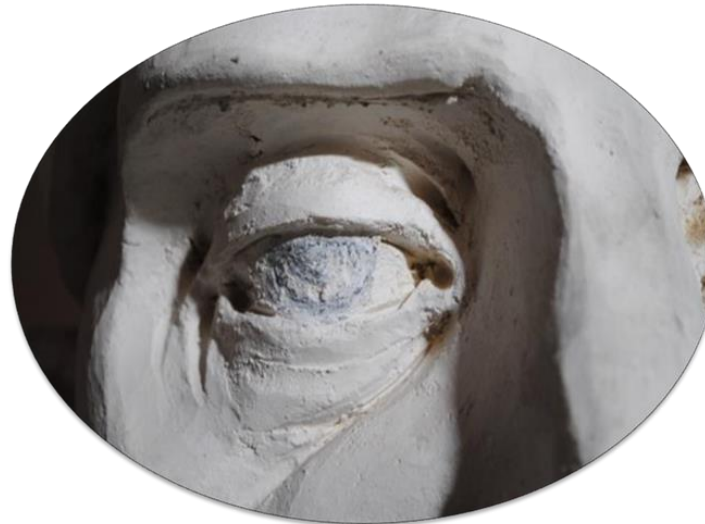


Stucco decoration across Europe

Introduction to a technical reading of a stucco work

Mendrisio 24th April 2023
ALBERTO FELICI – GIOVANNI NICOLI



STUCCO IS AN EASILY MOLDABLE MATERIAL ABLE TO TAKE STABLE SHAPE AFTER APPLICATION, PROCESSING AND HARDENING.

This term refers to a very wide range of material



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STUCCO DECORATION ACROSS EUROPE (2022-1-CZ01-KA220-HED-000085652)

- STUCCO *FORTE* or “alla romana”
- SCAGLIOLA o MESCHIA
- STUCCO LUSTRO
- PIETRA ARTIFICIALE – ROMAN CEMENT
- PLASTER MODELS - GESSI



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STUCCO FORTE or “alla romana”

Composed of a mixture of inorganic binders (mainly lime with the addition of calcined gypsum), various kinds of aggregates (sand, marble powder, pozzolana or brick powder) and organic additives. The modeling is obtained from the superposition of different layers for thickness, composition and type of processing. The plastic decorations could be carried out on site or off site or a combination of the two. Stuccoes require support of various kinds.





Morbio Inferiore, chiesa di Santa Maria dei Miracoli



Cabbio, Casa Cantoni, Caminiera, Baldassarre Fontana

Bissone, Oratorio di San Rocco,
Santo Vescovo, facciata



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Constituent materials

- Binders: lime
- additives
- aggregates
- supporting structures and armatures



The mix is essentially made up of a binder, one or more aggregates and possible additives to modify the performance of the mix.

The main binders are lime and gypsum, alone or mixed in different proportions.

We talk about stucco forte or “alla romana” when the binder is mainly lime.



The Binders: the lime

- Lime is the result of a production process, whereby calcium carbonate rock is collected in nature and then cooked (1050° - 1150° C) and quenched with excess water to obtain slaked lime. The attention paid to these stages determines the quality of the binder, i.e. the presence or absence of overcooked or unhydrated lime (coke).
- It must be mixed with the aggregates to compensate for the large shrinkage due to water loss with drying.
- The setting of the (aerial) lime occurs by carbonation in the air through which the calcium carbonate of the starting rock is reformed.



Extraction or choice of stone



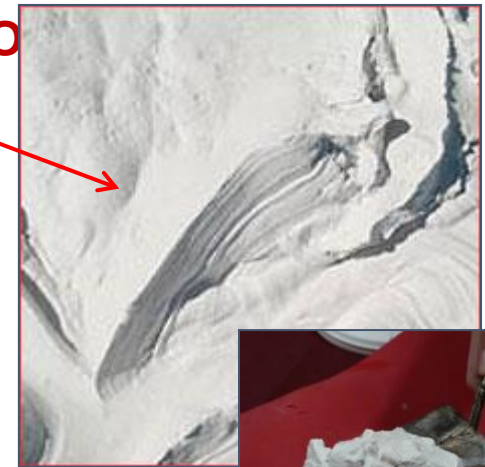
Calcium Carbonate
CaCO₃



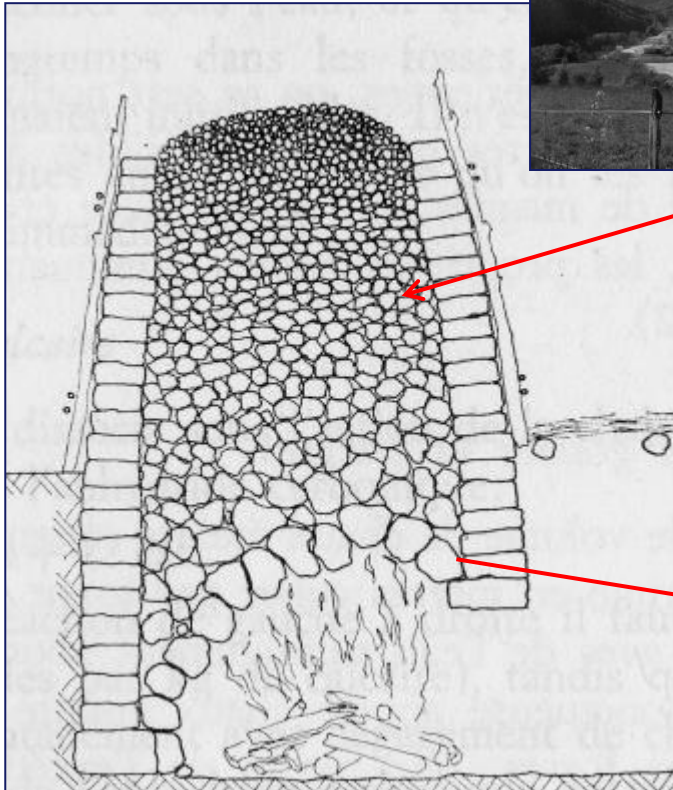
Calcium oxide or quick lime
CaO



Grassello or slaked lime
Ca(OH)₂



+ H₂O



LIME

The most common binder for stucco. It is obtained by firing naturally collected limestone, then the fired stone is bathed abundantly with large quantities of water to form the "grassello", which is a greasy and plastic mass thanks to its particular constitution. If stored away from the air, slaked stone keeps for a long time.



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AGGREGATES

They are essentially used to give body to the mixture in order to be able to reach certain thicknesses when installing the material. They are particularly important when the binder is lime, in order to compensate for the shrinkage caused by drying, and less important in the case of gypsum when it is used alone, although in this case too they could be used to facilitate and speed up the laying of large thicknesses.



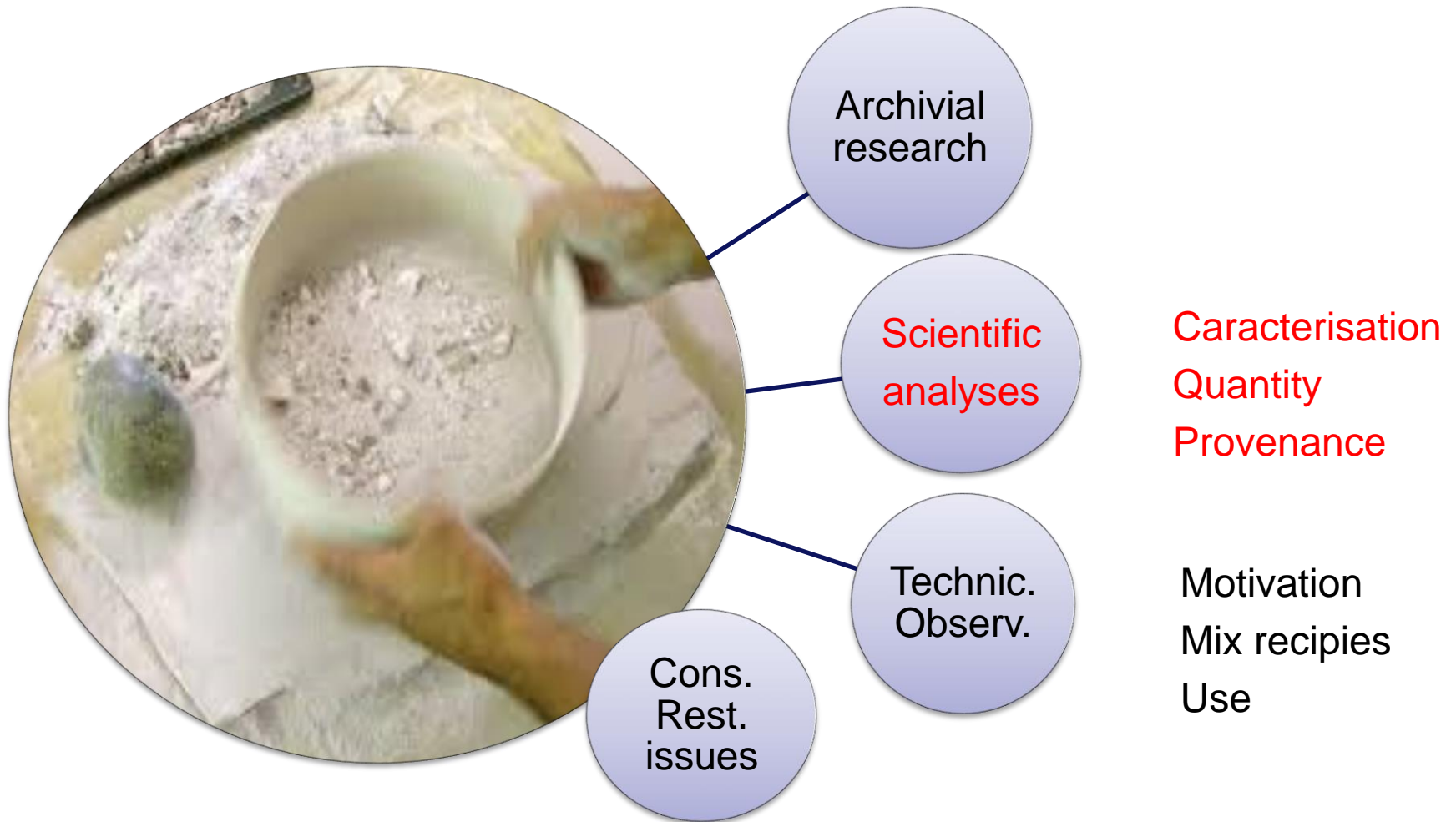
The most frequent aggregates: SAND, POZZOLANZA, PUMICE, COCCIOPESTO, TUFO, GESSO, MARBLE POWDER, CALCITE, QUARTZ, TRAVERTINO.



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The use of gypsum as a binder or additive



MIXTURE ADDITIVES

- By adding various substances to the mixture, the plasterers tended to improve its workability (by reducing the amount of water required) and to lengthen the modelling time or, conversely, to reduce the setting time, giving the dry mixture greater mechanical resistance and water repellence.
- The mixture had to have the characteristic of remaining in the shape given by the application in situ, without deforming due to its own weight, and at the same time preserve the mouldability necessary for the different shapes.

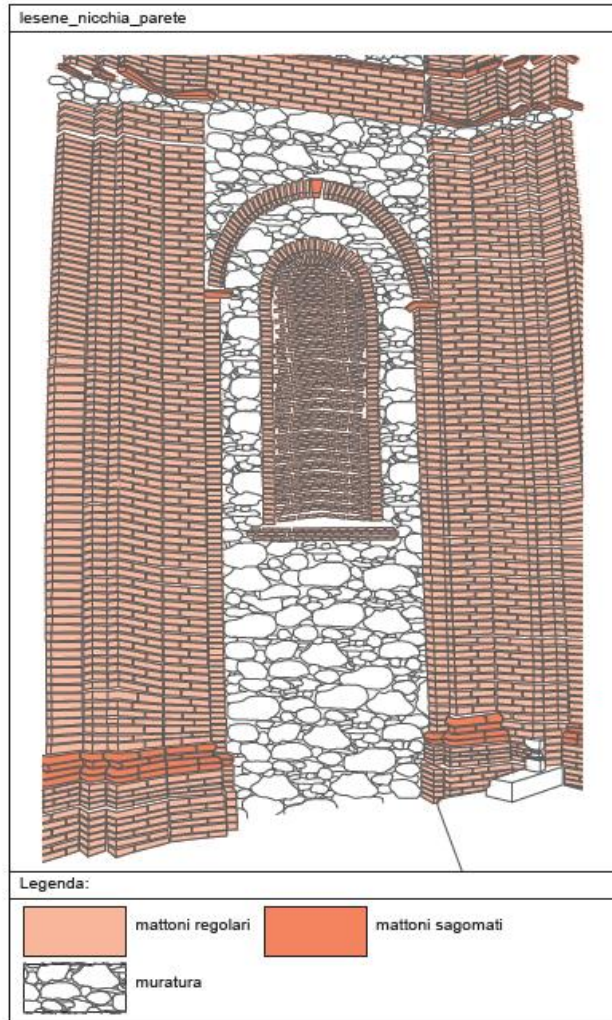


SUPPORTS, FRAMEWORKS, ANCHORS AND MORTARS

- **Supporting structure: composed of bricks and/or stones, it is the first layer on which subsequent layers are applied.**
- Supporting framework: made of iron, wood or bamboo canes, it is necessary to support the volume of the sculpture
- Anchorage: the element that connects the model to the wall structure, normally made of iron, more rarely of stone or wood.
- mortar support: this is a mixture of lime with the addition of gypsum and non-selected aggregates. Applied in several layers, it can reach considerable thicknesses, up to several centimetres.
- Finishing mortar: this is the last layer, its thickness does not exceed a few millimetres and it is composed of lime and fine aggregates.
- Finishing: consisting of a lime paint, it can be polychrome or composed of metal foils.

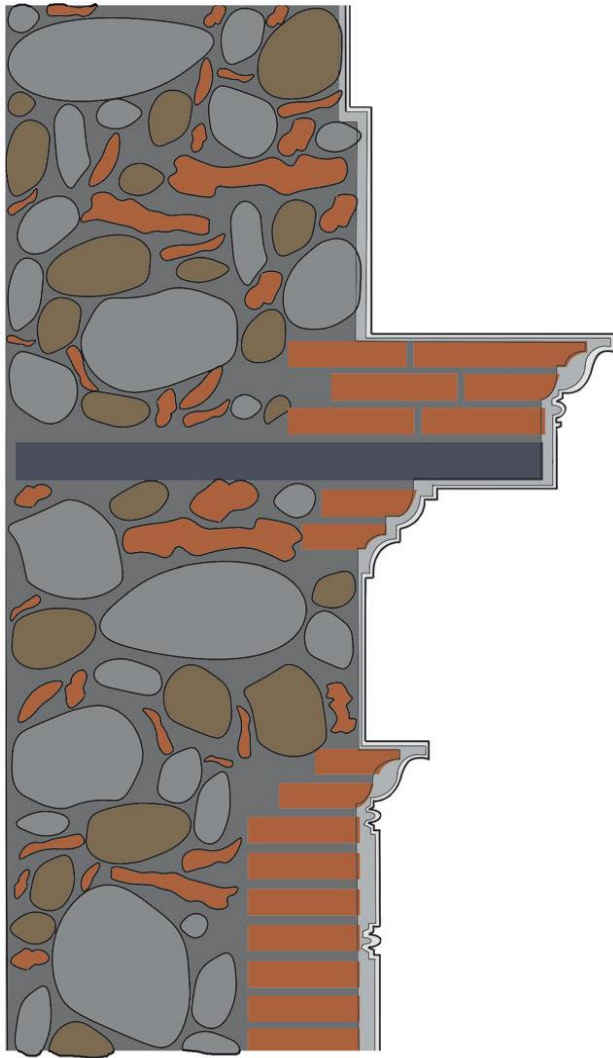


Supporting structure

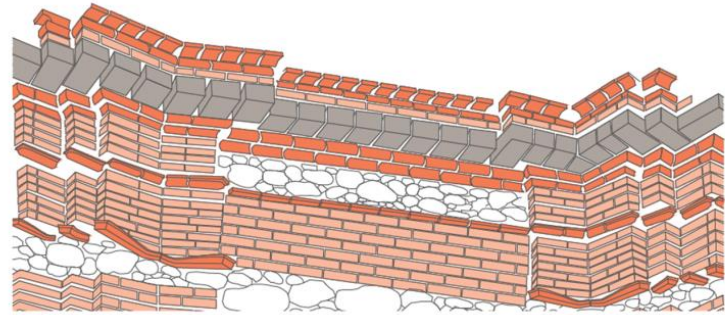


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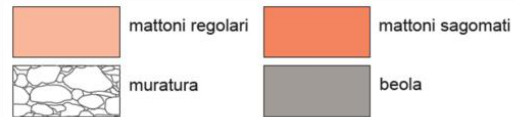
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trabeazione



Legenda:





Cavallasca, Oratorio S. Carlo degli Imbonati, Agostino Silva, 1669-75, Shaped brick of the pilaster base



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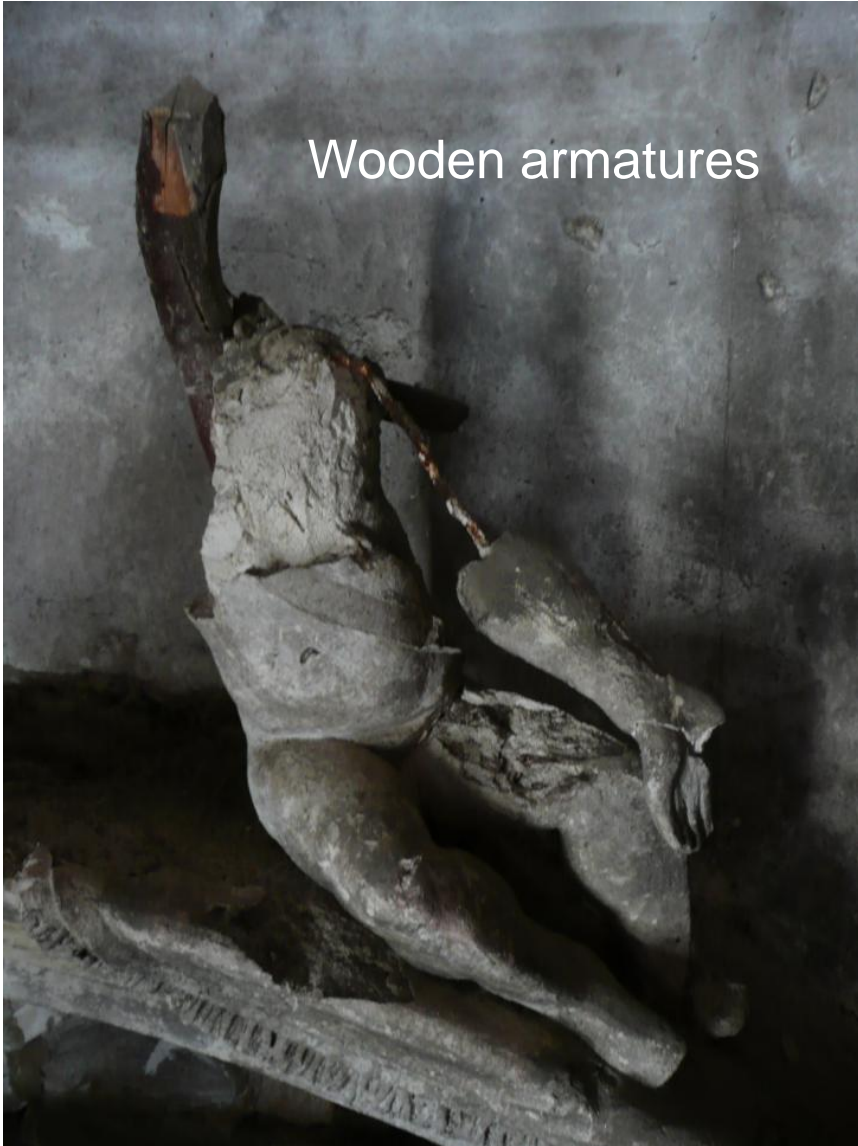
The use of reinforcements made of different sized iron wire can be seen in the ribbons connecting the volutes of the Ionic capitals with the central fruit festoon, a small bundle consisting of four or five iron wires was used.



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Wooden armatures



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ANCHOR NAILS



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Anchors



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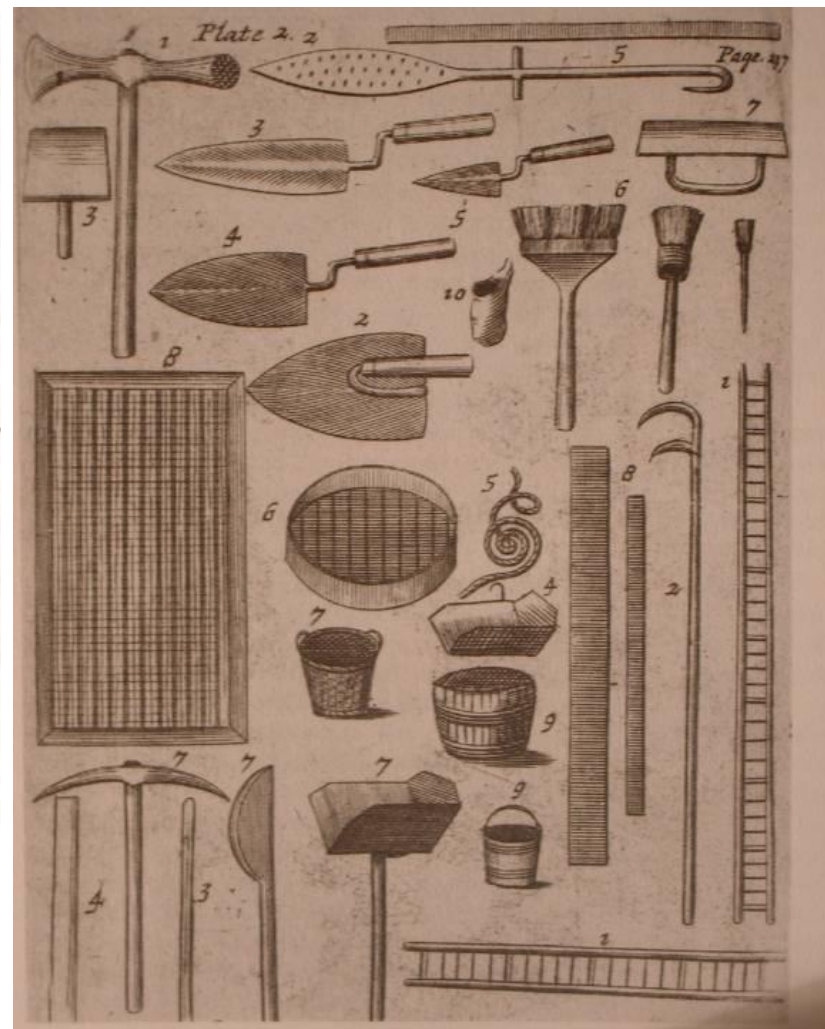
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TOOLS



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Limewash as a finishing



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Domaso, cappella dei SS. Antonio Abate e Francesco, Agostino Silva



Castione Andevenno , cappella di San Carlo, Alessandro Casella





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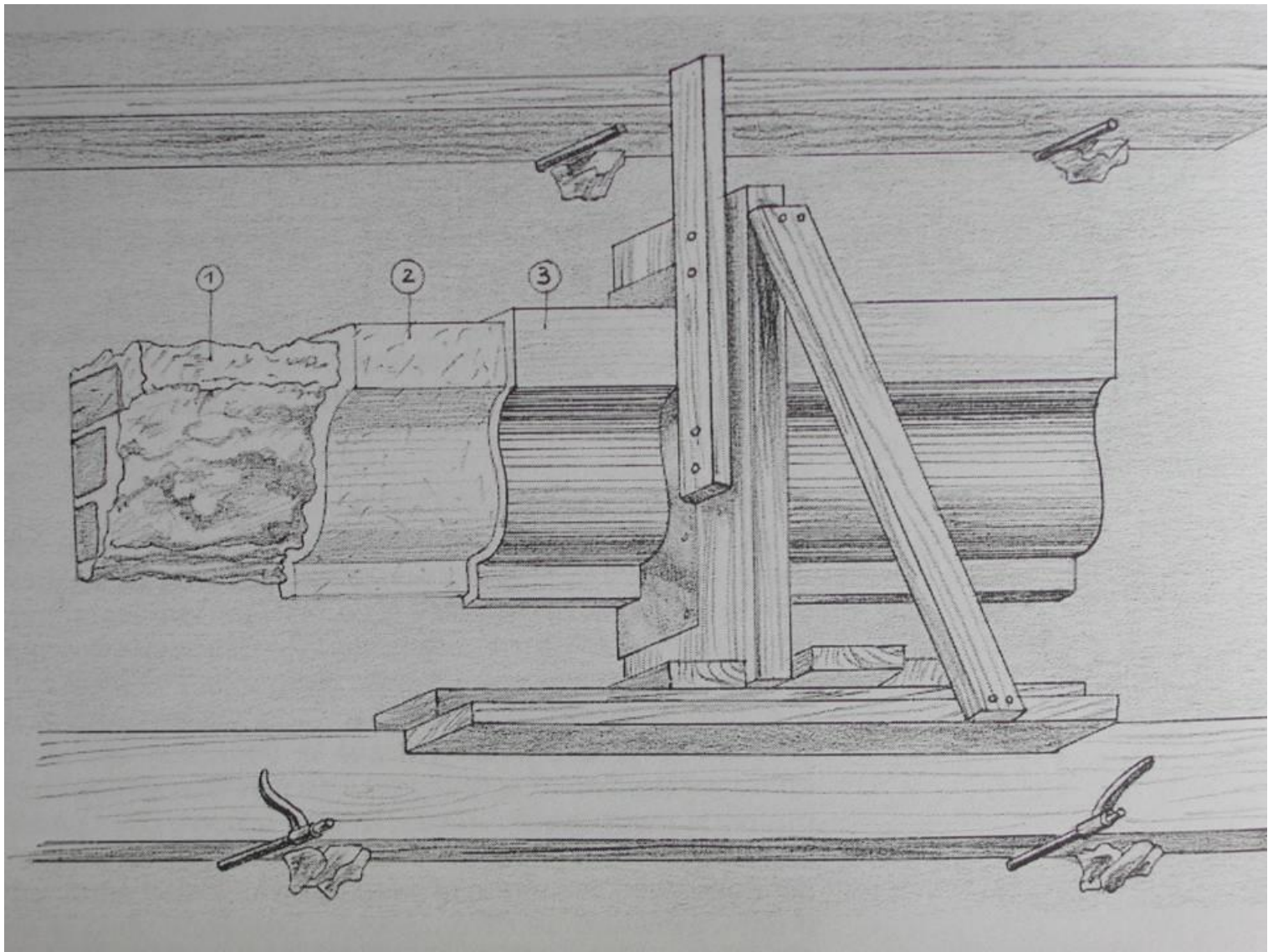
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MAKING FRAMES



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The Art of Stucco. From general recipes to the reality of Italian Switzerland in the 17th century



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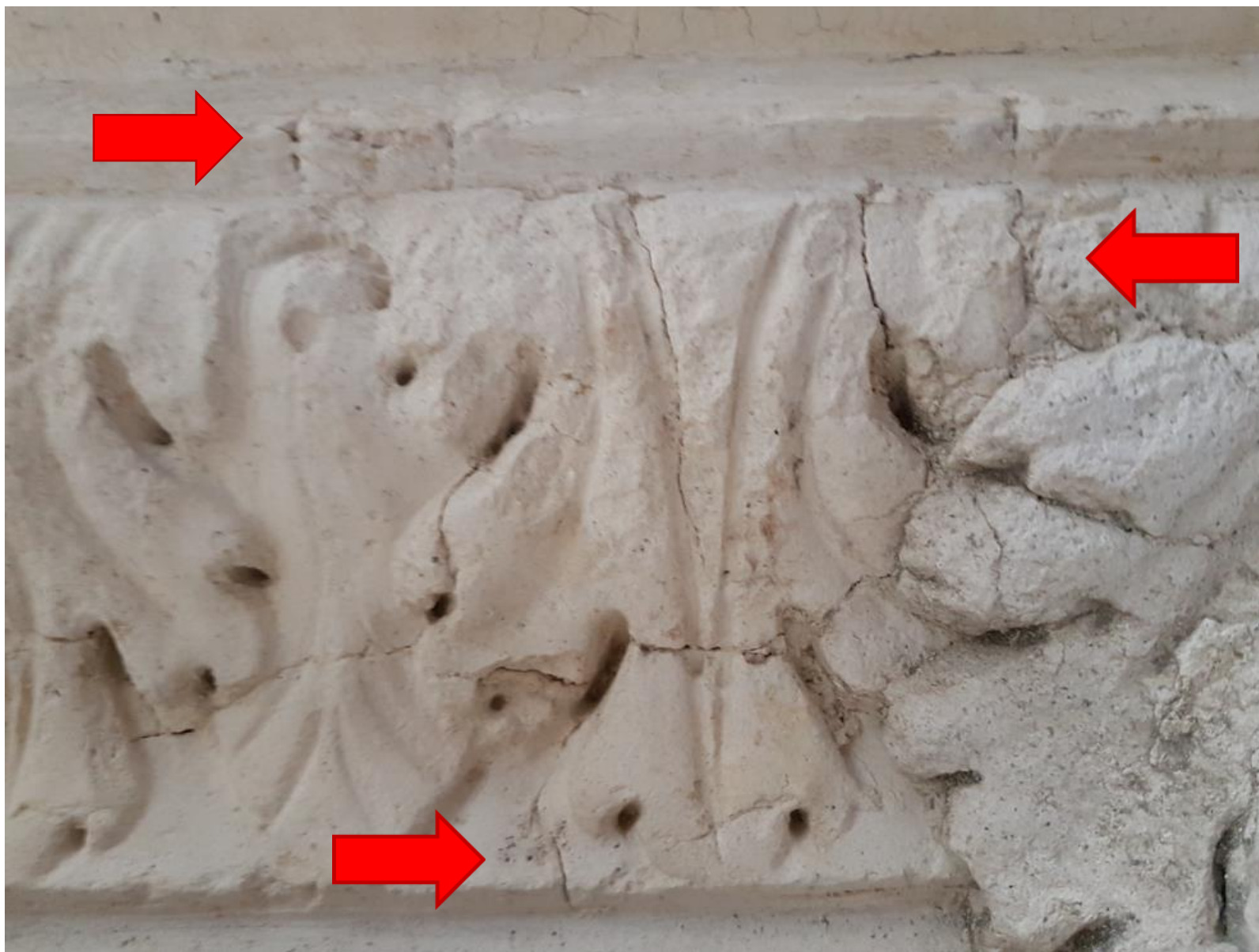


Riva San Vitale, Chiesa di Santa Croce, dettaglio della navata centrale



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The survey on site



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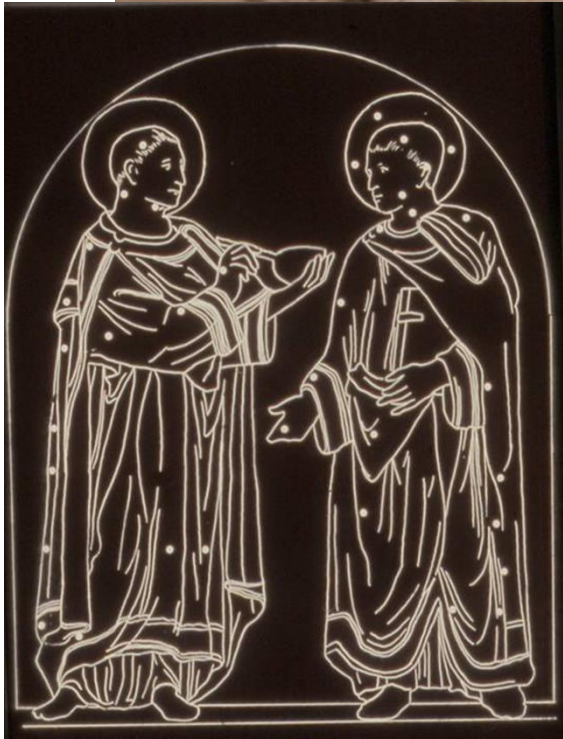
The survey on site



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Deterioration phenomena





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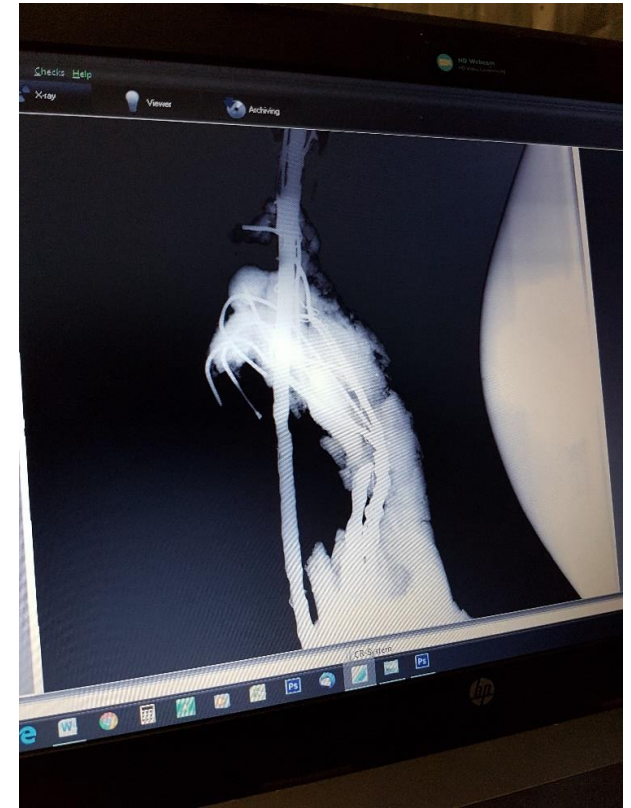
X-RAY



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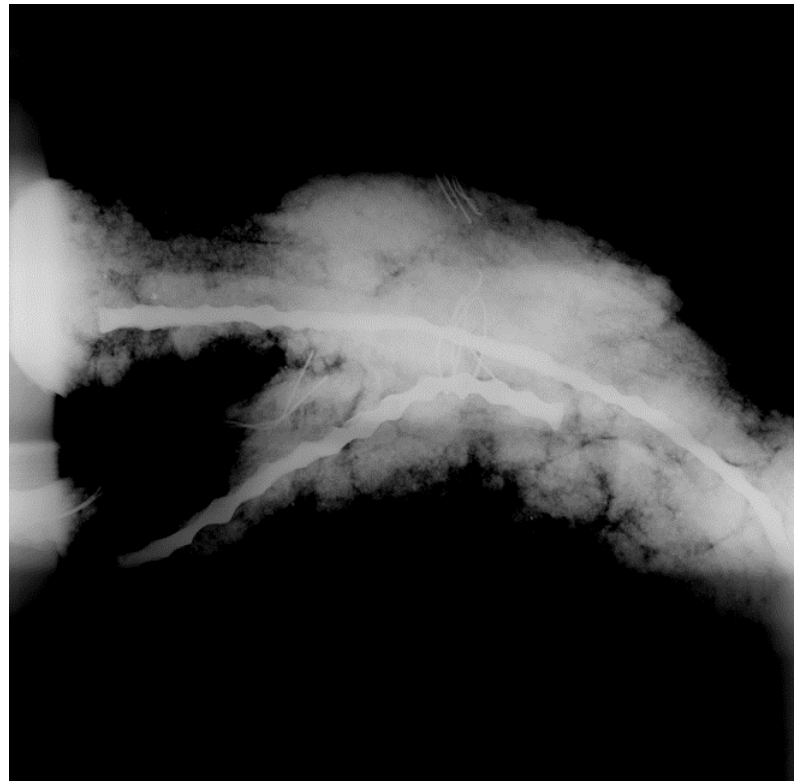
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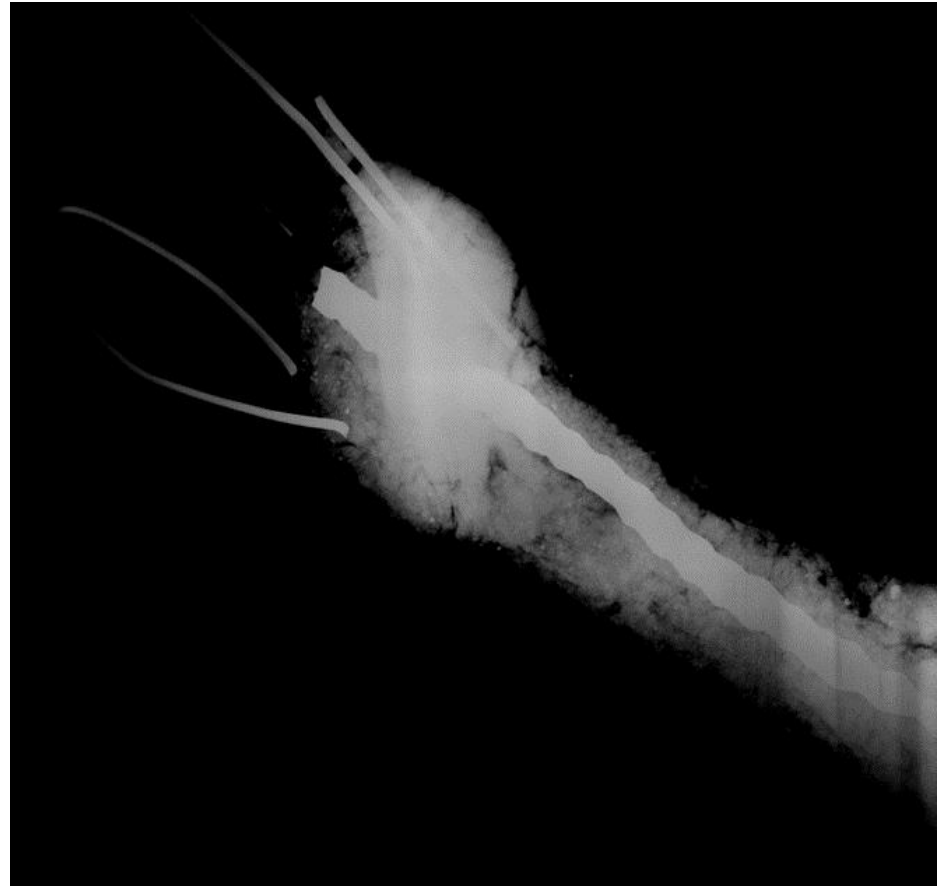
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SUPSI



**JAGIELLONIAN
UNIVERSITY
IN KRAKÓW**



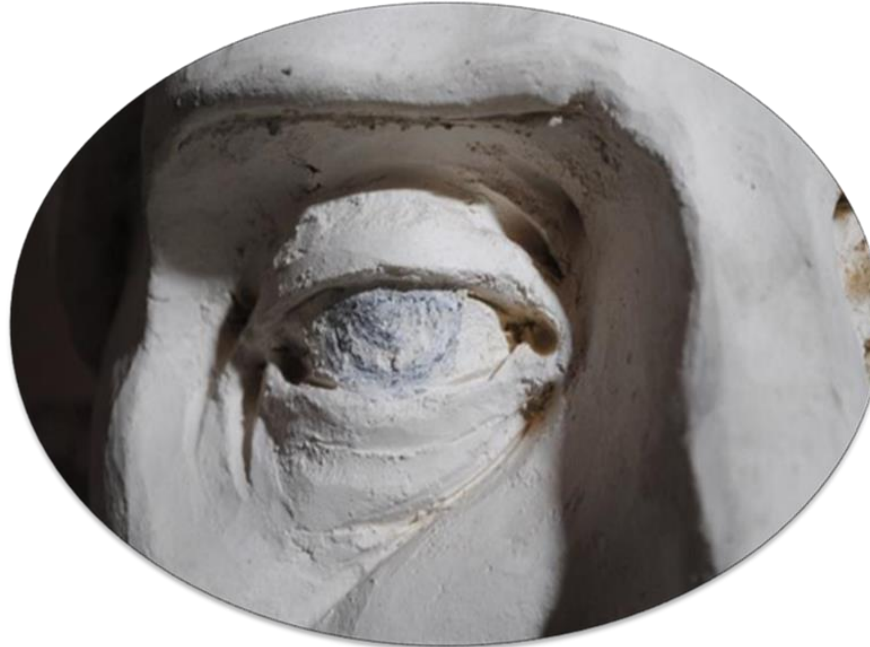
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Thank you for your attention



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