

The Johnston – Vieillard manufactory (19th century, Bordeaux, France): preliminary results on 'white earthenware' production

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INTRODUCTION

The **Johnston – Vieillard manufactory** used to be an industry in the Bordeaux area (France) for several decades in the 19th century (**1835-1895**) [1]. The factory produced **white earthenware**, a particular class of ceramics which was invented in the 18th century in England [2]. The present piece of research focuses on the **technical evolution** of the white earthenware productions during the different stages of the French factory life. The discovery by the Centre archéologie préventive de Bordeaux Métropole, in 2015, of dumps of the Factory containing rejects from the different production periods as well as the absence of the manufactory archives (that was lost?, destroyed?) justified the interest in this recent ceramic. That's why objects are the best carriers of information concerning the process of its own fabrication. Thus, we are concentrating on the **characterization of the paste**, to answer the following questions:

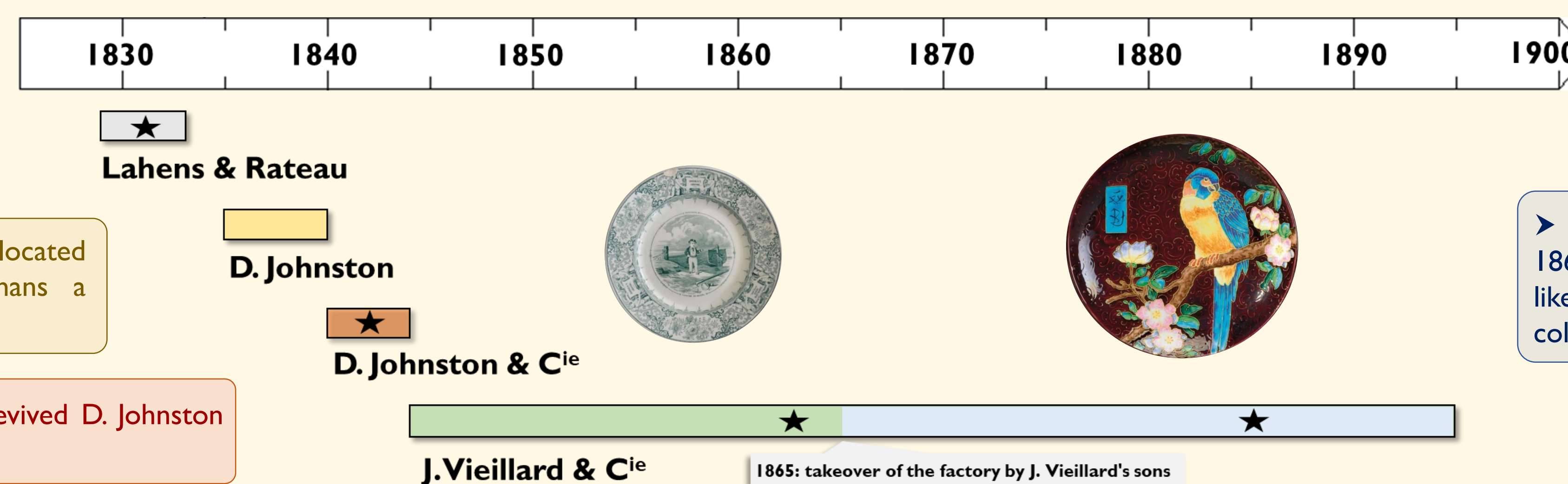
- (1) Is it possible to **differentiate** the different productions of the factory from a mineralogical and chemical point of view?
- (2) What is the process used in the **preparation of the paste** and the **firing process** of the ceramic?

HISTORY OF THE JOHNSTON – VIEILLARD MANUFACTORY

1829: Two merchants, Mr. **Lahens** and Mr. **Rateau**, founded the first manufactory of white earthenware of Bordeaux area. For a few years, they worked with a ceramist: **Honoré Boudon de Saint-Amans**.

➤ In **1834**, **David Johnston**, a wealthy dignitary, bought a mill located on the quays and co-founded with Boudon de Saint-Amans a manufactory of white earthenware in the *English way*.

➤ Declared bankrupt, the arrival of **Jules Vieillard** in **1840** revived D. Johnston Company. In **1844**, it was finally liquidated.



➤ J. Vieillard continued the earthenware productions and introduced the production of **porcelain**. Actually, he received some distinctions in World Exhibitions.

➤ His two sons took over their father's factory in 1865. They developed collaborations with ceramists - like **Amédée de Caranza** - which created 'cloisonné' colored glaze decoration.

NB: stars (★) symbolize the different periods which were concerned by archeological sampling.

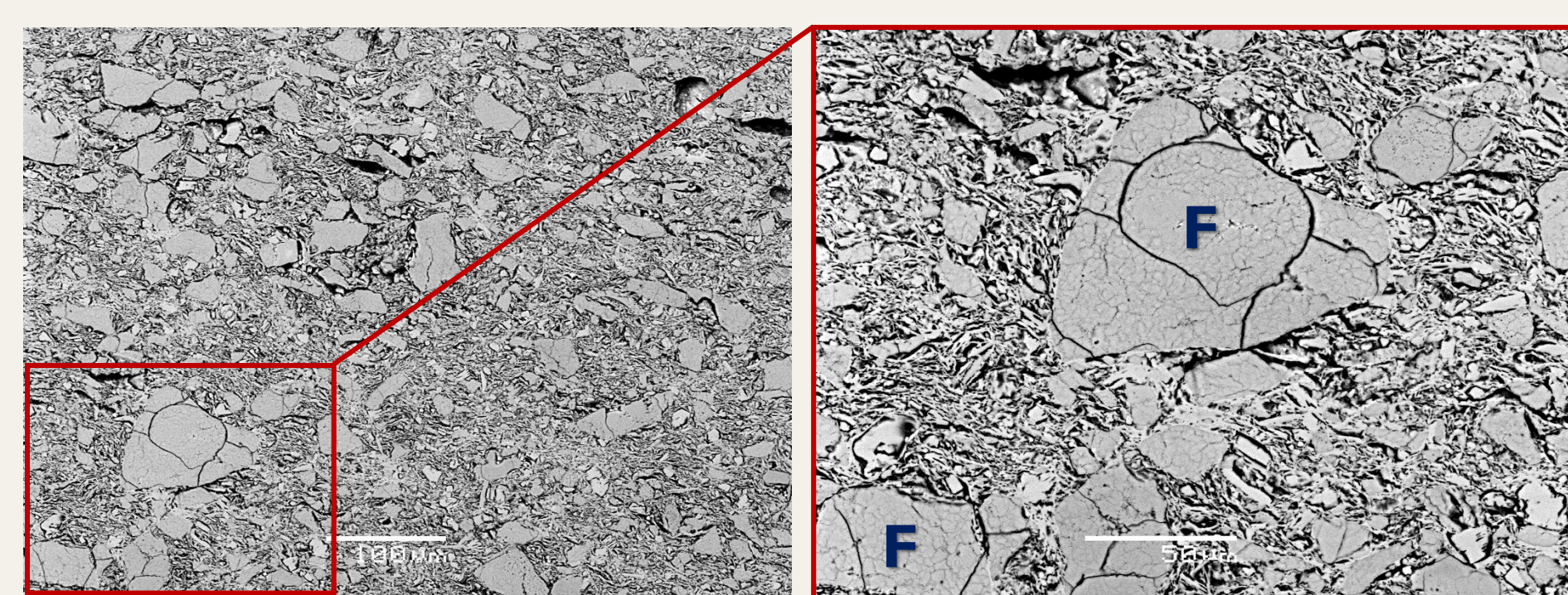
RESULTS AND DISCUSSION

⇒ 150 archaeological sherds = 70 biscuits + 80 glazed earthenwares

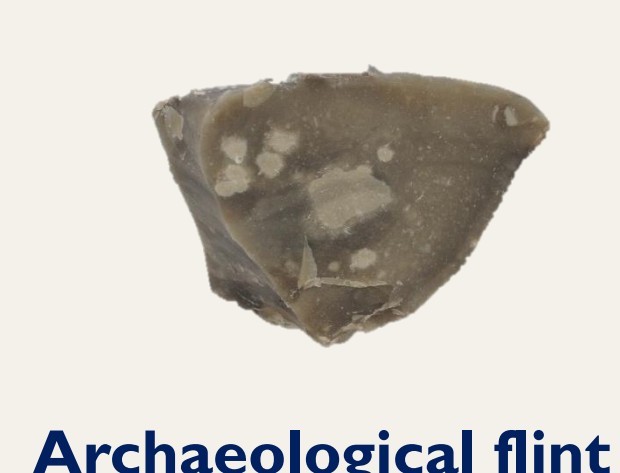
1) Presence of calcined flint in white earthenware body's

ARCHAEOLOGICAL SAMPLES

SEM BACKSCATTERED ELECTRON IMAGES



White earthenware



calcination
900°C



Calcined flint in laboratory and Archaeological calcined flint

- presence of **calcined flint** in the body of **all** samples (like Maggetti *et al.* in [3]).
↳ increases the whiteness of the body [4].

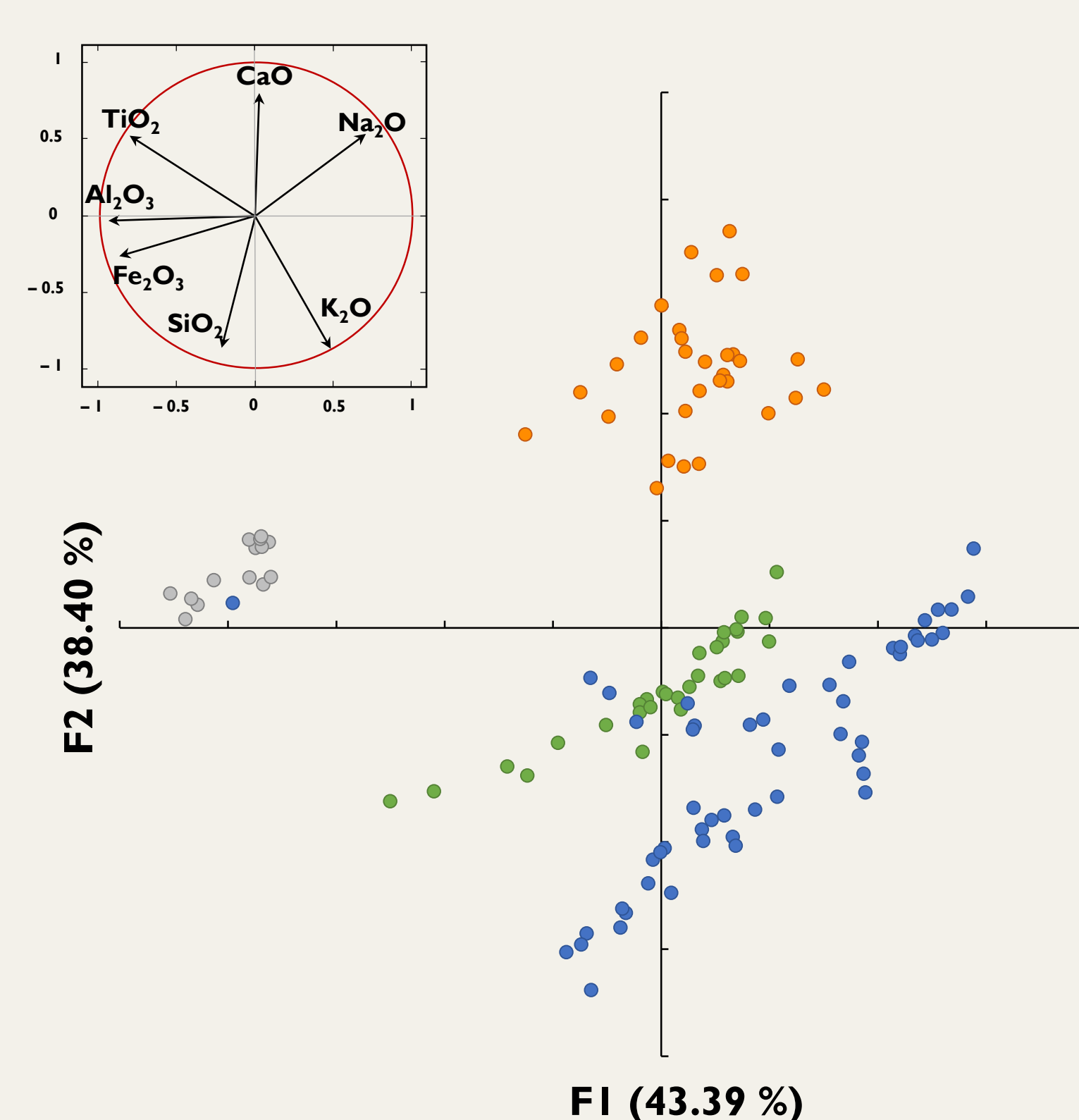
2) Evolution of composition of recipes?

	SiO ₂	Al ₂ O ₃	K ₂ O	Fe ₂ O ₃	CaO
LR	66.9	30.4	0.3	0.7	0.5
DJ & Cie	69.5	27.3	0.4	0.6	0.7
JV & Cie	71.5	25.4	1.2	0.6	0.5
JV's sons	73.4	23.0	1.5	0.5	0.4

▲ Paste chemical composition measured by SEM-EDS for different chronological periods (average of samples of the same period exprimed in wt %)

- Variation of K₂O between 1830 and 1885
↳ Addition of K-feldspars (fluxing materials) and diminution of clay portion.
- Evolution of chemical composition of body
↳ Change in paste receipt.
↳ What about technical choices and economic issues?

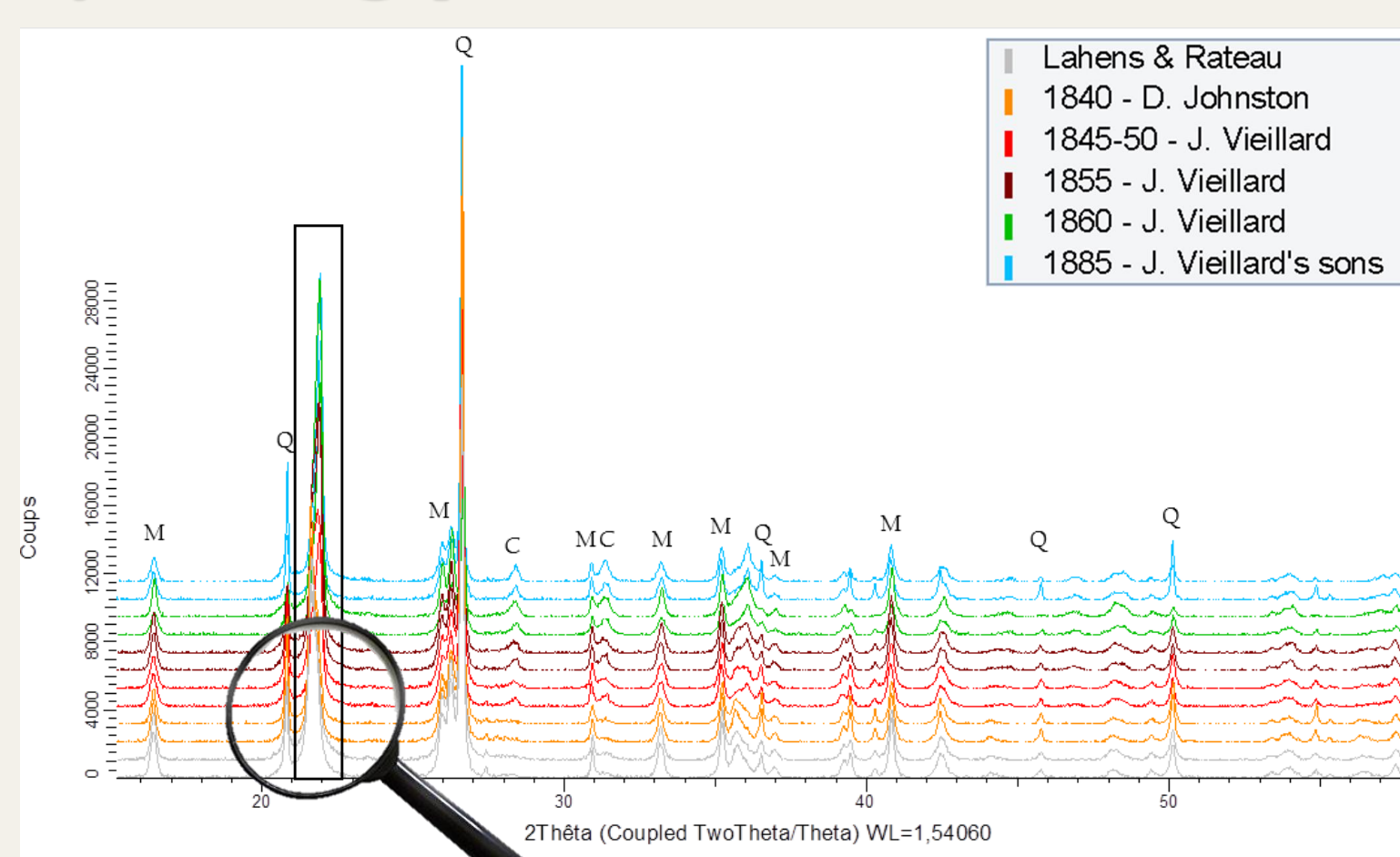
▼ PCA score/loading plot obtained with the EDS data of seven detected elements on bodies



LEGEND

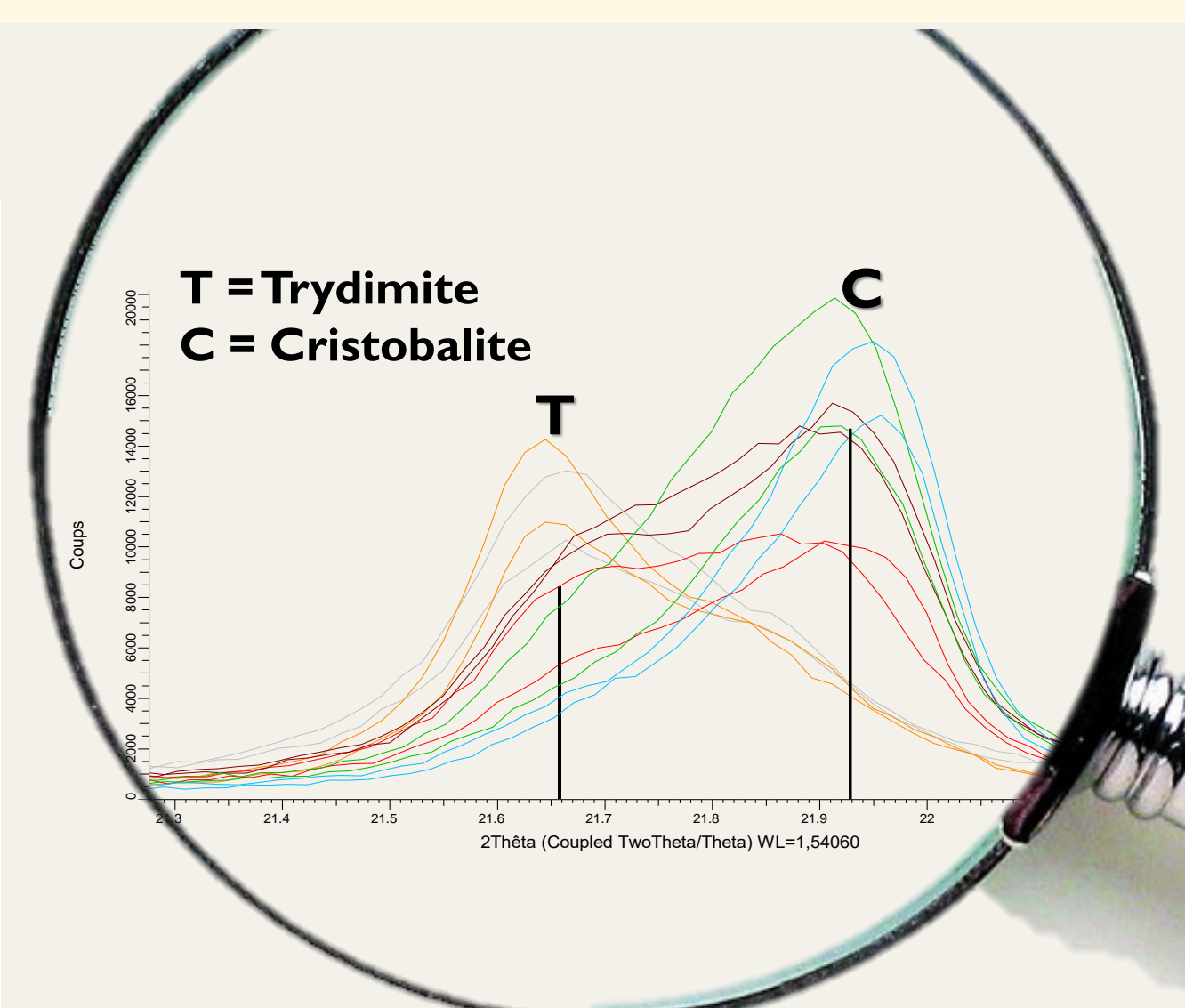
- 1830 – Lahens & Rateau
- 1840 – D. Johnston & Cie
- 1860 – J. Vieillard & Cie
- 1885 – J. Vieillard's sons

3) Firing process



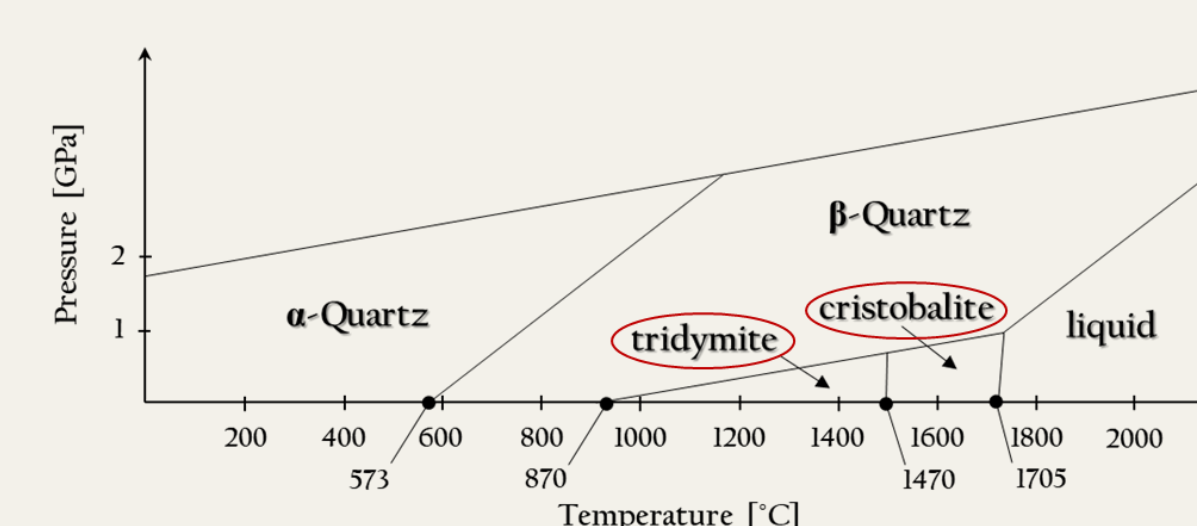
▲ Representative XRD patterns for pastes from white earthenware samples

- Presence of **mullite** (3Al₂O₃, 2SiO₂) in the body of **all** samples.
↳ Kaolinite clay may be used in white earthenware body's [5].

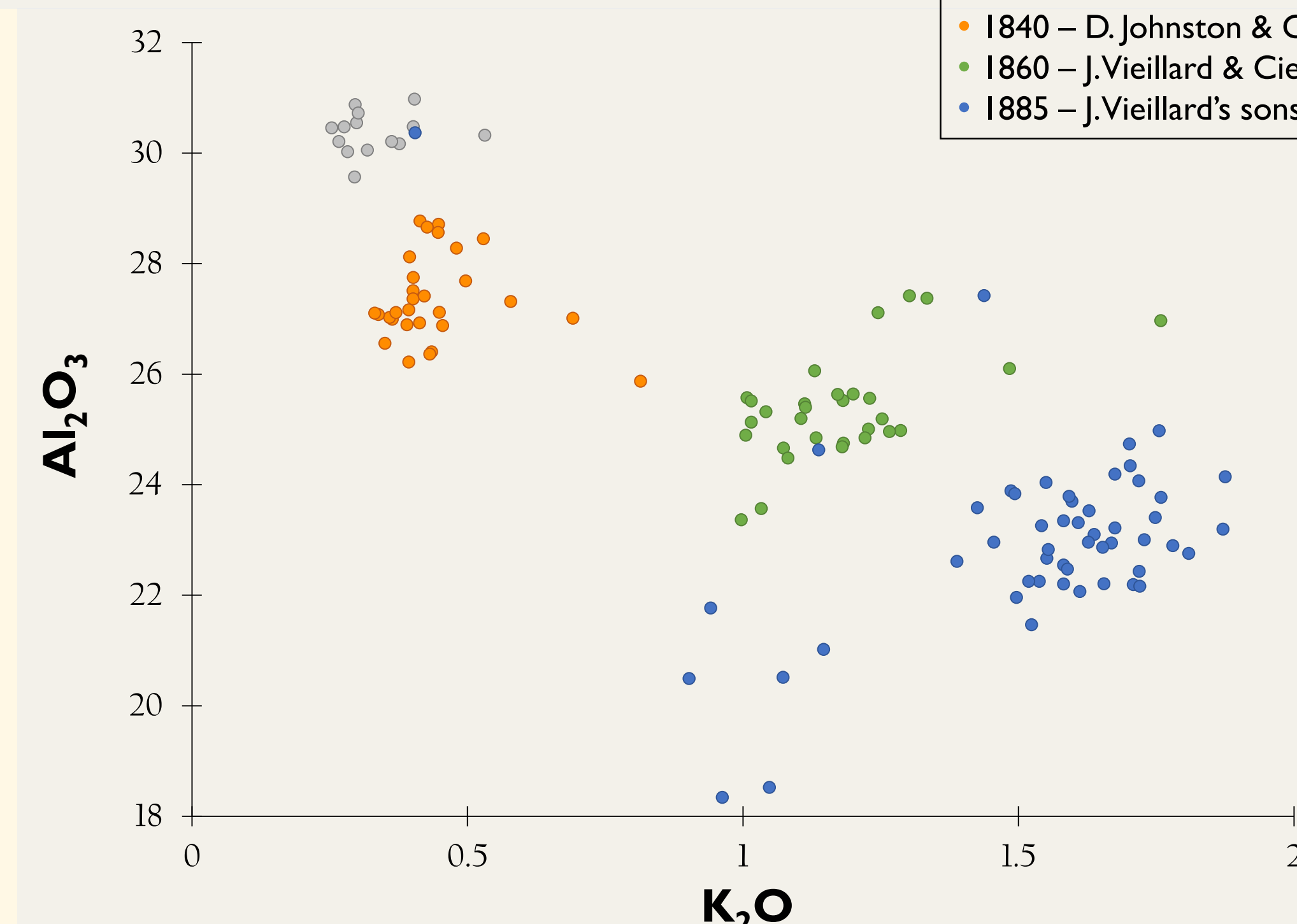


➤ **Transition zone** between **1845** and **1855**: presence of **T** and **C**.

- Change in the firing process
↳ Increase in the firing temperature?



▲ Phase diagram for SiO₂ polymorphs



▲ Variability in chemical composition of white earthenware based on SEM-EDS results (wt %)

CONCLUSION

- ✓ Possible to **distinguish white earthenware productions** of different chronological stages of the manufactory.
- ✓ Identification of some **ingredients** of paste recipes (calcined flint, kaolin, K-feldspars) and **change in the firing process**.

PROSPECTS...

- Investigations about potential raw clay materials.
- Quantification of different components of earthenware bodies.
- Relationship between the evolution of body and glaze composition's.

References

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- [5] H. Zhou, X. Qiao, J. Yu, Applied Clay Science 80–81 (2013) 176–181

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