

# ALL THAT GLITTERS IS NOT GOLD: CHARACTERIZATION OF METALLIC DECORATIVE ELEMENTS FROM FIVE ENCLOSED GARDENS

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G3: Calvary with Mary and John the Baptist



G2: Saints Elisabeth, Ursula and Catherine



G6: Saints Augustine, Anna Selbdritt, Mary and Child



G1: Calvary and hunt on the unicorn



G4: Daniel in the lion's den

- 5 reliquary altarpieces
- 16th century
- Part of the collection of 7 Enclosed Gardens of the Museum Hof Van Busleuyden, Mechelen (BE)
- Studied in the context of the ArtGarden Project
- Huge diversity
- Several well-preserved golden metallic elements

## Focus on metallic decorative elements

### Gilded wooden sculptures



- Gilded polychrome sculptures

### Gothic elements



- Decorative elements on wooden sculptures
- Often degraded

### Back-plates



- Shiny/glossy thin foils
- Pristine conservation state
- Gilded?

### Insignias



- Diverse appearance
- Different materials?

### Sequins



- Abundant in all the panels
- Well-preserved
- Similar to back-plates

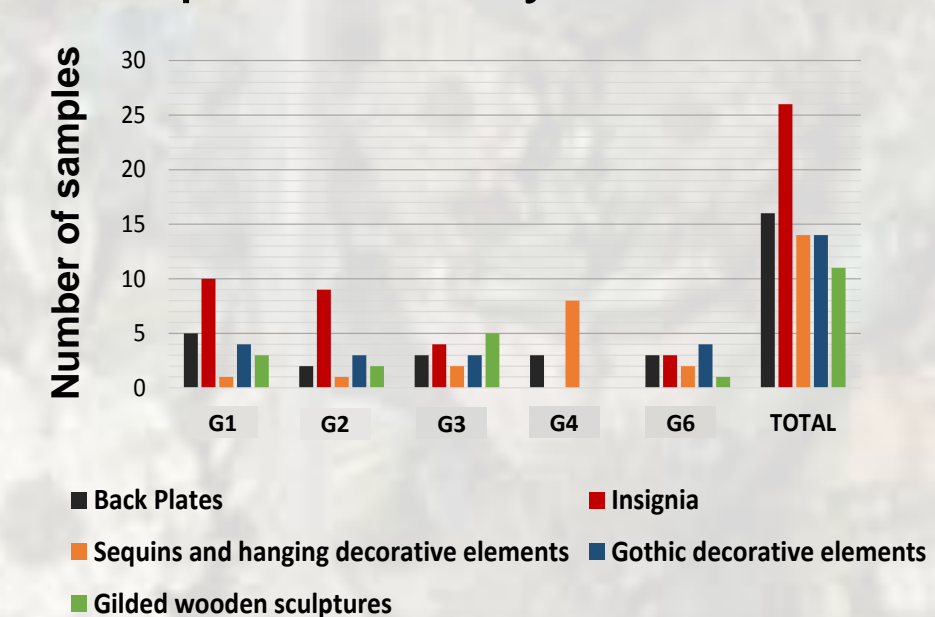
## WHY OUR RESEARCH?

- For conservation purposes
- To acquire more historical and technical information

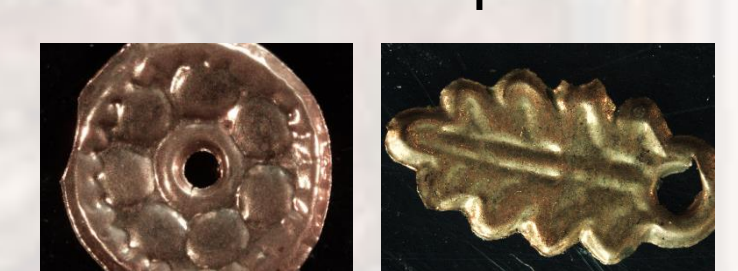
- Differences between panels?
- Are back-plates and sequins gilded?

## HOW?

### p-XRF analysis in-situ



### Laboratory analysis on five loose sequins

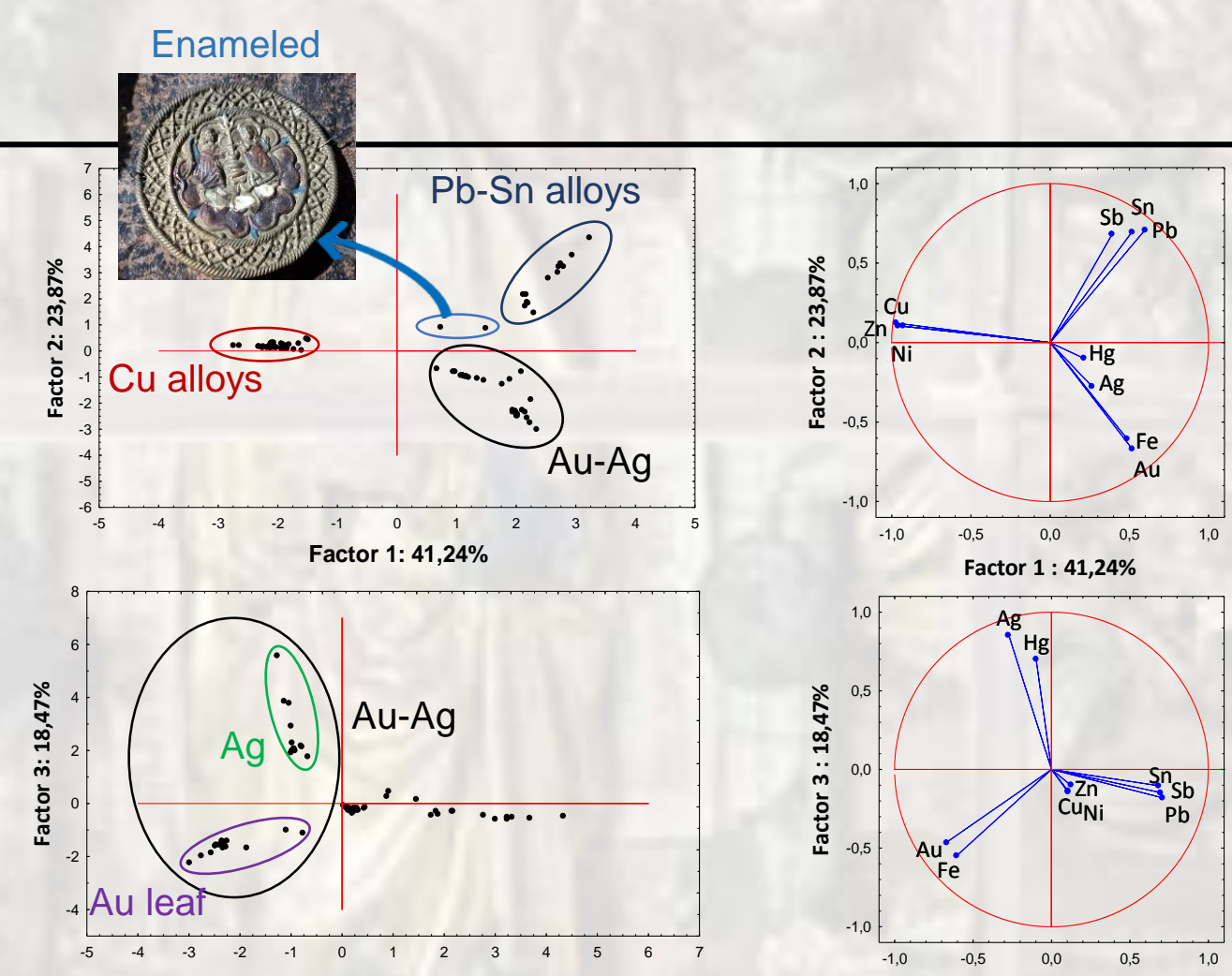


- OM
- SEM-EDX
- XRD
- $\mu$ -Raman
- FTIR-ATR

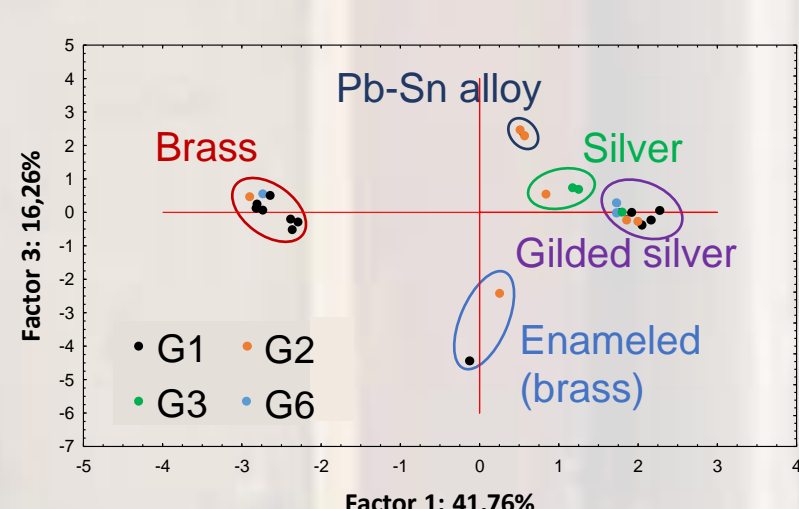
## Analysis in-situ

### Exploratory PCA

- Cu alloys (= leaded brass):
  - Back-plates
  - Sequins
  - Insignias
- Lead-Tin alloys:
  - Gothic decorative elements (gilded)
  - Insignias
- Silver:
  - Insignias
- Gold leaf:
  - Gilded sculptures



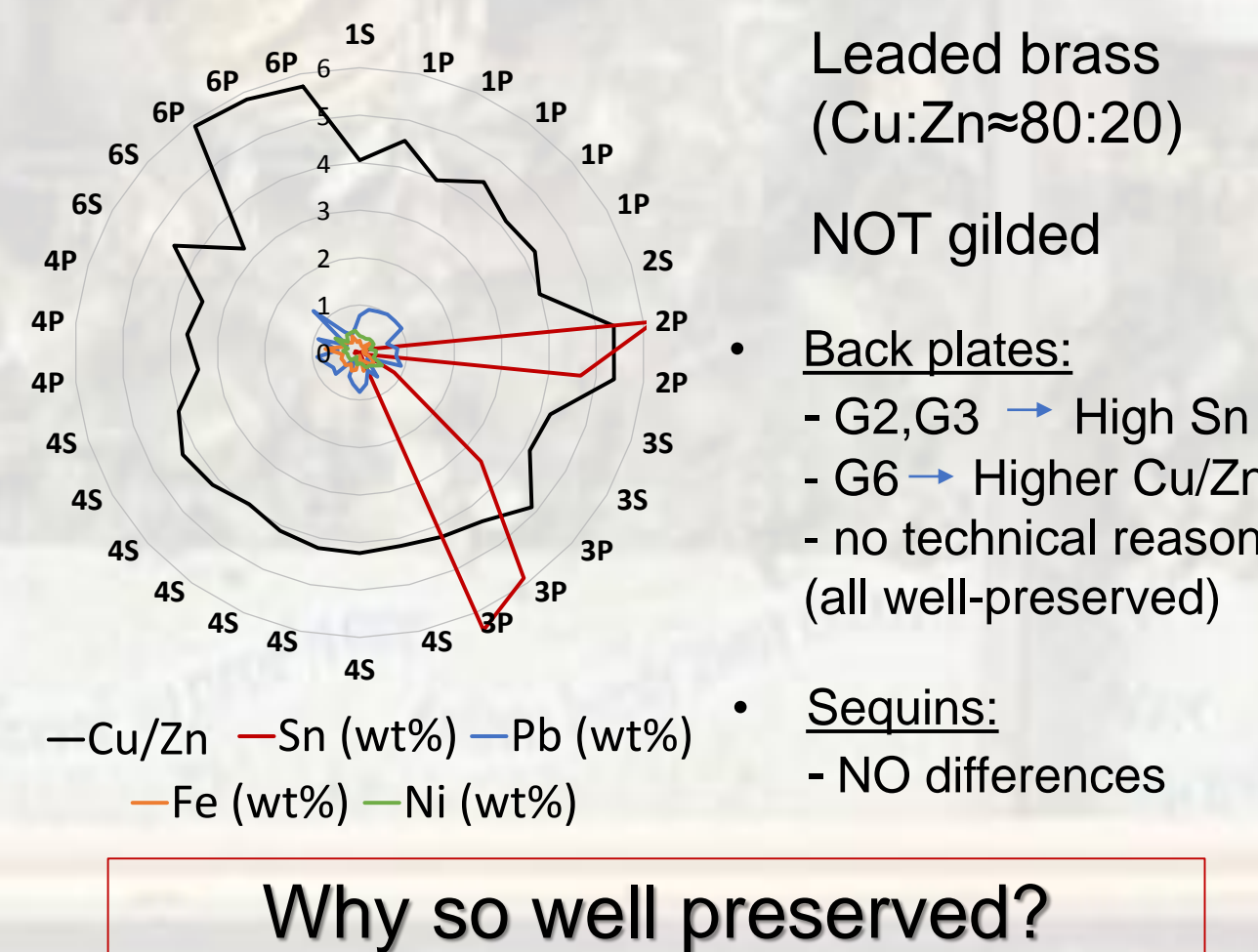
### Insignias



No significant distinction between different panels

Most silver insignias show residues of gilding (mostly not visible)

### Sequins (S) and back plates (P)



## Laboratory analysis: why is leaded brass so well preserved?

### NO organic protective layer (no FTIR-ATR signal)

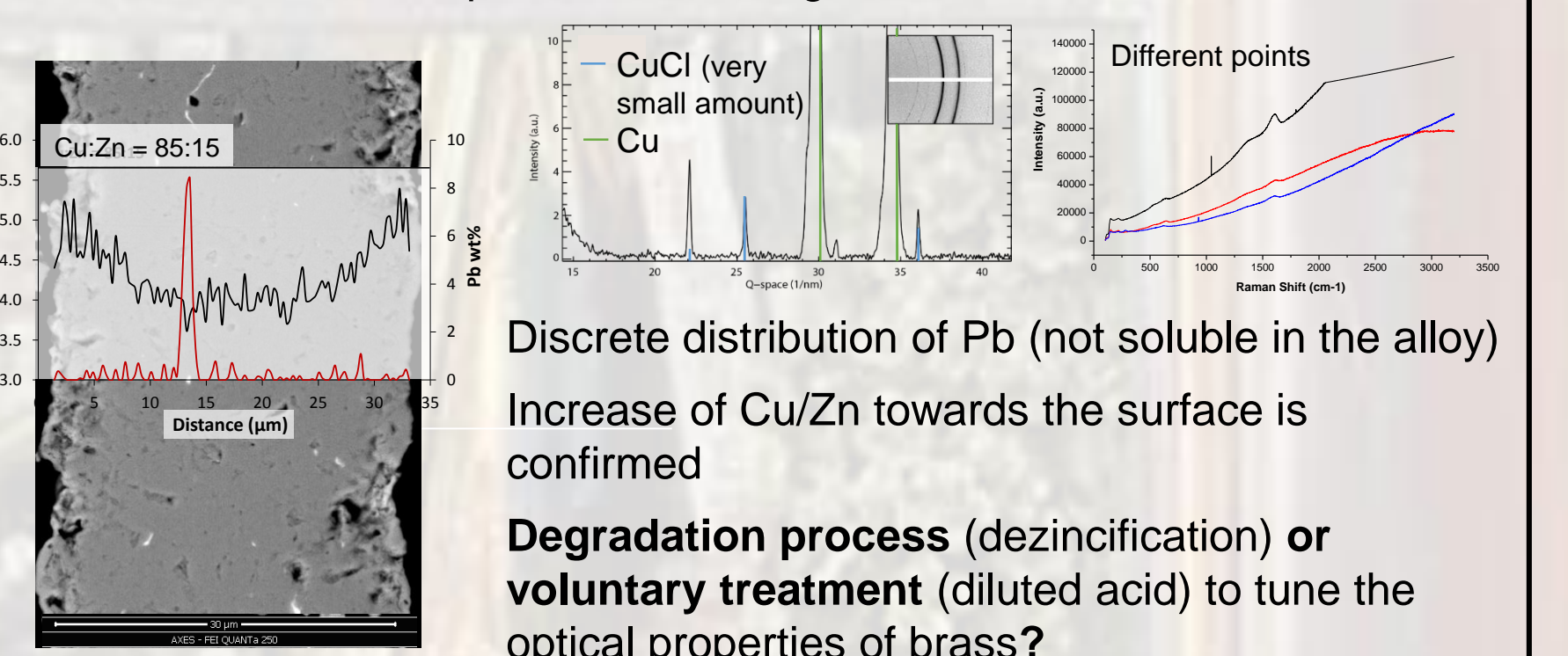
### Protective metallic surface layer?

SEM-EDX(Surface)										
	Al	Si	S	Cl	K	Ca	Fe	Ni	Cu	Zn
Surface (Area)	0.4	0.1	0.1	0.1		0.4	0.3	84.6	14.0	6.1
Surface (Point 1)	0.3		0.1			0.3	0.2	86.3	12.7	6.8
Surface (Point 2)	0.2		0.1			0.4	0.3	85.4	13.5	6.3
Surface (Point 3)	0.3		0.1			0.2	0.2	84.6	14.6	5.8
Surface (dust)	22.0	39.6	0.5	0.9	2.1	2.6	25.8	3.9	1.0	4.1

No Pb on the surface

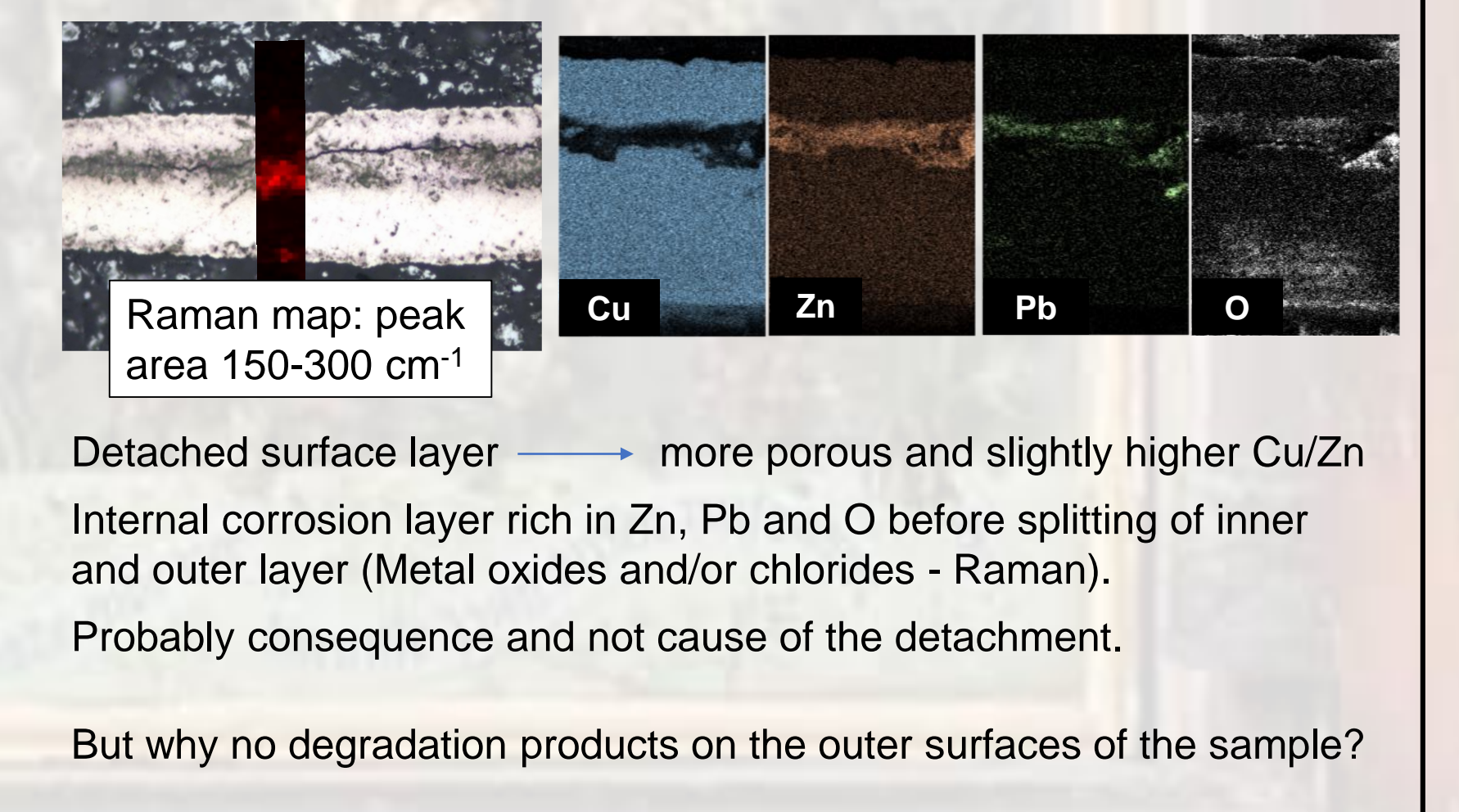
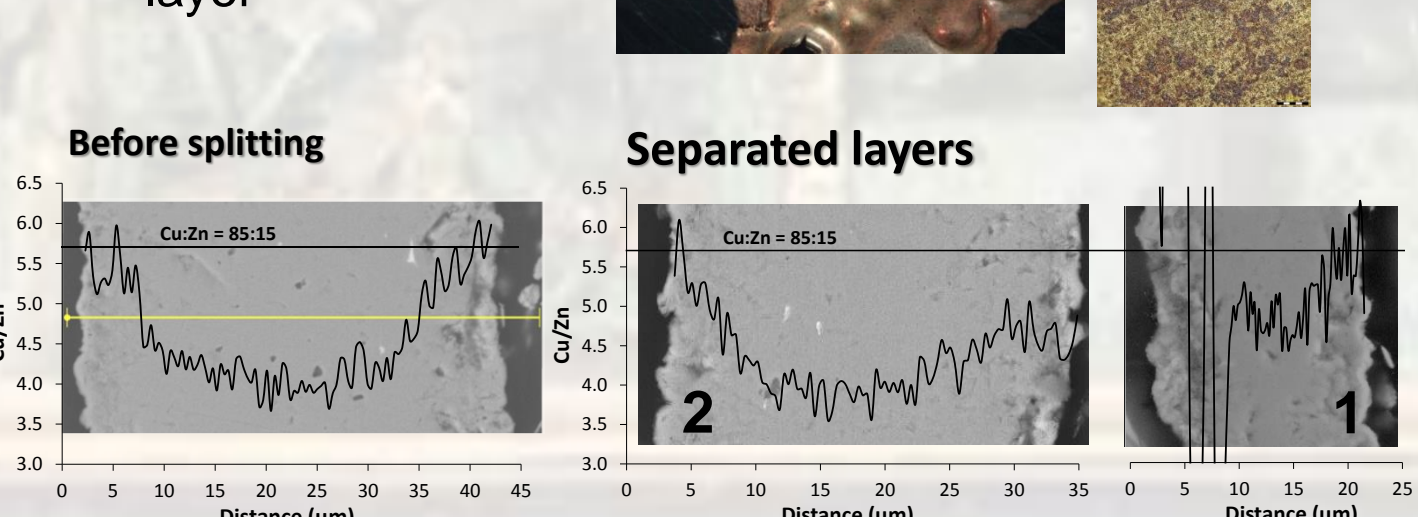
Higher Cu/Zn ratio on the surface than in the bulk

Cu:Zn ≈ 85:15 corresponds to a more golden color



### Sequin with detached surface layer

- Well-preserved surface layer
- Tarnished inner layer



## CONCLUSIONS

The results of this study showed no clear and systematic difference between the metallic decorative elements in the different Enclosed Gardens. Small compositional variations were observed only in the brass back-plates decorating the background of the panels. However, these slight changes do not seem to be justified by any technological need and show no effect on the overall stability. All the lead-tin gothic elements decorating the wooden sculptures, as well as most of the silver insignias, presented residues of gilding. On the contrary, none of the brass objects showed any traces of gold. The golden appearance of brass back-plates and sequins is in fact only related to a higher Cu/Zn ratio on the surface. It is not clear whether this dezincification is the result of a degradation processes or of a surface treatment aiming at enhancing the gold-like appearance of the metal. Contrarily to what expected, this porous Zn-depleted surface layer seems to protect the alloy from further degradation. The presence in the Gardens of large amounts of silk, potentially acting as a chemical sieve against gaseous pollutants, might also have positively influenced the overall stability of the brass elements.