Standard Font Screening Method for Replicating Ancient Mongolian Kanjur Fonts

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Abstract—The Beijing "red copy" of the Mongolian Kanjur as a classic of Mongolian Buddhism in the Qing Dynasty has a unique authority and representativeness. However, its font style research is still in a relatively weak state at home and abroad. In order to improve the quality of the font of Mongolian ancient books, it is necessary to determine the corresponding standard font. This paper analyzes, compares, summarizes and classifies the styles of ancient books of Kanjur from three aspects: font frequency, catalogue font and font neatness. The study tries to summarize the screening method of Mongolian "Kanjur" standard fonts and provides a reference for the further development of the ancient book font replicating.

Keywords—Kanjur, Mongolian font, Standard font, Ancient font replicating

I. INTRODUCTION

The Beijing "red copy" of the Mongolian Kanjur [1] (hereinafter referred to as the Mongolian "Kanjur"), after recollating the Beijing Song Zhu Temple version of the Tibetan "Kanjur" and the Mongolian "Golden Kanjur", was all published in woodcuts from 1717 to 1720 [2]. There are 108 volumes in the Mongolian "Kanjur" (plus another volume from the catalogue), with 1161 scripture in it. As a world-famous Buddhist classic and precious religious historical relics, the content is extensive and profound. It covers philosophy, history, language, literature, art, astronomy, geography, calendar, medicine, architecture, science, technology and many other important fields [3]. The Mongolian "Kanjur" is an indispensable documentary for studying Mongolian religion, history, culture, history of Mongolian and Tibetan relations, and history of Tibetan Buddhism.

At present, the investigation and research on the font style of Mongolian ancient books is still in a relatively weak state at home and abroad. Especially the Mongolian "Kanjur" as a representative work of Mongolian Buddhism in the Qing Dynasty, with 30 million typical Uighur Mongolia words of the 15th and 18th centuries, has unique authority and representativeness in terms of historical value, number of words, and popularity [4]. However, the study of font style has not attracted enough attention and recognition so far. Through the replicating of the Mongolian "Kanjur" font, a new vitality and appearance will be injected into it, and let it continue to be passed on for more long time. By analyzing, comparing, summarizing and classifying the characters of Mongolian "Kanjur" fonts, the author tries to summarize the screening methods of Mongolian "Kanjur" standard fonts, which can provide reference for the follow-up research on the font of ancient books.

II. STANDARD FONT SCREENING METHOD

The main problem in replicating Mongolian "Kanjur" font is to determine its standard font. According to the list of Mongolian "Kanjur" editorial committee, a total of 129 people participated in the writing, engraving and proofreading. After Bithesi writing, then the scriptures were carved on the wood block, and finally printed. First of all, artificial writing will more or less have the influence of emotional factors, resulting in different font sizes, unstable center of words, loose structure and other issues. Second, according to the reference there were about 44 Bithesi participated in the writing [5]. Each person's handwritten font is quite different, equivalent to the existence of at least 44 fonts in the entire Scripture. Third, the engraver accuracy and level are different, and it has a certain influence on the font style. Therefore, although the whole Scripture is neatly written and beautifully engraved, there are also phenomena of uneven font quality, uneven skew and uneven space. Thus, it is very difficult to determine a standard font. Based on previous research and access to relevant literature, the author finally determined three methods for screening standard fonts.

A. The most frequently appearing font as a standard font

At present, the author has collected a total of 108 volumes of Mongolian "Kanjur" image database[1] (plus another volume from the catalogue). The font analysis of the first 35 volumes has been completed, and 14 different fonts can be classified by comparison, as shown in Fig. 1.

In the process of classification, the author found that the catalogue used one font from the beginning to the end, the rest of 35 volumes used 3-5 different kinds of fonts. The same font appears in different volumes as well. For example, the font 1 appears frequently in 1st volume-25th volume, as shown in Fig. 2, and the probability of appearing in entire 35 volumes is about 21% (about 21% of the 35 volumes is printed in this font). The Font 6 frequently appearing in the 11th -28th volume, as shown in Fig. 3, and the probability of occurrence is about 16%. The probability of other 12 fonts account for 1%-14%.

This method of induction and classification can ensure the unity of the whole Mongolian “Kanjur” font design. It is
feasible to use the high frequency font in the scriptures as a method of screening standard font.

B. The catalogue font as a standard font

When collecting image database, the author found that the font similarity of the whole scripture is very high. Randomly selecting 5 pages of image database from the catalogue, as shown in Fig. 4, then comparing and analyzing typesetting and font style, it is believed that it may be the same font. In order to prove this point, the author randomly selects the letters from catalogue: prefix “A”, “Ba”, mid- “Ma”, suffix “Yi”, “Li”, each letter including 5 samples, as shown in Fig. 5. The computer image processing software is used to depict the appearance of the letters. By comparing the overlap of the digitized letters, as shown in Fig. 6, it is found that the similarity is very high. So the font used in the catalogue should be the same font.

Fig. 1. 14 different fonts appearing in the first 35 volumes(from left to right font1-14)

Fig. 2. Font 1

Fig. 3. Font 6

Fig. 4. Randomly selected 5 pages of catalogue

Fig. 5. Font 6 samples

III. CONCLUSIONS

The Mongolian "Kanjur" has been in the initial stage of the replicate. Through the current research and analysis, the fonts with the highest frequency, catalogue fonts and neat and beautiful fonts can be used as the basis for screening standard fonts. This conclusion provides certain valuable reference of the Mongolian ancient book font replicating.
The method of screening standard fonts is not fixed and will be further improved in future research. Based on this method, we tried to replicate one or three fonts which could represent the Mongolian "Kanjur".

REFERENCES


