

## THE COEXISTENCE OF WRITING MEDIA IN THE IBERIAN PENINSULA DURING THE MIDDLE AGES. THE STORY OF A LEGACY

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### Abstract

China offered humanity a cheap and highly durable material that, after six hundred years of adaptation through the Silk Road, would reach Europe via the Iberian Peninsula in the hands of the Arabs. Hispano-Arabic paper, as the paper produced in the peninsula was called in the Middle Ages, would soon replace the papyrus and parchment, with which it had coexisted in the beginning.

The historical context of each kingdom, as well as the devastation caused by the Black Death and the opening of trade with Italy after the expansion of the Crown of Aragon, would determine the origins and techniques used in the manufacturing of Hispanic paper. Three types of paper coexisted in the peninsula: Hispano-Arabic paper, a new type of paper imported from Italy and a third type with mixed characteristics.

The codices and the various documents preserved reflect not only the artistic trend of the place where they were produced, but also the technique of paper production, which was subject to the tradition inherited from the Hispano-Arab papermakers and improved from the thirteenth century

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onwards by the craftsmen of Fabriano, with great value as witnesses of a historical context.

**Keywords:** Iberian Peninsula, writing medium, Middle Ages, Hispano-Arabic paper, Italian paper.

## **Orta Çağ'da İber Yarımadası'nda Yazı Araçlarının Bir Arada Bulunuşu. Bir Miras Hikayesi**

### **Öz**

Çin'in insanlığa sunduğu ucuz ve son derece dayanıklı bir malzeme, İpek Yolu üzerinde geçirdiği altı yüz yıllık bir adaptasyon sürecinin ardından İber Yarımadası üzerinden Araplar eliyle Avrupa'ya ulaşacaktı. Ve çok geçmeden Yarımada'da üretilen kâğıt, Ortaçağ'daki adıyla İspanyol-Arap kâğıdı, ilk başta birlikte var olduğu papirüs ile parşömenin yerini alacaktı.

Her bir krallığın tarihsel bağlamının yanı sıra, Kara Veba'nın neden olduğu yıkım ve Aragon Krallığı'nın genişlemesinin ardından İtalya ile ticaretin başlaması, İspanyol kâğıdının kökenini ve üretiminde kullanılan teknikleri belirleyecekti. Yarımada'da üç tür kâğıt bir arada bulunuyordu: İspanyol-Arap kâğıdı, İtalya'dan ithal edilen yeni bir kâğıt türü ve karışık özelliklere sahip üçüncü bir tür.

Günümüze kadar ulaşan el yazmaları ve çeşitli belgeler, yalnızca üretildikleri yerin sanatsal eğilimini değil, aynı zamanda İspanyol-Arap kâğıt üreticilerinden miras kalan geleneğe tabi olup on üçüncü yüzyıldan itibaren Fabriano zanaatkarları tarafından geliştirilen kâğıt üretim tekniğini de yansıtmakta olup tarihsel bir bağlamın tanıkları olarak büyük değere sahiptir.

**Anahtar kelimeler:** İber yarımadası, yazı ortamı, Orta Çağ, İspanyol-Arap kâğıdı, İtalyan kâğıdı.

### **Objectives**

This paper aims to achieve the following objectives: First, to establish a chronology of the emergence, use and coexistence of different writing materials during the Middle Ages in the Iberian Peninsula by relating them to the complex socio-political context of Christian Spain. Secondly, to demonstrate the testimonial value of the paper at a historical and cultural level by highlighting the great capacity to adapt this material through different methods of production which would eventually become tradition and identity. Finally, to reconstruct the process of making a sheet of cloth paper in a traditional paper mill by clarifying the specific terminology found in the study.

## **Writing media as cultural identity**

The graphic language was perfected from the symbol to the signs representing the sounds, i.e. the alphabet. The difficulty of using this language lay not only in the transcription of the elements of oral expression, but also in the medium itself. With the invention of writing, many materials were used: stone, wood, fabrics, animal bones, palm leaves, etc. But it is in the great civilizations, driven by a greater need for communication, control, administration and cultural development that we find the creation of media that are much more writing-friendly, durable, and easy to store and transport. Thus, Clay tablets were used in Mesopotamia, papyrus<sup>1</sup> in Egypt, parchment in the Classical period and the Middle Ages, Amatl (amate paper) in the Aztec Empire, paper in China (José Manuel Fernández Zapico<sup>2</sup>).

## **Papyrus, from scroll to codex**

Ancient Egyptians used the stalks of papyrus, a plant that grew in abundance on the banks of the Nile. Papyrus thus became one of the most important writing media in ancient civilisations: during the first millennium BC and until the appearance of other alternative media, it was widely used in Rome, Persia, Classical Greece, Palestine and Syria (Salvador Muñoz Viñas<sup>3</sup>).

The unit of measurement for papyrus was the plagula (leaf). The leaves could be glued together at the ends to form a roll (scapus) on a wooden or ivory shaft, consisting of about twenty leaves and averaging 4 to 6 metres in length. The largest papyrus found is the Harris Papyrus I, which was over 41 metres long. The "index" or "titulus" was the label attached to the volume where the title of the document was written to make it easier to find when it was stored. The rolls were soaked in oil, which gave them a characteristic yellowish hue, and kept in wooden or clay containers to protect them from insects. However, the moisture and heat eventually caused the leaves to crack and the ink to become unreadable over time. They could also be folded into sheets to form a book-like codex, a practice popularised by the early Christians.

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<sup>1</sup> The word papyrus comes from the Greek term papiros, which in Latin is papyrus (plural is papyri). It was taken from the ancient Egyptian term, which means 'flower of the king', since its elaboration was a royal monopoly. Curiously, it is also the origin of the word paper.

<sup>2</sup> José Manuel Fernández Zapico. *La fabricación de las materias papeleras. Selección de materias primas, fabricación, catalogación de productos, comercialización, medioambiente y normativas*. 1ª ed. Barcelona: Ediciones CPG octubre 2008. Colección: Producción de Proyectos Gráficos.

<sup>3</sup> Salvador Muñoz Viñas. *La restauración del papel*. Madrid: Editorial Tecnos (Grupo Anaya, S.A.) 2010:35. ISBN 978-84-309-5112-3

Papyrus scrolls were used routinely until the early 2<sup>nd</sup> century AD, when the papyrus codex began to replace them. Later, in the 4<sup>th</sup> century AD, papyrus was gradually replaced by parchment, a material of greater strength and durability.

### **Parchment in Europe**

Although it originated with the nomadic peoples of Asia Minor, as evidenced by the city of Pergamon in the 2<sup>nd</sup> and 3<sup>rd</sup> centuries, parchment became widely used from the 4<sup>th</sup> century onwards and eventually became the predominant writing medium in Europe. Throughout the Middle Ages it was mainly made from the skins of lambs, calves or goats. Although there were scrolls of very different qualities, the general rule was that the larger the animal, the thicker the scroll. The skin of unborn or newborn animals was particularly prized for its exceptional whiteness, flexibility, strength and fineness (*vitela*)<sup>4</sup>. Such parchment was therefore reserved for the most luxurious manuscripts.

Papyrus had the disadvantage of deteriorating in a damp environment and becoming extremely brittle when stored in a very dry one. Parchment, on the other hand, had the problem of being both expensive and difficult to obtain: a large number of animals were needed to fill the libraries. For this reason, the *chartas* (as they were called for a long time) were recycled by washing and scraping them, thereby losing their written content.

China offered mankind a low-cost, highly durable material that soon replaced papyrus and parchment. This was due to a number of factors, including its economic nature and its greater capacity to absorb ink. Both parchment and papyrus had a less absorbent surface, so the ink remained without penetrating the medium. This, in turn, would facilitate the deterioration of the texts, making their preservation more difficult.

### **Paper**

“Three stages of six hundred years characterize the history of paper; six hundred years of concealment by its inventors, the Chinese people; six hundred years of migration until its introduction into European culture and another six hundred years until the invention of the continuous paper machine, which marks the beginning of the present stage”<sup>5</sup>.

Although recent archaeological excavations unearthed papers dating back to the period before the 2<sup>nd</sup> century AD, the year 105 AD is traditionally accepted as

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<sup>4</sup> This term originally referred to parchment extracted from calves, but later became a name for any high-quality parchment.

<sup>5</sup> “*El papel protagonista de nuestra historia*”. [PDF online] Asociación Hispánica de Historiadores del Papel (AHHHP). <https://bit.ly/3MmVtWa>

the date on which T'Sai Lun, a senior official of the court of the Emperor of China, introduced paper as the new official writing medium.

Prior to the invention of paper in China, writing was done either on silk cloth, a thin and durable but very expensive medium, or on bamboo fragments, a thick and rigid medium, but generally uncomfortable to handle. The official story is that T'Sai Lun was commissioned by Emperor Hedi (Ho Ti) to find a writing material that was lighter than bamboo and cheaper than silk. After some time T'Sai Lun presented a sample of paper to the court, which was essentially made from a paste of tree bark, hemp waste, remnants of rope and fishing nets (Maria Carolina Larrea Jorquera<sup>6</sup>).

T'Sai Lun's innovation was to use a wooden mallet to crush plant fibres and rags into a stone mortar. The form or mould of the sheet was to be a simple screen of cloth sewn at the ends to a wooden frame. This meant that each sheet manufactured had to be dried on the same screen before it could be separated, as the cloth screen did not allow the panel to be easily separated until it was almost completely dry.<sup>7</sup>

To optimize the result of this process, it was necessary to increase the size of the screen. Thus, large screens were still used in some parts of Asia as late as the early 20<sup>th</sup> century. Consisting of a fabric and a frame, such screens could measure up to 1.25 x 0.75 m. In this technique, which was carried out in the open air, the beaten pulp was formed into variously shaped cubes and left to dry in the sun. These techniques are now believed to have been used in the centuries following T'Sai Lun's invention (Salvador Muñoz Viñas). An extract of agar (derived from seaweed) was used to ensure the cohesion of the fibres and the necessary impermeability. This material had been used for medicinal purposes in China since ancient times.

In the words of Maria Carolina Larrea Jorquera<sup>8</sup>, to fully understand the history of paper and its journey around the world, it is essential to draw two main lines, both starting in China. One goes to the Far East and reaches Japan; the other eventually reaches the West, following the route of the Silk Road. During this journey, each nation that allowed paper trade adopted and further adapted papermaking techniques in one way or another, creating their own methods that eventually became part of their traditions and identities.

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<sup>6</sup> (Bloom, 2001). Obtained from María Carolina Larrea Jorquera. *El Papel en el Geido, enseñanza, praxis y creación desde la mirada de Oriente*. Tesis Doctoral. Directora: Dra. Marina Pastor Aguilar. Universitat Politècnica de València. 2015. <http://hdl.handle.net/10251/53030>

<sup>7</sup> Salvador Muñoz Viñas. *La restauración del papel*. Madrid: Editorial Tecnos (Grupo Anaya, S.A.) 2010. ISBN 978-84-309-5112-3.

<sup>8</sup> (Bloom, 2001). Obtained from María Carolina Larrea Jorquera. *El Papel en el Geido, enseñanza, praxis y creación desde la mirada de Oriente*. Tesis Doctoral. Directora: Dra. Marina Pastor Aguilar. Universitat Politècnica de València. 2015:86 <http://hdl.handle.net/10251/53030>

### Expansion through the Far East

All regions close to China received the transmission of Buddhism along with the proper techniques for papermaking, which spread rapidly throughout the region. Traditionally, the year 610 marks the arrival of paper in Japan. The art of papermaking in Japan reached a surprising level of sophistication with the development of a roll-up die mould which allowed for more than one sheet of paper per day per mould.

This mould has a screen made from a type of vegetable mat which was placed on a rectangular frame without being physically attached to it (Figure 1). A second frame of the same size as the first was placed on top of the sieve to retain the water in the fibres during sheet formation. Once the sheet was formed, the screen was separated from the frame and turned upside down on a smooth surface or on top of the previously formed sheets forming a pile. The screen was then removed by carefully bending it upwards from one end. This allowed the leaves to dry in a small space, as they could be placed on top of each other. This process brought the art of papermaking to an extraordinary level of sophistication.



**Figure 1.** Mould for the manufacture of Japanese paper. The mesh is always glazed and goes independent of the frame. Image obtained from: Asunción, Josep. *The Paper. Techniques and traditional methods of production*. Editions Parramón. Barcelona, 2009:63

In China, paper pulp was obtained from fabrics, ropes and vegetable fibres. In Japan, on the other hand, mainly plant fibres derived from native shrubs were used. Also, the plants had to be macerated to use their fibres. In addition,

regardless of the origin of the pulp, the fibres were subjected to a mechanical action of beating and crushing (Salvador Muñoz Viñas<sup>9</sup>).

The pilgrimage of Buddhist monks and trade along the Silk Route introduced paper to Central Asia. Central Asian papermakers were the first to use cotton cloths for papermaking, a process that also spread across all Islamic lands.

### **Expansion to the West**

When the Arabs conquered Spain in 711, they did not know the secret of papermaking. There is also no consensus among historians as to whether the confrontation between the Arabs and the Chinese on the banks of the River Tharaz in 751, also known as the Battle of Talas, was the gateway to the transmission of paper manufacturing to the West, which had hitherto been kept as a state secret in China.

It is said that Chinese prisoners in Samarkand began to produce it, trading their freedom for the secret of paper, revolutionising the form of writing in the Muslim world, from where it spread to Europe along the Silk Road. From this historical milestone to its arrival in the Iberian Peninsula, 200 years passed (M. <sup>a</sup> Carmen Hidalgo Brinquis<sup>10</sup>).

The Arabs introduced great advances in papermaking techniques: the use of ramie, flax and hemp as raw materials; the use of hydraulic energy to grind rags; the bleaching of fibres with lime; the gluing with gum arabic or starch paste; and the perfecting of the paper form (The leading role in our history<sup>11</sup>). They also developed a technique of shaping and satin finishing by adding rice starch to waterproof the surface and then polishing it with a stone on a piece of wood. They also added a soft dye to the paper so that it would not disturb the reader's eye and used the technique of marbled paper, also known as marbled paper technique, inherited from the Chinese (María Carolina Larrea Jorquera<sup>12</sup>).

In Europe, and later the American continent, paper was made from rags, ropes, fishing nets, boat sails and other materials based on vegetable fibres such as cotton, hemp, flax or esparto. Workshops on the banks of rivers or near natural springs used the hydraulic power of wheels to produce pulp and satin sheets. This is why they were often called "*paper mills*".

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<sup>9</sup> Salvador Muñoz Viñas. *La restauración del papel*. Madrid: Editorial Tecnos (Grupo Anaya, S.A.) 2010. ISBN 978-84-309-5112-3

<sup>10</sup> M.<sup>a</sup> Carmen Hidalgo Brinquis – secretaria general AHHP Sistach, M. <sup>a</sup> Carmen.

<sup>11</sup> "El papel protagonista de nuestra historia". [PDF online] Asociación Hispánica de Historiadores del Papel (AHHP) [ref. 4 10 2015]. Available on the Web: <https://bit.ly/3MmVtWa>

<sup>12</sup> María Carolina Larrea Jorquera. *El Papel en el Geido, enseñanza, praxis y creación desde la mirada de Oriente*. Tesis Doctoral. Universitat Politècnica de València. 2015. <http://hdl.handle.net/10251/53030>

Xàtiva<sup>13</sup> is the first documented city in the West to have a paper industry, in 1154. The Arab geographer El Edrisi wrote: "Játiva is a beautiful village with castles, and the paper it makes is like no other in the world. It is sent to the East and to the West"<sup>14</sup>. These early Spanish papers, called Hispano-Arabic papers, were characterised by a rudimentary crushing of the fibres and gluing with starch, which gave them a parchment-like appearance.

As far as the Hispanic-Arab paper<sup>15</sup> is concerned, it is necessary to distinguish between "Xàtiva paper", which was made in this city by its various Arab, Mozarabic, Mudéjar, Moorish and Christian inhabitants, and "Xativí paper", as an indicator of a quality paper made in the manner of the papermakers of this city and whose manufacture persisted through the Mudéjar and Moriscos until practically the expulsion of the Moriscos in 1609 (Juan Castelló Mora<sup>16</sup>).

In Europe, paper reached its peak of development and splendour in the town of Fabriano in the 13<sup>th</sup> century. Italy was a major power in paper production and introduced great improvements in the paper-making process, introducing a new way of identifying the authorship of the paper through watermarks or filigree, a drawing design with metallic thread sewn into the mesh of the frame (María Dolores García González<sup>17</sup>)

The oriental form of cloth adhered to paper fibres due to affinity of both cellulosic materials. The Japanese roll form is one solution to the problem, the European metal form another.

### **The Iberian Peninsula in the Middle Ages**

From the 8th century until the end of the 15th century, three different communities coexisted in the peninsula: the Muslims, the Christians and the Jews. For the Jews, the Muslim conquest of 711 put an end to the persecution they had suffered at the hands of the Visigoth kings and the Catholic Church, and they collaborated with the Muslim conquerors in the protection of some of their cities.

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<sup>13</sup> Xàtiva is the name given to the town in the Valencian language of the region, Játiva is the name given to it in Spanish.

<sup>14</sup> Xerif Aledris (El Edrisi) - 1100-1172 - in his work "Recreo de quien desea recorrer el mundo o Libro Rogenario"; see ASENJO, José Luis "Sobre El Edrisi", in Actas del II Congreso Nacional de Historia del Papel en España, Cuenca, 1997, pp. 61-63. Obtained from "Xàtiva La verdad sobre el origen de la primera fábrica de papel de Europa: Xàtiva", 2015 <https://bit.ly/3X2GFAF>

<sup>15</sup> Also called Hispanic papers, or Arabic tradition papers.

<sup>16</sup> Juan Castelló Mora. Conservator Museu Valencià del Paper de Banyeres de Mariola. "Primeros escritos sobre papel hispanoárabe". Actas del X Congreso Nacional De Historia Del Papel, 2013. 81-99.

<sup>17</sup> María Dolores García González. *Acerca del papel y su potencial como configurador plástico*. Tesis Doctoral. Universitat Politècnica de València. 2016. <https://bit.ly/3ANicvQ>



The height of the Middle Ages in the Iberian Peninsula lasted from the 11th to the 13th century. During this period, the Christian states of the north, which had merely survived the economic, political and military power of al-Andalus and whose borders had been practically stabilised since the 9th century, would, from 1031, the date of the disappearance of the Caliphate of Cordoba, launch a 250-year-long offensive of reconquest that would reduce al-Andalus to the Nasrid kingdom of Granada.

This fact led to the arrival of the Muslim Almoravid and Almohad states from North Africa, bringing with them a much more extremist and less "tolerant" conception of Islam towards Jews and Muslims. The Jewish population, along with many Muslims, began a mass exodus from the 12th century onwards, seeking refuge mainly in the Christian kingdoms of the north, where there was an ongoing process of repopulation, and acting as transmitters of knowledge of Arab culture. Toledo (under Christian rule since 1085) would be chosen as a centre of cultural diffusion.

The fourteenth century, a period of territorial, demographic and economic expansion in which Jews and Christians contributed to the general prosperity, gave way to wars and natural disasters that preceded and followed the Black Death, creating a breeding ground for militant anti-Judaism.

In the 15<sup>th</sup> century, the persecution against the Jews began to worsen despite the protection offered by the kings given the important role that the Jews played in their kingdoms (Josep Pérez<sup>18</sup>). By the end of the Middle Ages, the Christian kingdoms unified the political map with the marriage of the Catholic kings, their agreements with Portugal on the Atlantic and the conquest of Granada. The economic and social situation, as well as the desire to integrate the Jewish converts into a purely Christian Spain, led to the expulsion of the Jews in 1492, with the loss of much of their knowledge and local trades. And one of these was elaboration of paper.

### **The paper in the Peninsula**

According to Arab chroniclers, papermaking developed rapidly in the Iberian Peninsula thanks to the greatness of the Umayyad Caliphate in al-Andalus from 912 onwards. For three centuries, no paper could compete with the Spanish-Arab rolls. There are many documents that attest to its use, sale and distribution, not only in the Crown of Aragon, but also in the rest of the Christian kingdoms of

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<sup>18</sup> Pérez, Joseph (2012) [2009]. *Breve historia de la Inquisición en España*. Austral Editorial. ISBN 978-84-08-00695-4.

the peninsula and Italy, especially in Naples and Sicily (José Carlos Balmaceda Abrate<sup>19</sup>).

From the 13<sup>th</sup> century onwards, the use of paper was already widespread in the Crown of Aragón, especially after the conquest of the Kingdom of Valencia in 1245. "Starting from the reign of Jaime I, this type of support is already used in a regular form along with parchment<sup>20</sup>". During the 13<sup>th</sup> century, paper was becoming increasingly important in the ecclesiastical and public offices on the Mediterranean coast; even in Catalonia, where the law required notaries to keep their records in paper codices; everyone wrote in the new "pergamino de drap"<sup>21</sup>.

Similarly, the Castilian court inherited the use of paper from the practice of the chancellery of Alfonso X, known as the Sage, in the 13<sup>th</sup> century. Alfonso X dedicated a Law of *Partidas* to determining which documents should be written on parchment and which on paper. This paper was increasingly used to produce documents, ordinary writings and books of daily use, with the use of parchment being reserved for specific documents and certain classes of elite books. In addition, the new institutions that were emerging in the central administration, such as the Royal Council and the Audiencia, used paper as a basic support for their communications. Issuing a letter on paper was faster, cheaper and retained the same warmth as parchment. By the middle of the 14<sup>th</sup> century, paper was widely used in the Castilian administration for the procedural documents, books, records and documents issued to the different parties.

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Juan Castelló Mora believes that the study of the manuscripts preserved on paper, both in al-Andalus and in Christian Spain and outside the peninsula, "confirms the relevant and almost unique elaboration of the Hispanic-Arab roll until the second half of the fourteenth century, both in al-Andalus and in Christian Spain, whose use persisted, more or less accentuated, until the expulsion of the Moors in 1609"<sup>22</sup>. In 1355, however, the production of Arabic paper decreased drastically and was replaced by another from Italy, with filigree designs on most of the sheets, a more perfect *verjura* and no appreciation of thread strands or starch. The presence of Italian paper is due, among other things, to the deterioration in the quality of the Spanish-Arab roll, perhaps due to an increase in demand and the

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<sup>19</sup> José Carlos Balmaceda Abrate. "Apuntes para el estudio del papel y las filigranas durante el siglo XV en la Corona de Aragón". Aragón en la Edad Media XX. ISSN 0213 2486, N. ° 20, 2008 pp.103-116 <https://bit.ly/4g1rr7W>

<sup>20</sup> Isabel García Díaz, Juan Antonio Montalbán. "El uso del papel en castilla durante la baja Edad Media". Actas del VI Congreso nacional de historia del papel en España. 2005:1.

<sup>21</sup> Isabel García Díaz, Juan Antonio Montalbán, El uso del papel en castilla durante la baja Edad Media. Actas del VI Congreso nacional de historia del papel en España. 2005:1.

<sup>22</sup> Juan Castelló Mora. Conservador Museu Valencià del Paper de Banyeres de Mariola. "Primeros escritos sobre papel hispanoárabe". Actas del X Congreso Nacional De Historia Del Papel, 2013: 81.

opening of trade with Italy following the expansion of the Crown of Aragon into Sicily (1282) and Sardinia (1323). M.<sup>a</sup> Carmen Sistach<sup>23</sup> points out that the Black Death of 1348 drastically reduced the population and encouraged the arrival of Italian artisans, who brought with them the technology to produce paper with different characteristics and a characteristic element such as filigree. The depopulation caused by the plague made it necessary to import paper from Italy and the massive introduction of Italian paper production created the need to improve the rustic and simple production of Hispano-Arabic paper.

For this reason, the possibility of the coexistence of three different types of paper between 1350 and 1425 is examined: the typical Hispano-Arabic production paper (a), the new paper imported from Italy, with well-defined filigree and embossing (b), and a third type (c), which shares the characteristics of Spanish-Arab paper with some details of Italian production, such as the addition of filigree or gluing with gelatine. Craftsmen incorporated these details into the production of Hispano-Arabic paper with the intention of obtaining a paper that looked like Italian. The large, well-defined filigree in the centre of the sheet became an element of identity for the Italian paper used in the Crown of Aragon. The filigree on the Spanish-Arab paper was simple and small. The exceptional presence of these filigrees on Spanish-Arab paper in invaluable documents of the Castilian Chancellery from the early 15th century demonstrates the long coexistence of the two types of paper, especially in Castile, and the gradual incorporation into local Hispano-Arab production of the changes made to paper production by Italian manufacturers. It also shows the possible intervention of Italian masters in paper mills.

Hence, we can see how, in the Iberian Peninsula, the process of papermaking went through several stages, from the parchment of the thirteenth century, to the Hispanic paper crafted in the mills of the fourteenth century, and finally, at the beginning of the fifteenth century, to an Italian type of paper. All these writing systems coexisted and were influential in different regions and periods, as is the case with all technological advances, until one of them prevailed over the others.

### **The codex as a witness to a historical and cultural context**

The transmission of knowledge, art and culture during the Western Romanesque period took place inside the monasteries, in a room or chamber known as the *scriptorium*. It was a place where codices were copied and works of

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<sup>23</sup> M.<sup>a</sup> Carmen Sistach. "Filigranas en el papel hispano-árabe". Actas del X Congreso Nacional de Historia del Papel en España. Madrid, 26-28 junio 2013, pp. 101-115. <https://bit.ly/3ZRyFW5>

great artistic value were created as one of the usual activities of the monastic community (Josep Lluís Barona<sup>24</sup>).

Often, the same manuscript was dictated to a group of scribes who would transcribe it simultaneously to obtain several copies of the same text. This task was important in view of the destruction of so many libraries of classical antiquity by the decrees of the Emperor Theodosius at the end of the fourth century. The reproduction of literary, theological, religious, medical and scientific texts often involved copying different versions.

Most of the books in monastic libraries were copied, illuminated and bound by the monastery's own inhabitants. For Josep Lluís Barona<sup>24</sup>, this manuscript expresses the artistic trend of the place where it was created, so each work has great value not only for its content but also as a witness to a historical context.

Many manuscripts reached the "*scriptoria*" of the north of the peninsula at the hands of Mozarabs fleeing from Islam, a phenomenon particularly evident during the great migrations of the late ninth century<sup>25</sup>.

In the earliest times, manuscript codices were made on papyrus. Later, due to difficulties in trading Egyptian papyrus, parchment was introduced. As this material was expensive and scarce, between the 7<sup>th</sup> and 9<sup>th</sup> centuries many vellums and parchments were erased by scraping the ink with pumice stone and reused, giving rise to the so-called "re-engraved" "*palimpsestos*". From the thirteenth century, paper began to replace parchment because it was cheaper, first by a third and then by a sixth,<sup>26</sup> and parchment was reserved for more solemn documents.

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The Mozarabic Breviary of Silos or Misal of Silos (Burgos) is believed to be the oldest known paper document in Europe, written before 1036, when the Mozarabic liturgy was replaced by the Gregorian at the Council of Burgos. Some claim to be well before 1036, based on transcriptions of music. The Hispano-Arabic manuscript consists of 157 folios, of which the first 39 are paper and the rest parchment. It was produced in the scriptorium of the monastery of Santa María la Real de Nájera, la Rioja (Guillermo Carvajal<sup>27</sup>).

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<sup>24</sup> Josep Lluís Barona. "El scriptorium". *Historias de Ciencia. Revista Mètode. Universitat de València*. N.º 101, 2019 <https://bit.ly/4fZSxvV>.

<sup>25</sup> Juan Castelló Mora. "Primeros escritos sobre papel hispanoárabe". *Actas del X Congreso Nacional De Historia Del Papel*, 2013. 81-99.

<sup>26</sup> Dahl, Svende. *Historia del Libro*. Editorial Alianza. Madrid, 1972, p. 76-77. <https://bit.ly/4gs6ySH>.

<sup>27</sup> Guillermo Carvajal. "El misal de Silos, el libro europeo más antiguo hecho con papel". *LBV Magazine Cultural independiente*, 2019. <https://bit.ly/3XjOALm>

### **Differences between the Spanish and Italian papers**

According to Isabel García Díaz and Juan Antonio Montalban, the paper used in Castile during the 13<sup>th</sup> century and much of the 14<sup>th</sup> century was of Hispanic type.

One of the main characteristics of this type of paper is that the pulp is made up of flax, with a small variable amount of hemp fibres, some of which are very long. At first sight, it has a slightly crushed appearance, with fibres of irregular length and traces of thread without fibres, which causes the presence of lumps and poor distribution of the paste in some sheets. The thickness of the sheet must be noticeable to avoid the appearance of areas without fibres and to obtain a certain homogeneity of the surface of the sheet. Thicker boards are therefore more common.

In the production of Spanish paper, three mayas<sup>28</sup> were used during the period under study: one made of canvas (rarely found) a), another flexible made of hemp threads b) and a last one made of fixed wire c). This maya had as a general characteristic the presence of thick and separated dots with uneven spacing. The distance between the crowns also varied. The presence of curved crown marks on the paper indicates that the form that made them had hemp threads. If, very rarely, there are no stitches or crown marks on the sheet, it is made of canvas.

Gluing is done with starch and, in a few papers, with gum arabic. In the case of non-gluing, the burnishing indicates sebum smoothing, which often results in uneven gluing or burnishing even on the same sheet.

The colour of the sheets varies from a yellowish white or slightly dark to the smoky beige, grey and "*azeituno*"<sup>29</sup> of the "toledano paper". We only have one coloured paper, the red one from the Valencia distribution<sup>30</sup>. It had no filigree, and some sheets may have a characteristic zigzag mark.

These aspects differ from the Italian paper that would later become widespread, and which would replace the use of Spanish paper as a writing medium well into the 15<sup>th</sup> century. In Italy, paper had been used regularly since the middle of the 12<sup>th</sup> century (and in France from the middle of the following

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<sup>28</sup> Juan Castelló Mora uses the term form, here it has been replaced by maya because he considers that the characteristics indicated are specific to the maya used for the elaboration of the paper.

<sup>29</sup> Like the colour of the olive.

<sup>30</sup> Juan Castelló Mora. Conservator Museu Valencià del Paper de Banyeres de Mariola. "Primeros escritos sobre papel hispanoárabe". Actas del X Congreso Nacional De Historia Del Papel, 2013. 81-99.

century<sup>31</sup>). In the mid-13th century, the mills of Fabriano introduced a series of improvements to Arabic paper that would lead to a higher quality of Italian paper.

First of all, they adapted the process of grinding the rags, replacing the grinding used by the Arabs with the alternative effect of a metal mallet reinforced with wood, which achieves a well refined and homogeneous fibre. They also replaced the linen fibre with a softer cotton one.

Then they replaced the removable mat frame with one made of a metallic fabric of copper or bronze thread, which was fixed in the frame. This offers a new way of identifying the authorship of the paper by means of the watermark or the filigree, drawing the design with metallic thread sewn into the mesh of the frame (María Dolores García González<sup>32</sup>). Figure 2 shows the different parts that are distinguished in the metallic maya and that constitute the verjura of the sheet of paper.

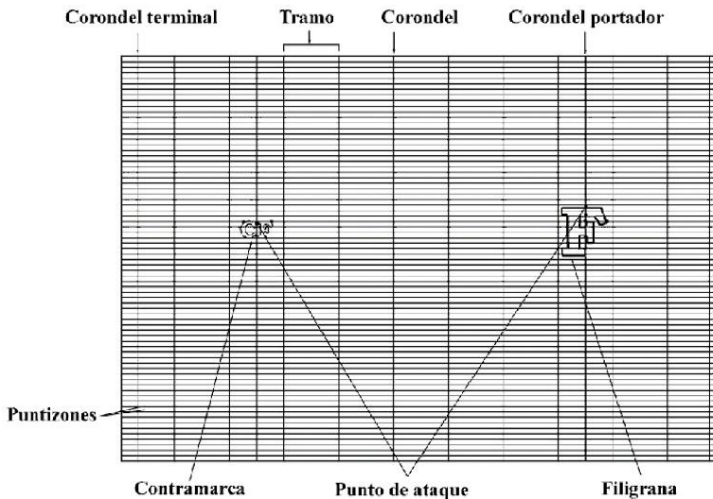


Figure 2. Reconstruction of a metallic maya used as support for the paper sheet. <https://www.ucm.es/quidestliber/verjura>

The verjura is the set of translucent footprints that can be seen on the paper sheet made in the vat. This is due to the morphology and structure of the paper mould or rectangular wooden mould on which the metal mesh is fixed that holds the paper pulp during its production. In the verjura you can see coroneles,

<sup>31</sup> Isabel García Díaz, Juan Antonio Montalbán. "El uso del papel en castilla durante la baja Edad Media". Actas del VI Congreso nacional de historia del papel en España. 2005

<sup>32</sup> María Dolores García González. *Acerca del papel y su potencial como configurador plástico*. Tesis Doctoral. Universitat Politècnica de València. 2016. <https://bit.ly/3ANicvQ>

puntizones, filigranas and contrafiligranas. Its different morphology may indicate the origin of the paper sheet<sup>33</sup>.

The oriental shape of the cloth adhered to the paper fibres due to the affinity of the two cellulosic materials. The Japanese roll form is one solution to the problem, the European metal form another. They also replaced starch glues with animal gelatine glues, which improved the quality and durability of the substrate. With the standardisation of formats in Bologna, the era of Western Italian paper with its own characteristics began<sup>34</sup>.

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<sup>33</sup> "Verjura". Quid est liber: proyecto de innovación para la docencia en libro antiguo y patrimonio bibliográfico. <https://bit.ly/4dENuIX>

<sup>34</sup> G. Castagnari E'arte della carta nel seculo deo Federico II, in Federico II e le Marche, a cura di C. D. Fonseca Luca, 1994 extracted from "Apuntes para el estudio del papel y las filigranas durante el siglo XV en la Corona de Aragón". *Aragón en la Edad Media XX*. ISSN 0213 2486, N. ° 20, 2008 pp.103-116 ISSN 0213-2486 by José Carlos Balmaceda Abrate. <https://bit.ly/4g1rr7W>

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