Sabaean, Syriac and Ugaritic Fonts*. (Los Angeles: Alaph Beth Computer Systems).

Maclean, A. *Grammar of the Dialects of Vernacular Syriac as Spoken by the Eastern Syrians of Kurdistan...*, 2nd edition (Amsterdam: Philo Press, 1971).

Maricq A. "La plus ancienne inscription syriaque: cell de Birecik" *Syria* 39 (1962), pages 88-100.

Mingana, A. *Catalogue of the Mingana Collection of Manuscripts*, vol. 1, Syriac and Garshuni Manuscripts (Cambridge, U.K., 1933).

Müller-Kessler, C. and Sokoloff, M. *A Corpus of Christian Palestinian Aramaic* (Groningen: Styx, 1996-1997).

Murre-van den Berg, H. *From a Spoken to a Written Language, The Introduction and Development of Literary Urmia Aramaic in the Nineteenth Century*, Ph.D. thesis, Leiden University, 1994.

Nelson, P., Kiraz, G., Hasso, S.. *Proposal to encode Syriac in ISO/IEC 10646*, 1998, (URL:

http://www.unicode.org/pending/syriac/default.htm, 1998).

Noldeke, T. *Compendious Syriac Grammar*, translated by James Crichton (London: 1904).

Oudo [sic.], T. *Treasure of the Syriac Language* (Holland: Bar Hebraeus Verlag, 1985).

Pirenne, J. "Aux origines de la graphie syriaque" in *Syria* 40 (1963).

Robinson, T. *Paradigms and Exercises in Syriac Grammar* (Oxford University Press, 4th edition, 1978).

Schulthess, Friedrich, *Lexicon Syropalaestinum* (Amsterdam: APA Oriental Press, 2nd edition, 1979). [Material on Pe, pp.154 ff.]

Segal, J., *The Diacritical Point and the Accent in Syriac* (Oxford University Press, 1953).

Smith, Payne, *Thesaurus Syriacus* (Oxford: The Clarendon Press, 1879).

Unicode, Inc., *Unicode Standard, Version 2.0* (Addison Wesley Longman, 1996).

Unicode, Inc., *The Unicode Standard, A Technical Introduction* (URL: http://www.unicode.org/unicode/standard/principles.html, 1999).

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 19-20

# Demonstration of Syriac Computing using the Windows Operating System

(Demo Abstract)

**PAUL NELSON**

*paulnel@microsoft.com*
*Microsoft Corporation*

Supporting Syriac under current Windows platforms is not an easy task. Apart from the Arabic and Hebrew versions of Windows, all Windows platforms expect left-to-right editing. There have been a number of utilities around where users enter Syriac texts in a right-to-left Windows, then use the clipboard (manually or automatically) to insert the text in a left-to-right application. This approach has many disadvantages, mainly that once the text has been pasted onto the desired application, editing the text becomes even more arduous.

Another approach is making a font that works under a bi-directional operating system such as Arabic Windows. While this approach is more desirable than the former one, it has its own disadvantages. Syriac letters the are not compatible with their Arabic counterparts in terms of textual analysis (e.g. Syriac taw connects to what follows, but not Arabic ta) have to be placed on obscure keys. More seriously, the operating system does not recognize the Syriac text as Syriac; in its eyes, it is Arabic text written in a Syriac font. Hence, sorting, spelling, etc., does not work.

Our aim here is to provide for a native support of Syriac under Windows. This presentation will demonstrate research work done to add Syriac language support to the Uniscribe Complex Script engine (Uniscribe), the lower level functions used by Windows applications to display complex scripts. This will allow any application that uses Uniscribe and its text rendering engine to automatically support Syriac, provided the user has a compliant Syriac font.

Syriac is considered a complex script because it must be preprocessed in order to get the correct contextual shape. There are glyphs that represent each form of the character in various contexts.

During my research, I have adjusted Uniscribe to:

Correctly identify Syriac Unicode characters (see Hasso, Kiraz and Nelson in this volume).

Shape them in the correct contextual shape.

Place characters, including diacritics, in the correct typographic location.

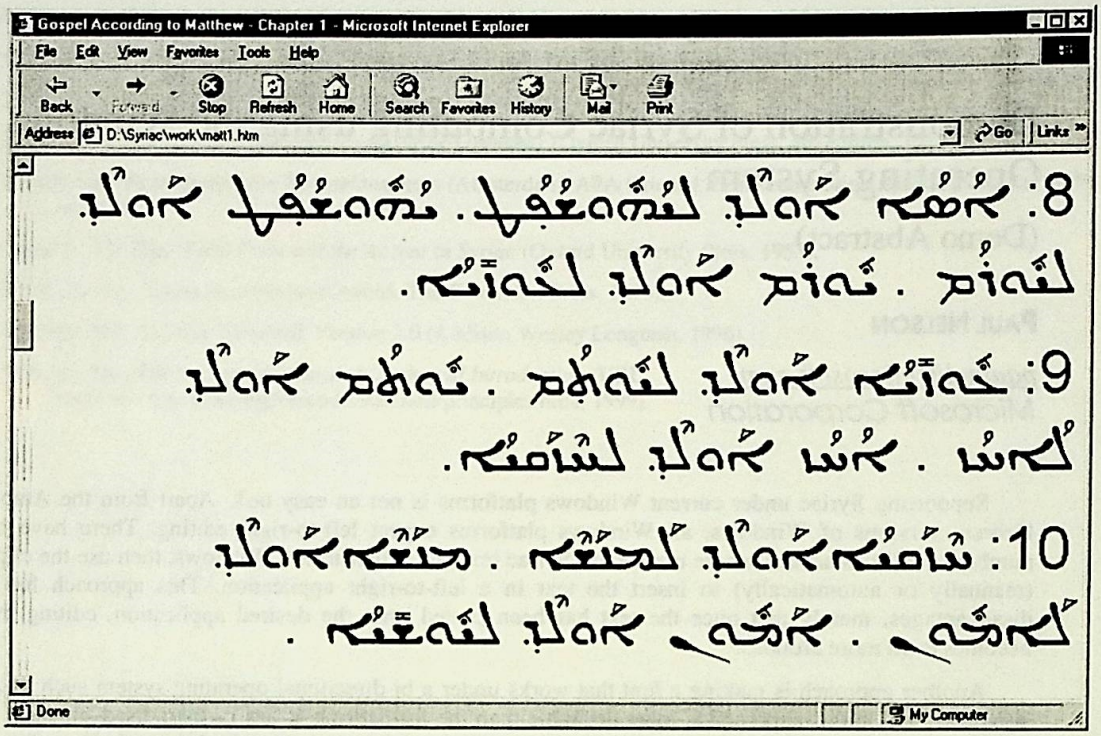
To correctly place diacritics on characters, I have implemented the Arabic/Syriac shaping engine using the OpenType Library. The OpenType library has tables that provide for correct mark-to-base and mark-to-mark placement on a glyph by glyph basis.

In collaboration with George A. Kiraz, we have developed templates for creating fonts for three type styles of Syriac: Estrangela, Serto and Eastern. The same engine is utilized for shaping all three type styles. Fonts contain tables that correctly position characters and diacritics for that specific face.

The figure at the end of this abstract gives the phrase "Where do you want to go?" in the Estrangelo script using Microsoft Internet Explorer.

To my knowledge, this is the first implementation of the Syriac Unicode standard. It is hoped that the

work described here will be of service to the academic community as well as to Syriac-speakers.



# The Use of WordCruncher Software for Electronic Publishing of Syriac Texts

(Demo Abstract)

**JAN WILSON**

*jan_wilson@byu.edu*
*Center for the Preservation of Ancient Religious Texts*

The Center for the Preservation of Ancient Religious Texts in Provo, Utah, is using the experience they gained when creating a Hebrew/Aramaic database of the Dead Sea Scrolls to create a database of electronic Syriac texts which will allow the user to do sophisticated searches on words, phrases, partial words, and other substring combinations. In addition, this software will allow scholars to do word studies on Syriac vocabulary by doing frequently distributions and collocation analyses, which will show the words with which a particular target morpheme is most commonly associated and other details about word usage. This software will also allow versions of a particular text to be scrolled simultaneously (such as the Peshitta NT simultaneously with the Sinaiticus) and thus allow a close study of textual variants. It is anticipated that we will eventually be able to allow the end user to shift on the fly between scripts (e.g. from Serto to Estrangelo or to the Eastern script). WordCruncher is also useful in gathering the data used in some techniques of word print analysis. The demonstration will show some of these features.

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 22-27

# Leading Students to Syriac Resources on the World Wide Web:

## Retrieval and Evaluation Skills

**AMY E. AGNEW**

*agnew@cua.edu*
*Mullen Library, The Catholic University of America*

***Abstract***

Students can search the Web without specific sources in mind or without complete information on a source. Search engines, which are essentially indexes of the Web, are available in order to assist them in finding materials. Search engines are indexed by computers, also known as robots, crawlers, or spiders. Search directories are compiled by professional indexers. Both types of search tools have unique features and strengths. Students should read Web pages as they would any other printed resources. Assessing the research value of a Web page is an important skill. The five different search engines and directories that will be explored are AltaVista, HotBot, Northernlight, Yahoo!, and ABZU. Their formulas for refining the precision of a search will be demonstrated. I will also look at institutional and organizational Web guides as another way to find Syriac resources. General evaluation guidelines for Web pages will be proposed.

### I. INTRODUCTION

Students can search the World Wide Web[1] without specific sources in mind or without complete information on a source. Search engines, which are essentially indexes of the Web, are available in order to assist them in finding materials. Most search engines are commercially maintained. One exception to this is Argos. It is maintained by the academic entity of the same name sponsored by the University of Evansville. Search engines (AltaVista, HotBot, Northernlight) are indexed by computers, also known as robots, crawlers, or spiders. Search directories (Yahoo! and ABZU) are compiled by professional indexers. Both types of search tools have unique features and strengths. These will be discussed below.

The Web is not designed to provide small, specific pieces of information. It gives access to many different sources of information. Search engines are easy to use because they allow for natural language searching. An AltaVista search "what language did Jesus speak?" retrieves over five and a half million results[2]. Formulas for refining the precision of such a search will be presented.

Students should read Web pages as they would any other printed resource. Assessing the research value of a Web page is an important skill. General evaluation guidelines will be proposed.

### II. SEARCHING FOR RESOURCES

Two major approaches to finding materials on the World Wide Web will be discussed and demonstrated: (1) Search engines and directories to retrieve information on the Web, and (2) Institutional home pages as a starting point for finding information.

---

[1] "The 'multimedia' portion of the Internet, with color, graphics, sound, video and other possibilities. The Web is made up of pages organized into sites all over the globe linked by hypertext." http://www.newbie-u.com/peg/.

[2] Search date: 4-28-99.

## *1. Search Engines.*

Search strategies are essential for successful information retrieval. Simply speaking, a search strategy means planning a search. The example above, "what language did Jesus speak?" is an unplanned search. It yields a high number of results. High numbers are not indicative of a successful search. In this case, the first result is a Web page by an organization called Speak Out[1] featuring Jesus "Chuy" Negrete, a chicano folk musician.[2] A planned search can reduce unwanted hits[3] like this. The student should think through and write down exactly what she is looking for. She should be prepared to use synonyms or more specific ideas if her first search is unsuccessful. This will constitute the formal search statement.

A search for Ephraem's homilies is not as simple as it might seem. The variables for this search are the title, the spelling of the personal name, the descriptive term for Ephraem's works. This is demonstrated in the chart below[4]:

| ***Saint*** | |
|---|---|
| saint ephraem the syrian homilies | Web Matches: 3 |
| saint ephraim the syrian homilies | Web Matches: 30 |
| saint ephrem the syrian homilies | Web Matches: 25 |
| saint afrem the syrian homilies | Web Matches: 2 |
| ***St*** | |
| st ephraem the syrian homilies | Web Matches: 7 |
| st ephraim the syrian homilies | Web Matches: 44 |
| st ephrem the syrian homilies | Web Matches: 30 |
| st afrem the syrian homilies | Web Matches: 2 |
| ***Saint*** or ***St*** omitted | |
| ephraem the syrian homilies | Web Matches: 8 |
| ephraim the syrian homilies | Web Matches: 48 |
| ephrem the syrian homilies | Web Matches: 33 |
| afrem the syrian homilies | Web Matches: 2 |

These are just some of the possible combinations for the search. Additional complications arise with transliterated Syriac words. Here are a few more examples: mar, tub(v)ana/toub(v)ano, memra(o)/mimra(o), etc. The lack of uniformity in Syriac transliteration remains a problem for online searching.[5]

---

[1] See: http://www.vida.com/speakout/home.html.

[2] Search date: 4-24-99.

[3] "The retrieval of any item, like a page or a graphic, from a Web server." http://webopedia.internet.com/TERM/h/hit.html.

[4] All of these searches were performed with the search engine HotBot. Search date: 4-28-99.

[5] For more on this see: Christopher Buck. "Computing Strategies for Transliterating Syriac." *SyrCOM -95 Proceedings of the First International Forum on Syriac Computing*. Edited by: George Anton Kiraz. June 8, 1995. The Catholic University of America. p. 1-10 + 4 tables. See too in the same volume: Peter Jasim. "Syriac Unicode Standard." p. 81-91.

Once the search statement has been established, it is typed out using specific search formulas/syntax. Results will vary with the different search engines. The following is a list of selected search engines and directories along with important search command formulas:

### AltaVista[1] ( http://www.altavista.com)

AltaVista searching is straightforward and simple. Of all the search engines discussed here, it has possibly the largest number of Web pages indexed.[2]

Double quotes around phrases. The quotes direct the search engine to retrieve Web pages with that exact phrase. For example, searching for the phrase Ephraem the Syrian in quotes ("ephraem the syrian") retrieves 81 Web pages. Searching for the same phrase without quotes (ephraem the syrian) retrieves 31,580 Web pages.

Lowercase letters. A search statement in lower case letters is more inclusive than one in capital letters. AltaVista searches for words in both lower and upper case letters when the search is typed out in lower case (e.g. "ephraem" will retrieve pages containing the spelling Ephraem, EPHRAEM, and ephraem). AltaVista will search only for words spelled with capital letters if that is how the search statement is written (e.g. "Ephraem" will retrieve pages only containing the spelling Ephraem).

Truncation.AltaVista has a truncation feature called "wild card." The wild card command is an asterisk (*). Typing the asterisk (*) at the end of a word (teaching*) or at the root of a word (teach*) allows AltaVista to search for all forms of the word. It is important to remember that the truncation does not work for exact phrase searching.

### HotBot[3] (http://www.hotbot.com)

HotBot has pulldown menus below the search box. These are useful for limiting a search. It also has a button marked more search options. The more search options screen has more pulldown menus. These menus help to define the search. The search syntax that is listed above for AltaVista is also relevant for HotBot. However, common words like "and" and "the" are considered stopwords in HotBot. That is, HotBot does not index these words. Thus, they are not useful even in an exact phrase search.[4]

ElectricLibrary. This is the article database for HotBot. It finds publications related to HotBot searches. However, the publications are only accessible to members, and for a fee. The quality of the publications varies. They include popular and scholarly articles and book reviews. The Electric Library is more limited and general in scope than the ATLA Religion Database, a journal article, book essay and review print and electronic index produced by the American Theological Library Association.

### Northernlight[5] (http://northernlight.com)

Northernlight accepts the same search syntax as AltaVista (the double quotes, the lower case and the truncation).

Custom Search Folders. This is a unique feature of Northernlight (patent pending). The custom search folders appear on the left hand of the Web page after a search has been performed. The search "syriac fathers" yields folders grouped in the following categories: (1) Search Current News (2) Special Collection documents (3) Christianity (4) New Testament (5) Roman Catholicism (6) Personal Pages (7) www.studentgroups.ucla .edu (8) www.stmaron.org (9) Non-profit sites (10) www.mari.org (11)

---

[1] For more search features and help see: http://www.altavista.com/av/content/help.htm.

[2] See also: http://www.searchenginewatch.com/facts/major.html.

[3] For other search features: http://www.hotbot.com/help/tips/search_features.asp.

[4] "They act like wild cards, even if they are included in an 'Exact Phrase' search, and pull up results that appear to have little or nothing to do with your search." (http://www.hotbot.com/help/questions/question4.asp) In fact, they can be used. They do not seem to pose a problem in very narrowly defined searches (e.g. "ephraem the syrian" retrieved 41 Web pages).

[5] For more details on search options see: http://www.northernlight.com/docs/search_help_optimize.html.

www.netadventure.com (12) Book reviews (13) www.ocf.org (14) all others....[1] Clicking on a folder brings up the Web pages listed in this category. The Special Collection Documents folder is a commercial document delivery service similar to HotBot's Electric Library.

### Yahoo! (http://www.yahoo.com)

Yahoo! is a search directory. It is divided into browsable subject categories. Yahoo! is reviewed in Search Engine Watch: "The secret to Yahoo!'s success is human beings. It is the largest human-compiled guide to the web, employing 80 or more editors in an effort to categorize the web."[2] Yahoo! recommends double quotes for exact phrase searching. The Yahoo! help menu[3] does not mention truncation, case sensitive searching, or any stop words to be avoided.

### ABZU (http://www-oi.uchicago.edu/OI/DEPT/RA/ABZU/ABZU.HTML)

ABZU is a "guide to resources for the study of the ancient Near East."[4] It uses the peer-reviewed search engine Argos. Argos is designed to cover Web resources for ancient and medieval studies.[5] The only search syntax feature for Argos is an asterisk (*) truncation symbol. Argos covers the general geographical areas and time periods in which Syriac language and literature flourished. It may not have many Syriac resources right now, but it is growing steadily.

### *2. Institutional Web collections, projects, and guides for Syriac studies.*

While it can be difficult to keep up with new search engines and search syntax features, it is possible to identify institutions and specialists who compile valuable resources on the Web. Internet research guides prepared by subject specialists offer an alternative to Web search engines. Teachers and librarians direct students to the best print resources. In the same way, students are directed to the best electronic resources.

Syriac Web guides represent a variety of perspectives -- academic, religious, cultural. Some of the larger Web guides for Syriac studies are:

Assyrian Academic Society: AAS Links http://www.aas.net/.

The Catholic University of America's Internet Researcher: A Guide to Semitic and Christian Oriental Resources: http://www.cua.edu/libraries/semweb.html

Syriac Computing Institute, SyrCOM Links: http://www.acad.cua.edu/syrcom/Links/.

Syrian Orthodox Resources, SOR Links: http://www.netadventure.com/~soc/Links/index.html.

## III. Evaluating Resources [6]

The evaluation of Web resources is similar to that of print materials. When deciding to use print sources, i.e. books or journal articles, students assess their credibility and validity: They should ask: Who is the author? What institution is the author associated with? Who published this? What audience is this intended for? What is its relation to previous scholarship (with what horizon)? Is this older or more up-to-date material? These same questions should be asked of Web materials. Other questions and considerations that are specific to Web pages involve computer capabilities and limitations. Does the student's computer have Adobe Acrobat Reader? Is it possible to obtain this program? Is the computer able to download all of the images that are in a Web page?

---

[1] Searched: 4-29-99.

[2] http://www.searchenginewatch.com/facts/major.html.

[3] http://help.yahoo.com/help/search/index.html.

[4] http://www-oi.uchicago.edu/OI/DEPT/RA/ABZU/ABZU.HTML.

[5] This also known as a LASE (limited area search engine). See also: http://argos.evansville.edu/about.htm.

[6] For more suggestions on Web page evaluation see: David L. Gants. "Peer Review for Cyberspace: Evaluating Scholarly Web Sites." *The Chronicle of Higher Education.* April 9, 1999. B8. See also: "Internet Researcher: Strategies for Researching a Topic." [Online] http://www.cua.edu/libraries/trgstrat.html

*WHO IS THE AUTHOR? WHAT INSTITUTION IS THIS INDIVIDUAL ASSOCIATED WITH? WHO PUBLISHED THIS?*

It is not always easy to identify the author/institution and publisher/source of a Web site. For example, a Web page entitled Letters of Christ and Abgarus lists the text source and translator. But it is not clear that this document is connected to the Noncanonical Homepage,[1] which is connected to the Wesley Center for Applied Theology.[2] In fact, there are no links from the Letters of Christ and Abgarus page to these other pages. This is a flaw in the Web site design of the Wesley Center for Applied Theology.

The URL can be a useful indication of the source. The URL for Letters of Christ and Abgarus is http://wesley.nnc.edu/noncanon/writing/jnabgar.htm. The edu represents an educational affiliation, in this particular case, a Wesleyan college. Deleting the part of the URL after edu reveals the institutional entity. The procedure is a quick and easy way to locate the source of information.

*WHAT AUDIENCE IS THIS INTENDED FOR?*

There is no obvious answer to this question, because information on the World Wide Web is intended for everyone. Identification of the author/source is a first step in determining the intended audience.

*WHAT IS ITS RELATION TO PREVIOUS SCHOLARSHIP (WITH WHAT HORIZON)?*

This question is related to all of the above questions. When the author/source and institutional affiliation and intended audience have been identified, then questions such as this can be addressed.

*IS THIS OLDER OR MORE UP-TO-DATE MATERIAL?*

A regularly updated Web site is preferable to one that is not updated. The student user will not use a Web page with dead links. But updating links should not be confused with discarding useful information. Some Web pages have older materials that are not archived. It is important to preserve these materials. This is especially true in the areas of the arts and humanities where retrospective resources have more enduring value.

*DOES THE COMPUTER THAT THE STUDENT IS WORKING WITH HAVE ADOBE ACROBAT READER?*[3] *IS IT POSSIBLE TO DOWNLOAD THIS PROGRAM? IS THE COMPUTER EQUIPPED TO DOWNLOAD ALL OF THE IMAGES THAT ARE IN A WEB PAGE?*

Most universities provide the best and most recent computer hardware and software for students. Students' personal computers are not always as good. Their Web page access will be limited. Quick access is an important consideration. Graphics can impede Web page retrieval.

## IV. CONCLUSION

The World Wide Web is expanding everyday. More tools for serious research in Syriac studies are being developed for the Web. Examples include:

The Comprehensive Aramaic Lexicon (http:call.cn.huc.edu/index.html).

The Corpus Fontium Manichaeorum Project (http://www.ancient.mq.edu.au/ahist/DocCtr/manics/corpus.html).

Konkordanz zur Syrischen Bibel (http://www.gwdg.de/~mzumpe/seite1.htm).

SyrCOM Projects: (http://www.acad.cua.edu/syrcom/ Projects/).

An electronic journal dedicated to Syriac studies is Hugoye: Journal of Syriac Studies

[1] http://wesley.nnc.edu/noncanon.htm

[2] http://wesley.nnc.edu/Index_NS4.htm

[3] A program for reading PDF (portable document format) files. See: http://www.adobe.com/homepage.shtml.

(http://syrcom.cua.edu/Hugoye). New tools include hybrids that function as e-journals and Web guides. Two examples are BSW - Biblical Studies on the WEB (http://bsw.org) and Suryoyo Online:Online Journal of Syrian Orthodox Church (http://www.gwdg.de/~grabo/).

Search engine design is also being improved. Search screens and help guides are becoming user-friendlier. As the Web grows, searches will retrieve more materials. The searches done in this paper will yield different results in a few weeks.

Using the Web is always a learning process. The sheer quantity of information on the Web can be overwhelming. The lack of quality control is a weakness. The many viewpoints represented on the Web can be a strength. A student equipped with good evaluation skills can find the best Syriac resources of the Web.

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 28-33

# The SOR Web Site: The Spiritual Heritage of the Syrian Orthodox Tradition at a Keystroke

**THOMAS JOSEPH**

*thomas_joseph@hotmail.com*
*Syrian Orthodox Resources, Web Master*
*Syriac Computing Institute, Web Master*

***Abstract***

The Syrian Orthodox Resources web site attempts to reveal the rich spiritual heritage of the Syrian Orthodox Church to the modern world. Syrian Orthodox Christians dispersed all over the world as well as several others who have an interest in the spiritual heritage of the Church have "surfed" to the site thanks to the reach of the world wide web. The web site also reveals a living community of Christians, who trace their spiritual heritage to Apostolic times, to a world which has forgotten its existence and legacy.

The web site was created in early 1996 and has grown continuously ever since. It provides information about biblical and liturgical texts of the Syrian Orthodox Church, commentaries, works of the Syriac fathers, biographies of the fathers, musical traditions of the church, history of the church, churches and monasteries of antiquity, the hierarchical orders and organization of the church, etc. The web site also publishes lectionaries, liturgical calendars, bibliographies and other aids for Syrian Orthodox Christians to enrich their spiritual lives. In addition, the web site provides current information of interest to Syrian Orthodox communities of both Middle Eastern and Indian origin, including news, culture, etc.

This paper describes the history of the web site depicting its evolution from a "vanity" web page to a mature web site catering to diverse people who access its content for a variety of information. It explains principles behind its design and its appropriate use of technology in creating a "sacred space" in a medium which has essentially become the market-place of the world. The paper describes how the Editorial Board has attempted to create a community around the web site and the challenges it has faced in reaching out to diverse people who access the web site. It also illustrates how the web site has been created and expanded upon through collaborative work of the members of the Editorial Board and volunteers. The paper describes plans for the future and challenges in its execution.

## INTRODUCTION

After about 25 years of existence in the elite world of academia and the science establishment, the Internet became a wildly popular medium for communication and collaboration in 1994 with the creation of the world wide web browser and is rapidly becoming ubiquitous all over the world. The potential of the medium became immediately apparent to a world that was ripe to adopt this innovation. More than a mere medium of communication, the Internet has evolved into a rich parallel universe where men and women engage in every day activities as in the real world with far fewer constraints on time and space. Web sites, home pages, and a whole slew of esoteric terms like URL, HTTP, HTML, ISP, etc., have since become an integral part of our every day vocabulary.

Web sites disseminating information on all that is known to man sprouted up in subsequent years. Web sites dedicated to religion were second to none in debuting on the web. Mainstream as well as fringe religions have discovered the reach of the medium in spreading their message. For the Syrian Orthodox Church, the medium provides an unparalleled opportunity to emerge from the near obscurity to which

history had condemned it. In a world where its few adherents are scattered across the world due to the adverse circumstances of its history, the Internet offers a medium that could bring together far flung communities and offer to the world a glimpse of the rich spiritual heritage of the Church.

## A Brief History of Syrian Orthodox Resources

In September 1995, a web page that Thomas Joseph created for the St. Mary's Jacobite [sic] Syrian Orthodox Church, a Malankara parish in Los Angeles, was hosted voluntarily by a fledgling Internet Service Provider, netadventure.com, based in Fullerton, California. This was the first web page that had any reference to the Syrian Orthodox Church on the web. Subsequently, in January 1996, following a memorable visit to the monastery of Mor Ephrem at Losser in the Netherlands, Thomas created a web page with several photographs describing his visit. This seeded the Syrian Orthodox Resources (SOR) web site. In the few months that followed, pages were added on prominent churches and monasteries, brief biographies of selected saints, patristic literature on the web, etc. The SOR site was first hosted on the web on a server at the University of California, Los Angeles on May 16, 1996. Subsequently, netadventure.com graciously agreed to host the site free of cost in August 1996, which they continue to do to this day. In 1998, the Catholic University of America agreed to host the site permanently; SOR will migrate in the near future to its new home at CUA.

SOR started out as a solo effort. After some content was added and a vision and structure developed for its growth, the web site caught the attention of Dr. George Kiraz, the organizer of this conference. Dr. Samir Anz was also enlisted and the Editorial Board of SOR was formed on October 25, 1996. With George as the subject matter expert and Samir providing the graphics support, the web site grew tremendously in subsequent years. The patronage and support of Syrian Orthodox archbishops and other clergy in the US was also sought and they agreed to serve as advisors to the Editorial Board. The site was, however, established as an independent entity and not an official web site of the Church. The web site grew from a "vanity" homepage to a mature web site supported by a semi-formal organization. On August 9, 1997, the web site was blessed by the "visit" of H.H. Mor Ignatius Zakka I, the head of the Syrian Orthodox Church. There is significant work ahead; with the generous space offered by CUA, the web site will hopefully grow to become an encylopedic reference to the spiritual heritage of the Syrian Orthodox Church in the coming years.

## Shedding Light on a Glorious Past

The Syrian Orthodox Church has a glorious past; scholarly fathers of the church have produced a rich legacy which unfortunately is unknown even to most adherents of the faith today. Over the past few centuries, adverse circumstances in the lands of origin of the faith have left the Syrian Orthodox communities weak in numbers, and in spirit. The goal of the web site, from the very beginning, was to become an objective source providing information about the diverse facets of the church's spiritual heritage to a generation of church members who were never exposed to the rich ancestry of the church. Our primary focus was to be on biblical and liturgical texts, works of the Syriac fathers, their biographies, musical traditions of the church, history of the church, churches and monasteries of antiquity, the hierarchical orders and organization of the church, etc. We would also publish lectionaries, liturgical calendars, bibliographies and other aids for Syrian Orthodox Christians to enrich their spiritual lives. Secondarily, we intended to provide current information of interest to Syrian Orthodox communities of both Middle Eastern and Indian origin, including news, culture, hosting pages for churches and church groups, etc. We took on this task only because there was no other web site catering to this need. The "spiritual" was always to take precedence over the "communal". Further, it was hoped that the web site would bring together far-flung Syrian Orthodox communities whether from Middle East or from India and engender a sense of unity in the diversity.

## Mission

As stated on the home page of the web site, the mission of SOR is as follows:

> "The Syrian Orthodox Resources web site focuses on the unique spiritual experience in Christ that the Syrian Orthodox Church—one of the most ancient Christian churches—

> offers the faithful. It aims to provide objective information that helps Syrian Orthodox Christians learn about their glorious spiritual heritage and live a life in Christ guided by the scriptures, the teachings of the holy Fathers and the traditions of the Church. It also educates other Christians and non-Christians about this ancient Church and its contributions to spirituality and culture. The web site is maintained by the SOR Editorial Board which is a body independent of the Syrian Orthodox Church."

The mission statement reflects the strong desire of the founders of the web site to be an objective and scholarly source of information on the heritage of the church. The core membership of the SOR Editorial Board is also actively involved in the Syriac Computing Institute—an academic web site devoted to Syriac Studies. The SOR web site is envisaged to be a bridge between the academic community of Syriac Studies scholars and the Syrian Orthodox laity, bringing the fruits of scholarship to the practicing Syrian Orthodox Christian. While representing the interests of the Syrian Orthodox Church, the web site is an independent entity which does not purport to be an official mouthpiece of the Church.

While the mission of the web site is to be a source of information about the Church for all, today, practical limitations restrict access to the English speaking world. We hope to provide, in the future, original texts in Syriac, and translations in Arabic, Malayalam and other languages used in Syrian Orthodox communities. However, for the immediate future, English will continue to be the primary language on the web site.

The web site can truly become "home" to the Syrian Orthodox diaspora only if it is able to attract active representation of the diverse communities. Due to practical limitations in gaining such active representation, we hope to collaborate with other sites in Europe, Australia, etc., in seeding a federation of Syrian Orthodox web sites which can better cater to the local needs of each community.

A significant achievement, thus far, has been the active representation of the two large and diverse Syrian Orthodox communities—that in the Middle East and in Malankara, India. The relationship between the two communities, strongly cemented in the past by the pastoral work of bishops and monks from the Middle-East in Malankara, has weakened considerably in recent times. Today, the SOR web site is perhaps the only active collaboration between the two communities.

## Building Content

The Syrian Orthodox Church traces its roots to Apostolic times. It's rich history thus spans two millenniums. During this time, the prolific fathers and scholars of the Church have produced six translations of the Bible into Syriac, innumerable commentaries on the Bible and other exegetical works, liturgies, metrical hymns and homilies, political and ecclesiastical histories, secular works on astronomy, mathematics and medicine, etc. The entire corpus of these works is immense. Much of it is authored in Syriac, the Edessan dialect of Aramaic, and the language of the Church since its origin. Due to its close affinity to the language spoken by Christ, Syriac has remained the "official" language of the Church to this day, despite the fact that it is a classical language. Only a small portion of these works have been translated into English. Among the translations, the liturgies have been translated and published by the Church and are available to SOR. Other works translated by Syriac Studies scholars have been published by commercial publishing houses who hold copyrights to these works. In short, there is limited content available in English and even that restricted further by copyright issues; currently, we are engaged in hosting the unrestricted content on the web site.

As a web site catering to the spiritual needs of a living community, we also have to provide material addressing contemporary concerns and issues. Here, we face a different problem. Substantive articles are often published in rather obscure publications with limited circulation, such as diocesan journals, church souvenirs, local association publications, etc. The SOR Editorial Board has to rely on informal contacts to obtain information and copies of such articles. They do not have the benefit of peer review and often require translation and significant editing to meet the standards of publication for SOR. In the past, the church had a home-grown system that produced scholarly works and passed it down over generations. With the political misfortunes of the community and the onslaught of western modes of education and thinking, the church has lost its traditional systems of producing scholarship and have been unsuccessful, so far, in the feeble attempts to emulate the western system of scholarship. This leaves the SOR Editorial Board with the task of generating content—a task which requires much more competence, resources and authority than

the Board commands today.

The World Wide Web offers the capability to transmit rich multi-media content. This enables SOR to host the liturgical and musical legacy of the church, preserved over centuries as oral traditions. Many such traditions face corruption or extinction, today, due to the dispersion of communities across the world and the onslaught of contemporary secular music and visual media. The traditional mechanisms by which the oral traditions were transmitted have been weakened. Capturing these traditions in modern audio-visual media is critical in their preservation. The most significant of these is the liturgical music tradition of the Church. SOR web site has hosted the Beth Gazo—the Treasury of Chants, the source-book of the Syrian Orthodox musical tradition. Chants of one school of music—the Mardin school—have been hosted and an interface is being developed for easy access to over 800 melodies recorded. We hope to host, in the future, melodies in the tradition of other schools of music. In addition to music, we hope to host video clips of sacramental and other liturgical rites in major languages of the Syrian Orthodox communities.

In building content, the SOR Editorial Board is committed to upholding high standards. Members of the Editorial Board rarely have an opportunity for face-to-face communication. Hence, collaborative work and review are carried out over the Internet using email and the web site. The members of the Board have developed informal conventions in facilitating such collaborative work. The Board solicits volunteers in building content. The typical volunteer, thus far, is a young internet-literate male of the Syrian Orthodox faith who helps with digitizing and formatting text from hard copy for hosting on the web site. A challenge ahead for the web site is to get the elder clergymen and lay members to contribute while providing a less daunting environment for authoring content. To ensure quality content, a community of contributors is essential; the SOR Editorial Board has significant work ahead in seeding and nurturing a network of content providers who contribute to the web site. The task is daunting given that the typical contributor with the appropriate credentials is not technically adept and requires considerable hand-holding to appreciate the reach and the benefits of the medium. The web site content authoring standards ensure that efforts of all contributors irrespective of the nature of contribution are duly acknowledged.

Different classes of users visit the SOR web site and have different expectations from the web site. Some dichotomous groups include Syrian Orthodox faithful who are familiar with the traditions of the Church versus others whose first introduction to the ancient Christian tradition may be on the web site, those who seek out the spiritual versus those who seek out the cultural and ethnic, those from the Middle East and its diaspora versus those from Malankara and its diaspora, etc. The web site has to cater to the needs of these dichotomous groups. Content on the web site has been categorized and labeled to facilitate access to content by the different user classes. A terminology model for the domain with a hierarchy of terms has to be developed for clear labeling of content.

The SOR web site can never be the one-stop source of spiritual, social and cultural information for diverse Syrian Orthodox communities scattered across the globe. Locally tailored content in local languages is best provided by locally focused web sites be it at the parish, diocesan or national levels. The SOR web site will focus primarily on the spiritual legacy of the Church common to all its communities. However, it can temporarily host pages to seed autonomous web sites focused on local communities or associations. In the future, the SOR web site will hopefully be able to build a network of federated web sites affiliated with it; SOR will offer technical assistance and publication standards for these web sites.

As it builds content, SOR will have to consider means to ensure protection of intellectual property rights. Clearly, there are no commercial motivations in doing so. Our interest is to prevent content that we build from being manipulated and distorted especially by fringe religious groups who often resort to eclectic "borrowing" from different traditions for their own purposes; the Syrian Orthodox tradition, being an ancient Christian tradition rich in literary content, is often borrowed from and rarely reproduced faithfully.

## Technology and Design

The interactivity and richness of the world wide web has indeed made it a virtual space where human beings across the world engage in everyday activity much as they do in the real world. This virtual space has been created to emulate the physical world using visual and aural signals. However, the interface between the physical and the virtual worlds is the computer. Imagery that conjures a visual representation

of the physical world is displayed on the computer screen; aural reality is recreated using audio equipment on the computer. Whether a denizen of the net takes a virtual safari in the African forests or engages in a securities transaction at a discount brokerage or indulges in the lascivious imagery at the Playboy web site or looks up a passage in the Bible for spiritual nourishment, the interface remains the same. Different virtual worlds whether profane or sacred, scholarly or mundane, are all created on the same interface. Much as a flip of a TV channel switches a viewer from a rock music channel celebrating a New Year to the Pope's midnight mass on the same TV screen, different virtual worlds are just a mouse-click away. In the physical world, different physical structures evoke in human beings different emotive responses. A shopping mall or promenade is designed to evoke the desire to buy. Restaurants are designed to produce an atmosphere that evokes an appetite. Recreational parks induce relaxation. A cathedral evokes feelings of awe for the divine. We, thus associate different emotions with different spaces in the physical world. We do not expect profanity where we are accustomed to experiencing the divine. In the virtual world, where both the profane and the sacred are represented on the same interface and transfer from one to the other is instant, web sites have to strive to produce a virtual space that evokes emotive responses appropriate to the intent of the site. For SOR, the design challenge is to create a "sacred space" appropriate to the spiritual focus of the web site. At the same time, current bandwidth constraints and download delays for a vast number of internet users across the world constrain the use of extensive graphics, and other aids in achieving the desired effect.

The SOR web site has been designed to evoke this sense of sacred space; at the same time, it is functional and simple. Motifs common in the Syrian Orthodox world are employed. The pages have a consistent layout and style. The web site logo is displayed on each page. Navigation links are provided on each page to navigate along the directory tree. Page design takes a lowest common denominator approach and assumes the typical user to have a low resolution monitor and connecting over a slow speed dial-up connection. A plain white background has been used for simple elegance even on low resolution monitors. The lowest resolution that faithfully represents an image is used for graphics to reduce download times on slow dial-up links. Frames have been avoided so far since its implementation in pure HTML has the potential to confuse navigation. The major categories of content are linked on the home page of the web site. The home page is designed for fast download and kept short to prevent the need for scrolling. Simple keyword search facilities are provided. For repeat visitors, the "What's New?" page helps track additions and changes to the web site since their last visit.

Many emerging standards on the web promise an enhanced experience. Unfortunately, these standards have not been widely accepted. Some of these include Cascading Style Sheets for enforcing consistent style and making style changes quickly across documents, Dynamic HTML and Javascript for dynamic generation of web pages and facilitating navigation, Frames for segmenting the screen space between navigation and content, etc. Two factors prevent the immediate adoption of emerging standards. Firstly, the two major browsers—Netscape Communicator and Microsoft Internet Explorer implement these standards differently, often deviating further with new releases. Current implementations circumvent these differences with additional programming effort. Secondly, the limited resources of the SOR Editorial Board have to be employed in adding content. Re-designing and reformatting of existing content detracts from creating new content. As technologies and standards emerge, the site, however, will have to keep pace; where there are compelling reasons for adoption of new technologies the Editorial Board will have to find resources for implementation. The web site will have to accommodate new technologies without significant maintenance on existing content.

## Building a Community around the Web Site

The SOR Editorial Board had recognized early on that in order for the web site to be effective in its mission, it could not merely provide content. For a person seeking spiritual direction, access to biblical literature, the works of the fathers, the liturgies, etc., is a starting point. However, he or she seeks much more—a nourishing community which can provide spiritual guidance. The interactivity of the medium facilitates the building of such a community around the web site. Yet, the web site has had a chequered history in its attempts to build such a community

The SOR Forum was the first attempt towards facilitating interaction on the web site. It was intended to be a forum where anyone could post messages and initiate a thread of discussion. Several topics of

discussion around the spiritual heritage of the Syrian Orthodox Church came up on the Forum. Some sought counseling, others sought advise on the canonical laws of the Church especially in conducting marriages between members of the faith and others; some of these requests clearly were beyond the competence of the Editorial Board or other participants on the discussion forum. However, it was evident that a need existed for counseling services. Those who sought help on the web site were motivated by the anonymity that the interaction offered.

Given the experience of several discussion boards and newsgroups on the Internet, clear guidelines were published to regulate the tone and content of the discussions on the Forum. While many appropriate topics came up for discussion, a majority of the topics began to lean toward the ethnic identity issue that troubles the Syrian Orthodox community in the Middle East. Being a politically charged issue which had little to do with the spiritual focus of the web site, our attempt was to avoid the topic on the forum. A small group of vocal communal activists who did not profess the Syrian Orthodox faith managed to gain the upper hand and forced the Editorial Board to shut down the Forum, a year after it was initiated. The discussion forum will hopefully be re-started with better technical capabilities to moderate discussions. Our reluctance in a second attempt stems from our prior experience; moderation of the Forum and fostering of appropriate discussions on the Forum requires a significant commitment of time and effort from the Editorial Board. The Board can successfully build an interactive community only with the participation of mature and competent contributors.

Even so, the web site can never replace the traditional means of providing spiritual counsel such as the parish clergy and community. However, it can rejuvenate and augment these traditional channels.

Currently, the guest book of the web site is the only area where visitors can leave their thoughts and impressions. The guest book is strictly intended for providing feedback on the site. Yet, in the absence of the Forum, visitors often pose questions, vent their frustrations, etc., on the guest book. Everyone who leaves a message on the guest book is contacted by the web master by email. This email typically solicits participation of the visitor in the activities of the web site. We also welcome and receive email directly from the visitors. Those of the Syrian Orthodox faith are urged to join SORNet, the electronic directory of Syrian Orthodox Christians on the net hosted by the web site. Unlike typical directories, SORNet page has a brief biographical sketch of each of those who enlist. This provides a profile of the community and demonstrates its diversity. The electronic directory is used to broadcast information on events of importance to all Syrian Orthodox Christians, typically reported in SOCNews—the news page of the web site.

## THE FUTURE

In due course of time, the SOR web site will hopefully grow into an encyclopaedic reference on the Syrian Orthodox tradition. This, as mentioned earlier, can be realized only by creating and nurturing a community of active contributors whose work is subject to peer review. The task is daunting but the rapid spread of the Internet across the world offers the infrastructure to make this feasible.

In addition to being a source of information, the SOR web site will hopefully seed the notion of an eChurch in a world where email, eMeetings, eCommerce, etc., have become common place. In catering to the spiritual needs of a widely dispersed community, the Church should leverage modern technologies with prudence while maintaining its sacred and ancient traditions. This calls for a deliberation on the role of the Church in the virtual world by the Church hierarchy and the laity. Many issues are worthy for consideration. Can a member of the faith in a far corner of the world participate in the sacramental life of the Church, at least to some extent, electronically? Is an electronic broadcast of the Divine Liturgy over the net to the spiritual benefit of those who are deprived of the opportunity to attend in person? Can one hope to confess and seek redemption electronically? These are, of course, issues that are difficult for a Church steeped in tradition to consider. Before grappling with the more controversial issues, the Church can begin to establish its presence in the virtual world through offering Sunday School classes for children and adults, devotional lectures, study of scripture and works of the fathers, broadcast of events, etc., over the Internet. With its experience, the Syrian Orthodox Resources will be in a position to assist the Church in assuming its role in the virtual world on the World Wide Web.

SOR can be found at http://sor.cua.edu.

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 34-40

# The Soul of a New Encyclopedia:

## The Encyclopedic Dictionary of the Syriac Heritage

**ROBERT A. KITCHEN**

*rakitchen@dlcwest.com*
*Knox-Metropolitan United Church*
*Regina, Saskatchewan*

The information highway adopts many roads and turns for Syriac studies in the strange new world of computer technology. Despite the propaganda to the contrary, we are the ones who construct the highway. In our case the construction took place at tea.

The idea of an encyclopedia of Syriac Christianity and culture began in computerized format and that story has been chronicled. The purpose here is to detail the "evolution" of the Syriac HyperText (SHT) online project into a printed format entitled The Encyclopedic Dictionary of the Syriac Heritage (EDSH). Along its evolving way, the shape of the material is being modified and augmented, as well as the circle of the editorial team and contributing scholars being widened.

The SHT project originally was the concept of George Kiraz to be a means of making available through an Internet website a vast amount of material regarding Syriac Christianity and its context in an encyclopedic or dictionary format. A great deal of work went into the compilation of over 1200 entries by a few asistants, primarily Dr. Andrew Criddle and Ken Moxham who compiled the majority of the original SHT articles, giving the project a solid base from which to build.[1]

The project began in 1993, but after the initial burst of energy there was a slow period after 1995. The project gained new life and a different focus. In the fall of 1996 Kiraz visited Oxford and had lunch at Wolfson College with his former supervisor, Sebastian Brock, and a few others involved in the SHT project. During tea the strategy of also publishing a printed book version of SHT gradually took shape in the conversation.

The online aspect of the SHT, however, remains a basic foundation of the project. The printed book version began as a digest of the online edition, targeted towards the library of scholars, members of the Syriac-speaking churches and others interested in an introduction to the tradition.

By the spring of 1998 the shift was complete and the project was renamed the Encylopedic Dictionary of the Syriac Heritage (EDSH). Kiraz assembled a core of editors to reshape the evolving document. Kiraz (gkiraz@research.bell-labs.com) is the general editor, assigning and directing the work of the other editors, and contributing on Syrian Orthodox liturgical materials. Thomas Joseph (thomas_joseph@hotmail.com) is the technical editor, managing the computer technologies of the project.

Robert Kitchen (rakitchen@dlcwest.com) is the organizing editor, coordinating assignments and the editing of EDSH, along with reviewing and editing articles concerning Syriac authors. James Coakley (coakley@husc.harvard.edu) and Witold Witakowski (witold.witakowski@afro.uu.se) each have responsibility for reviewing, editing, and in some cases writing articles on East Syrian matters (Coakley) and early topography and historical figures, and chronicles (Witakowski). David Wilmshurst also is a

[1] Three reports on the progress of SHT have been written. The first two are available online at http://syrcom.cua.edu/Projects/Ongoing.html.
The third report was delivered to the Second Conference on Syriac Computing at Uppsala, 1996: "Syriac hypertext Project III," R.A. Kitchen.

contributing editor, particularly in 13th-century and later topography and historical figures, as well as providing maps of Syriac church locations in several time periods. Sebastian Brock (Oriental Institute, Oxford) will be the overseer of the project and review all the articles.

EDSH remains a publication intended for use by students of Syriac studies and members of Syriac-speaking congregations, but the editors are envisioning a broader audience. It is hoped that the printed volume will find its way onto the desk of every student of Christian history, or at the least, of those engaged in the study of early Christianity. While not intended to be an exhaustive, definitive treatment of all things Syriac, the goal of the editors is to provide an open door for non-specialists and specialists alike into the study of the personalities, texts, and institutions of the Syriac tradition.

As a consequence, the EDSH became the central focus of the project, the online version providing an inclusive archive of all the material collected. Perceiving gaps in the present collection, the editors reviewed the initial SHT corpus and then compiled a working list of subjects (i.e. "lemmata") to be treated or rewritten. The Lemmata list is now in the range of 1500 articles. Recently, the editors have begun to invite scholars to contribute articles in the areas of their recognized expertise.

Early in the process the editors decided to utilize The Oxford Dictionary of the Christian Church (ODCC) (3rd edition, 1996) as the model for the format of the encyclopedia and the style of its articles. There was no desire to invent a new wheel, especially since at that time we had barely any idea what kind of a wheel an encyclopedia was!

I communicated with Elizabeth A. Livingstone, editor of the 2nd and 3rd editions of ODCC, requesting a copy of the guidelines supplied to authors in compiling the ODCC. Dr. Livingstone replied promptly, but revealed that the current edition had no style sheet or written guidelines. The 3rd edition is simply the product of evolution.

We also admired the form and content of the Encyclopedia of Early Christianity.[1] Editor Everett Ferguson did have a set of guidelines available which helped us in several matters. Gradually, we developed, circulated, and amended our own "Guidelines for Contribution to EDSH." We realize that the "Guidelines" is a working document, providing not only a style sheet for contributors, but also a consensus of operating principles for the editors.

Several issues and problems have surfaced in the work done so far, some of which are reflected in the "Guidelines."

The principle dilemma, as with any encyclopedia, is which topics or articles to retain and include, and which to omit for the printed edition of EDSH. There is editorial comfort in the realization that nothing will be cast into the outer darkness, but will be retained in the online version.

Nevertheless, starting with a legacy of over 1200 articles from SHT, it was soon recognized that we had too much as well as too little. For the printed edition, a significant number of very short articles, often only a line or two, regarding places, people, monasteries and churches should be consigned to the online edition. Many such notices derive from single references in the source materials and indicate no wider significance except the fact that they existed.

There were important gaps in the coverage of the Syriac heritage. A number of important writers were not yet included and few articles dealt with the classical literature. A guide to developing our lemmata list and filling in the gaps has been the section headings in Sebastian Brock's Syriac Studies: A Classified Bibliography (1960-1990).[2]

The broadened audience has modified the approach to assembling the necessarily limited bibliography. In SHT the bibliography featured references for the content of the article. A shift has been made in EDSH to list bibliography which supplies an introduction to the topic itself, particularly for the non-specialist.

---

[1] Everett Ferguson, Editor; Michael P. McHugh & Frederick W. Norris, Associate Editors. Garland Publishing, Inc.: New York & London, 1990, 1st edition; Garland Reference Library of the Humanities: New York, 1997, 2nd edition; paperback edition, 1999.

[2] Sebastian P. Brock, Syriac Studies: A Classified Bibliography (1960-1990) (Parole de l'Orient: Kaslik, Lebanon, 1996).

The long task now in process is the editing of the existing articles by the team of editors. In addition, scholars are being contacted and invited to contribute articles according to a reasonable deadline, and then these articles will be integrated into the whole. The "soul" of this encyclopedic pilgrimage is perceived in that the love for the Syriac Church and its traditions may be amplified beyond our admittedly too narrow circles by means of computer technology and the Internet. Already many "lonesome souls" are discovering community via Syriac cybernetic resources, such as Hugoye: A Journal of Syriac Studies and the Hugoye Email List.

The road - could it be highway? - has now been chosen and paved, but there still is a long way to walk.

Appended to this paper is the "Guidelines for Contributors," along with two demonstration articles. The list of abbreviations to be used for journals and other familiar resources is that used by Sebastian Brock in his Syriac studies bibliography.[1]

## APPENDIX 1

ENCYCLOPEDIC DICTIONARY OF SYRIAC HERITAGE

(SYRIAC HYPERTEXT PROJECT)

GUIDELINES FOR CONTRIBUTORS

### *READERSHIP*

Scholars who seek fast basic information with guide to references (specialized academic readership).

Students of Syriac Studies (academic readership)

Syriac Christians (general readership)

### *SCOPE: CATEGORIES OF TOPICS*

1. Modern Scholars and Clerics
2. Churches
   a. Ecclesiastical traditions
      b. Liturgy
   c. Feast calendars
3. Literature
4. Topography
   a. Towns/areas
   b. Monasteries
      5. Technical Terms
6. General Topics
7. Classical Personalities
   a. Authors
   b. Saints
   c. Clerics

[1] ibid., 17-22.

d. Other historical personalities

8. Theological Topics

9. History

## *ENTRY TYPES*

Simple: (Single-author/contributor which in most cases does not contain subheadings): a) Short: Quarter- to Half-Column (+/-), ca. 100-350 words inclusive of bibliography; b) Medium: One column (+/-), ca. 350-600 words; and c) Long: One and a half to Two Columns (+/-), ca. 600-1200 words.

Composite: (Multi-authored entry, e.g., "Liturgy" under which liturgy of various churches is given, each by a separate contributor)

General: (Single-author/contributor entry which gives general overview of a topic with references to more specialized entries (e.g., "Bible" with references to 'Diatessaron,' 'Old Syriac,' 'Peshitta.')

## *ENTRY CONTENT*

**Readership**. The content must cater to both general readership and scholars, with the general information given first, followed by more specialized information. Avoid jargon and technical terms. Where the latter are necessary, define or explain. Write for the student and the person out of his/her field.

**Tradition**. When applicable, after each lemma give in parentheses the appropriate tradition: Syr Orth (Syrian Orthodox), Ch of E (Church of the East), Maron (Maronite), Chald (Chaldean), Syr Cath (Syrian Catholic), Syro-Malab (Syro-Malabar), Syro-Malan (Syro-Malankara).

**First sentence**. Begin each entry with a brief definition, identification, or characterization.

Biography. Ask the question: Who is this person? Give a one-sentence answer.

Aba I. (Ch of E). Patriarch 540-51.

Abd Allah I Stephen. (Syr Orth) Patriarch 1521-57.

Abimalek of Qardu. First head of the school of Beth Sahde at Nisibis.

Abraham of Harran. Ascetic bp of Harran.

Antony of Takrit. (Syr Orth) Monk and scholar who may have lived in the 9th century.

Badma. Persian martyr late in the reign of Shapur II.

Bar Ebroyo. (Syr Orth) Maph 1264-86, and polymath.

Topography. Ask: Where is this place?

Mardin. Fortress city on a hillside SW of Tur Abdin.

Malabar. Costal area of India (modern Karnataka and Kerala) between the Arabian Sea and the W Ghats.

Mar'ash. Episcopal town in Cilicia, c. 80 km N of Cyrrhus.

Churches and monasteries. Ask: denomination (if applicable) and location.

Mark's Monastery, St.. (Syr Orth) monastery and church in Jerusalem.

Topics. Ask: What is it?

Eskimo. (Syr Orth) A hood worn by monks.

Hudra. (Ch of E) Book of the canonical prayers for Sundays and Lent.

**Rest of article**. Proceed with antecedents to the subject (if applicable) and then give the chronological

development. The treatment may be arranged topically, if appropriate. Important source documentation should be included in parentheses in the article.

Other Notes.

Use gender-neutral language, for example, "English people" instead of "Englishmen."

Spell out numerals up to 100, except in dates.

Place a comma before the word "and" in a series.

Main articles will be listed under the Syriac form of the name. References to European forms will be in the following manner: "Simeon - see Shem'on".

Syriac names should generally be given in a unified "Scottish" system (e.g. MacDonald). Thus, BarDaysan, Bar'Ebroyo. Traditional European spellings (Bardesanes, Bar Hebraeus) should be "empty" entries as noted above, referenced to the Syriac form.

Use "of" instead of "de, d', d-". E.g. Paul of Tella.

Regarding Eastern and Western Syriac spelling, the general principle is to use Eastern spelling with Eastern articles and Western spelling with Western articles. E.g. Shubhalmaran...Bar'Ebroyo.

Avoid using the terms: Nestorian, Monophysite, Jacobite. The appropriate expressions today are, respectively: Church of the East, henophysite, Syrian Orthodox.

### *BIBLIOGRAPHY*

Intended as an entry, not an exhaustive or definitive bibliography. Accessibility of resources is the focus.

The bibliography should consist primarily of standard English works, but major works in European languages may be included. Include older "classic" studies/editions when still useable and accessible.

Put editions of the original works first, then translations, and next studies in chronological order, according to the following style:

First name [or initials if name not available] and Last name, Title (Place, Publisher, Date); Name, "Article," Journal Volume (Year); pp.; Name, "Entry," Encyclopedia (Publication information), Vol. number, pp. (or col.) number.

### *MODEL ARTICLES FOR FORMAT.*

See The Oxford Dictionary of the Christian Church (Oxford, 3rd edition, 1997); Encyclopedia of Early Christianity (2nd edition, 1997; paperback, 1999).

## APPENDIX 2: DEMONSTRATION ARTICLES

Liber Graduum (The Book of Steps; Ktābā dMasqātā) .

Mid-fourth century collection of thirty Syriac discourses (mēmrē) plus an introductory essay (mamllā) on the spiritual life and the pursuit of perfection. The anonymous author gives very few historical or geographical details in the mēmrē, but one reference points to a location of the author and his spiritual community in NE Iraq near the Lesser Zab River.

The collection does not have a Syriac title. Its Latin title was given by Michael Kmosko in his 1926 critical edition of the Syriac text (with Latin translation), referring to the ascetical "steps" (masqāṯā) one must climb along the steep road to the heavenly city of Christ. This term is mentioned only in two mēmrē, numbers 19 and 20. Kmosko utilized fifteen mss, only three containing more than five mēmrē.

Kmosko theorized that the LG was a primary text of the Messalian movement in the mid- to late-fourth century. This view was accepted by I. Hausherr and dominated scholarship for the next thirty years.

In the 1950's A. Vööbus challenged the Messalian characterization of LG and directed scholars towards its witness to early Syriac asceticism and spirituality. Others focused on the pneumatology (A. Guillaumont), ecclesiology (R. Murray), anthropology and prayer (A. Kowalski), rhetorical method (A. Bšhlig), textual structure (L. Wickham), christology and asceticism (D. Juhl).

The thirty mēmrē are of uneven length and utilize a variety of genre: extended Biblical exegeses, sermons, discourses on ascetical method. The dominant theme threading throughout the collection is the description of the two statuses of Christian life: uprightness (kenūṯā) and perfection or maturity (gmīrūṯā) and those individuals who attempt to embody these ways of life - the Upright (kēnē) and the Perfect (gmīrē).

Writing in the midst of a pre-monastic religious community, the author of LG attempted to counter a decline in the standards and fervor among the Perfect. The first half of the collection presents a rule for both levels as the ideal to which they aspire. The second half contains a variety of materials, with the last six mēmrē advocating the legitimacy of the Upright.

The titles of the mēmrē are: Preface by the editor of collection; 1. Author's introduction; 2. About those who want to become Perfect; 3. The physical and spiritual ministry; 4. On the vegetables for the sick; 5. On the milk of the children; 6. On those who are made Perfect and continue to grow; 7. On the commandments of the Upright; 8. On one who gives all he has to feed the poor; 9. On Uprightness and the love of the Upright and the prophets; 10. On fasting and the humility of body and soul; 11. On the hearing of Scripture when the Law is read before us; 12. On the hidden and public ministry of the church; 13. By the same author on the ways of the Upright; 14. On the Upright and the Perfect; 15. On Adam's marital desire; 16. On how a person may surpass the major commandments; 17. On the sufferings of our Lord who became through them an example for us; 18. On the tears of prayer; 19. On the discernment of the way of Perfection; 20. On the difficult steps which are on the road of the City of our Lord; 21. On the tree of Adam; 22. On the judgments which do not save those who observe them; 23. On Satan and Pharaoh and the Israelites; 24. On repentance; 25. On the voice of God and of Satan; 26. On the second law which the Lord established for Adam; 27. About the history of the thief who is saved; 28. On the fact that the human soul is not identical with the blood; 29. On the discipline of the body; 30. On the commandments of faith and the love of the solitaries.

BIBLIOGRAPHY: (Syriac text with Latin translation) Liber Graduum (PS 3; Paris, 1926) edited by M. Kmosko; (English translation) Liber Graduum: The Syriac Book of Steps, R.A. Kitchen & M.F.G. Parmentier (Cistercian Press: Kalamazoo, MI, in press); Articles and monographs - A. Vööbus, "Liber Graduum: Some aspects of its Significance for the History of Early Syrian Asceticism," PETSE 7, Stockholm, 1954,108-128; idem., History of Asceticism in the Syrian Orient vol. I (CSCO 184, Louvain, 1958) 178-184, 190-197; ibid., vol. III (CSCO 500, Louvain, 1988) 1-18; R. Murray, Symbols of Church and Kingdom (Cambridge, 1975) 34-36, 263-269; A. Guillaumont, "Situation et significance du Liber Graduum dans la spiritualité syriaque," (OCA 197, (1974) 311-322; A. Kowalski, Perfezione e giustizia di Adamo nel Liber Graduum OCA 232 (1989); idem., "Die Gebete im Liber Graduum," OCP 55 (1989) 273-282; C. Stewart, 'Working the Earth of the Heart: The Messalian Controversy in History, Texts, and Language to AD 431 (Oxford, 1991); L. Wickham, "The Liber Graduum Revisited," OCA 247 (1994) 177-187; D. Juhl, Die Askese im Liber Graduum und bei Afrahat, OBC 9, (1996); R.A. Kitchen, "Conflict on the Stairway to Heaven: The Anonymity of Perfection in the Syriac Liber Graduum," OCA 256 (1998) 211-220; Klaus Fitschen, Messalianismus und Antimessalianismus (Gšttingen, 1998) 104-128.

- R.A. Kitchen

Joseph Hazzāyā (abbot) ("The Seer" or "Visionary")

Mid-to-late-eighth-century theologian, abbot and solitary of the Church of the East, who has been viewed as the systematizer of the mystical and ascetic life for the Syriac-speaking churches.

The primary source for Joseph's life is The Book of Chastity by Išoū'dnah of Basrah (ca. 868-870). Joseph was born of Persian Zoroastrian parents in the village of Nimrud early in the eighth century (ca. 710?). After the village rebelled against caliph Omar ibn al 'Aziz (717-720), the latter retaliated and soldiers captured the seven-year-old Joseph, eventually selling him as a slave to an Arab, then later to a

Christian of Qardu in present-day northern Iraq. Impressed by the life of the monks of the nearby monastery of John of Kamul, John asked to be baptized and was allowed to enter at a young age into the monastery of Abba Sliwa in Bet Nuhadra in northern Iraq.

After the obligatory novitiate in the cenobitic community, Joseph established himself as a hermit in Qardu for a number of years. Later he was made the head of the monastery of Mar Bassima, also in Qardu, but eventually he returned to the eremitical life in the mountain of Zinai in the Adiabene of northeast Iraq. In the neighborhood of his hermitage was another monastery, that of Rabban Bakhtisho', and before long Joseph was persuaded to become their abbot, remaining until his death.

Abdīšo' of Nisibis (died 1318) said that Joseph had written an incredible number of works - 1900 in total - but only ten were extant by Abdīšo''s time. His most systematic work, "A Letter on the Three Stages of the Monastic Life," was not positively identified as his work until the last thirty years. The manuscript tradition had attributed the Letter to Philoxenus of Mabbug, but a number of items in and about the text had raised questions about its authorship for quite some time.

A synod called in 786-787 by the patriarch of the Church of the East Timothy I condemned a trio of writers - John of Apamea, John of Dalyatha, and Joseph Hazzāyā - for certain of their theological ideas. Joseph was accused of messalianist tendencies, supposedly claiming that it is necessary to reject prayer and the office in order to receive the gifts of the Spirit. Allied to this is the alleged doctrine that the gmīrā (the perfect or mature person) no longer has any need of active prayer, the offices, reading, or manual labor. Neither have any substantive foundation in the known writings of Joseph. The synod denied the possibility of Perfection for the human nature, except for that of Christ.

BIBLIOGRAPHY: (English translation) Joseph Hazzaya (under the name of his brother Abdīšo), "Treatise on the Workings of the Grace of God,"in Alphonse Mingana, Woodbrooke Studies, vol. 7: Early Christian Mystics, (Cambridge, 1934) 145-184, 262-281; "On spiritual prayer," and "On the stirrings of the mind during prayer," translated by Sebastian P. Brock, The Syriac Fathers on Prayer and the Spiritual Life (Cistercian Studies 101; Kalamazoo, 1987) 314-325; (French translation) Joseph Hazzaya, Lettre sur les Trois étapes de la vie monastique, Paul Harb & Fran ois Graffin (editors) (PO 45 fasicule 2, no.202; Turnhout, Belgium, 1992); (German translation) Gabriel Bunge, Rabban Jauseph Hazzaya. Briefe Ÿber die geistliche Leben und verwandte Schriften ostsyrische Mystik des 8. Jahrhunderts (Trier, 1982); Articles - E.J. Sherry, "The Life and Works of Joseph Hazzaya," The Seed of Wisdom: Essays in Honour of T.J. Meek, edit. W. Stewart McCullough (Toronto, 1964) 78-91; Paul Harb, "Faut-il restituer ˆ Joseph Hazzaya la Lettre sur les trois degrés de la vie monastique attribuée à Philoxène de Mabboug?" Melto 4 (1968) 13-36; Robert Beulay, "Joseph Hazzaya," DSpir 8 (1974) 1341-1349.

- R.A. Kitchen

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 41-45

# A Project for Computer Assisted Study of Neo-Syriac Texts

**GIORGIO BUSATTO**
busatto@wi.leidenuniv.nl
*Leiden University*

**ALESSANDRO MENGOZZI**
mengozzi@letmail.let.leidenuniv.nl
*Research School CNWS*

In the context of a larger lexicographical project (Lesele: Lessico Semitico e Lessicografia Ebraica), a research program for the study of Eastern Neo-Aramaic religious literature was started in Turin in 1989. The texts being studied are written in different dialects and reflect the linguistic diversity of the Christian communities living in the region from the plain of Mosul up to the mountain villages near the Turkish-Iraqi border. The oldest dated poems we know of were written in the 16th-17th centuries, when North Iraq was under Ottoman rule, and they represent, alongside the production and transmission of Classical Syriac literature, a revival of East-Syriac culture, which characterizes the history of Iraqi Christian communities in that period (MACUCH 1976, p. 98-99; MURRE-VAN DEN BERG 1998).

The manuscript called Habbi 3 - dated Alqosh 1933 and reproduced in facsimile by the Chaldean Parish of San Diego CA in 1977 - was chosen as main source for text editions and lexical study. With 433 pages of text written in Eastern Syriac script, this manuscript contains 24 Neo-Syriac poems from the 16th to 20th centuries and represents the most complete anthology of this genre that we have at our disposal. Each page contains 25 to 30 verse lines for a total of around 12.000 lines, roughly equivalent to half of Homer's Iliad. The content of the manuscript was fully described by Pennacchietti and collated to the poems known from other collections. All the texts contained in Habbi 3 were then transliterated and put into electronic form.

Since then, two of the poems have been edited with an Italian translation and linguistic and literary commentary, while five other texts form the basis for a Ph.D. dissertation (jointly subventioned by the Dutch Organization for Scientific Research and the Research School CNWS, Leiden University), which will result in a critical edition of Neo-Syriac poems from the 17th century (MENGOZZI 1999).

The analysis of the texts and the preparation of the critical edition and glossary are now facilitated by special software, developed in the context of a project for computer assisted study of Neo-Syriac texts. The scope of the present paper is to present the objectives of this project and the results achieved so far. Particular attention will be given to issues specific to Neo-Aramaic lexicography and the computerized treatment of Neo-Syriac texts.

Besides the authors of this paper, the team of young researchers supervised by Prof. Fabrizio A. Pennacchietti (University of Turin) is formed by Emanuela Braida, Simona Destefanis, and Rita Saccagno. Nobody is working full-time on the project, which is partly financed by the Italian Comitato Nazionale delle Ricerche, but mostly supported by the enthusiasm and goodwill of the supervisor and his team. We would like to thank Max Rogland and Ray Dassen (Leiden University) for their help and suggestions.

## 1. TRANSCRIPTION OF THE TEXTS IN A FORMAT SUITABLE FOR COMPUTER ASSISTED ANALYSIS

The corpus available in electronic transliteration can be classified in three categories: 1) texts which have been transliterated, but not yet studied (328 pages of Habbi 3); 2) texts published, transliterated and translated from Habbi 3 and various other manuscripts; 3) texts forming the corpus for the critical edition mentioned above (100 pages of Habbi 3, collated with 2-4 manuscript witnesses of the same texts).

The texts have been transferred from manuscripts to computer files according to a transcription system in ASCII code which 1) faithfully reflects the orthography of the manuscripts; 2) can be typed using the characters of the Italian or the American keyboard; 3) allows the reading of a transliterated text. With the use of available word-processing software (Multi-Lingual Scholar 4.0™), appropriate tables have been compiled to convert the transliterated text into documents in East-Syriac script and in a Roman transliteration readable for Neo-Aramaic scholars and familiar to Semitists.

**Transcription system**

tuv durek&A' d-qa$i$A' 'isrAyEl 'alqo$AyA' (ASCII transcription)

tūḇ dūrekṯā d-qašīšā 'īsrāyēl 'alqōšāyā (Roman transliteration)

ܬܘܒ ܕܘܪܟ̣ܬܐ ܕܩܫܝܫܐ ܐܝܣܪܝܝܠ ܐܠܩܘܫܝܐ

The syntax format is tailored to texts belonging to the genre of the durektha (Neo-Syriac religious hymn). In order to facilitate the automatic scanning of the texts, the format stores information about the text structure in the form preserved on manuscripts: redactional title, main body composed of several 3-6 line stanzas, and redactional conclusion. In the case of a poem preserved in different manuscripts, variants can be recorded in the text with references to the source manuscript.

In the following figure we illustrate the syntax of the format used for transliterated texts. It is given using (a variant of) the Backus-Naur form (see, e.g., RFC2234), with the convention that square brackets denote an optional element, a star denotes zero or more repetitions, and a plus denotes one or more repetitions. Double quotes denote a string literal, and \n denotes a newline character.

**Syntax for the format of transliterated texts**

| | |
|---|---|
| <text> ::= | <text-id><nl>+<incipit><nl>+<stanza>+<nl>+ <appendix><eof> |
| <text-id> ::= | "{"<letter>+<num>*"}" |
| <incipit> ::= | (<line><nl>)+ |
| <stanza> ::= | <num>(<line><nl>)+<nl>* |
| <appendix> ::= | (<line><nl>)+<nl>* |
| <line> ::= | (<term>["."])+ |
| <term> ::= | <word>[<ms>] |
| <nl> ::= | "\n" |
| <num> ::= | <digit>+ |
| <ms> ::= | "*"<letter> |
| <word> ::= | <letter>+["-"] |

## 2. Scanning of the texts and preparation of a glossary

As a first step for the creation of a lexical database, concordances to the texts must be made. For this purpose, we have developed a set of software tools, which scan the transliterated texts and produce a glossary. Our software runs both on a Windows95/NT™ and on a Unix (Linux, Solaris™) platform and were implemented using the cross-platform GNU C++ compiler (see GNU). The tools consist of the following components:

A tool for extracting the list of words occurring in a given text.

A tool for ordering a list of words according to the Syriac alphabet.

A scanner that reads a list of words and a text and produces the glossary.

We will first illustrate the transcription format used for the texts and then briefly describe the

components listed above, aiming at giving a good idea of their capabilities, rather than explaining technical details in depth.

**Sample of transliterated text**

```
{isr3}
tuv durek&A'd-qa$i$A'isrAyEl 'alqo$AyA'd-'al $ark'd-$moni w-da-vnEyh.
'@Hrt*W dilEh*W d-sAvA*W 'isrAyl*W.
tuv*S dork*S d-'al*S $moni*S w-vnyh*S d-'viDA*S l-qa$i$A*S isrAyEl*S
$nA&*S 'Smg*S l-yAwnyE*S.
tuv*K dorek*K d-$muni*K w-davnEyh*K.

1   ba-$mA'da-&li&Ayu&A'.          d-*S de-*K
    kwAn qAnE''@nA'mlilu&A'.       kon*S
    w-qAy&A'bi 'A$oqu&A'.          qaym*S qAymA*K

2   'A$oqu&A'bi qAy&A'.            'a$equ&*S qAymA*S qay&A*K
    'en b-barAyE'w-'en b-baytA'.   bArye*S bArye*K bay&A*K
    d-qAwlen w-'n@hA&'li SAy&A'.   Say&A*K
    ...

36  'nA*S d-ile*S frnsi*S $emi*S.
    k&uvli*S 'Ad*S durek*S m-gami*S.
    $moni*S pAy$A'li*S yemi*S.

$elmA& durAk $ab'A'sahdE'bany $moni w-la-'lAhA'$uvHA'.
$elmat*S dorek*S da-$moni*S w-da-vneyh*S.
```

1. The first phase for producing the glossary is the extraction of a word list. The result of this operation is the list of all words occurring in the text, without repetitions.

2. The word list is then ordered according to the Syriac alphabet (a discussion of the problems specific to Neo-Syriac lexicography is provided in the following section). Below is an example of such a list.

**List of the occurring words**

| | | | |
|---|---|---|---|
| A'nay | 'wedlE' | 'eTmAteh | tAwriton |
| A'rul | 'uTmAtEh | 'eTmAtEh | tut' |
| 'ad | 'widAlay | 'Eyl$adAy | tlA&A' |
| 'Ad | 'uproxon | 'yEl$aday | tmAnyA' |
| 'Ahun | 'urkA' | | taninA' |
| 'Ahi | 'urxA' | ... | troSt' |
| 'Ahin | 'urxan | tAwdi&A' | &li&Ayu&A |
| 'o | 'urxAn | twiri | |
| 'wedlA' | 'ore$lem | twerwA' | |

3. After producing the ordered list of words, the text is scanned a second time, and occurrences of each word are detected in the text. This is performed by another software module, which associates words to their occurrences in the text, generating a glossary of the scanned text.

**Glossary**

A'nay: isr3 25a*K
A'rul: isr3 22b*S
'ad: isr3 13b*K
'Ad: isr3 13b, 35b*S, 36b*S
'Ahun: isr3 17a
'Ahi: isr3 30a*W
'Ahin: isr3 30a
'o: isr3 19a*S
'wedlA': isr3 35b*M
'wedlE': isr3 35b
'uTmAtEh: isr3 20b
'widAlay: isr3 26b
'uproxon: isr3 5c*S
'urkA': isr3 26b

'urxA': isr3 9c
'urxan: isr3 33a*S
'urxAn: isr3 33a
'ore$lem: isr3 10a
'eTmAteh: isr3 20b*A
'eTmAtEh: isr3 20b*W
'Eyl$adAy: isr3 24c
'yEl$aday: isr3 24c*K
...
tAwdi&A': isr3 22c

twiri: isr3 20a, 23b
twerwA': isr3 21b
tAwriton: isr3 13b
tut': isr3 30a*S
tlA&A': isr3 11a
tmAnyA': isr3 11b*S
taninA': isr3 10b
troSt': isr3 22b
&li&Ayu&A': isr31a

The glossary consists of the ordered list of words – together with references to the text, manuscript, stanza, and line in which they are found – and is generated in three formats:

A plain text file, suited for editing the text and its glossary for publication.

A tabular version, which can be easily imported into a data-base management system (DBMS).

A hypertext, consisting of an HTML version of both the text and the glossary, with the appropriate cross references between them, suitable for publication in electronic form.

Glossaries from various texts can be combined in a comprehensive glossary, by using an ordered list of the words occurring in the various scanned texts.

## 3. Further steps in the lexical analysis

The items listed in the glossary as described above need to be grouped in the lexical entries to which they belong. The process of lemmatization – assignment to ordered lemmata and/or roots of morphologically analyzed words – in Neo-Syriac poses problems unknown to Syriac lexicography, namely the lack of a standard spelling and of unified lexicographic conventions. The two problems are in fact interrelated.

The Neo-Aramaic dialects known from records of oral texts are normally published in Roman transliteration, with glossary based thereupon. Few dialects gained the status of written languages and texts have been written or printed in Hebrew, Syriac, Cyrillic or Roman script. The manuscripts of our corpus are written in vocalized East-Syriac script and display a predominantly phonetic spelling, in contrast to the historico-etymologically oriented spelling of Urmi and Assyrian orthography (Mengozzi 1999).

In our corpus, e.g., the Semitic root $^{C}$BD is generally written 'WD, rarely 'BD, since <w> alternates with <b>, both probably pronounced [w]. The lack of a fully standardized orthography is the most conspicuous source of variation among the manuscripts and also within a single manuscript.

The wide range of possibilities between a purely phonetic and a purely etymological spelling is reflected in the conventions adopted in Neo-Aramaic lexicography. We confine our discussion to scholarly works which dealt directly with the Neo-Syriac texts relevant for our project. Lidzbarski (1896) preferred to order his glossary by grouping the letters which are interchangeable in the fluctuating spelling of the copyists: <'=y=$^{C}$>, <b=w>, <k=h>, etc. On the other hand, Maclean (1901) favoured a predominantly historical spelling, close to the Urmi standard (see, e.g., Oraham 1943) and rarely corrected by cross-references: 'WD/'BD is to be found under $^{C}$BD.

In our glossary, words are now automatically arranged according to the spelling actually occurring in the manuscripts. In the ordering of lemmata, we are planning to include the etymologically reconstructed roots and to adopt a system of cross-references in order to make every lemma accessible from an either phonetic or etymological point of view. E.g., both 'BD and the etymologically reconstred form $^{C}$BD will refer to the lemma 'WD, which represents the most frequently occuring spelling for this root. A system of this kind has been profitably applied by Pennacchietti to Neo-Aramaic texts from the Soviet Union (Cerulli - Pennacchietti 1971; Pennacchietti - Tosco 1991).

## 4. Present and future applications

The results achieved so far within this project – transliteration and automatic generation of glossaries – are

being used by scholars in the team in order to prepare a critical edition of part of the corpus, with concordances. As far as text criticism is concerned, the automatically generated glossary includes all the spelling variants which are not recorded in the apparatus. The scope of the critical apparatus can be thus confined to variants relevant for the translation, such as major changes in the text (omissions, inversions) or morphological and lexical variants. Spelling variation is recorded in the apparatus only in the case of obscure passages.

At present, a lexical data-base is being developed by combining the glossaries, the texts, and their translations, if available. This process involves interactive use of a DBMS and has as its main objective the development of software assisting in the translation and study of the corpus.

Our future plans are to facilitate further the interaction between the translator and the lexical data-base. The computer system could, e.g., provide tentative translations of given words, possibly based on spelling variants, and the translator could then choose to accept a proposed option, or to add the word in question as a new entry, updating the existing dictionary.

As mentioned above, the current format is tailored to texts belonging to a particular genre. In a future scenario, where our methodology is applied to a wider variety of texts, the adoption of a standard mark-up language (e.g. based on SGML, or XML) would be of great importance, since many standard tools for the treatment of coded texts are already available. The automatic conversion of our texts to such formats should not pose relevant problems. The use of a mark-up language would also allow the translator to encode additional information about the words (e.g. grammatical annotations), which could then be automatically fed into a lexical data-base.

It would be of great interest to widen the scope of our project in order to contribute to the general study of Aramaic and in particular Neo-Aramaic lexicography. Especially at the lexical level, our Neo-Syriac poems contain important evidence of the modern literary language from its earliest attestation onwards. In the context of Neo-Aramaic dialectology, the Iraqi genre of the dorekyatha allows one to appreciate the lexical receptiveness of the vernacular language, as opposed to the puristic attitudes which are very popular in other dialects, and in later periods of the history of Eastern Neo-Aramaic. In this respect we envision the adaptation and application of our lexicographic conventions and the data-base format to other existing projects. Our corpus is probably too limited in respect to genre and vocabulary to justify the making of a specific dictionary, but it may certainly give a substantial contribution to the compilation of a comprehensive (Neo-) Aramaic dictionary.

## REFERENCES


CERULLI, E. - PENNACCHIETTI, F.A., 1971 – *Testi neo-aramaici dell'Iran Settentrionale*, Napoli.

GCC – *GCC - The GNU C Compiler*, published on the World-Wide Web at http://www.gnu.org/software/gcc/gc.html.

KROTKOFF, G., 1990 – «An Annotated Bibliography of Neo-Aramaic», in W. Heinrichs (ed.), *Studies in Neo-Aramaic*, Atlanta Georgia, 3-26.

LIDZBARSKI, M., 1896 – *Die neu-aramäischen Handschriften der Kgl. Bibliothek zu Berlin*, 2 vol., Weimar (reprint Hildesheim 1973).

MACUCH, R., 1976 – *Geschichte der spät- und neusyrischen Literatur*, Berlin - New York.

MACLEAN, A.J., 1901 – *Dictionary of the dialects of Vernacular Syriac as spoken by the Eastern Syrians of Kurdistan, North-West Persia and the plain of Mosul*, Oxford (reprint Amsterdam 1972).

MENGOZZI, A., 1999 – «The Neo-Aramaic Manuscripts of the British Library: Notes on the Study of the *dorekyatha* as a Neo-Syriac Genre», *Le Muséon* (forthcoming in the 2[d] issue 1999).

MURRE-VAN DEN BERG, H., 1998 – «Syrian awakening. Alqosh and Urmia as centres of Neo-Syriac writing», in R. Lavenant (ed.), *VII Symposium Syriacum (1996). Orientala Christiana Analecta* 256, Rome, 499-515.

ORAHAM, A.J., 1943 – *Dictionary of the Stabilized and Enriched Assyrian Language and English*, Chicago.

PENNACCHIETTI, F.A. - TOSCO, M., 1991 – *Testi neo-aramaici dell'Unione Sovietica raccolti da Enrico Cerulli*, Napoli.

RFC 2234 – *Augmented BNF for Syntax Specifications: ABNF*, published on the World Wide Web at http://www.ietf.org/rfc/rfc2234.txt.

*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 45-51

# Talking English-Assyrian Dictionary:

## Progress Report on Assyrian Academic Society's Dictionary Project

**TONY KHOSHABA**
*khoshaba@xnet.com*
*Assyrian Academic Society*

**RABI YOAB BENJAMIN**
*yoaben@earthlink.net*
*Assyrian Academic Society*

***Abstract***

This paper describes the on-going computational subprojects of the Assyrian Academic Society's (AAS) dictionary project. The AAS dictionary project was initiated in 1996 to compile English-Assyrian (i.e., Neo-Aramaic) and Assyrian-English dictionaries. We will demonsrate the steps that were undertaken to produce software tools for an Assyrian lexicographical project. First we show how we can create visual Windows software components for Assyrian language which can actively communicate with an existing standard dataabase engine. Then we describe a Windows application program developed to assist an Assyrian lexicographer to compile an Assyrian dictionary. Various features of this software and its possible applications are discussed.

## INTRODUCTION

The Assyrian Dictionary Project of the Assyrian Academic Society (AAS) was initiated in 1996. The major motivation for establishing this project was that the existing Assyrian-English dictionaries (Maclean 1901, Oraham 1943) were either outdated or incomplete and that they were not comprehensive from the perspective of giving usage examples and covering a variety of expressions in modern Assyrian. In addition the project intended to be an initiative for standardizing the modern Assyrian language which has never been completely standardized neither with respect to its orthography nor with respect to its morphology and syntax. Since the majority of Assyrians in Diaspora live in English speaking countries and since the only English-Assyrian dictionary (David 1924) is a highly incomplete one, the project team saw an urgency to create an initial simple English-Assyrian dictionary. To accomplish this goal a fund was raised from the members of the AAS and from other community organizations. Rabi Yoab Benjamin, a senior member of AAS, was assigned as the main lexicographer to work on dictionary entries for this project.

Working on a project of this scale would need a user friendly database program. The lack of appropriate software components for Assyrian language motivated us to work on two subprojects:

1. Development of visual software components for the Syriac script that is employed by modern Assyrian.

2. Development of an Assyrian dictionary database program

In the following pages we discuss the above subproject in detail.

## ASSYRIAN VISUAL COMPONENTS FOR WINDOWS

The main difficulty of using the existing Windows operating system for writing Assyrian texts with the Syriac script is the lack of customized Windows software components with built-in features appropriate for processing of Assyrian texts. The most important standard Windows visual components are Edit and Memo components which are available in all Rapid Application Development (RAD) tools for Windows. If such components existed for the Syriac scripts, then the RAD tools could easily be used to develop software for any linguistic project related for Assyrian language.

To achieve this goal, the visual component for Windows should have the following features:

1) It should support right-to-left processing of the entered text.

2) It should have a built-in Assyrian rendering engine.

3) It should be data-aware. That is it should be able to connect to the existing database engines.

With the current extensive usage of the Web, it is also desirable that the visual components in mind be Web-enabled. With such web-enabled components, the web-developers can give web pages a more Assyrian look and feel and can utilize the Syriac script more extensively in web pages. This would definitely enhance the usage of the language in diaspora communities as well as scholarship.

The Assyrian visual components in Windows 95 environment were designed with the above features in mind. The Delphi software package was chosen to develop these components since Delphi, which is based on Object Pascal programming language, provided an easy method to customize existing Windows components.

Figure 1 shows an example of using an Assyrian Edit component on a Windows form. This Assyrian Edit component is installed as a precompiled visual component on the Delphi's component toolbar and can be dropped on a form similar to other standard Windows components. Note that the details of the design of this component are totally hidden from the user of the component. The programmer can use this component in his or her application and can select various parameters of the component through programming or the provided object inspector interface in Delphi environment. This Assyrian Edit component has three parameters for making it a fully operational database visual component. The programmer can enable the data-aware feature of the Assyrian Edit component at design time. Then a data source and a data field can be assigned to it. The Assyrian Edit component was derived from the TCustomControl class. TCustomControl is a lower level class in Delphi that can be used for developing customized Windows controls. Various Windows event handlers of this class and its paint method were modified for processing of Assyrian texts.

## THE ASSYRIAN DICTIONARY DATABASE PROGRAM

The Assyrian dictionary database program was also designed in the Delphi environment. Our goal was to provide the following features in the software:

1) Provide full control of the database to the user. The user should be able to create a new database and customize it. The user should also be able to navigate in the database and edit it. Some of these features will only be enabled for Assyrian linguists to enter and edit lexicographical data. For a general user of a dictionary only the navigating feature will be enabled.

2) Enable the program to read and render data files from ShoeBox software. The ShoeBox Software is a free software available through Summer Institute of Linguistics (SIL) and it can be downloaded through SIL's web page. This program is very useful for linguistics application. It initially did not support the Syriac script and did not have right-to-left capability. Thanks to the hard work of SIL programmers and Rabi Yoab Benjamin's consultation the ShoeBox program right now can fully support any linguistic project related to the Assyrian language in its eastern script. This program is currently being used by our project team for entering data.

3) Provide report generation capability from the database.

4) Provide voice recording and voice playing capability for the dictionary entries. The recording feature will be disabled for the general users.

Figure 2 shows the main interface to the Assyrian dictionary database program which is currently customized for a simple English-Assyrian dictionary. The File menu in this program is designated for handling the creation of a new database, the opening and editing of the existing databases, and the parsing of the ShoeBox program's data files. The Edit menu allows copying of the Assyrian text to Windows clipboard which then can be pasted in any Windows compatible text editor. The Tools menu allows the user to create a report from the currently active database of the dictionary. Figure 3 shows an example of a generated report. Wrap-around Assyrian text should happen from left side; therefore, the report generation components were slightly modified as well. The Options menu in this program allows the user to customize the user interface. The Voice menu allows the user to configure, record and play voice files associated with the selected English or Assyrian words. The Help menu describes various aspects of the program for the user.

## CONCLUSION

In this paper, we described two subprojects that could help create appropriate software applications for the Assyrian language using the East Syriac script. The program can be easily used by Estrangela and Serto fonts. A lot of work still needs to be done in the field of Assyrian comupting in order to provide software developers with sufficient software components and tools. We have tried to contribute to this field by providing a few customized visual components and a dictionary database program. The outcome of our project will be available for public use in the near future. For more information and updates the readers are encouraged to visit the Assyrian Academic Society's web site at www.aas.net.

## REFERENCES

David, Rev. S. (1924). The First English-Chaldean Dictionary.

Maclean, A. J. (1901). Dictionary of the Dialects of Vernacular Syriac. The Claredon Press

Cambridge. (Reprinted in 19971 by Philo Press, Amsterdam.)

Oraham, A. J. (1943). Oraham's Dictionary of the Stabilized and Enriched Assyrian Language and English. Assyrian Press of America, Chicago.

**Figure 1.** An example of an Assyrian Edit visual component in Delphi environment droped on a form. The parameters of this component can be adjusted through Object Inspector or through programming at design time.

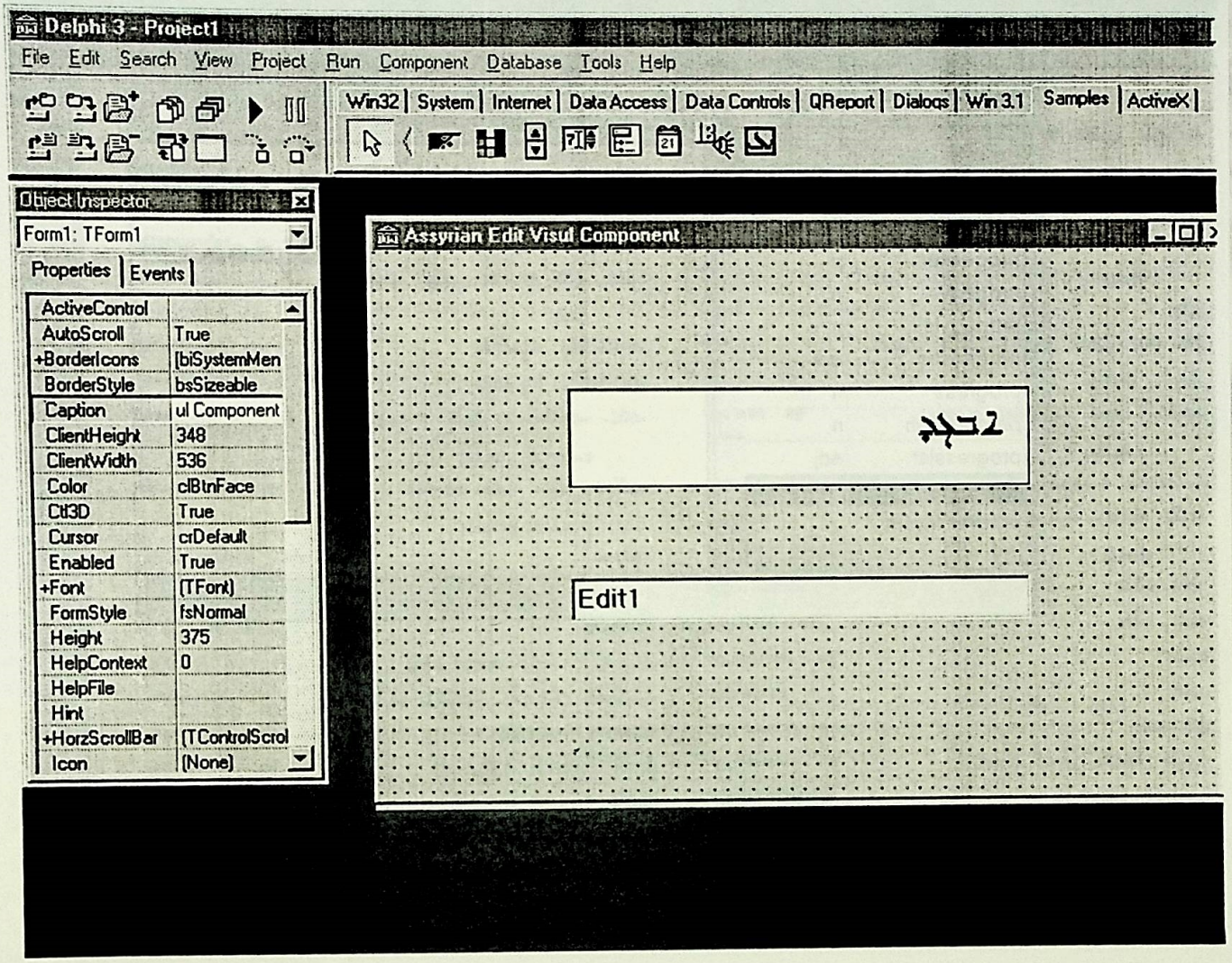


**Figure 2.** The user interface of the Assyrian dictionary database program customized for a basic English-Assyrian talking dictionary

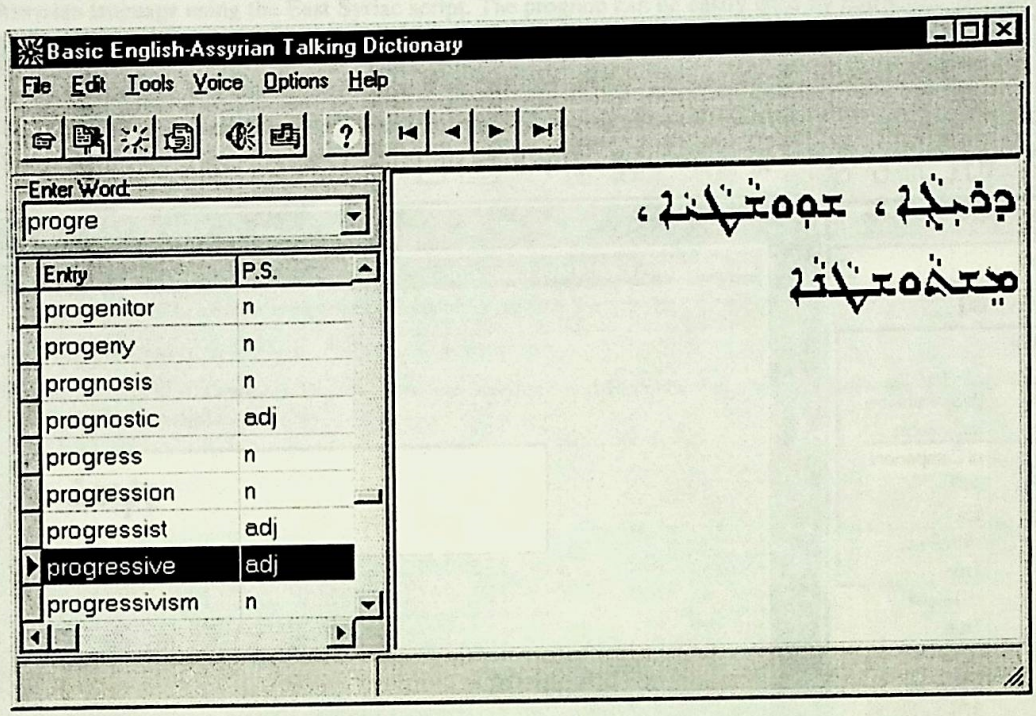
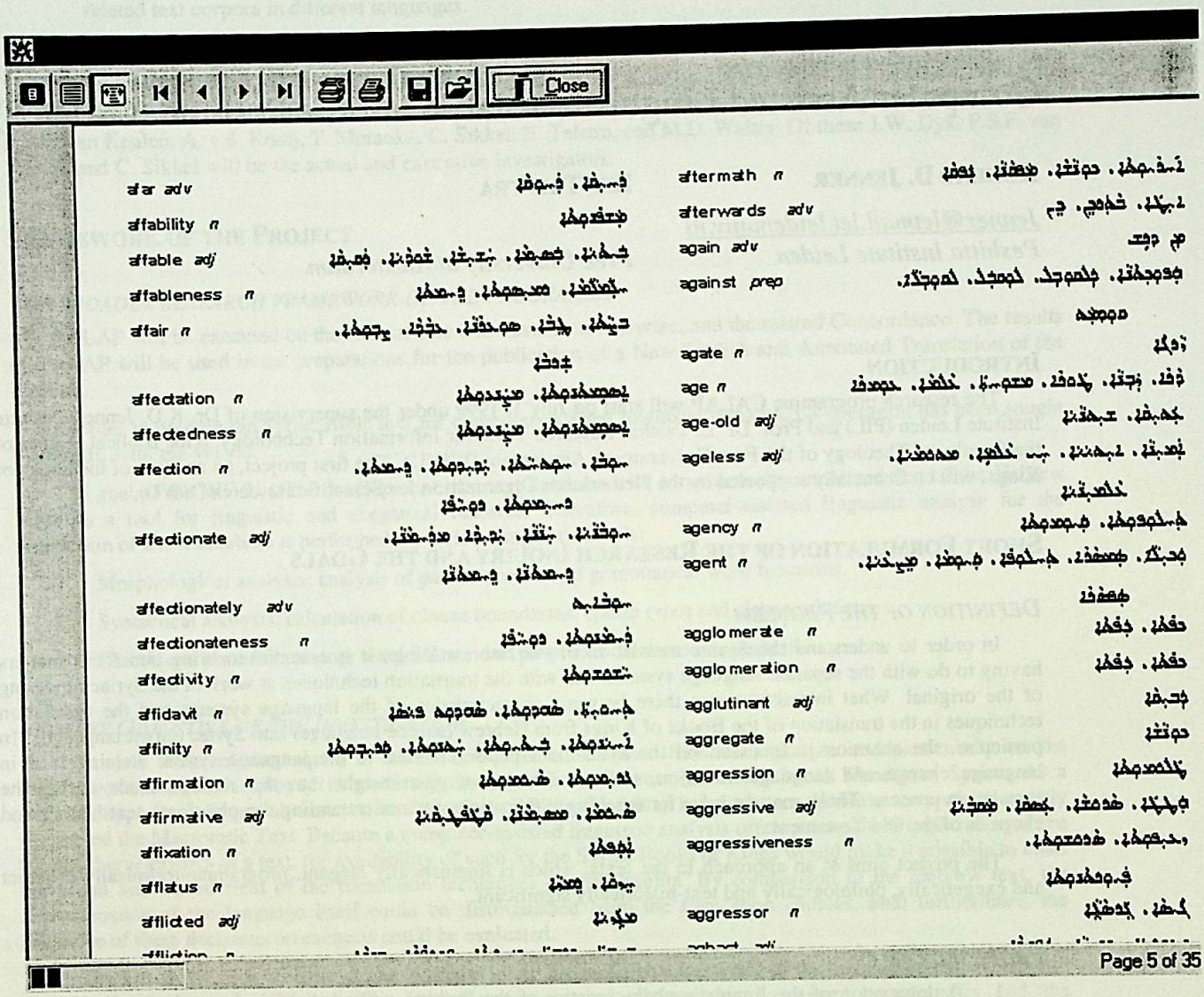


**Figure 3.** A sample of a report generated from the Basic Englisg-Assyrian dictionary database.



*SyrCOM-99: Proceedings of the Third International Forum on Syriac Computing*, pp. 52-56

# Computer Assisted Linguistic Analysis of the Peshitta (CALAP)

**KONRAD D. JENNER**
*Jenner@letmail.let.leidenuniv.nl*
*Peshitta Institute Leiden*

**EEP TALSTRA**
*Free University at Amsterdam*

## INTRODUCTION

The research programme CALAP will start on July 1, 1999 under the supervision of Dr. K.D. Jenner, Peshitta Institute Leiden (PIL) and Prof. Dr. E. Talstra, Research Team for Information Technology in the Biblical Studies of the Faculty of Theology of the Free University at Amsterdam (WIVU). The first project, an analysis of the books of Kings, will be financially supported by the Netherlands Organization for Scientific Research (NWO).

## SHORT FORMULATION OF THE RESEARCH INQUIRY AND THE GOALS

### *DEFINITION OF THE PROBLEM*

In order to understand the Syriac translation of the Hebrew Bible, it is essential to bring into focus matters having to do with the separate language systems and with the translation techniques at work in the Syriac rendering of the original. What interaction was there between characteristics of the language systems and the translation techniques in the translation of the Books of Kings from Hebrew (source language) into Syriac (target language)? In particular, the attention is focussed on the syntactic aspects reflected in the language system and involved in language change and language variation, aspects, which can give insight into the choices, made during the translation process. These matters have far-reaching implications for understanding the philology, text history and exegesis of the Old Testament.

The project aims at an approach to the texts, which is linguistically elegant, programme-technically efficient and exegetically, philologically and text-historically significant.

### *PROPOSED GOALS*

1. A description of the linguistic characteristics of the Peshitta on morphological, grammatical and lexical levels, with the intention of supplementing the classical grammars such as L. Costaz, Th. Nöldeke, C. Brockelmann and A. Ungnad.
2. An expansion of the knowledge of the orthography; with the mentioned classical grammars as starting points.
3. A thorough and extensive contribution to the study of the syntax and lexicology of biblical Syriac, intended as a supplement to and amplification of the recent pioneer publications of G. Goldenberg, J. Joosten, G. Khan and T. Muraoka.
4. A minute comparison of the formal characteristics (morphology, lexicon, phrase and clause structure) of Massoretic Text and the text of the Peshitta in order to discover and describe the translation techniques applied within the Peshitta. This comparison of the two text corpora will take place with a minimum of presuppositions concerning the texts themselves.
5. The expansion of the computer-assisted linguistic analytical techniques of the WIVU by application to a related Semitic language, that is, innovation and refinement by means of extension and furthermore, the

development of new analytical instruments, namely, programmes for executing a linguistic comparison of related text corpora in different languages.

## COMPOSITION OF THE RESEARCH TEAM

The participants in this project are (in alphabetical order): P.G. Borbone, J.W. Dyk, K.D. Jenner, J. Joosten, P.S.F. van Keulen, A. v.d. Kooij, T. Muraoka, C. Sikkel, E. Talstra, and M.D. Walter. Of these J.W. Dyk, P.S.F. van Keulen and C. Sikkel will be the actual and executive investigators.

## FRAMEWORK OF THE PROJECT

### *THE BROADER RESEARCH FRAMEWORK OF THE PROGRAMME*

CALAP will be executed on the base of The Old Testament in Syriac, and the related Concordance. The results of CALAP will be used in the preparations for the publication of a New English and Annotated Translation of the Peshitta.

In order to prepare the Syriac Bible text for computer-assisted linguistic research, co-operation has been sought by the PIL with the WIVU.

The goal of the WIVU is the development of a text database with a syntactically annotated text of the Hebrew Bible as a tool for linguistic and exegetical research. Therefore, computer-assisted linguistic analyse for the production of a text database is performed on various linguistic levels:

1. Morphological analysis: analysis of part of speech and grammatical word functions.
2. Syntactical analysis: calculation of clause boundaries, clause types and clause relations.
3. Clause and sentence parsing: textgrammar and proposals for discourse analysis.

### *PRIMARY OBJECTIVE OF THE INVESTIGATION*

The main focus of the inquiry is on the comparison of related Semitic languages and particularly on the translation techniques employed in rendering the Bible from Hebrew (for some books Greek) to Syriac. As a working hypothesis it can be assumed that the Syriac Bible (Peshitta) is based on a Hebrew text, which greatly resembled the Massoretic Text. Because a computer-assisted linguistic analysis offers a consistent registration of the formal characteristics of a text, the availability of such for the Syriac Books of Kings would make it possible to chart the broad and varied field of the translation techniques of the Peshitta. By comparison to the Hebrew text, the characteristics of the language itself could be distinguished from the translation choices, and, furthermore, the influence of these decisions on exegesis could be evaluated.

In order to do so, it is necessary to have access to the linguistic characteristics of the source language (Hebrew) and the target language (Syriac). The formal registration of all available language characteristics and the development of programmes, capable of recognising the patterns of formal elements which combine to form words, phrases, clauses and textual units, are in an advanced stage for biblical Hebrew at the WIVU. The development of comparable analysis techniques for biblical Syriac is a part of the central definition of the inquiry of this research. At the Peshitta Institute a database is being developed, based on text of The Old Testament in Syriac. By entering a co-operative working relationship with the WIVU, the present project aims at developing for Syriac the same analytical database as is available for Hebrew.

## CONSTITUENT PROJECT P.S.F. VAN KEULEN

### *LINGUISTIC ANALYSIS*

The linguistic analysis of biblical Syriac will involve morphological and syntactic description of the basic text on the following levels:

- Word level: a) segmentation of the Syriac words into morpheme in accordance with the defined morphological

paradigm; b) analysis of word forms on the basis of grammatical functional deductions from the paradigm.

- Phrase level: Combination of words into phrases; this entails the lexicographical analysis (determining of the lexical class), the morphosyntactic analysis (systematic adaptation of word classes in certain environments), the analysis of phrase-internal relations.

- Clause level: Combination of phrases to form clauses, at which level syntactic functions will be assigned (determining of predicate, subject, obligatory and optional constituents, and distinction between verbal and nominal clauses).

*TRANSLATION TECHNIQUES*

Comparing the Hebrew and the Syriac texts, an analysis of the translation techniques and of language specific characteristics of the Peshitta Books of Kings will be deduced. This analysis involves:

A. Selection and definition of diverse linguistic categories to benefit the text comparison in close co-operation with Dr. Dyk (clause patterns with, for example, attention for the place of the Subject Verb patterns in main and subordinate constructions).

B. Analysis of the lexical and syntactic choices made in the Peshitta in the translation of the Hebrew on the basis of the categories defined (in close co-operation with J.W. Dyk). Questions, which will receive attention, include:

- Does the translation imitate the Hebrew?

- Does the translation exhibit its own sentence structure?

- Does the translation follow the same text divisions (paragraphs or text structuring)?

- How are direct and indirect speech marked?

C. Research on the presence of exegetical tendencies in the language of the Peshitta Books of Kings. An important aspect is the question of the relation between the translator and the author. On the basis of the translation choices, is it possible to indicate how the translator understood the source text? In answering this question, special attention will be given on the unique material in the Peshitta Books of Kings.

*TEXT HISTORICAL ANALYSIS*

In order to research the translation techniques and the language characteristics of the Peshitta, it is necessary to have available:

A. The text material from the Peshitta Books of Kings and from the Masoretic text to be used for comparison will be precisely determined. This involves the omission of all material for which there is no quantitative (and/or globally contentwise) correspondence between the two texts. This relates to plus[es], minus[es] and content variations of more than one or two words.

B. Investigation to be done on the text-historical relation between the Peshitta Books of Kings as a whole (especially the passages without correspondence in the Massoretic text) and other contemporary text witnesses (MT, LXX Old Greek, LXX kaige, LXX Antiochene text tradition, [Syro-] Hexapla, etc.). Also in light of the so-called question of the "Vorlage" of the Midrash it is necessary to determine what material is unique to the Peshitta Books of Kings.

C. The problems around the determining of the standard text for the Peshitta need to be viewed against the background of the position defended by D.M. Walter and K.D. Jenner that the manuscript material concerning the text history of the Peshitta Books of Kings point in the direction of an original text form, a later revision and a standard text composed out of these (monograph of the PIL in preparation).

## CONSTITUENT PROJECT J.W. DYK

### *SYSTEMS ANALYSIS*

In making the transition from the available Hebrew data sets to the Syriac data sets to be created, it is necessary to define certain elements in accordance with the Syriac data:

A.. "Morf-set" = the morphological paradigm for the set of grammatical morphemes for the segmentation of the words; in connection with this it is necessary to define the relation between the morphemes and the word-level grammatical functions and to solve the morphological ambiguities.

B. "Lex-set" = the lexical paradigm, i.e., the schema of formal characteristics useable for the analysing programmes, on which basis the analysing programmes can make use of the designed Syriac lexicon of lexemes and word forms; to this end, lexemes, word classes and possible secondary word classes need to be defined in connection with the formation of phrases.

C. "Phrase-set" = a list of the formal characteristics of the structures of phrases, i.e., acceptable strings of word types and lexical and morphosyntactic conditions which allow phrase boundaries to be recognised. Such a data set with patterns of phrase-internal relations is necessary for the parsing of phrase-internal functional relations.

D. "Clause-set" = a list of patterns of consecutive phrases which can form a (part of a) clause for the determining of the boundaries of simple sentences. At the same time, separate data sets are necessary with valence patterns of verbal lexemes and with the nominal patterns within nominal clauses in order to parse clause-internal functional relations.

E. Data-sets for calculating the relation between clauses: morphological, lexical and syntactic data which

- Indicate sentence relations.

- Indicate the beginning of direct speech.

- Indicate the distinction between the connection between main clauses and the connection between a main clause and a subordinate clause.

### *TEXT PRODUCTION*

A. Included is:

- Insuring the consistency of the linguistic systematics of the morphological paradigm, the lexical paradigm and the patterns for the forming of phrases.

- Linguistic definition of and experimentation with the "clause-set" and the data sets for calculating sentence relations.

B. In the combination of the expertise of linguistics and philology, in close co-operation with P.S.F van Keulen, an analysed version of the Syriac Books of Kings will be created. During this process decisions will be taken together concerning:

- The text basis (standard text), i.e., decisions concerning variants in orthography and text portions.

- The textual segments which are grammatically difficult to interpret.

During the parsing process, the analysis of the text is performed and the data sets for the phrase level and clause level analysis are progressively augmented, on which basis the programmes are able to make more refined suggestions for analyses.

C. In the combination of the expertise of linguistic and literary analysis, in close co-operation with P.S.F. van Keulen, proposals for the definition of the various linguistic categories for the comparison of the Hebrew and Syriac texts will be made.

D. Within the context of recent publications (by M. Folmer, G. Goldenberg, J. Joosten, T. Muraoka, J. Lund, L. Van Rompay and P. Williams), a further linguistic study of certain selected and defined phenomena in the area of the syntax of Peshitta Syriac will be produced.

## CONSTITUENT PROJECT C. J. SIKKEL

C. Sikkel's project constitutes the information-technological support for the above-mentioned projects. This involves incorporating the requirements of Peshitta Syriac into the current system for Biblical Hebrew (and Aramaic). The formalisation of the grammar and syntax of the three languages involved leads toward a stage of further language independence with respect to the Semitic languages. For the source language (Hebrew) this yields a further refinement of both the existing implements and the knowledge of grammar and syntax. Moreover, for the target language (Syriac), new linguistic tools become available.

### *SYSTEMS ANALYSIS*

The systems analysis comprises the laying down of the requirements for the development of the new programmes and the adaptation of existing ones. This results in a formal specification of the functions of the programmes and the file formats involved. This specification presents the framework for the design and implementation of the individual programmes.

### *PROGRAMME DEVELOPMENT*

The research by J.W. Dyk and P.S.F. van Keulen requires the design, implementation and maintenance of three kinds of programmes.

A. Programme for the translation of the electronic version of the Peshitta (tagged lemmas) into a text conforming to the WIVU standard for morphologically analysed texts. This conversion is a prerequisite for further processing.

B. Language-independent programmes for the text production. The existing production programmes for Hebrew and Aramaic are brought to a higher level of language independence where all language-specific information is kept in designated files. This independence is fully attained for the three languages involved.

C. A programme (suite) for the comparison of Hebrew and Syriac texts at several stages of their analysis.

NOTES

# Hugoye: Journal of Syriac Studies



[1] *Hugoye: Journal of Syriac Studies* is an electronic journal dedicated to the study of the Syriac tradition, published semi-annually (in January and July) by The Syriac Computing Institute at http://syrcom.cua.edu.

[2] The word *Hugoye*, the plural form of *Hugoyo*, derives from the root *hg'* meaning 'to think, meditate, study'. *Hugoyo* itself means 'study, meditation'. In modern times, the term has been applied for academic studies; hence, *Hugoye Suryoye* translates as 'Syriac Studies'.

[3] *Hugoye* is a member of the Association of Peer-Reviewed Electronic Journals in Religion.

[4] *Hugoye* welcomes articles, squibs, project reports and book reviews on all topics related to Syriac studies. All submissions are subject to peer-review by the editors. For more submission information, please contact the General Editor at Gkiraz@research.bell-labs.com.

## CONTENTS AT A GLANCE



**Visit *Hugoye* at http://syrcom.cua.edu/Hugoye**