Geophysical Research Abstracts
Vol. 13, EGU2011-9296, 2011
EGU General Assembly 2011

Building material supply strategy in "Chalky Champagne" area (France): combined use of local raw materials and importations from surrounding regions.

Gilles Fronteau, Aurélie Turmel, Céline Thomachot-Schneider , and Jean-Paul Deroin
EA 3795 GEGENAA, University of Reims (URCA), 2 esplanade Roland Garros, F-51000 Reims France (gilles.fronteau@univ-reims.fr)

The western part of Champagne, round Reims, Epernay, Châlons, etc. is known as chalky Champagne. This natural area is characterized by a quite homogeneous geological substratum made of Upper Cretaceous chalks. This area, 60 km wide and 120 km long, forms a striking geomorphological and agricultural unit. Throughout ages from the Gallo-Roman times to present, Chalky Champagne shows for traditional buildings the use of local raw materials and at the opposite side, the use of imported geomaterials, especially for prestigious buildings such as elite houses, basilicas and cathedrals.

The various traditional raw materials of this area indicate a good understanding of the potentiality offer by the chalk substratum and its two kinds of superficial covers: Thanetian residual sandstones and chalk cryoclasts made during the last glacial period. Basements of buildings are usually made of raw sandstone blocks, whereas wall elevations of the ground floor are in small blocks of chalk. Wall elevations of the other floors, lateral walls, and outbuildings are in adobe, made of chalk cryoclasts and clays collected in the surroundings.

The prestigious buildings are built with limestones, imported from the margin of the Chalky Champagne area. For example, in Rheims, the main monuments, such as the Notre-Dame Cathedral, the former Saint-Rémi Abbey,and the Palace of Tau (World Heritage List n°601) are in Lutetian limestones, quarried from 20 to 30 km west of limit of the chalky substratum. In Troyes and Châlons-en-Champagne, the main monuments are in Upper Jurassic limestones from the south (Tonnerre stone) or the south-east (Savonnières stone), quarried around 90km from these towns.

For more ancient times, as Gallo-Roman periods, examples from archaeological site studies allow to consider that the same mixed use of local and imported materials already exist. On the contrary, since the modern times and mainly during the 18 and 19th centuries, the use of Noyant, St-Maximin, Savonnières and Euville stones spread all over the studied area and beyond, and marks the decrease and then the disappearance of the use of local materials.
In present days, pushed by the sustainability approach and the renewal of traditional construction materials, the use of raw materials is promoted again.

Based on an inventory and an inquiry in various places of the studied area, associated with some petrographical and petrophysical tests of local materials, we showed that in the Chalky Champagne area, the loss of memory concerning the appropriate use of these materials was important and that the bad behaviour to weathering of the chalky adobes and their incompatibility with the use of concrete renders were two important hurdles for the change of practice. The return to the combined use of both local raw materials and other materials for building the more exposed parts of the construction seemed to be a good trade-off, even more it is the expression of old practices.