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MONGOLIAN SCRIPT FONTS FOR THE MACINTOSH®
PERSONAL COMPUTER

Wayne V. Richter (USA)

It has now been about five years since reports first started appearing on the computer processing of Mongolian script¹. These early reports from Japan, China and Germany have since been supplemented by reports from other locations². The purpose of this report is to show four Mongolian fonts which I have designed and to open discussion on what still needs to be done in advancing the computer processing of Mongolian script. At the present time, China probably leads the world in the use of computerized Mongolian, using computer fonts in several styles for text processing, publishing, and many other applications. With the projected change back to the traditional Mongolian script one may expect that Mongolia will also advance rapidly in this area.

The Wilson Library at Western Washington University, located in Bellingham, Washington, between Seattle, Washington, U.S.A. and Vancouver, B.C., Canada, appears to house the largest collection of Mongolian-language

¹ See Ikeda (p. 255-268 deals specifically with Mongolian script), Choyijungjab, Vietze "Mongolische Schriften," and Vietze "Beispiel" (discusses parts of Choyijungjab's article).

² E.g. see Beffa & Hamayon, and Street.

materials in North America³. This collection also has many publications in many other languages and it was felt a computer which could print in foreign languages would be a valuable addition to the library as an aid in using the foreign language collections and also as an aid to personal research since non-roman alphabet works are represented in cataloging records only in romanized (transliterated) form. After examining what was available, the decision was made in 1987 to purchase an Apple® Macintosh® SE computer. In many ways the Apple Macintosh computer with its graphics-based operating system is an ideal personal computer for anyone needing the capacity to do word processing in several languages and writing systems. Bitmapped fonts appear on screen (the Macintosh is WYSIWYG (what you see is what you get)) and the number of fonts used in a document is only limited by the availability of fonts and memory in the computer. As an example of this, see the Appendix: Printouts 1 and 2. Laser printing is limited by the availability of fonts and the number of downloadable fonts which can be loaded into the printer at one time.

After purchasing the computer we examined what foreign language fonts were available. There are many beautifully designed freeware and shareware⁴ fonts available for various languages, but we did not find any for

³ See Richter (a fuller report was presented in a paper delivered at the **Анхдугаар Олон улсын эзлүү нонголч эрдэнтний зуны сургууль**, Ulaanbaatar, August 11, 1989, and an update was given as a report at the meeting of the International Association of Orientalist Librarians, Toronto, August 21, 1990), and Schwarz.

⁴ Freeware and shareware are terms used to indicate privately developed software. Freeware designates software which may be copied and used without charge. Shareware designates software for which the developer charges a minimal amount for the use of the software. The second category depends on the honor system since in most cases these can be readily accessed and copied from various sources. An example of free ware is the Devanagari font used in Printout 1 (see Appendix).

Mongolian script so we purchased some commercial fonts (including Mongolian script and Tibetan) from Ecological Linguistics® in Washington, D.C. I soon found out that the purchased Mongolian font was not at all satisfactory for what I needed although the other fonts were very well designed and worked well. The Mongolian script font could only be input from right to left using the shareware program MacinHebrew, then the page could be turned to represent vertically written Mongolian. The result was that it was almost impossible to edit unless you edited a whole line at a time (because a mirror image of the text-as-input appeared on the computer screen). There were also design problems such as missing letters and forms of letters.

This led to the purchase of the bitmap font editor FONTastic™ Plus which was the first step in solving the problems with the purchased font. The font editor also made it relatively easy to modify any of the numerous freeware Cyrillic fonts so that they could be used for any of the Mongolian or Turkic languages written in the Cyrillic alphabet. I rotated the entire purchased Mongolian script font in order to get left-to-right input. The main reason for wanting left-to-right input was for ease of editing. There are many programs available for the Macintosh which have the ability to rotate text blocks and these lessen the need for right-to-left input but there are problems with distortion of the fonts in some of them. In addition, many recent publications from China have large blocks of Mongolian text inserted horizontally left-to-right in publications which are predominantly in Chinese. Next came the more time-consuming problem of redrawing letters, adding missing letters and letter forms, and devising a logical keyboard input. In the process the original purchased font was completely redesigned and almost completely redrawn. On the one hand, this is not as difficult as it might seem because it is

well known that Mongolian script is made up of a few basic shapes which are then modified to represent most of the basic letters. The difficulty is in accommodating the variations in form due to position in a word (including the spacing between letters) and in handling the numerous variations in form over time and in specialized usages such as representing words in foreign languages. Printouts 3-5 (Appendix) show screen dumps from the font editor.

Let me now make some general remarks about the fonts to be shown. All of these fonts are bitmapped fonts and are reproduced on an Apple Imagewriter™ II printer (a 9-pin dot matrix printer). In designing and coding these fonts I have considered two works to be indispensable. These are Poppe's "Grammar of written Mongolian" and Shagdarüren's "МОНГОЛ ҮСЭГ ЗҮҮГ I". There are other useful general sources⁵ as well as sources useful for the construction of special fonts⁶. Coding has been addressed in a number of publications⁷ and will not be covered here except to say that two special characteristics of these fonts are the splitting of the ligatured consonants (B, P, K/G, F, K (ᠪ, ᠫ, ᠬ, ᠭ, ᠮ)) (Beffa & Hamayon's "round consonants")) at midpoint and the addition of a keyboard location for a 3 pixel wide piece of the

⁵ E.g. see Kara "Knigi," and Bulay. Both are very useful general sources but especially so for the preclassical period.

⁶ E.g. Two works were primarily used in the construction of Font no. 4: a children's textbook ("Kele bicig 1"); and Bai Yunshan's writing textbook "Mongol üstin bir-ün bicilge." The 1988 Beijing edition of the "Merge᠔ yarqu-yin oron" was used in the construction of the Galig letters for Font no. 2. Kara/Batucir provides a good source for possible future fonts.

⁷ E.g. Vietze "Mongolische Schriften," and Beffa & Hamayon.

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ᠪᠠᠶᠠᠲᠤᠷ. «ᠮᠣᠩᠭᠣᠯ ᠤᠰᠤᠨ ᠪᠢᠴᠢᠭ ᠤᠨ ᠲᠣᠯᠢ ᠪᠢᠴᠢᠭ ᠤᠨ ᠶᠡᠷᠦᠩᠭᠡᠯ ᠲᠣᠶᠢᠮᠤ ᠶ᠋ᠢᠴᠢᠭ», *ᠮᠣᠩᠭᠣᠯ ᠡᠯᠡ ᠤᠳᠤ-᠎ᠠ ᠵᠠᠳᠢᠶ᠋ᠠᠯ* [Bayatur, D. "Mongyol kelen-ü yayca kelen-ü toli bičig-ün yerüنگkel toyimu", *Monggol kele udq-a jokiyal*], 1990, 2 (1990), 49-66.

Bai Yunshan

ᠪᠠᠢ ᠶᠤᠨᠰᠠᠨ ᠮᠣᠩᠭᠣᠯ ᠤᠰᠤᠨ ᠪᠢᠴᠢᠭ ᠤᠨ ᠲᠣᠯᠢ ᠪᠢᠴᠢᠭ ᠤᠨ ᠶᠡᠷᠦᠩᠭᠡᠯ ᠲᠣᠶᠢᠮᠤ. --
ᠵᠠᠳᠢᠶ᠋ᠠᠯ : ᠮᠣᠩᠭᠣᠯ ᠤᠰᠤᠨ ᠪᠢᠴᠢᠭ ᠤᠨ ᠲᠣᠯᠢ ᠪᠢᠴᠢᠭ ᠤᠨ ᠶᠡᠷᠦᠩᠭᠡᠯ ᠲᠣᠶᠢᠮᠤ
[Mongyol üsün bir-ün bičigge / Bai Yün Šan nayirayulun .
bičibe. -- Kökeqota : Übör Mongyol-un Suryan Kümüjil-ün
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Beffa & Hamayon

Beffa, Marie-Lise, & Roberte Hamayon. "Written Mongolian from its transliteration to its automatic writing : analysis and coding of the traditional Mongolian script for computer-processing", *Zentralasiatische Studien* 21 (1989), 163-175.

Bulay

ᠪᠤᠯᠠᠶ ᠮᠣᠩᠭᠣᠯ ᠤᠰᠤᠨ ᠪᠢᠴᠢᠭ ᠤᠨ ᠲᠣᠯᠢ ᠪᠢᠴᠢᠭ ᠤᠨ ᠶᠡᠷᠦᠩᠭᠡᠯ ᠲᠣᠶᠢᠮᠤ. --
ᠵᠠᠳᠢᠶ᠋ᠠᠯ : ᠮᠣᠩᠭᠣᠯ ᠤᠰᠤᠨ ᠪᠢᠴᠢᠭ ᠤᠨ ᠲᠣᠯᠢ ᠪᠢᠴᠢᠭ ᠤᠨ ᠶᠡᠷᠦᠩᠭᠡᠯ ᠲᠣᠶᠢᠮᠤ [Mongyol
üsüg bičig-ün tobči telüke / Bu?. Bulay nayirayulun jokiyaba.
-- Kökeqota : Übör Mongyol-un Arad-un Keblel-ün Qoriy-a],
1983.

Kara/Batucir

Batuvčir's specimens of Mongolian penmanship (1934) / re-edited and commented by G. Kara. -- Budapest : Akadémiai Kiadó, 1990.

Kele bicig 1

ᠠᠨᠠ ᠪᠢᠴᠢᠭ, 1. ᠶ᠋ᠢᠨᠴᠢᠨ. -- ᠠᠨᠠᠨᠠᠨᠠᠨ : ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ [Kele bicig, 1. debter. -- Kökeqota : Übür Mongyol-un Suryan Kümüjil-ün Keblel-ün Qorly-a], 1978. [a beginning children's writing textbook]

Merged yarqu-yin oron

ᠮᠡᠷᠭᠡᠶᠠᠷᠠᠴᠤᠶᠢᠨ ᠣᠷᠤᠨ - ᠳᠠᠭ ᠶᠢᠭ ᠮᠬᠠᠰ ᠫᠠᠭᠠᠨ ᠪᠠᠭᠠᠨ ᠶᠢᠨ ᠠᠨᠠᠨᠠᠨ /

ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ [- ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ -

ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ] -- ᠠᠨᠠᠨᠠᠨ : ᠠᠨᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ ᠠᠨᠠᠨᠠᠨ

[Merged yarqu-yin oron = Dag yig mkhas pa'i 'byuñ gnas / Janggīy-a Isidanbirome [- Janggīy-a Rolbidorji - Lcañ-skya Rol-pa'i-rdo-rje]. -- Begejng : Ündüsüten-ü Keblel-ün Qorly-a], 1988. [collated, annotated edition]

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Vietze "Mongolische Schriften"

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APPENDIX

PRINTOUT 1: Partial Galig letter table. LC = U.S. Library of Congress. Mong. GT = Mongolian Galig letter table. The Devanagari font was freeware, the Tibetan font was purchased from Ecological Linguistics®, the Mongolian font was designed by me, and the transliteration font was shareware.

SIBILANTS

Sanskrit	श	ष	स
LC Romanization (Sanskrit)	śa	ṣa	sa
Poppe Romanization	ṣa	ṣa	sa
Tibetan	ཤ	ཤ	ས
LC Romanization (Tibetan)	śa	ṣa	sa
Mongolian	ᠰ	ᠱ	ᠰ
LC Romanization (Mong. GT)	śa	ṣa	sa

ASPIRATE

Sanskrit	ह
LC Romanization (Sanskrit)	ha
Poppe Romanization	ha
Tibetan	ཨ
LC Romanization (Tibetan)	ha
Mongolian	ᠬ
LC Romanization (Mong. GT)	ha

PRINTOUT 2: Partial list of Mongolian-language dictionaries. The original list was from D. Bayatur.

ᠨᠣᠵᠢᠨ ᠨᠢᠭᠡᠲᠦ ᠲᠠᠶᠢᠯᠪᠤᠷᠢ ᠲᠣᠯᠢ / ᠤᠪᠦᠳᠦᠷ ᠮᠣᠩᠭᠣᠯ-ᠤᠨ ᠮᠣᠩᠭᠣᠯ ᠬᠡᠯᠡ ᠤᠳᠤ-ᠠ ᠵᠣᠵᠢᠶ᠋ᠠᠯ ᠲᠡᠭᠦ ᠰᠦᠳᠤᠯᠠᠭᠤ ᠮᠠᠵᠠᠷ. -- Kōkeqota, 1977).
(Qorin nigetü tayilburi toll / Übür Mongyol-un Mongyol Kele Udq-a Jokiyaᠯ Teüke Sudulaqu Gajar. -- Kōkeqota, 1977).

ᠰᠤᠷᠤᠶᠠᠨ ᠬᠡᠯᠡᠨ-ᠤ ᠲᠠᠶᠢᠯᠪᠤᠷᠢ ᠲᠣᠯᠢ / ᠤᠪᠦᠳᠦᠷ ᠮᠣᠩᠭᠣᠯ-ᠤᠨ ᠰᠤᠷᠤᠶᠠᠨ ᠬᠡᠯᠡᠨ-ᠤ ᠲᠠᠶᠢᠯᠪᠤᠷᠢ ᠲᠣᠯᠢ -- ᠬᠣᠪᠡᠬᠡᠴᠣᠲᠠ : ᠤᠪᠦᠳᠦᠷ ᠮᠣᠩᠭᠣᠯ-ᠤᠨ ᠰᠤᠷᠤᠶᠠᠨ ᠬᠡᠯᠡᠨ-ᠤ ᠲᠠᠶᠢᠯᠪᠤᠷᠢ ᠲᠣᠯᠢ, 1978. (Suruyčī-yin mongyol kelen-ü toll / Übür Mongyol-un Suryan Kümüjil-ün Keblel-ün Qoriy-a. -- Kōkeqota : Übür Mongyol-un Suryan Kümüjil-ün Keblel-ün Qoriy-a, 1978).

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PRINTOUTS 3-5: Screen dumps from FONTastic™ Plus (reduced 50%) showing entry levels of the font editor for Font no. 2.

