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Conservation Strategies for Earthen Constructions

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Earthen constructions, built in many European, American, Asian and African countries, represent an interesting and important architectural heritage, whose conservation is necessary in order to make possible the transmission of a technological culture which keeps values of uniqueness of the landscape as well as of the history. A study of the conditions of preservation of many unplastered earthen buildings revealed the need to set-up and test out treatments for the protection of the walls of such buildings, still in good conditions, in order to improve their resistance against the aggressive action of environmental agents. The preservation of this heritage calls for the definition of effective techniques able to mitigate and, if possible, to prevent processes of alteration and ruin in order to guarantee their long-term conservation.

The application of plasters on earthen constructions, even if makes it difficult to appreciate their real material consistence, however can guarantee an adequate safeguard. Used since the ancient times (Jean Baptiste Rondelet in the Traité théorique et pratique de l'art de bâtir points out how walls made of earthen bricks were usually coated with plasters made with clay, straw or with lime or gypsum), it certainly is the protection method more diffused worldwide. The materials generally used to make plasters are earth and/or sand with lime and clay in order to make the characteristics of the plaster more similar to those of the wall. Many additives have been mixed to these materials to increase resistance or alter specific properties, mainly natural organic compounds. With the advent of cement-based coatings in the XX century, lime and gypsum were left aside. But the recent understanding that those new products are not the best choice because of the poor compatibility with earth buildings, produced an important return in recent years to traditional materials, especially lime.

A testing campaign was conducted on different plasters, purposely tailored for the safeguard of earthen masonries, These plasters prepared mixing earth and gypsum or earth, gypsum and additives, real sacrifice surfaces which, trying to guarantee the readability of the actual aspect of the walls, intend to offer an effective means of protection against the atmospheric agents characterising the locations in which the constructions to be protected are built. The testing campaign, including capillary absorption test, erosion tests, XRD measurements, microscopic observations and FTIR spectroscopy, made it possible to assess the compositional features, effectiveness and performances of the different plasters.

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