POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE
Degree in Architecture
Honors theses

Passive climatic control in low-cost housing : natural cooling system. Hot dry climates : where does Egypt stand between tradition and Haasan Fathy innovation

by Michela Perin-Bert
Tutor: Massimo Foti
Cotutor: Mario Grosso

This work is centred on cooling systems for hot regions, especially from a low-cost point of view.
The first part is a general overview on cooling methods, connected to the natural environment and the microclimate: the control of the sun, of the wind and the building characteristics are analysed.
Then, the research focuses on low-cost connected to bioclimatic matters.
I deeply analysed the traditional cooling systems, elaborated from the pharaonic period, till today, in the hot-dry regions.
The most interesting example of the connection between past and present, is the Egyptian architect Hassan Fathy. Large part of my research is focused on his work, his bioclimatic approach and all the cooling systems, he designed.
As main example of his theoretical approach, I studied New Gourna Village. About this, I made many considerations and some metrical and climatic relives, going to the place.
The last part of the work is centred on a deep analysis and critic of traditional and Fathy's cooling systems. Aim of this is to understand which technological systems can be maintained, which can be improved and how, for a future employment.

Fig.1 Malquaf, or wind-tower, seen from Cairo Citadel. The malqaf, facing north, receives the cool winds and avoids the direct solar radiation to enter inside the courtyards or the rooms, covered by that system.

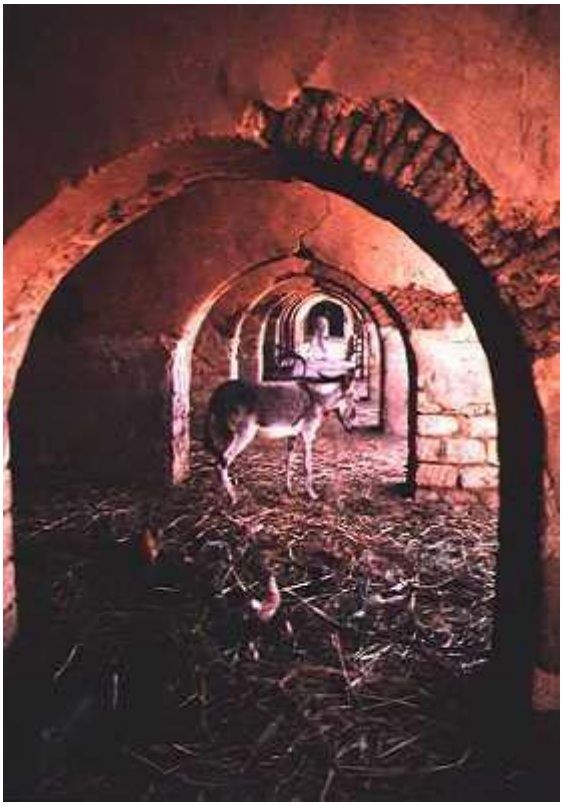

Fig. 2 New Gourna village, Luxor, Egypt. Covered area of the market, built with nubian vaults in earth bricks. Today the market is abandoned and is utilised just as dust place and stable.

Fig. 3 Resthouse, building for climatic relieves, in New Gourna village. The building is built around a courtyard, furnished with vegetation and water jars, put inside the mazeer. All these systems co-operate to improve the internal microclimate.