

ANALYSIS OF THE FIRST STOP OF PAPERMAKING TECHNOLOGY'S WESTWARD TRANSMISSION TO CENTRAL ASIA

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Abstract: As one of the four major inventions of ancient China, papermaking technology's westward transmission process profoundly reshaped the pattern of world civilization exchanges. The controversy over the first stop of the westward transmission in Central Asia centers on the theories of Samarkand and Kokand. This paper adopts the historical document method, systematically reviews Chinese ancient texts, local historical materials in Central Asia, and related archaeological literature records. From the dimensions of political and diplomatic connections, the logic of technology dissemination, and the excavation of paper artifacts, it demonstrates the rationality of Kokand as the first stop of papermaking technology's westward transmission in Central Asia. Based on its deep ties with the Tang Dynasty and the bond of marriage alliances, Kokand became the primary carrier for the spread of papermaking technology and the Silk Road. This further substantiates its preeminent position.

Keywords: Westward transmission of papermaking technology, Central Asia, First stop, Samarkand, Kokand

1. Introduction

The invention and dissemination of papermaking technology was an important milestone in the course of human civilization. It spread from China to Central Asia, West Asia, and Europe, completely changing the methods of information recording and dissemination worldwide.

For a long time, the academic community has held diverse viewpoints regarding the first stop of the westward spread of papermaking technology in Central Asia: The mainstream view holds that Samarkand was the first place of introduction, with the core evidence being the records in Arabic literature about Chinese prisoners of war teaching papermaking after the Battle of Dangyluo; while analyzing based on Chinese ancient texts and local historical materials in Central Asia, Kokand is said to be more historically reasonable - Kokand, relying on its deep vassal relationship with the Tang Dynasty and peaceful communication channels, was exposed to and

introduced papermaking earlier than Samarkand, and should have been the first stop of the westward spread of papermaking technology in Central Asia. The core of the controversy between these two viewpoints lies in the different interpretations of the transmission path of technology and the time limit of the documentary records, and the Arabic literature records of Samarkand say have post-dating and one-sidedness, and need to be corrected by combining earlier Chinese historical texts and local historical materials in Central Asia.

This article will take ancient Chinese official histories, Western Regions Travel Notes, works by Arab scholars, local historical materials in Central Asia, and related archaeological discoveries as the core research materials, to examine and refute each of the controversial viewpoints regarding the first stop of the westward spread of papermaking technology in Central Asia, in order to restore the historical truth.

2. The origin of papermaking in China

Regarding the origin of papermaking, early academic research suggests that it was invented by Cai Lun during the Eastern Han Dynasty (25 AD - 220 AD). In 105 AD, Cai Lun, through long-term exploration and repeated experimentation, invented a writing paper - "Cai Hou Paper". After presenting the paper and papermaking technique to Emperor Han and Empress Deng, he was praised. (Z.Z.Zhong, 2007)

Based on subsequent archaeological discoveries, the invention of papermaking predates Cai Lun. The excavation of ancient paper provides strong evidence for the existence of papermaking during this period. According to the current information on ancient paper unearthed from Chinese archaeological sites, 9 batches of ancient paper have been discovered, all of which date back earlier than Cai Lun's papermaking (Y.F.Zheng, 2015). The excavation of these early ancient paper indicates that papermaking had already emerged in China as early as the Western Han Dynasty, and people had begun to attempt using paper as a writing material. Although these early ancient paper still have problems such as rough texture, low strength, and poor writing performance, their appearance marks the birth of papermaking and lays the foundation for the subsequent development of papermaking technology.

What is particularly remarkable is that in 1986, a map-painted Han Dynasty paper was unearthed in Tianshui, Gansu Province. This paper is even older. Through microscopic observation and analysis of the Fangmatan paper unearthed in the suburbs of Tianshui City, Gansu Province, several new insights were obtained. This is the earliest known paper made of hemp in the world, dating back to the 2nd century BC. It is also the earliest surviving paper with primary processing, and it is the earliest paper map in the world. Moreover, it can be confirmed that it was made from hemp fibers. (X.C.Li, 2016) This paper is thin and soft in texture, with a smooth surface. Fine black lines were used to draw mountains, rivers, roads, etc., reflecting that the paper at that time already had certain writing and drawing functions. This is

of great significance for understanding the origin of papermaking and its processing technology in the world.

The paper-making technology during the Western Han Dynasty was still in its infancy, but it marked the beginning of the history of paper-making for mankind, setting the direction for the continuous improvement and development of the paper-making technique. Subsequently, with the passage of time and the advancement of technology, the paper-making technique underwent significant innovations and breakthroughs during the Eastern Han Dynasty. During the Tang and Song periods, with the development of paper-making technology, the variety of paper types became increasingly diverse, and its uses were also widely expanded.

3.The controversy over the first stop of the transmission of Chinese papermaking technology to the West

3.1 The Viewpoint of Battle of Talas

The traditional view holds that the Battle of Talas was a crucial turning point in the westward spread of papermaking technology. The Battle of Talas took place in 751 AD, which was a battle between the Tang Dynasty and the Arab Empire. In this battle, the Tang army was defeated. Numerous documents indicate that many captives were taken by the losing side.

In the 11th century, Persian scholar Biruni in his work "The History of India" stated: "It was in China that paper was first manufactured. Chinese prisoners introduced the production of paper to Samarkand, and thus it was made in various places to meet the existing demand. (Sachau E, tr, 1910)" This record directly links the introduction of papermaking technology to the captured Tang soldiers. Considering the historical context, these Tang captives were usually interpreted as the Tang soldiers who were captured in the Battle of Tarsus in 751.

Earlier Arab documents also provide relevant evidence. In the 10th century, Persian scholar and Arab writer AL-THA ALIBI wrote: "Papermaking was introduced to Samarkand from China due to captured Tang soldiers. The person who obtained these captured Tang soldiers was General Ziyad b. Salih. Among the captives were some who were engaged in papermaking, so factories were set up to produce paper, and it became well-known far and wide. After the development of the paper industry, paper became an important export item for Samarkand's foreign trade." (AL-THA ALIBI, 1968) At the same time, Arab bibliographer Ibn al-Nadīm (Ibn al-Nadīm) in his bibliographical work "The Classified Collection of Books" said: "Khurasan paper was made from flax. Some say it began in the Umayyad era, and some say it began in the Abbasid era; some say it is very old, and some say it is a recent invention. It is said that Chinese craftsmen brought it to Khurasan. (Ibn al-Nadīm, 1970)" Although all these documents mention that there were papermaking craftsmen among the captured Tang soldiers, the sources they relied on were all based on the same

materials, and no earlier original archives or other supporting evidence were found.

Although ancient Chinese documents do not directly record the process of papermaking technology being introduced to Samarkand, they indirectly mention the Battle of Tarsus and the activities of Tang Dynasty craftsmen in the Western Regions after the war. Du You's "General Catalogue of Laws" quotes a fragment from his son Du Huan's "Journey Record": Du Huan, who was a captive in the Battle of Tarsus, traveled in the Western Regions and Arabia for more than ten years. His records mentioned, "Silk, cotton, looms, goldsmiths, painters, Han craftsmen engaged in painting, people from Changzhou named Fan Shu and Liu Jin, weavers from Hedong named Le and Lu Li." Although it did not explicitly mention papermaking craftsmen, it is likely that there were not just papermaking craftsmen among the captured soldiers, which logically supplements the literature chain of the Samarkand account. However, this is not recorded in Chinese sources, so some scholars doubt the truth of this matter. Nevertheless, when viewing the accounts of various Arab sources, they are well-grounded, and the time, place, and person are all clear. It is unlikely to be purely a fabrication. Moreover, the original book "Journey Record" has been lost, and the only surviving ones are excerpts by Du You, which may not cover all the information. Or the papermaking craftsmen might be included but not explicitly mentioned, or it might be possible.

Archaeological-related documents also provide evidence to support the claim of Samarkand. In the Mugan Mountain manuscripts (120 kilometers east of Samarkand) discovered in the 1930s, there are 8th-century pre-25-year-old Sogdian language documents. Some of these were suspected to be paper produced locally in Central Asia. Although they predate the Battle of Tarkhan, some scholars interpret them as early evidence of the gradual spread of papermaking technology in the Samarkand region, rather than denying the status of Samarkand as a major dissemination site.

3.2 The Viewpoint of Kokand

With the continuous deepening of archaeological and technological history research in Central Asia, the international academic community has gradually begun to challenge the traditional view that "Samarkand was the first stop for the spread of papermaking technology to the West". Uzbek scholars proposed that the initial node of the westward spread of Chinese papermaking technology should be the Kokand region. (S.C.Chen, 1995) Professor Chen Dachuan from China, through cross-referencing and verification of documents such as "New Book of Tang - Western Regions" and "Zuifu Yuan Gui", further demonstrated the possibility of the capital of Ferghana, Kokand, as the first stop for the spread of papermaking technology, providing new empirical support for this academic controversy. (D.C.Chen,2005)

Firstly, from the perspective of geographical environment, the capital of Beshan, Kokand, is located in the alluvial plain of the Jaxartes River (now the Syr River).

This area still retains the remnants of water conservancy facilities. This river-based power system provides crucial production conditions for pulp production. Its geographical environment has significant similarities with the Zerafshan River Basin of Samarkand. In the past, there were still traditional paper-making workshops. Secondly, according to the "Zizhi Tongjian", in the third year of Tianbao period of the Tang Dynasty (744), the "Emperor of Beshan" Asirandag was sent by the King of Beshan to request an imperial title, and the Tang Dynasty granted it the title of "Ningyuan" and arranged a marriage alliance with a princess from the imperial family yihe. The Tang Dynasty's marriage alliance system shows that the accompanying personnel of the princess usually included artisans in industries such as weaving, brewing, and papermaking. This "military alliance + royal marriage + title grant" multi-link relationship was much closer than the diplomatic exchanges between the Tang Dynasty and the Kingdom of Kungu where Samarkand was located. Furthermore, according to the "Zuifuguanyigui · External Ministers · Enfeoffment" record, during the Kaiyuan period of the Tang Dynasty (713-741), the King of Beshan Asirandag sent envoys to the Tang Dynasty six times. What is particularly notable is that in the 27th year of Kaiyuan (739), the members of the Tang Dynasty's envoys for enfeoffment included 32 craftsmen from the Department of Works. According to the "Tongdian · Official Positions" record, the Department of Works of the Tang Dynasty had a "Paper Workshop Office" under its jurisdiction, specifically managing the paper-making affairs of the imperial court. This multi-link diplomatic mission with professional paper-making artisans as its members provided a direct carrier for technology dissemination.

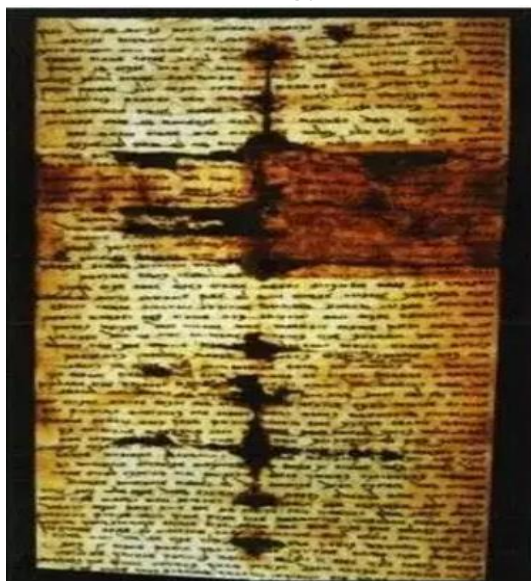


Figure 3.1.1. The ancient Sogdian paper. It was discovered by Sten in the ruins of a watchtower on the western section of the Great Wall of Dunhuang in 1907. It is currently housed in the British Library

In 1907, Stein discovered a set of Sogdian letters at the ruins of the beacon towers in Dunhuang, consisting of 8 pieces. This discovery caused a sensation in the academic community. Some scholars conducted systematic research and analysis and concluded that the longest letter, number 2, was written in the years 311-312 AD. The second, fourth and fifth letters were commercial letters sent by Sogdian merchants from China to Samarkand. (V.Livshits,2008) These letters demonstrate that a significant scale of Sogdian trade system had already been established between the Central Asia Sogdians and the Hexi Corridor and the Central Plains regions of China.

4. Discussion

The core advantage of the Hamzan theory lies in the "political-process-time" triple verification chain formed by relying on Chinese historical records and local historical materials in Central Asia. The documentary records of this theory possess higher originality and relevance. The records about the tributary relationship and marriage events between the Tang Dynasty and Bactria in the Chinese historical records all come from authoritative official histories, which were compiled during the Five Dynasties and Northern Song periods, less than 300 years after the key period of papermaking technology's westward transmission. The details of the records are also very detailed. It can be inferred that the target is precisely the introduction of papermaking technology.

Combining the commercial network of the Sogdian merchants in Central Asia (the Sogdian written letters unearthed in Dunhuang from 311 to 313 AD prove their long-term activity between the Tang Dynasty and Central Asia), it can be inferred that the papermaking technology in Samarkand was introduced to it through the Sogdian merchants from Hamzan.

The core defect of the Battle of Talas theory lies in the fact that the Arab historical records it relies on have post-event nature and recording deviations, and lack direct evidence of connection with the technology dissemination of the Tang Dynasty. The core documents supporting the Samarkand theory were all compiled in the 9th to 11th centuries, having passed 150 to 350 years since the Battle of Talas. They are second-hand or even third-hand historical materials, and the "Tang army prisoners spreading the papermaking technology" recorded in them have the possibility of memory deviation. As the most original first-hand historical materials, the records of "Jingxing Ji" directly refute the core logic of "the Dharros war prisoners spreading the papermaking technology", and the post-event records of the Arab historical materials do not form mutual verification with this original historical material, and their credibility is questionable.

From the perspective of historical status and transmission path, the core position of Samarkand may be the result of technology diffusion rather than the source of

technology introduction. In the Chinese historical records, Samarkand was enfeoffed by the Tang Dynasty as the "Ningyuan Kingdom", being an "administrative state-level" vassal of the Tang Dynasty in Central Asia, having the qualification to directly receive the official technology output of the Tang Dynasty; while the Kangguo where Samarkand is located was only a "tribute state", with a lower political connection level with the Tang Dynasty. From the perspective of transportation paths, the Ferghana Basin where Hamzan is located directly connects to the Tang Dynasty's Anxi Four Fortresses through the Sonikol Road, being the "first gateway" for the westward transmission of Tang Dynasty technology; Samarkand is located in the Zerafshan River Basin, and needs to pass through the area where Hamzan is located to connect with the Tang Dynasty, geographically speaking, it is impossible to be the first station for technology introduction. The reason why the Arab historical materials focus on recording Samarkand is actually because it later became the core stronghold of the Arab Empire in Central Asia, and the scale development of the papermaking industry after that overshadowed the source of technology, Hamzan, and belongs to "result replacing the source" kind of recording deviation.

It should be clear that the Samarkand theory and the theory of the spread of war prisoners at Battle of Talas are not completely equivalent. The former is a conclusion about the transmission site, while the latter is a speculation about the transmission path. From the perspective of document examination, the theory of the spread of war prisoners at Battle of Talas has certain documentary doubts. Du Heng's "Jingxing Ji" as the personal record of the captives at the Dharros battle only mentions the Tang Dynasty's textile, gold and silver, and painting artisans, but not the papermaking artisans, which undoubtedly weakens the directness of the theory of the spread of war prisoners.

Overall, the theory of the spread of war prisoners at Battle of Talas lacks first-hand documentary support and conflicts with the historical context. Even if we do not deny that there might have been technology diffusion after the Battle of Talas, its time is later than the time when Hamzan introduced the papermaking technology through the marriage channel (744-751), and can only be regarded as a secondary diffusion of the papermaking technology in Central Asia, rather than the initial introduction. The Arab historical materials binding Samarkand with the spread of papermaking technology are essentially a record of the technology diffusion stage, rather than a trace of the introduction source, and cannot be taken as the core basis that Samarkand was the first station.

5. Conclusion and Outlook

By systematically collating and cross-verifying Chinese ancient documents, local historical materials from Central Asia, and archaeological records, this article holds that the time when the papermaking technique first spread westward is earlier

than the Battle of Talas. As for whether it was first transmitted to Kokand or Samarkand, further exploration is needed. According to the research in this article, Kokand, as the first stop of the papermaking technique's spread to Central Asia, is more convincing. With its deep vassal relationship with the Tang Dynasty and the historical bond of Princess Yixing's marriage, Kokand became the primary carrier for the peaceful westward spread of the papermaking technique. The indirect evidence from the archaeological discovery of ancient paper and the records of political interaction and commercial trade in Chinese historical documents all indicate the chronological sequence of the early technological dissemination before the Battle of Talas.

However, the important hub position of Samarkand in the spread of papermaking technology in Central Asia cannot be denied. Located at a key point on the Silk Road, it gathers eastern and western technologies and cultures, and becomes a crucial node for the large-scale production and westward transmission of paper to Persia, Arabia, and even Europe. Thanks to its unique geographical location and the advantage of cultural integration, Samarkand played an irreplaceable role in the subsequent spread of the papermaking technique.

Future research can strengthen the detection of the origin of early paper through technological archaeological methods for the unearthed or circulated ancient paper in Central Asia, and promote the diversified development of the research on the history of technology dissemination along the Silk Road. Of course, regarding the first stop of the spread of papermaking technology to the West, it is worth further investigation from the perspective of the trade exchanges between the Sogdians and the Tang Dynasty.

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