

中國古代玻璃技術的本土發展與絲綢之路上的中外交流

李青會 博士/研究員

中國科學院上海光學精密機械研究所科技考古中心，上海 201800

古代玻璃與絲綢、金屬製品等都是探索絲綢之路上中外經濟、技術和文化交流的重要實物資料。絲綢之路的四條主要線路，即草原絲綢之路、綠洲絲綢之路、西南絲綢之路和海上絲綢之路，在與古代玻璃及技術的傳播中發揮了交叉和互補作用。通過絲綢之路傳入中國的玻璃器，在器形、製作工藝、化學成分、分佈區域等方面具有明顯的時代特點。綜合考古發掘、產地風格、地域分佈、科技分析、歷史文獻的研究結果，已能夠對不同時期、不同來源古代玻璃在沿絲綢之路的分佈有了較為清晰的認識。本文主要圍繞外來玻璃製品的客觀影響和中國古代玻璃製作技術的本土發展兩個方面進行闡述。

本文的研究物件為考古發掘所發現的春秋至東漢時期的玻璃製品，以及相關的鉛鋇釉低溫釉陶、蝕刻石髓珠、石榴子石、綠柱石等器物。這些器物分佈在中國的新疆、陝西、山西、河南、湖北、湖南、廣西、廣東等地。根據春秋戰國時期蜻蜓眼玻璃珠的化學成分體系（如鈉鈣玻璃、鉛鋇玻璃、鉛鋇低溫釉陶）、著色劑和乳濁劑（如銻酸鉛、銻酸鈣、鋇的化合物）、年代早晚，探討了陸上絲綢之路沿線的玻璃製品傳播和中外交流。基於對中國不同亞類鉀玻璃的分佈特徵和寶石、半寶石珠飾的研究，與東南亞、南亞出土的鐵器時代古代珠飾進行了比較分析，探討了漢代前後海上絲綢之路上的貿易和文化交流。鑒於古代玻璃對研究絲綢之路早期中外交流的重要指示意義，指出了今後應加強研究的幾個方向。

Native Development of Ancient Chinese Glassmaking and the Mutual Exchanges between the East and West along the Silk Road

Qinghui Li Dr./Professor

Center of Sci-tech Archaeology, Shanghai Institute of Optics and Fine Mechanics,
CAS, Shanghai 201800 · P. R. China

As same as silk, metal and other artifacts, ancient glass is one kind of important materials to trace the economic, technical and cultural exchanges between China and West along the Silk Road. For the transfer of ancient glass and glassmaking technology, the four main routes of the Silk Road, that is to say the Steppe Route, the Oasis Route, the Maritime Route and the Southwestern Route, played a cross and complementary role. The glass artifacts imported into China through the Silk Road have typical characteristics of the relative times in the aspects of typology, craftsmanship, chemical composition and others. Basing on the research results of archaeological excavation, original style, regional distribution, technical analysis and historical literatures, we have obtained a better understanding on the distribution of the early glasses, which were dated to different periods and with versatile provenances, along the Silk Road. The present paper will main focus on two aspects, one is the objective effects of imported glasses from the West and the other is native development of ancient Chinese glassmaking technology.

The present research focuses on excavated artifacts of glass, glazed potteries with lead-barium-silicon glaze · etched carnelian beads, stone beads made of beryl and garnet, and so on. These artifacts were mainly dated from the Spring and Autumn period to the Eastern Han Dynasty. The covered areas include Xinjiang, Shaanxi, Shanxi, Henan, Hubei, Hunan, Guangxi, Guangdong and et al. of China. Basing on their chemical composition (e.g. soda-lime glass, lead-barium glass and glaze), colorant and opacifier (e.g. $Pb_2Sb_2O_6$, $CaSb_2O_6$ and barium-based compounds), and appearing time, we discussed the dissemination of glass artifacts and exchanges between the East and the West along the steppe and oasis routes of the Silk Road. Through analyzing the distribution characteristics of the potash silicate glasses, which were divided into different subtypes, and combining the research results about gemstone and semi-gemstone beads, we compared them with those of the Iron Age found in Southeast and South Asia and discussed the trade and cultural exchanges along the maritime Silk Road around the Han Dynasties. In view of the above - mentioned facts, we made some proposals for the following studies related to the mutual exchanges along the Silk Road related to ancient glass artifacts.