

# **History and Typology of Paper in Central Asia During the First Millennium C.E.: Analysis of Chinese Paper Manuscripts**

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## **Project Description**

This project seeks to contribute to the history of paper in Central Asia during the first millennium C.E., and aims to create a typology of paper based on a systematic study of manuscript collections found along the Silk Road. The famous manuscripts from Dunhuang and Turfan encompass a broad range of paper types: from rough and low-quality paper to highly refined paper probably from Chang'an colored with a yellow dye. These papers constitute a valuable resource for the reconstruction of this decisive period in the early history of papermaking.

Typologies of 'national' or 'cultural' characteristics that are based on classifying manuscripts' features according to the language in which they are written are very restricted. This project seeks to go beyond their limited findings by combining the information contained in manuscript texts and in historical records with scientific data, thus an alternative creating, more reliable typology of these manuscripts. Macro- and microscopic research on early Chinese papers should answer questions about craft transmission, helping to explain who acquired the know-how of paper production from whom and when. Manuscript studies is an emerging interdisciplinary and cross-disciplinary field that brings together the humanities, conservation, technology, statistics and the natural sciences. Hence, the key feature of this project is a close cooperation with philologists, curators and collection keepers, which will allow us to examine original manuscripts in a thorough manner with respect to a broad variety of information sealed in manuscripts (not only their content) and statistics.

The current project is realized in close cooperation with International Dunhuang Project, British Library in London; Turfan Project, Berlin-Brandenburgische Akademie der Wissenschaften; Staatsbibliothek zu Berlin, and Bibliothèque Nationale de France. The research on chosen collections of manuscripts is synchronized with the project *Das Schreibmaterial der Seidenstraßenkulturen in Turfan: Analyse von Tuschen und Pigmenten* [The Writing Materials of the Silk Road Cultures in Turfan: An Analysis of Inks and Pigments] conducted by Bundesanstalt

für Materialforschung und - prüfung in Berlin.

## **Brief Overview of the History of Papermaking**

Although paper is one of the most important inventions in human history, our knowledge about its making and distribution in China and Central Asia in the first millennium remains very selective and fragmentary. The year 105 is commonly cited as the date of the invention of paper. Historical records for that year show that the technique of papermaking was reported to the Eastern Han Emperor He by Marquis Cai, an official of the Imperial Court. Archaeological records suggest, however, that paper had already been known in China as early as the second century BCE. It was used in China and spread to the rest of world through the Silk Roads. In the east, the art of papermaking reached Korea, where paper production began in the 6th century. According to traditional accounts, sixty years after Buddhism was introduced in Japan, a Korean monk brought papermaking to Japan, sharing his knowledge at the Imperial Palace in ca. 610.

Along the Silk Road, paper was introduced to the Xinjiang area very early according to archaeological records. The paper manuscripts found at Kaochang, Loulan, Kusha, Kotan, Dunhuang, and Turfan sites date as early as the third century. The art may eventually have reached Tibet around 650 and then spread to India. The preliminary findings in research on manuscripts support the view that Tibetans were able to make paper at least by the 9<sup>th</sup> century and that they apparently adjusted plants of the *Thymelaeaceae* family—which occur widely in the Himalayas—as raw material for the technology invented and practiced by Chinese communities.

According to written sources, after 751, paper production spread westward to Arabia via Samarkand. There is a story about Chinese papermakers who were captured by the Arabian army as prisoners of war in the battle of Talas and later settled in Samarkand. The Arabs supposedly learned the craft from the Chinese prisoners and built the first paper mill in Baghdad in 793. Yet this account oversimplifies the matter—papermaking may have been practiced in Samarkand decades before that battle.

Around that time, papermaking spread west of the Pamir, but probably not because of one singular event, but rather through a gradual transmission via many routes. The craft continued to spread gradually from Islamic Asia to Europe and, from there, around the world. The Egyptians

learned papermaking from the Arabs during the early tenth century. Around 1100 paper arrived in Northern Africa and by 1150 it arrived in Spain as a result of the crusades. 1453 saw the establishment of the first paper mill in Europe. The first paper mill in North America was built in 1690 in Philadelphia.

We do not know if these very few early dates singled out from written records are truly the turning points of paper history. In fact, there exist no written records of papermaking in Central Asia in any of the languages known in the region. Yet what we have available are manuscripts and xylograph prints from that time. By expanding the scope of research from their textual content to their material characteristics, we move beyond legends to a more precise understanding of the history of papermaking, its spread and its defining developments.

### **Project Objectives**

The first goal of the project is a Silk Road paper typology, the aim of which is to provide knowledge about the development of papermaking technologies and the materials used in the early stages in the history of paper production. In addition, the comparison of the physical features of the manuscripts studied should enable a reconstruction of the relationships between the regions of the manuscripts' origin, materials used for their production, dating, and perhaps even text genres. An examination of paper in a representative and carefully selected group of manuscripts should also allow us to establish criteria for the systematic classification of Central Asian papers found along the Silk Road and for improving methodology. The fiber examination of these manuscripts will establish a key for identification of Central Asian plant fibers used for papermaking. Technological aspects such as records of paper components and other features of preserved manuscripts will be used as independent records alternative to written sources. The results will be organized and presented within the framework of the International Dunhuang Project data base at the British Library.

Furthermore, a collection of plants used for papermaking in Central Asia will be created during field work in China and it will consequently be used for the preparation of master samples (references) for fiber identification. Reconstructing their distribution in Central Asia in the past should allow us to find the regional origin of unknown books when compared to the results of fiber analyses of other manuscripts with the same plant occurrence. A fiber library will be produced for the purpose of documenting differences in visual appearance of fibers used for

papermaking in different stages of the technological process and in historical papers. Visual changes in particular fibers' morphology, starting from raw material through the semi-products processed for newly produced paper and in historic papers at the different stages of deterioration, will be collected, compared and described for a better understanding of paper features.

The final goal of the project will be the development of a terminology and key words related to medieval manuscripts of Central Asia (manuscriptology). A bibliography of the history of paper in the first millennium in Central Asia will be produced and discussed with colleagues from the National Library in Beijing. This will be based on secondary literature in East Asian languages and European technical literature on papermaking.