




Mengling Cai

School of Information Resource Management,  
Renmin University of China, Beijing, China  
2015103510@ruc.edu.cn

 0000-0002-4248-0853

## Overview of paper and papermaking in Xinjiang, China<sup>1</sup>

**Abstract:** Papermaking in Xinjiang has a long history beginning during the Han Dynasty, to which a good many ancient documents excavated there bear witness. As an important transmitter of culture along the Silk Road, paper bears the imprint of the historical development of Xinjiang. Paper and papermaking techniques in Xinjiang are therefore of great historical and cultural importance. This article gives an overview of the development of traditional papermaking in Xinjiang, especially the mulberry papermaking in the Hotan area, by presenting its history, the raw materials used, papermaking and processing techniques, usages and the revival of handmade mulberry paper today in order to demonstrate its diverse values.

**Key words:** mulberry paper, history, papermaking technique, Uighur minority.

---

<sup>1</sup> A Major Planning Project in Social Science at Renmin University of China: “Arrangement, excavation and urgent conservation of documents from the Western Regions (Xiyu Wenxian Zhengli, Wajue Yu Qiangjiuxing Baohu)”, project number: 20XNLG06.

## History

There is no literature dealing with the time the people of Xinjiang began making paper. In 1933 the Chinese archaeologist Wenbi Huang found a piece of paper made of “*ma*”<sup>2</sup> near Lop Nor. When the wooden slips with the record of the first year of Huanglong (49 BCE) were all unearthed, the paper was dated to the Western Han Dynasty (202 BCE–8 CE)<sup>3</sup>. This was unfortunately destroyed in the Second Sino-Japanese War around 1930. Whether it could be called paper today is a moot point. This is the earliest paper found in Xinjiang, though, based on the archaeological findings to date, the wider use of paper began during the Eastern Han Dynasty (25–220 CE)<sup>4</sup>. In 1901 Marc Aurel Stein discovered two pieces of undated ancient paper featuring characters near Lop Nor<sup>5</sup>. The style of the calligraphy told Zhenyu Luo, a Chinese archaeologist and ancient philologist, that the paper was from the Eastern Han Dynasty<sup>6</sup>. In 1959 a small, black-coloured piece of paper was found in the Eastern Han tomb, located in the Niya ruins; it was called Niya paper<sup>7</sup>. It is thus clear that paper had already been in use in Xinjiang before 220 CE. In the ruins near Loulan and Lop Nor, archaeologists found fragments of *Stratagems of the Warring States* from the late Eastern Han Dynasty and documents dating from 252, 265, 310 CE<sup>8</sup>. The findings showed that the paper was largely used for writing during the late Eastern Han Dynasty in Xinjiang.

Marc Aurel Stein discovered a great many Khotanese documents made from mulberry (*Morus alba* L.) paper among the ruins of the Mazatag temple from the Tang Dynasty (618–907 CE) during his second visit to the Hotan area in 1908<sup>9</sup>, meaning mulberry paper had already been produced and used there as

<sup>2</sup> Hemp, flax, ramie, jute are collectively called “*ma*” in old Chinese documents and it is also used to refer to these materials when the exact species are unknown.

<sup>3</sup> W. Huang, *Luobunao'er Kaogu Ji (Archaeological Records of Lop Nor)*, Peiping 1948, p. 168.

<sup>4</sup> H. Anniwa'er, J. Yang, *Weiwu'erzu Sangpi Zhi Jiqi Zhizuo Gongyi (The mulberry paper made by the Uighur and its papermaking techniques)*, “Xinjiang Difang Zhi (Xinjiang Chorography)” 2012, vol. 1, pp. 47-50.

<sup>5</sup> D. Qu, *Zhongguo Yinshua Fazhanshi Tujian, part 1, (A illustrated book on the history of Chinese printing. Vol. 1)*, Shangxi 2013, p. 34.

<sup>6</sup> Z. Luo, G. Wang, *Liusha Zhui Jian (Sands falling from bamboo slips)*, Beijing 1993, p. 71.

<sup>7</sup> X. Li, J. Guo, B. Wang, *Xinjiang Minfeng Donghan Mu Chutu Guzhi Yanjiu (Research on ancient paper unearthed from the tomb of Eastern Han Dynasty in Minfeng, Xinjiang)*, “Wenwu (Cultural Relics)” 2014, vol. 7, pp. 94-96.

<sup>8</sup> Q. Wang, *Shilun Zhi He Zaozhishu Zai Xinjiang De Chuanbo (The spread of paper and papermaking in Xinjiang)*, “Zhongyang Minzu Daxue Xuebao (Journal of Minzu University of China)” 1995, vol. 2, pp. 36-40.

<sup>9</sup> G. Chen, *Stein Suohuo Tulufan Wenshu Yanjiu (Research on Turfan documents acquired by Stein)*, Wuhan 1997, pp. 285-288.

early as during the Tang Dynasty<sup>10</sup>. The sentence “Zhi Shi Kui Xiannu” (Xiannu Kui is a papermaker) found in a document from around 620 CE unearthed at Tomb 151, Astana, Turpan, in 1972 tells us that there had been specialised papermakers in Turpan at that time<sup>11</sup>. Another document from the Tang Dynasty unearthed at Tomb 72, Astana, recorded “Dang Shang Dian Yu Pei Zhi Fang Qu Shi” (“Prisoners were sent to paper mills as workers”)<sup>12</sup> indicated that there were paper mills in Turpan at that time.

After the 11<sup>th</sup> century Khotan (now Hotan Prefecture) was occupied by Qara Khanid, Islam was introduced into the area and the Uighur inherited the ancient papermaking techniques. The spread of mulberry papermaking techniques from Hotan to Turpan can be traced back to the conversion of the Uighur in Turpan to Islam in the middle of the 14<sup>th</sup> century<sup>13</sup>.

According to the archives on the Qing Dynasty (1636-1912), the mulberry paper was widely used in southern Xinjiang during the reign of the Qianlong Emperor (1736–1795 CE), but the paper used in other places within Xinjiang would still have been largely from inland China<sup>14</sup>. In the early 20<sup>th</sup> century machine-made paper from the Soviet Union was imported into Xinjiang and the need for domestic paper diminished, but the mulberry paper made in southern Xinjiang retained one advantage on the whole market insofar as it was relatively cheap<sup>15</sup>. By the end of the Qing Dynasty the mulberry papermaking industry was highly developed, and the paper was produced in many counties in Hotan rich in mulberry trees.

In the early 1930s, family-run paper workshops producing hand-made paper began gradually to be substituted by large-scale factories producing machine-made paper and managed by the local government. In “The outline of Xinjiang construction plan” drafted by the Xinjiang Construction Planning Committee of the Executive Council in 1934 it was suggested that the Department of Construction should appoint papermaking experts, purchase new machines and set up factories in Hotan to increase the production of paper and to improve

---

<sup>10</sup> H. Anniwa'er, J. Yang, op. cit., pp. 47-50.

<sup>11</sup> J. Pan, *Zhongguo Zaozhi Jishu Shigao (The history of Chinese papermaking techniques)*, Beijing 1979, p. 136.

<sup>12</sup> *Xinjiang Kaogu 30 Nian (Thirty years of archaeology in Xinjiang)*, Institute of Archaeology, Xinjiang Academy of Social Sciences, Urumqi 1983, p. 207.

<sup>13</sup> Y. Hu, Y. Mao, *Huanxing Silu Jiyi – Weiwu'erzu Sangpi Zhi Gufa Jiyi Chuancheng Yu Kaifa Celue (Memories of the Silk Road – Inheritance & development of the mulberry paper among Uighur craftsmanship)*, “Xinjiang Yishu Xueyuan Xuebao (Journal of Xinjiang Arts Institute)” 2017, vol. 15, no. 2, pp. 11-20.

<sup>14</sup> J. Fang, *Jianguo Qian Xinjiang Zhishi Qiankao (Preliminary Study Before the Founding of the Paper History in Xinjiang)*, “Zhongguo Zaozhi (China Pulp & Paper)” 1994, vol. 13, no. 4, pp. 67-70.

<sup>15</sup> Ibidem.

the quality of handmade mulberry paper, whose colour was less white and whose surface was noticeably rough<sup>16</sup>. In 1937 the Changji Paper Mill, established in the Changji Hui Autonomous Prefecture, began to produce packaging paper<sup>17</sup>. During this time, however, although the development of the machine-made paper industry was often included in the government's construction plan for Xinjiang, the real development began after the birth of the People's Republic of China. The mulberry paper, however, continued to be used for writing official documents and contracts, as well as packaging, until the 1940s.

After 1949 the modern papermaking industry developed rapidly and since then mulberry paper has not been used for printing and writing. In 1958 the first modern paper mill was planned in Urumqi and the following year, it began production of machine-made paper<sup>18</sup>. There were 19 small and medium-sized modern paper mills in Xinjiang by the early 1980s<sup>19</sup> and thus machine-produced paper replaced handmade mulberry paper as the main type of paper used in daily life. The Changji Hui Autonomous Prefecture, the Bayingolin Mongol Autonomous Prefecture, Urumqi and Shihezi became important areas for the development of the modern paper industry and the total output of the paper industry in these areas accounted for 91.8% of that in Xinjiang in 2004, but no modern paper industry had so far developed in Turpan, Hotan, Hami, the Bortala Mongol Autonomous Prefecture, the Kizilsu Kirghiz Autonomous Prefecture and other areas<sup>20</sup>.

Alongside the development of modern paper industry, the shortage of raw materials also posed a serious threat to the local mulberry papermaking industry. The promotion of the forestry and fruit industries peaked after 2002<sup>21</sup> and thousands of mulberry trees were cut down. Traditional mulberry paper tended moreover to be produced in family-run workshops where techniques would be handed down from generation to generation. The economic development after the birth of the People's Republic of China led to many young people moving to cities in search of improved career opportunities. The legacy of mulberry

<sup>16</sup> The Xinjiang Construction Planning Committee of the Executive Council, *Xinjiang Jianshe Jihua Dagang Cao'an (Outline of the Xinjiang construction plan)*, Urumqi 1934.

<sup>17</sup> *General Records of Xinjiang: Science and Technology*, Chorography Compilation Committee of the Xinjiang Uighur Autonomous Region, [in:] *Xinjiang Tongzhi Di 72 Juan, part 1: Kexue Jishu Zhi (General Records of Xinjiang. Vol. 72: Science and Technology)*, Xinjiang 2000, p. 453.

<sup>18</sup> *Ibidem*.

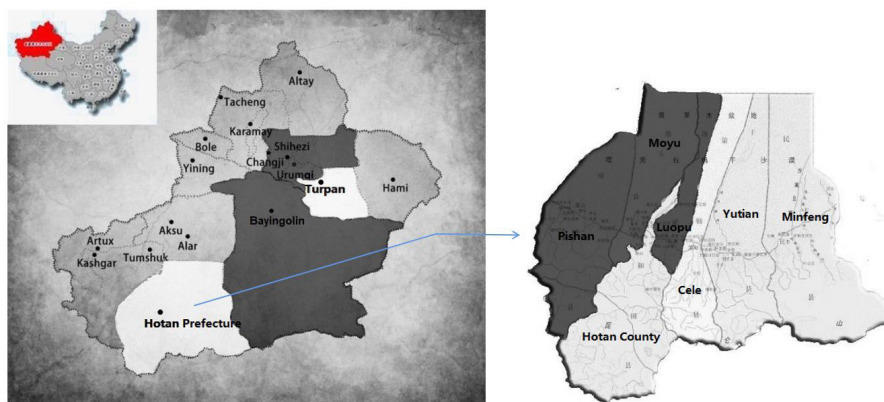
<sup>19</sup> J. Fang, *Jianguo Qian...*, pp. 67-70.

<sup>20</sup> F. Zhao, Y. Cui, H. Kang, *Xinjiang Zaozhi Gongye Fazhan Fangxiang (The development of the paper industry in Xinjiang)*, "Zhonghua Zhiye (China Pulp & Paper Industry)" 2006, vol. 27, no. 6, pp. 24-27.

<sup>21</sup> X. Li, *Xinjiang Moyu Xian Weiwu'erzu Shougong Zaozhi Diaocha (Investigation of Uighur handmade paper in Moyu County, Xinjiang)*, "Xibe Minzu Yanjiu (N W. Ethno-National Studies)" 2009, vol. 3, pp. 147-154.

papermaking industry faced a lack of beneficiaries and aging heirs. Traditional mulberry paper is primarily produced in Moyu, historically known as Qaraqash, Pishan and Luopu in Hotan<sup>22</sup>.

Fig. 1. Maps of the major papermaking areas in Xinjiang. Left: map of the Xinjiang Uighur Autonomous Region (the main mulberry-paper-producing area before 1949 are in a light colour: Hotan and Turpan, and the major modern papermaking industry sites were developed after 1949 and are in a dark colour: Changji, Bayingolin, Urumqi and Shihezi); Right: map of Hotan Prefecture (the best-known places where mulberry paper was produced and continues to be produced are in a dark colour: Moyu, Pishan and Luopu)



## Raw materials

So important a component of ancient Xinjiang paper is Ramie (*Boehmeria nivea*) that it is found in the majority of paper excavated dating back to before the Tang Dynasty. Hemp (*Cannabis sativa L.*) is another common raw material<sup>23</sup>. They are not derived from the raw fibres, however, but from abandoned clothes, fishnets, shoes, ropes and other fabrics made of “ma”<sup>24</sup>. It is worthy of mention that paper made from bast was discovered in the Khara-khoja tomb and the raw material used was identified as paper mulberry (*Broussonetia papyrifera L.*)<sup>25</sup>.

<sup>22</sup> Y. Hu, Y. Mao, op cit., pp. 11-20.

<sup>23</sup> X. Li, B. Zheng, B. Wang, *Tulufan Astana – Halahezhuo Gumu Chutu Guzhi Yanjiu (A study on ancient paper sheets from Astana-Khara Khoja graves in Turfan)*, “Xiyu Yanjiu (The Western Regions Studies)” 2012, vol. 1, pp. 62-68.

<sup>24</sup> J. Pan, *Xinjiang Chutu Guzhi Yanjiu – Zhongguo Gudai Zaozhi Jishushi Zhuanji Yanjiu Zhi 2 (Research into Ancient Paper Unearthed in Xinjiang – Special Research into the History of Ancient Chinese Papermaking Technology. Part 2)*, “Wenwu (Cultural Relics)” 1973, vol. 10, pp. 52-60.

<sup>25</sup> X. Li, B. Zheng, B. Wang, op cit., pp. 62-68.

The paper has been dated to between 304 and 439 CE and is one of the earliest examples of bast paper found in Xinjiang. A paper-made shoe was also discovered at the same time and the raw materials were identified as hemp, ramie and silk<sup>26</sup>. The singular combination of both vegetable and animal fibres identified in the shoe suggests that rags might have been recycled to produce this paper. Although mulberry paper was used in Hotan during the Tang Dynasty, “*ma*” fibres remained the primary raw materials for papermaking at that time. Dr. Julius Wiesner from the University of Vienna also examined the paper collected by Marc Aurel Stein from Eastern Turkestan (the southern and central parts of modern Xinjiang) and concluded that the paper dating from between the fourth and fifth centuries were made of a mixture of raw fibres from the bast of various dicotyledonous plants; the paper from the fifth, sixth and seventh centuries was made of a mixture of raw fibres; and during the seventh and eighth centuries paper made from raw bast fibres and that made of a mixture of rags and raw fibres were equally common<sup>27</sup>. August Friedrich Rudolf Hoernle concurred that paper from the eighth century was made of a mixture of certain raw fibres (identified as mulberry, laurel and ramie) with rags (of flax, hemp or ramie)<sup>28</sup>.

The book *Hui Jiang Zhi* compiled between 1736 and 1795 described the paper in Xinjiang as Huijiang paper<sup>29</sup>, divided into black paper and white paper, and they were made of mulberry and cotton rags<sup>30</sup>. In the early 1930s mulberry, recycled cotton and hemp formed part of the raw materials of paper in southern Xinjiang<sup>31</sup>. The book *Xin Jiang Zhi Gao* records that mulberry paper was originally made in Hotan, and then in Dihua (Urumqi) and Turpan the techniques evolved slightly: cotton, wheat straw would be mixed with mulberry bast during papermaking process<sup>32</sup>.

When the modern papermaking industry in Xinjiang had developed, reeds, wheat straw, kenaf, waste paper, and many other fibres were said to constitute the bulk of the raw materials used by paper mills<sup>33</sup>, unlike those used in traditional handmade paper.

<sup>26</sup> Ibidem.

<sup>27</sup> J.R. Wiesner, *Mikroskopische Untersuchung alter ostturkestanischer und anderer asiatischer Papiere. Nebst histologischen Beiträgen zur mikroskopischen Papieruntersuchung. Mit 18 Textfiguren- Denkschriften der Akademie der Wissenschaften*, [online] [https://www.zobodat.at/pdf/DAKW\\_72\\_0583-0632.pdf](https://www.zobodat.at/pdf/DAKW_72_0583-0632.pdf) [accessed 02.05.2020].

<sup>28</sup> A.F.R. Hoernle, *Art. XXII. – Who was the Inventor of Rag-paper?* “Journal of the Royal Asiatic Society of Great Britain and Ireland” 1903, vol. 35, no. 4, pp. 663-684.

<sup>29</sup> Huijiang was generally used during the Qing Dynasty to refer to Tianshan South Road in Xinjiang.

<sup>30</sup> E. Su, *Huijiang Zhi (Records of Huijiang)*, Taipei 1968, p. 125.

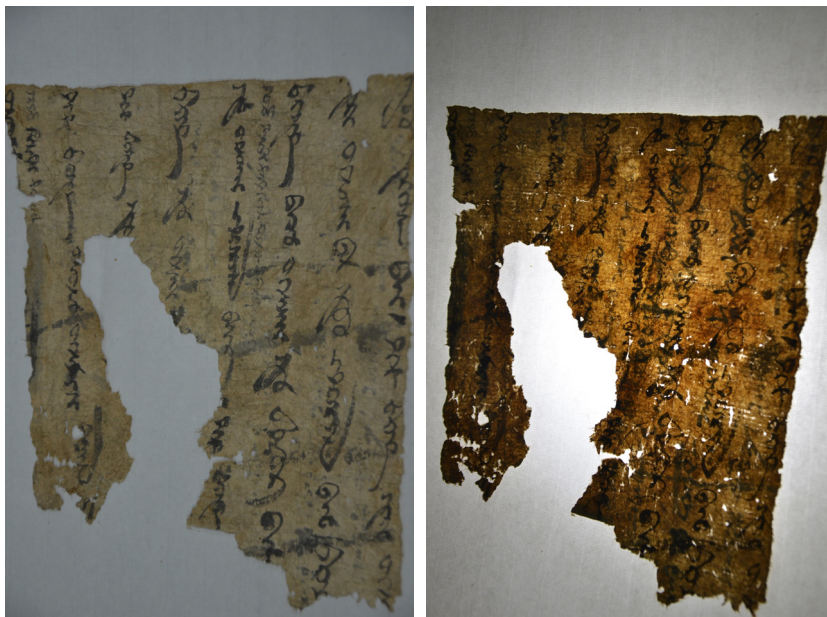
<sup>31</sup> S. Wu, *Xinjiang Gaiguan (Overview of Xinjiang)*, Nanjing 1933, p. 258.

<sup>32</sup> G. Zhong, *Xinjiang Zhigao (Records of Xinjiang)*, Taipei 1931, p. 122.

<sup>33</sup> F. Zhao, Y. Cui, H. Kang, op cit., pp. 24-27.



Fig. 2. A document from Tang Dynasty which used “ma” paper and was written on in Sogdian on both sides. It was discovered in Hotan, Xinjiang and is now preserved in the Museum of Renmin University of China



### Papermaking techniques

Nowadays traditional mulberry paper is made mainly in the counties of Moyu, Pishan and Luopu in Hotan, where large areas of mulberry trees are to be found. The paper is primarily produced in family-run workshops in the Uighur community, so the original techniques are passed down from generation to generation and are preserved in some families. The main process is described as follows<sup>34</sup>

#### 1. Collecting raw materials

The papermakers will collect mulberry branches from May to August, since the tender fibres are more suitable for papermaking. Trees selected should be more than ten years old.

#### 2. Preparing raw materials

The collected mulberry branches need first of all to be rinsed in a water tank for about three hours until the water takes on a tawny hue. The dark outer layer

---

<sup>34</sup> X. Li, op cit., pp. 147-154; H. Anniwa'er, J. Yang, op cit., pp. 47-50; Y. Hu, Y. Mao, op cit., pp. 11-20.

of bark is then be peeled off using a knife and the inner bark the length of which should be between thirty and sixty centimetres should then be scraped out. In most cases, the outer bark will be discarded, but it too may be used to make paper. The bast should then be spread on the ground and dried in the sun, which will cause the bast to blanch. This process tends to take no longer than one day.

### 3. Boiling

The bast is cooked in water, stirred with a wooden stick until the bast becomes soft and turns tawny. A kind of alkaline crystallisation from *Populus euphratica*, which is white or brown, will be added after an hour's cooking. This chemical substance helps fermentation of the bast and makes it easy to soften.

### 4. Beating and preparing the pulp

The soft mulberry bast should be taken out of the water and put on a slate. First of all the impurities are removed by hand, and the strips are then beaten with a wooden mallet until they are a pulp similar in consistency to dough. It often takes about half an hour and during this process the bast should be kneaded and water added constantly. The beaten materials should then be put in water in a wooden barrel and mixed by hand to begin with. A wooden stick with a small cross on one of its ends should be used to stir the fibres until they are evenly dispersed in the water. The paper pulp needs to be filtered before being used to make sheets of paper.

### 5. Forming sheets of paper

A fixed mould with a wooden frame and a cotton sieve is placed on the surface of a puddle or water container. The pulp is slowly poured into the mould using a ladle and spread out by dint of whirling the stick with the small wooden cross at its end constantly when passing it over through the pulp at the same time. Once the pulp is spread evenly on the sieve, the impurities are picked out. The mould is then carefully removed from the water.

### 6. Drying and calendering

The newly made sheet of paper would be propped still in the mould diagonally in the sun and the paper is peeled off once it is completely dry. The surface of such paper tends to be rough, so the paper is lightly calendered before use to make the surface glossier and more even. Further processing leaves the mulberry paper somewhat yellow, with a soft texture, durability and tensile resistance.

This floating method of papermaking, whereby the paper pulp is poured onto the sieve and the sheets of paper are dried on the mould, is extremely time-consuming and labour-intensive. This low productivity prompted the dipping method, a method that seems to have developed after the floating method and one that is widely used in inland China. The mould is dipped into the paper pulp and the movable sieves allow the wet sheet of paper to be removed from the sieve once it is half-dry. As a result, the mould may be used more time



the mould more frequently and gives rise to greater productivity. In fact, the floating papermaking method has long been used in Xinjiang. Many pieces of ancient paper made of “*ma*” unearthed there have been identified as being made by this method. The Niya paper found in the Eastern Han tomb in the Taklamakan Desert was thick with unevenly distributed fibres and no clear sieve prints on the surface<sup>35</sup>, which are the tell-tale features of the floating method. At the Astana and Khara-khoja tombs in Turpan, several fragments of “*ma*” paper dated to between the Eastern Jin Dynasty (317-420 CE) to the Tang Dynasty had the same features<sup>36</sup>. This method therefore seems to have been used in Xinjiang for more than 1500 years.

Ancient, dip-method-made “*ma*” or bast paper found in Xinjiang have also been discovered. The paper was comparatively thin with even surfaces and clear laid lines<sup>37</sup>, both regular and irregular, the former made by bamboo sieves and the latter by reed or other grass sieves<sup>38</sup>. The fragments of paper with laid lines found at the Astana and Khara-khoja tombs were also from between the Eastern Jin and the Tang Dynasties and had different numbers of lines per centimetre. The majority of the paper made with a dipping mould and bamboo sieves had between 6 and 7 laid lines per centimetre, while the paper made with grass sieves had 4 lines per centimetre<sup>39</sup>. Since some pieces of the paper made with a dipping mould were unearthed in the same tomb as those made with a floating mould in Turpan, it may be inferred that these two methods of papermaking were both used between the Eastern Jin Dynasty and the Tang Dynasty in Xinjiang.

### Paper processing

While in most cases mulberry paper today is only lightly calendered after the sheet is formed and dried, further processes have been identified from the excavated paper in Xinjiang, including dyeing, sizing, filling, and coating, to render the paper more suitable for writing.

Niya paper from the Eastern Han Dynasty is the earliest coloured paper so far discovered in the world. Most of the surface is covered by black ink or pigment and the yellowish natural fibres are visible at the edge, where the

---

<sup>35</sup> X. Li, J. Guo, B. Wang, op cit., pp. 94-96. X. Li, B. Zheng, B. Wang, *Tulufan Astana – Halahezhuo...*, pp. 62-68.

<sup>36</sup> X. Li, B. Zheng, B. Wang, op cit., pp. 62-68.

<sup>37</sup> J. Pan, *Xinjiang Chutu Guzhi...*, pp. 52-60; X. Li, B. Zheng, B. Wang, op cit., pp. 62-68.

<sup>38</sup> A. Helman-Ważny, *More than meets the eye: Fibre and Paper Analysis of the Chinese Manuscripts from the Silk Roads*, “STAR: Science & Technology of Archaeological Research” 2016, vol. 2, no. 2, pp. 127-140.

<sup>39</sup> X. Li, B. Zheng, B. Wang, op cit., pp. 62-68.

black colour did not reach. This suggests that the paper was painted on the surface or dyed after it had been formed<sup>40</sup>. In addition, a piece of brown paper made of “*ma*” from Tang Dynasty unearthed at the Astana and Khara-khoja tombs in Turpan was deduced to be dyed with some botanical pigments<sup>41</sup>.

Sized paper was still rare in Jin Dynasty (266-420 CE) China, but at the Astana and Khara-khoja tombs in Turpan four pieces of “*ma*” and bast paper were found sized with starch on one or both sides. Three fragments were filled with starch, suggesting starch was added to the paper pulp before forming the sheet, and they all date to the Eastern Jin Dynasty<sup>42</sup>. Starch was also found inside a fragment of ancient paper from between 405 and 417 CE discovered at the Astana tomb<sup>43</sup>.

Coated paper was also discovered in Xinjiang. The book “*Romance of the Three Kingdoms: Biography of Sun Quan*” (*San Guo Zhi: Sun Quan Zhuan*) written during the Jin Dynasty used paper coated with a white mineral powder, perhaps gypsum or lime<sup>44</sup>. There were also other fragments of paper dating from the Jin Dynasty coated with white powder, but unfortunately the chemical composition was not analysed<sup>45</sup>. Julius Ritter Wiesner<sup>46</sup> claims to have found pieces of Eastern Turkestan paper from between the fifth and seventh centuries that were further processed, such as being coated with gypsum, and sized with starch or gelatin extracted from lichen. Five other samples of local documents collected by the Xinjiang Uighur Autonomous Region Museum in 2009 were also analysed and it was found that kaolin, calcium carbonate and talcum powder were used as the main fillers in these samples<sup>47</sup>.

## Usage

During Jin and Tang Dynasties (266-907 CE) paper was widely used in daily life in Xinjiang. Marc Aurel Stein discovered ledger for paper buying and usage at the Mazatag temple from the Tang Dynasty in Hotan<sup>48</sup>. The records confirm that during the Tang Dynasty paper was not only used for documents, but also to make lanterns. In the several archaeological excavations of Astana

<sup>40</sup> X. Li, J. Guo, B. Wang, op cit., pp. 94-96.

<sup>41</sup> X. Li, B. Zheng, B. Wang, op cit., pp. 62-68.

<sup>42</sup> Ibidem, pp. 62-68.

<sup>43</sup> J. Pan, *Xinjiang Chutu Guzhi...*, pp. 52-60.

<sup>44</sup> Ibidem.

<sup>45</sup> Ibidem.

<sup>46</sup> J.R. Wiesner, op. cit.

<sup>47</sup> J. Guo, Y. Sun, M. Yang, etc., *Structural and compositional analysis of paper documents newly collected by the Xinjiang museum*, “Science of Conservation and Archaeology” 2012, vol. 24, no 3, pp. 41-46.

<sup>48</sup> G. Chen, op cit., pp. 285-288.

and Khara-khoja tombs in Turpan, in addition to documents, ledgers, contracts and letters in a variety of languages from the Jin Dynasty to the Tang Dynasty (the earliest document being from 273 CE and the latest from 778 CE, according to the records<sup>49</sup>), paper cuts, paper coffins, paper human figures, paper shoes, and paper hats were found<sup>50</sup>, suggesting that the use of paper in Turpan at that time was quite extensive and that paper was turned to a wide variety of daily uses.

Mulberry paper in Xinjiang had a wide range of uses, especially during the Qing Dynasty and the Republic of China (1912-1949), the uses differing according to the raw materials. There were generally three types of paper<sup>51</sup>. The first would be made from the inner bark of mulberry branches and the paper was of high quality, mainly used for writing and printing books, official documents, archives, contracts, letters, and Buddhist scriptures. Banknotes in circulation in Hotan at the beginning of the 20<sup>th</sup> century would even be printed on mulberry paper. Refined mulberry paper was also an essential accessory for embroidered hats made by Uighur girls. The second type of paper was also made from the inner bark, but the quality of the paper would be poor. It would be used for packing tea, food, medicinal herbs, as well as making kites and pasting windows. The third type was made from the bark which was not cleaned from its outer layer, so the paper would tend to be dark in colour, thick and rough and had few uses. It would mainly be used for funeral supplies or auxiliary materials for leather boots because of its advantageous propensity to absorb sweat quickly.

Mulberry paper was completely replaced by modern paper in daily life after 1980s and enjoyed only a limited market, primarily serving tourists.

### Revival in modern society

The Chinese government's keen emphasis on the protection of cultural heritage led to the Uighurs' technique of making mulberry paper being included in the national list of intangible cultural heritage in 2006<sup>52</sup>, since when a variety of measures have been taken by the government and cultural departments at all levels to safeguard this technique.

---

<sup>49</sup> Q. Wang, op cit., pp. 36-40.

<sup>50</sup> X. Li, op cit., pp. 147-154.

<sup>51</sup> H. Anniwa'er, J. Yang, *Weiwu'erzu Sangpi Zhi...*, pp. 47-50; X. Zhang, *Xiyu Zhi De Chuanbo Tujing Yanjiu (Study on the spreading route of the Paper from the Western Regions)*, "Lantai Shijie (Lantai World)" 2015, vol. 21, pp. 84-85.

<sup>52</sup> Notice of the State Council on the Publication of the first batch of National Intangible Cultural Heritage List, [online] [http://www.gov.cn/gongbao/content/2006/content\\_334718.htm](http://www.gov.cn/gongbao/content/2006/content_334718.htm) [accessed 06.09.2020].

The Department of Intangible Cultural Heritage in Moyu, one of the main areas of production of mulberry paper in Xinjiang, paid a great deal of attention to the protecting those who take over the industry by boosting their incomes, improving social welfare and reducing taxes. Training courses to reach mulberry papermaking techniques have also been organised. With the building of “a street for mulberry papermaking” in Moyu, Chinese and foreign tourists increasingly visit Xinjiang, calling at the mulberry papermaking workshops, watching papermakers and observing the entire papermaking process, as well, of course, as buying mulberry paper and other paper artefacts, which have promoted the production and the spread of Xinjiang mulberry paper. Many national projects have been established and research carried out in order to investigate the current state of mulberry papermaking in Xinjiang and to explore different ways productively to safeguard this traditional technique for posterity.

Machine-made paper which can be mass produced cheaply and sold at low prices has already been widely adopted by people in their daily life and threatens the revival of traditional handmade paper. Since mulberry paper is thin and soft but also tough with a smooth texture, good water absorption and capacity to resist insect infestation, it was favoured by photographers and painters. Since 2010 many exhibitions of photography and painting have been held in Xinjiang or Beijing, in which the work on display all used mulberry paper<sup>53</sup>. The mulberry paper and the art on it were a “gift from Xinjiang” in the spirit of regional cultural exchange<sup>54</sup>. As well as art, products such as calendars, and notebooks, were especially designed and developed to be a cultural brand of Xinjiang mulberry paper. In 2017 the “Belt and Road” International Cooperation Summit Forum was held in China and it opened up more room for actively promoting the protection, heritage and development of traditional handmade paper.

## Conclusion

Archaeological findings have revealed that papermaking in Xinjiang has a history going back more than 1800 years. “*Ma*” fibres were the first main raw materials used for papermaking until mulberry tree bast became the dominant papermaking material in Hotan during the Tang Dynasty. Although

---

<sup>53</sup> F. Yu, M. Wang, *Xinjiang Sangpi Zhi Zhizuo Gongyi Chuancheng Celue (The inheritance strategy for Xinjiang mulberry papermaking techniques)*, “Xinjiang Yishu (Xinjiang Art)” 2018, vol. 3, pp. 127-131.

<sup>54</sup> F. Wu, *Feiwuzhi Wenhua Yichan Shengchanxing Baohu De Shijian Yu Sikao – Yi Weiwu’erzu Sangpi Zhi Zhizuo Jiye Weili (Practice and theory on productive protection of intangible cultural heritage – take paper skill made by MORUS ALBA of Uighur people as an example)*, “Xinjiang Shehui Kexue (Social Sciences in Xinjiang)” 2015, vol. 3, pp. 117-123.

traditional mulberry paper is made with the floating papermaking method, some fragments of excavated paper from Xinjiang showed that the floating and dipping methods were both used from the Eastern Jin Dynasty to the Tang Dynasty and some additional processes were identified from the paper from the Han and Jin Dynasties, such as dyeing, sizing, filling and coating. By the end of the Qing Dynasty mulberry papermaking in Hotan had become highly developed and the paper made at that time in southern regions was widely used in daily life in other parts of Xinjiang. The development of modern papermaking combined with the lack of raw material and workforce, however, has meant that the traditional handmade mulberry paper industry in Xinjiang has declined and almost disappeared.

Once the mulberry papermaking technique of the Uighur minority was placed on the list of National Intangible Cultural Heritage in 2006, conserving the technique attracted a good deal of attention and both the paper and the technique have become increasingly widely used in art and culture. Through the joint efforts of the government and the whole society, the Xinjiang mulberry papermaking technique, known as the “living fossil of ancient papermaking”, is now gradually recovering and spreading both at home and abroad.

This paper gives a relatively comprehensive overview of paper and papermaking in Xinjiang in terms of both literature and archaeological findings. This look at the chronological development of raw materials, papermaking techniques, paper processing techniques and usages, as well as the revival of handmade mulberry paper in modern society seeks to provide a basic review for future work in the study of the materials used in ancient documents discovered in Xinjiang and now preserved in the Museum of Renmin University of China. It may also prove helpful in finding the historical, cultural and modern significance of these documents from the perspective of their materials.

### Bibliography

- Anniwa'er H., Yang J., *Weiwu'erzu Sangpi Zhi Jiqi Zhizuo Gongyi (The mulberry paper made by the Uighur and their papermaking techniques)*, “Xinjiang Difang Zhi (Xinjiang Chorography)” 2012, vol. 1, pp. 47-50.
- Chen G., *Stein Suohuo Tulufan Wenshu Yanjiu (Research on Turfan documents carried out by Stein)*, Wuhan 1997.
- Fang J., *Jianguo Qian Xinjiang Zhishi Qiankao (Preliminary Study Before the Founding of the Paper History in Xinjiang)*, “Zhongguo Zaozhi (China Pulp & Paper)” 1994, vol. 13, no. 4, pp. 67-70.
- Xinjiang Tongzhi Di 72 Juan, part 1: Kexue Jishu Zhi (General Records of Xinjiang. Vol. 72: Science and Technology)*, Xinjiang 2000.

- Guo J., Sun Y., Yang M., etc., *Structural and compositional analysis of paper documents newly collected by the Xinjiang museum*, “Science of Conservation and Archaeology” 2012, vol. 24, no. 3, pp. 41-46.
- Helman-Ważny A., *More than meets the eye: Fibre and Paper Analysis of the Chinese Manuscripts from the Silk Roads*, “STAR: Science & Technology of Archaeological Research” 2016, vol. 2, no. 2, pp. 127-140.
- Hoernle R.A.F., *Art. XXII. – Who was the Inventor of Rag-paper?* “Journal of the Royal Asiatic Society of Great Britain and Ireland” 1903, vol. 35, no. 4, pp. 663-684.
- Hu Y., Mao Y., *Huanxing Silu Jiye – Weiwu'erzu Sangpi Zhi Gufa Jiye Chuancheng Yu Kaifa Celue (Memories of the Silk Road – Inheritance & development of the mulberry paper among Uighur craftsmanship)*, “Xinjiang Yishu Xueyuan Xuebao (Journal of Xinjiang Arts Institute)” 2017, vol. 15, no. 2, pp. 11-20.
- Huang W., *Luobunao'er Kaogu Ji (Archaeological Records of Lop Nor)*, Peiping 1948.
- Li X., *Xinjiang Moyu Xian Weiwu'erzu Shougong Zaozhi Diaocha (Examination of Uighur handmade paper in Moyu County, Xinjiang)*, “Xibei Minzu Yanjiu (N.W. Ethno-National Studies)” 2009, vol. 3, pp. 147-154.
- Li X., Guo J., Wang B., *Xinjiang Minfeng Donghan Mu Chutu Guzhi Yanjiu (Research on ancient paper unearthed from the tomb of the Eastern Han Dynasty in Minfeng, Xinjiang)*, “Wenwu (Cultural Relics)” 2014, vol. 7, pp. 94-96.
- Li X., Zheng B., Wang B., *Tulufan Astana – Halahezhuo Gumu Chutu Guzhi Yanjiu (A study on ancient paper sheets from Astana-Khara Khoja graves in Turfan)*, “Xiyu Yanjiu (The Western Regions Studies)” 2012, vol. 1, pp. 62-68.
- Luo Z., Wang G., *Liusha Zhui Jian (Sands falling from bamboo slips)*, Beijing 1993.
- Xinjiang Jianshe Jihua Dagang Cao'an (Outline of the Xinjiang construction plan)*, The Xinjiang Construction Planning Committee of the Executive Council, Urumqi 1934.
- Pan J., *Xinjiang Chutu Guzhi Yanjiu – Zhongguo Gudai Zaozhi Jishushi Zhuanti Yanjiu Zhi 2 (Research into Ancient Paper Unearthed in Xinjiang – the Special Research project into the History of Ancient Chinese Papermaking Technology. Part 2)*, “Wenwu (Cultural Relics)” 1973, vol. 10, pp. 52-60.
- Pan J., *Zhongguo Zaozhi Jishu Shigao (The history of Chinese papermaking techniques)*, Beijing 1979.
- Qu D., *Zhongguo Yinshua Fazhanshi Tujian, part 1, (An illustrated book on the history of Chinese printing. Vol. 1)*, Shangxi 2013.
- Su E., *Huijiang Zhi (Records of Huijiang)*, Taipei 1968.
- Xinjiang Kaogu 30 Nian (Thirty years of archaeology in Xinjiang)*, Institute of Archaeology, Xinjiang Academy of Social Sciences, Urumqi 1983.
- Wang Q., *Shilun Zhi He Zaozhishu Zai Xinjiang De Chuanbo (The spread of paper and papermaking in Xinjiang)*, “Zhongyang Minzu Daxue Xuebao (Journal of Minzu University of China)” 1995, vol. 2, pp. 36-40.
- Wiesner J.R., *Mikroskopische Untersuchung alter ostturkistanischer und anderer asiatischer Papiere. Nebst histologischen Beiträgen zur mikroskopischen Papieruntersu-*



- chung. Mit 18 Textfiguren- Denkschriften der Akademie der Wissenschaften*, [online] [https://www.zobodat.at/pdf/DAKW\\_72\\_0583-0632.pdf](https://www.zobodat.at/pdf/DAKW_72_0583-0632.pdf) [last accessed 02.05.2020].
- Wu F., *Feiwuzhi Wenhua Yichan Shengchanxing Baohu De Shijian Yu Sikao – Yi Weiwu 'erzu Sangpi Zhi Zhizuo Jiyi Weili (Practice and theory on productive protection of intangible cultural heritage – take paper skill made by MORUS ALBA of Uighur people as an example)*, “Xinjiang Shehui Kexue (Social Sciences in Xinjiang)” 2015, vol. 3, pp. 117-123.
- Wu S., *Xinjiang Gaiguan (Overview of Xinjiang)*, Nanjing 1933.
- Yu F., Wang M., *Xinjiang Sangpi Zhi Zhizuo Gongyi Chuancheng Celue (Heritage strategy of the mulberry papermaking techniques of the Xinjiang)*, “Xinjiang Yishu (Xinjiang Art)” 2018, vol. 3, pp. 127-131.
- Zhang X., *Xiyu Zhi De Chuanbo Tujing Yanjiu (Study on the spreading route of the Paper from the Western Regions)*, “Lantai Shijie (Lantai World)” 2015, vol. 21, pp. 84-85.
- Zhao F., Cui Y., Kang H., *Xinjiang Zaozhi Gongye Fazhan Fangxiang (The trend of development of paper industry in Xinjiang)*, “Zhonghua Zhiye (China Pulp & Paper Industry)” 2006, vol. 27, no. 6, pp. 24-27.
- Zhong G., *Xinjiang Zhigao (Records of Xinjiang)*, Taipei 1931.