

The Dawn of Paper in Europe

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Historical Paper Research

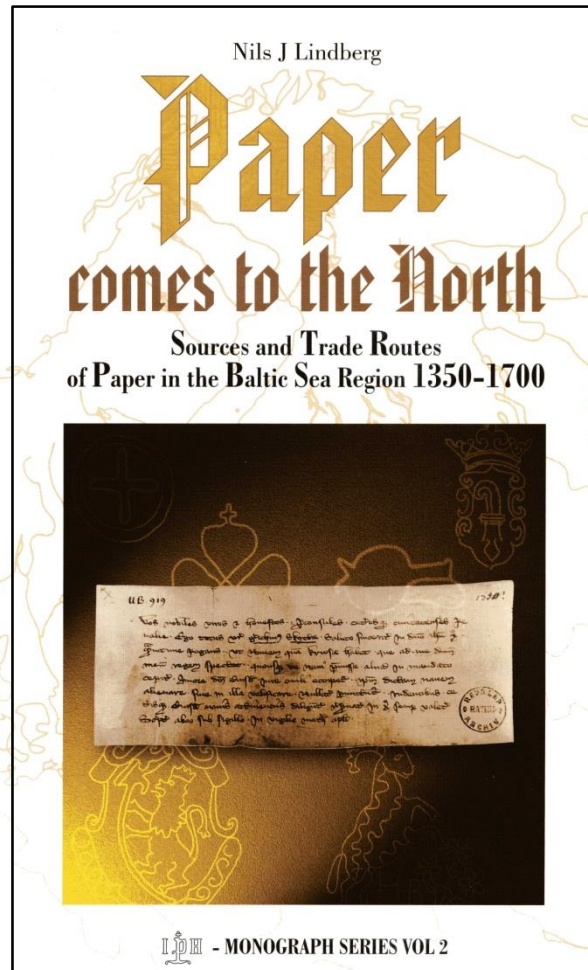
- Historical research concerning Asian paper is centered on few text sources and mainly on technical investigation.
- Historical research concerning paper in Europe is centered mainly on watermark research.

Comprehensive watermark research is needed!

- To obtain authentic results in watermark research, a comprehensive investigation is needed:
 - historical research work, based on archives and libraries, -
 - technical research work, based on methods of physical and chemical examination of original papers, on preserved historical tools, and on historical descriptions of the former states of the art,-- historical research work concerning the commercial context and -- historical research work concerning the cultural context.

Comprehensive watermark research

- Example 1: Ph.D. Thesis of Nils J. Lindberg



Comprehensive watermark research

- Example 2: M.A. Thesis of Nana Badenberg

Nana Badenberg

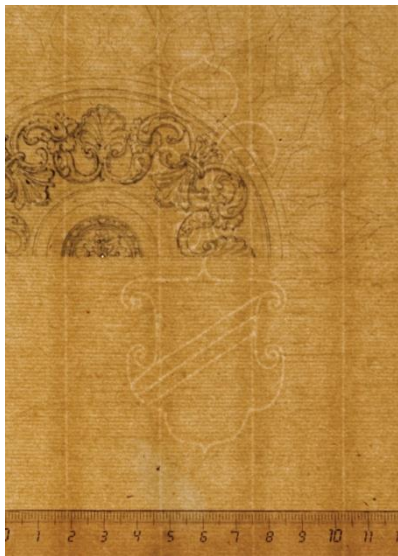
Das Pro Patria-Wasserzeichen

Zur Geschichte eines filigranen Motivs
(1699–1914)

SPH Schweizer Papierhistoriker

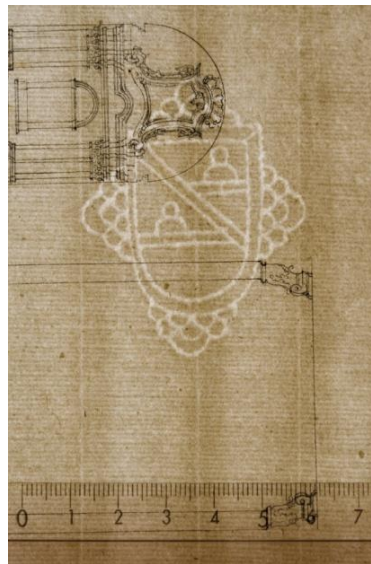
Comprehensive watermark research

- Use of comparison of the basic paper coloration in the case of multinational watermark use (example: Rabaglio papers, Bellinzona)



provenance:

France



Spain



Netherlands

Where does Early Paper in Europe come from?

- *Statement 1: Paper comes to Europe from the Far East via Persia and/or Arab countries.*



Statement 2: A new, comprehensive study of early papers (ss. IX – XIII) with or without watermarks in Europe is urgently needed.

- *First step: Compiling accurately an inventory of early papers, early papermills, early papermakers and early paper merchants in every country*

Statement 2: A new, comprehensive study of early papers (ss. IX – XIII) with or without watermarks in Europe is urgently needed.

- Are those papers imported or made in Europe?
- Where did papermaking start in Europe?
- Which technology was used?
- Where and when technological changes occurred?
- Are we able to tell the differences between classes or types of early European paper?

Statement 2: A new, comprehensive study of early papers (ss. IX – XIII) with or without watermarks in Europe is urgently needed.

Focus: Paper documents forming a series or sequence, as e.g. to be found in archives, or voluminous manuscripts

Statement 2: A new, comprehensive study of early papers (ss. IX – XIII) with or without watermarks in Europe is urgently needed.

- *Second step: examination of the papers concerned:*
 - historically, including use/storage conditions
 - technically, using non-invasive technology:
 - macroscopy/microscopy (transparency photographs)
 - remission spectrometry

A case history: Switzerland

Paper grades of the „Notary Minutes“ of the Diocese of Sion

	<i>Grade 1</i>	<i>Grade 2</i>	<i>Grade 3</i>	<i>Grade 4</i>	<i>Grade 5</i>	<i>Grade 6</i>	<i>Grade 7</i>
<i>Date</i>	1275	1280	1285	1296	1302	1302	1312
<i>Coating</i>	thick, glazed	medium	medium	medium, glazed	thin	none	none
<i>Pulp</i>	coarse	coarse	coarse	coarse	coarse	fine	fine
<i>Ribs</i>	reed	reed	wire	wire	wire	wire	wire
<i>Chains</i>	hair?	yarn	yarn	yarn	yarn	wire	wire
<i>Size</i>	Arab	Arab	Arab	Lombard	Lombard	? (fragment)	? (fragment)
<i>Special</i>	-	-	-	Zigzag	-	water- marked (Fabriano)	water- marked (Fabriano)

The Sion Minutes

- Paper grade 1, 1275:

On the (uncoated) deckle edge, yarn fragments and fibres from hemp and linen are visible.

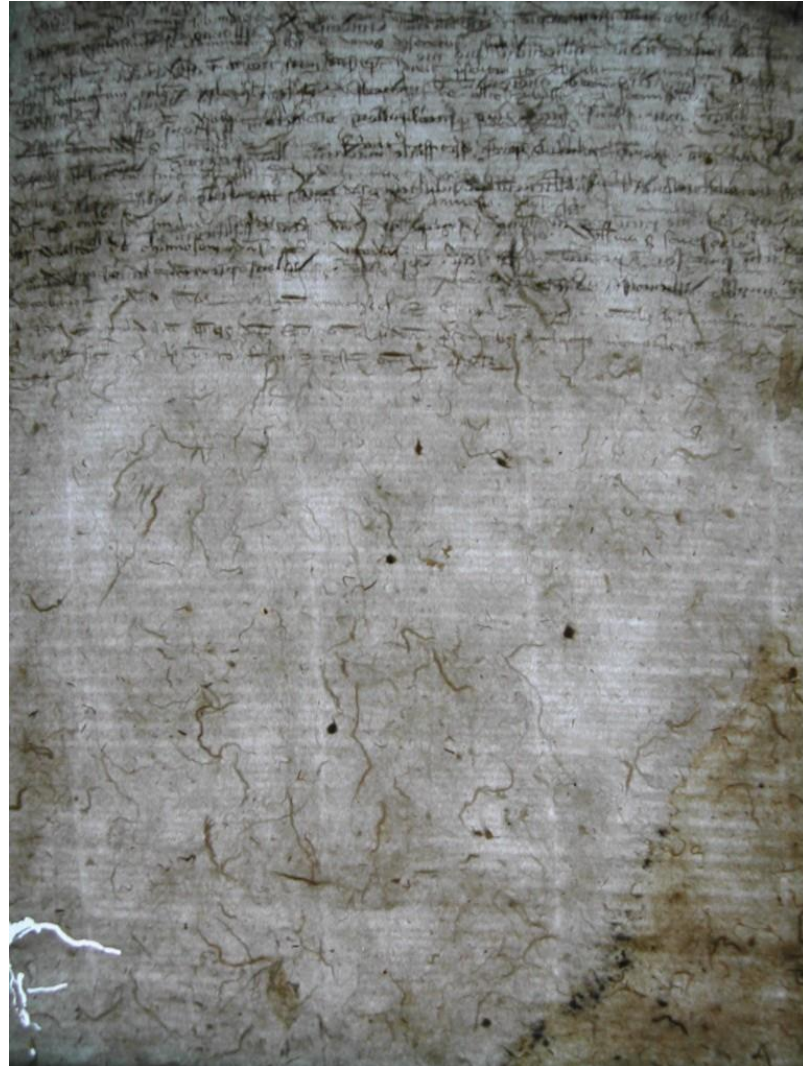
(camera: Olympus FE 340 with additional macro lens 10x)



The Sion Minutes

- Paper grade 2, 1280:

The reed ribs are slightly curved (as a result of couching); the textile yarn chains are irregularly sewn.



The Sion Minutes

Paper grade 3, 1285:
straight ribs (wire);
textile chains sewn;
coarse pulp



The Sion Minutes

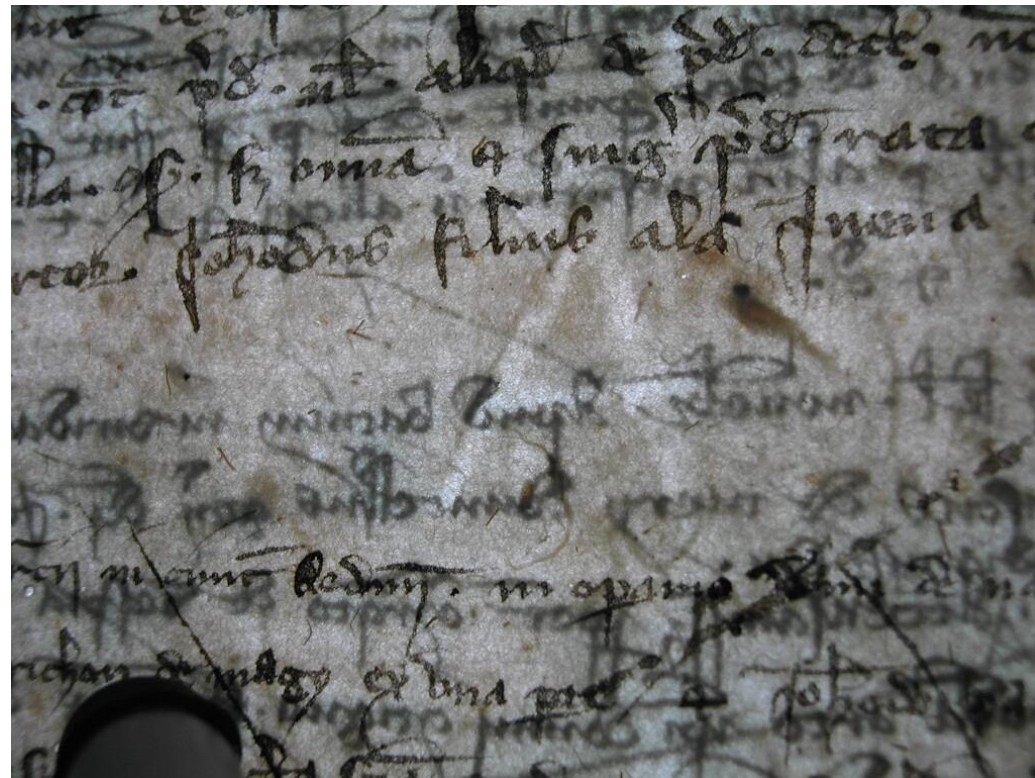
Paper grade 5, 1302:

straight ribs (wire); textile chains sewn more regularly; pulp
less coarse

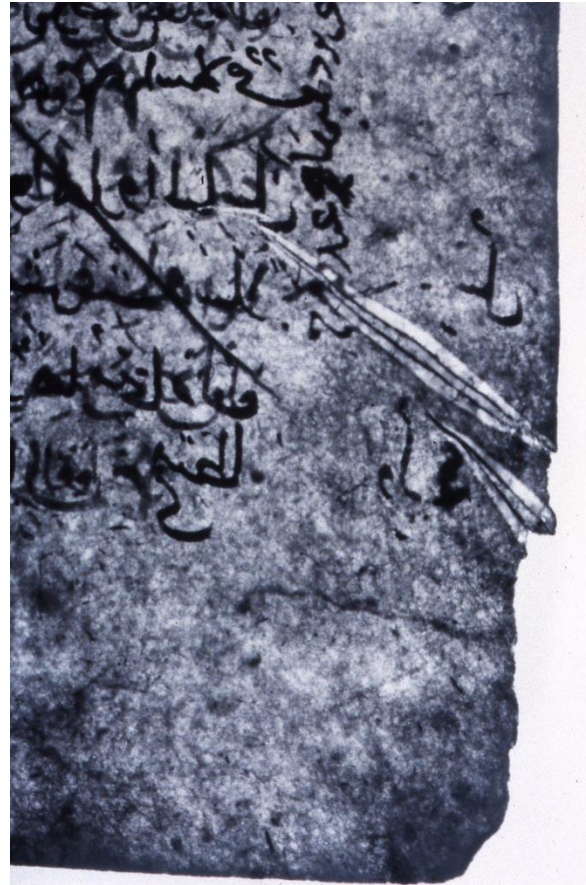


The Sion Minutes

Paper grade 7, 1312: watermarked paper, European standard, starch sized; provenance: Fabriano (Zonghi, Monumenta tav.2, nr.18; pp. 45. 137)

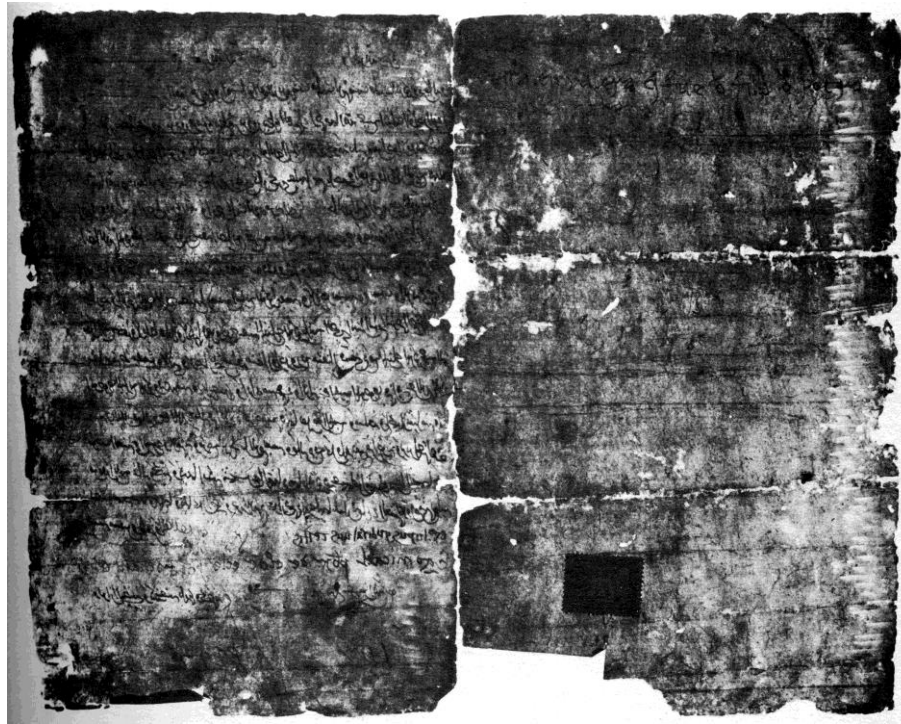


- *Statement 3: Papermaking in Europe started using Arab technology*



Example of Arab paper: Ms. Baghdad s. XII

Statement 3: Papermaking in Europe started using Arab technology: Spain



Example: Ms. Toledo, 1222

Statement 4: Amalfi - Genova - Lombardia - Fabriano: The Arab Technology Becomes European.

- Earliest Amalfi papers: not yet known (*lack of research*)
- Early Genovese/Lombardian papers:

Example:

Reggio Emilia

1331

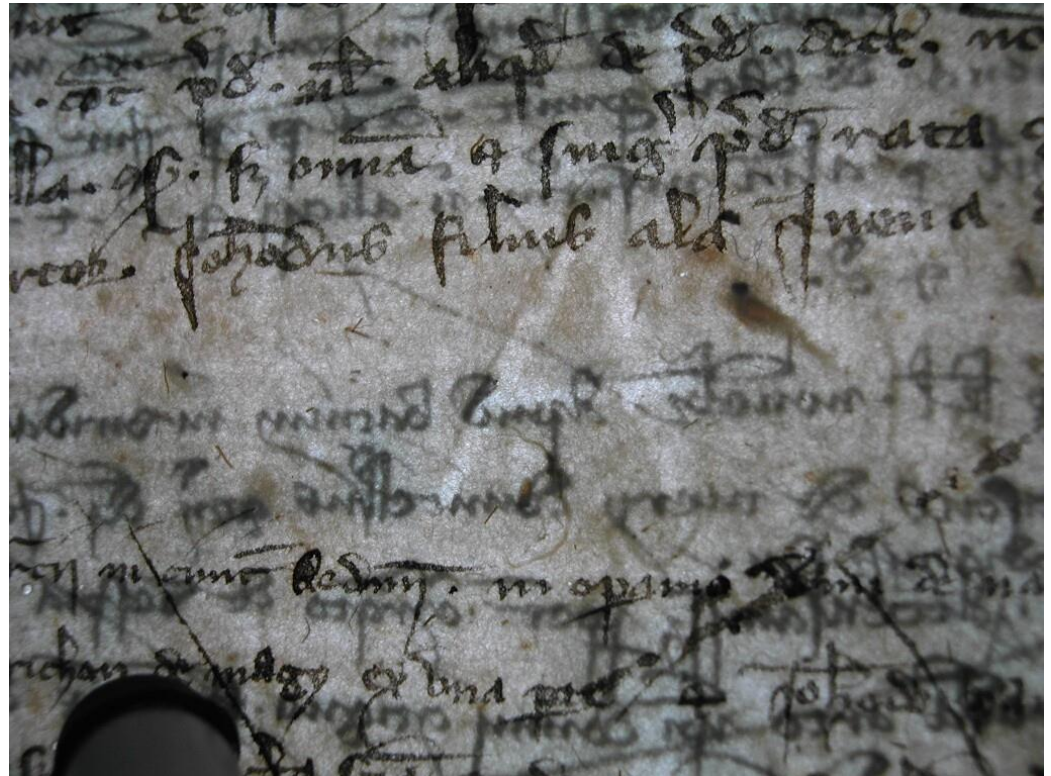
watermarked



Statement 4: Amalfi - Genova - Lombardia - Fabriano: The Arab Technology Becomes European.

Earliest Fabriano papers:

- Finer pulp
- chains and ribs made of wire
- watermarks
- starch sized
- marks of felt couching



Statement 4: Amalfi - Genova - Lombardia - Fabriano: The Arab Technology Becomes European.

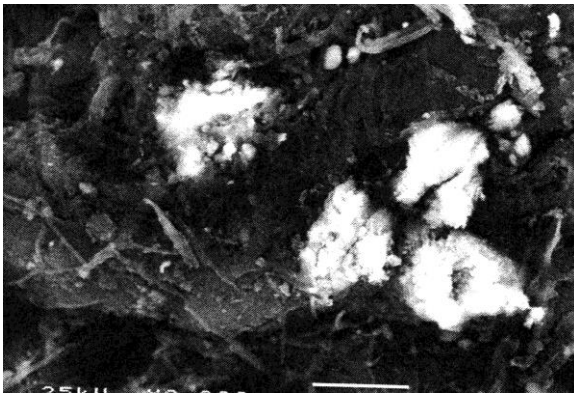
The principal features of the new methods are:

- altered rag treatment
- use of water-driven stamping mills derived from the *qualchiere* for textiles and leather
- firm moulds, with chains and ribs made of wire
- couching on textiles/felts; laying; drying in the air; glazing/calendering
- replacing starch size by animal glue.

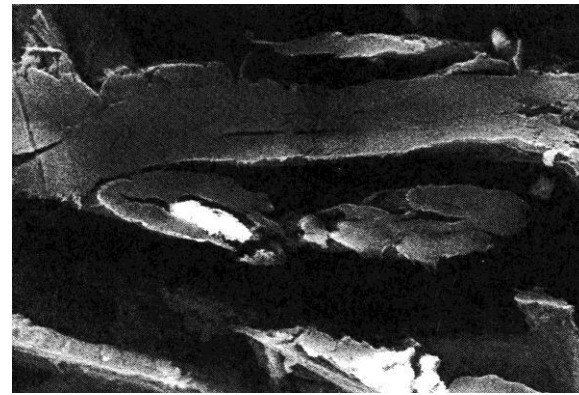
This is what we call "*European Paper*".

European paper

- An example of the evolution of new technology:
Filling / Fibre loading



Calcium carbonate particles
on the fibre surface



Calcium carbonate particles
inside the fibre walls

SEM micrographs (2000x), book printed in Venice 1548

(Jozef Dąbrowski)

*Statement 6: Some medieval manuscripts,
mainly Greek, are written on a special
kind of paper, neither Arab nor European:
Byzantine paper*

subsumed as

Carta bombycina

Cotton paper

Byzantine Paper

Two sub-types have to be distinguished, which differ chronologically:

A) s.X / XI. Its features are:

- - alkaline pulp of poorly refined textile rags
- - sheet formed according to the arab mode (mostly dipping)
- - slight coating or impregnation (starch; arabic gum?); some glazing
- - light overall base colour; medium transparency
- - good strength of the sheet in spite of its suppleness.

B) s. XII / s. XIV. Its features are:

- - alkaline pulp of accurately refined textile rags
- - sheet formed according to the arab mode (mostly dipping)
- - no or slight coating or impregnation (rice starch; arabic gum?); heavy glazing
- - light overall base colour and bright transparency
- - good strength of the sheet in spite of its suppleness.

Byzantine paper

Example of Type B: Basel Codex AN I 8 (~1200 A.D.)

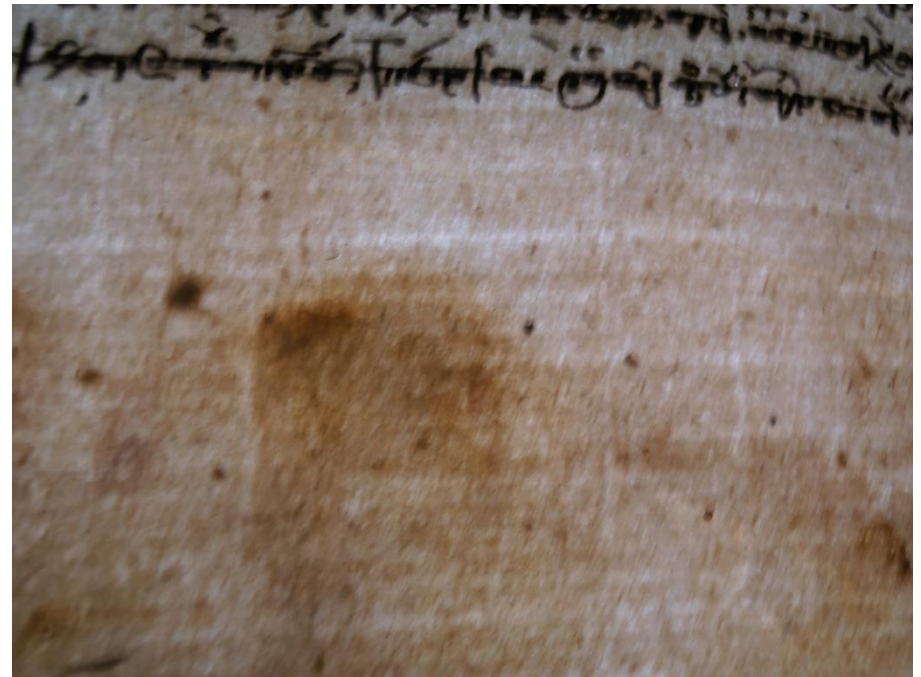


*very small rag fragments;
single fibres of linen and
hemp, bright basic colour of
the pulp.*

(camera: iPhone with additional
micro lens 55x)

*special formation of the textile
double chains;
fine ribs (reed?) curved as an
effect of couching*

(camera: Olympus HD 3D, SuperMacro
function)



Conclusion

- We propose an **European research project** to detect and examine early papers (ss. IX to XIV) kept in Europe in order to classify them according to technical and historical criteria:
 - True Arab paper (imported)
 - Paper made in Spain according to Arab technology
 - Paper made in Italy according to Arab technology
 - Byzantine paper
 - Paper made in Italy or other European countries according to the newly developed “European” technology

and to clarify the technical progress steps leading to the most successful dissemination of "modern" European paper.

We need your participation!

**Please, join us in our commitment to clarify the
history of early European paper!**



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