



# Interdisciplinary analysis of bricks from Royal Castle in Poznań (Poland)

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## INTRODUCTION

In medieval Poznań (Poland), surrounded by defensive walls, the Royal Castle hill towered over the rest of the buildings.

On the basis of historical data and relative chronology it is estimated that the buildings and walls of the castle were raised at the end of 13<sup>th</sup> cent. To verify the age of the first phases of castle erection the samples of bricks from the chronologically oldest part were taken for luminescence analyses.

The collected bricks differ macroscopically. These differences are consistent with two different types of brick binding, Vendian and Gothic found in the castle walls.

## METHODS

Dating were preceded by detailed material characterization. Different methods like macro- and microscopic observations using polarizing light microscopy and scanning electron microscopy with electron dispersive spectrometer (SEM-EDS), were applied.

## RESULTS

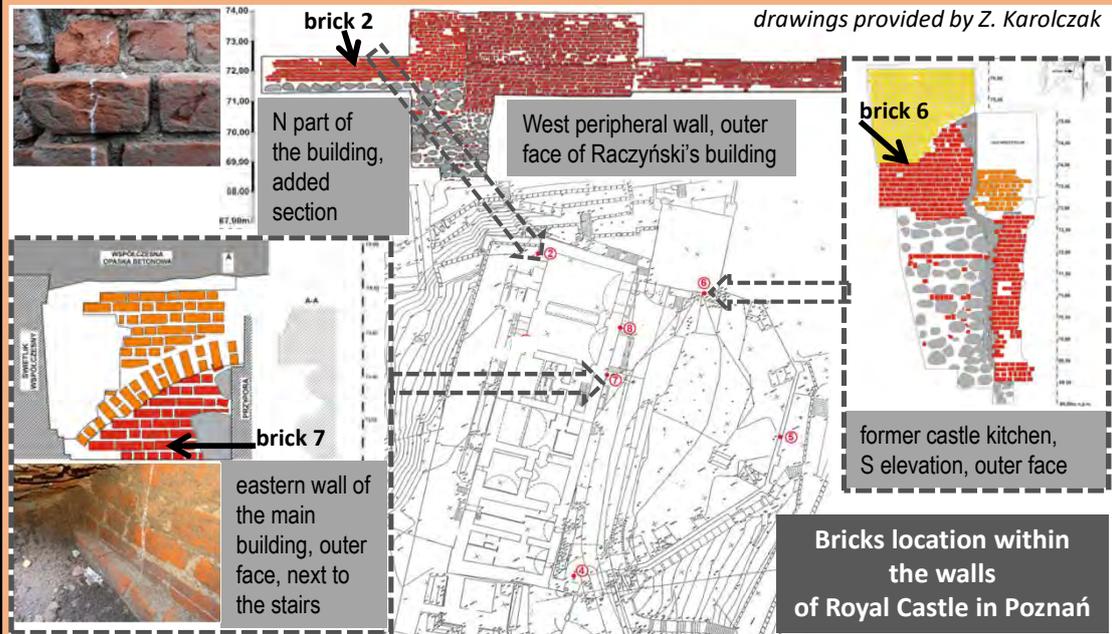
The OSL dating results compared with the time range of castle existence from historical sources (Karolczak, 2008) show considerable convergence. Adding to this the diversity of bricks composition on the basis of petrographic research and their preservation state, it can be concluded that the older phase in the Vendian binding within the walls is confirmed by the obtained luminescence dates (13/14 cent.).

## REFERENCES

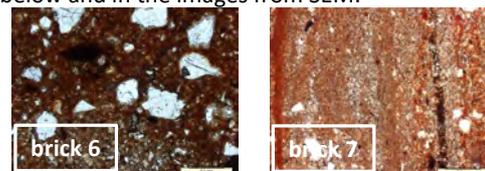
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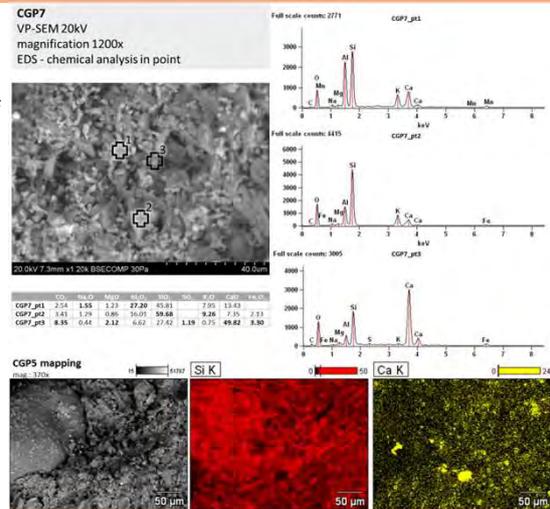
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The examined building ceramics contain quartz grains and individual fragments of limestone. It was probably made of clay rich in iron oxides, containing a large amount of quartz sand. The proportions of the coarse impurities vary within the samples. Macroscopically examined samples also show differences in color and composition. These features can be observed both in the petrographic photos below and in the images from SEM.



Petrography of selected bricks samples – mag. 10x (Olympus ax-70 Provis)



Distributions of obtained ages are shown below where the relative probability density functions (Berger, 2010) for all samples are presented. The ages show good stratigraphic consistency, with no inversions.

Sample name	Dose rate (Gy/ka)	OSL Age (a)	Archaeological estimation cent. AD
CGP_2	3.58±0.16	362±22	14-15 (?)
CGP_4	2.95±0.12	607±29	13-14
CGP_5	3.78±0.16	381±19	14 (?)
CGP_6	3.66±0.15	482±25	14 (?)
CGP_7	2.75±0.12	603±50	14
CGP_8	3.36±0.14	570±34	14

The ages were calculated using the Central Age Model (CAM) (Galbraith et al., 1999). The age results are referred to 1950 year.

Keywords: brick OSL, SEM-EDS of bricks, chronology of Royal Castle in Poznań, bricks dating