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The Arab Vernacular Architecture and its Adaptation to Mediterranean Climatic Zones

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Throughout history people have employed building strategies adapted to local climatic conditions in an attempt to achieve thermal comfort in their homes. In the Mediterranean climate, a mixed strategy developed – utilizing positive parameters (e.g. natural lighting), while at the same time addressing negative variables (e.g. high temperatures during summer).

This study analyzes the adaptation of construction strategies of traditional Arab houses to Mediterranean climatic conditions. It is based on the assumption that the climate of the eastern Mediterranean led to development of unique architectural patterns. The way in which the inhabitants chose to build their homes was modest but creative in the context of climate awareness, with simple ideas. These were often instinctive responses to climate challenges.

Nine traditional Arab houses, built from the mid-19th century to the beginning of the 20th century, were analyzed in three different regions in Israel: the “Meshulash" – an area in the center of the country, and the Lower and Upper Galilees (in the north). In each region three houses were examined. It is important to note that only a few houses from these periods still remain, particularly in light of new construction in many of the villages’ core areas.

Qualitative research methodologies included documentation of all the elements of these traditional houses which were assumed to be a result of climatic factors, such as - house position (direction), thickness of walls, thermal mass, ceiling height, location of windows, natural ventilation, exterior wall colors and shading strategies.

Additionally, air temperatures and relative humidity were measured at selected dates throughout all seasons both inside and immediately outside the houses during morning, noon, evening and night-time hours.

The documentation of the architectural elements and strategies demonstrate that climatic considerations were an integral part of the planning and construction process of these homes. Measurements showed that during winter, the temperature inside the houses was significantly higher than outside at all hours. In summer, the temperature in the houses was lower at noon. However, it was found that at night the houses were warmer than their surrounding areas. This led to several simple solutions such as window openings or places to sleep on the roof-tops.

Calculations of the heat stress indices based on temperature and relative humidity did not reveal heat stress conditions during the transitional seasons but only on rare occasions of moderate conditions in three houses during mid-summer.

In general, the climatic measurements detected that the climatic adaptation of the traditional houses allowed for better thermal comfort levels in comparison to the adjacent outdoor areas.

These findings may contribute to future building construction which maximizes thermal comfort with minimum damage to the environment. Better understanding of fundamental insights which have been passed between generations may be adapted to modern green building strategies in Mediterranean climate-type regions, mainly due to the simplicity and inexpensiveness of these concepts which may contribute to energy savings.