

The use of limestone in the medieval masonries of Assisi region, Italy

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In all Europe the relationship between landscape and architecture is strongly influenced by the geology of the territory and consequently by the raw materials that are available. This relation is mainly important in Umbria (Italy) where it is always possible to link the colour and the appearance of cities and characteristic buildings to the geology of the area. Present study investigates the use of local limestone in Assisi in medieval buildings. It assesses the material properties and construction techniques in order to improve the conservation of the original materials. In Assisi a typical and striking feature of heritage buildings is the use of bi-chromatic stone; pinkish and white stone elements. This bi-chromatic use of stones is observed in medieval architecture in other parts of Europe from the late 8th century, but in Umbria it only appears in the 10th century. With the improvement it reached its highest technical accuracy in the late 1300s and 1400s. It occurs in other cities of this region, but the present study focuses especially on Assisi. Entire walls were constructed from white to pink limestone ashlar of Scaglia Rossa (mid-Cretaceous to Upper Eocene). This very fine grained micritic limestone were set up in alternate order to make lines, bundles or more complex structural decorations from pink and white stone elements. A systematic classification of the Assisi Middle Ages masonries, allows the reinterpretation of building materials, taking into account the decay of the limestone. It is mostly visible in the form of colour change since the pink limestone can discolour, turning to white or to ochre. This process is an irreversible one making difficult to interpret the original colour pattern used in wall cladding. Our analyses point out the complexity and interrelationship between stone properties and architectural use of medieval masonry structures.