

# Pińczów limestone in the architecture of Cracow, Poland

Dominika Makowska

AGH University of Science and Technology, Faculty of Geology, Geophysics and Environment Protection;  
al. Mickiewicza 30, 30-050 Krakow, Poland; e-mail: domi\_m@interia.pl

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The Pińczów limestone is as well-known building material commonly used in Poland as building stones, facing slabs, etc., but the most for carved details and sculptures.

These limestones occur within the area of the Nida Trough, with Pińczów, a small town distant about 70 km to NE of Cracow, being the most known place of their exploitation.

The occurrence of the Pińczów limestone is associated with the NE margin of a postorogenic sea, extending within the foreground trough north of the Carpathians from the vicinity of Miechów to NE towards Pińczów and Sandomierz, then to E towards Biłgoraj and further towards Lvov and the Podole area (Peryt & Peryt 1994). This rock is from the Lower Badenian stage and diversified lithologically sediments of this trough, whose thickness reaches 50 m. The Pińczów limestone is a phytogenic calcarenite or calcilutite with the calcite contact cement. It formed from accumulated detritus of the algae *Lithothamnium* sp., contains a subordinate admixture of quartz grains and clay, as well as the fragments of bryozoans, molluscs, brachiopods, corals, barnacles, crabs, crayfishes, echinoids, crinoids, and others.

The Pińczów limestone belongs to the rocks self-hardening after excavation from the source quarry. The porosity of this limestone is usually high, ranging from above 35% in coarse-grained rock to ca 25% in fine-grained rock and a bulk density of 1.5–2 g/cm<sup>3</sup> (Bromowicz 2001). Compression strength of this stone is 70–150 MPa, abrasion resistance on Boehme's disk – 2–2.5 cm and water

absorption is about 12–18%. The fresh Pińczów limestone is soft and can be easily worked even with the help of carpenter's tools. Under influence of natural atmospheric factors, the limestone is covered by a natural protective layer – a patina. During dressing the stone does not take polish and always displays a dull lustre.

This *Lithothamnium* limestone is not only associated within Świętokrzyskie district and Roztocze, but similar rock could be finding in Austria. The most widespread unit along the Leithagebirge and the Ruster Höhenzug, as well along the western margins of the Vienna Basin, is the Leitha limestone, also well-known as *Nullipora* or *Lithothamnium* limestone. The southern tip of the Leithagebirge is the best-developed of this rock, where the limestone reaches the greatest spatial extent and the thickest sequences about 50 m.

The Pińczów limestone has been used in Poland since the 10<sup>th</sup> century and in the Cracow architecture since the 12<sup>th</sup> century, with the peak of its popularity in the Renaissance, forming the cultural heritage of Krakow, spread all over the city. One of first places, where the Pińczów limestone was used in masonry, is the large, Gothic window situated between two towers of St. Mary's Church. Also it was used by Wit Stwosz to curve a huge crucifix in this church and the figures of the Gethsemani chapel of St. Barbara's Church. The Pińczów limestone was used in the finest stone masonry, 14<sup>th</sup>-century portal with floral ornamentation and dragons hiding among the plants, in the church of Dominican Fathers. As well this

limestone was used to the rosette and outer wall facings of the Renaissance Myszkowskis' chapel executed (1613) by the church of Dominican Fathers. We can find the Pińczów stone in the 16<sup>th</sup>-century Renaissance canopies over the sarcophagi of kings Ladislaus Jagiełło and Casimir the Great in the Wawel cathedral. An excellent Renaissance sculptor and architect Jan Maria Padovano curved in these stone ornamental masks of the Cloth Hall attic. Regarded the most beautiful in Poland is the attic of the Boner family mansion in the Main Market Square, curved by Santi Gucci. Another characteristic element of the Cracow landscape can be seen outside the church of saints Peter and Paul in Grodzka Street. These are figures of twelve apostles standing at the front of this church, curved by David Heel (1715) in the Pińczów limestone. The current statues are replicas of the original ones, dating back to the beginning of the 18<sup>th</sup> century, damaged in the second half of the 20<sup>th</sup> century by environmental changes.

The Pińczów limestone represents an architectural stone still used in Krakow, mostly limited to revaluation works and small replacements during reconstructions. Still it is the stone-of-choice for

sculptors: in the lay and graveyard sculpture, as well as in a small municipal and garden architecture.

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