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The Historical Development of the Jordanian Rural House and its Effects on Traditional and Modern Buildings

1. INTRODUCTION

Modern changes in life style and new construction, particularly new roads, have resulted in the disappearance of a large part of the traditional built environment. For this reason, many historians, archaeologists and architects are trying to save what remains. Except for a few attempts at preservation, most of their work has been descriptive documentation of the existing buildings. Analysis and synthesis are required to find historical roots and relationships in the built environment.

The research presented here covers various stages of history, starting with the town of Umm al-Jimāl (third to eighth centuries AD) and continuing to the present. A comprehensive perspective is required to see how the rural Jordanian house was formed, where its roots are, how its parts are composed, and what effects it has on modern buildings.

2. EXAMPLES OF BUILDINGS FOR STUDY AND REASONS FOR THEIR SELECTION

All buildings chosen for this study have similar characteristics of an empirical nature, and layout patterns similar to that of the rural house. They are selected from different areas of Jordan in order to achieve broad coverage.

2.1. Umm al-Jimāl

This settlement is located in the southern Ḥawrān. Its buildings represent the oldest known historical development of a vernacular nature similar to that of the rural houses found in Jordanian villages.

2.1.1. The Nature of the Early Settlements

The first historical reference to the Nabataeans in this region was during the third century BC, later they established their settlements in the Ḥawrān, such as Bostra, Umm al-Jimāl, Umm Surāb, etc., with Petra as the capital of their kingdom.

The Nabataean built environment reflects a distinctive nature that shows creative ability in utilizing natural conditions and available sources. In Petra, they used the natural site for defense and the caves for storage and living. They covered the caves with false facades in a decorative manner suitable to the environment. In the Ḥawrān they devised construction techniques suitable to the locally available basalt stone (see FIGS. 1, 2, 3, 6).

The Nabataeans created complete water irrigation systems in all their settlements. They used the topography of the surrounding lands to control water flow through networks of dams, channels and reservoirs. This achievement influenced later patterns and forms of settlements.

2.1.2. The Use of the Arch

Butler's work at Umm al-Jimāl in the early 20th century described its building characteristics as native or at least of Oriental origin (Butler 1913: 153-155).

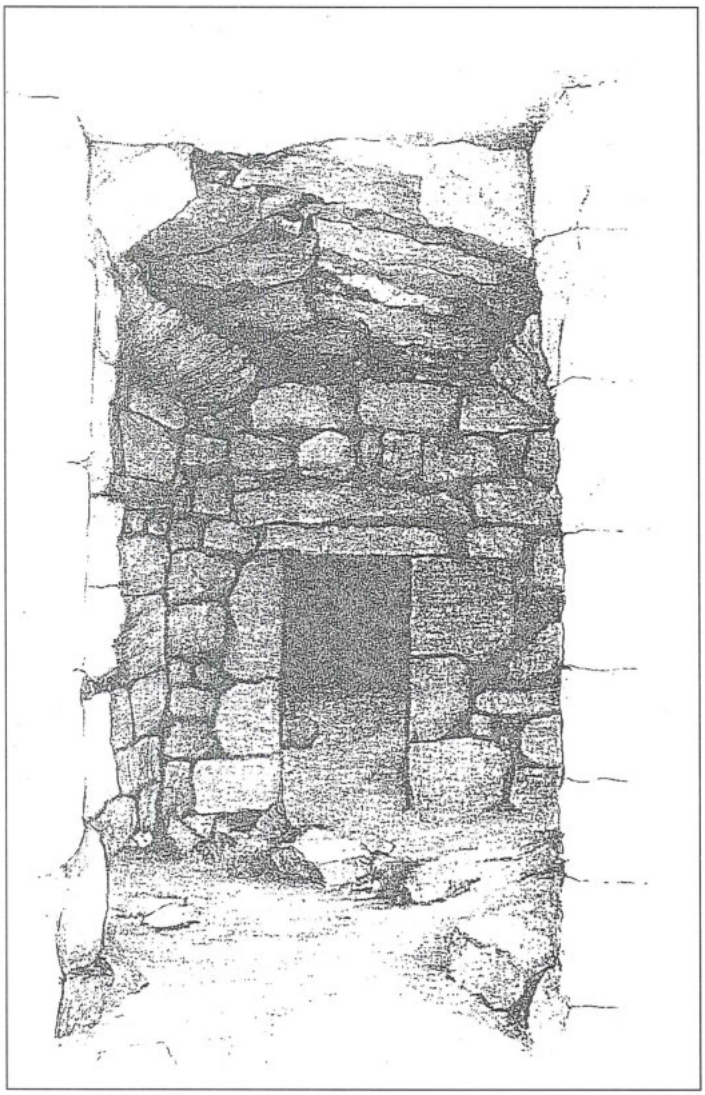
The dark gray-black basalt stone, thick walls, small windows, roofing method, and irregular clusters of buildings and courtyards are common features of the buildings.

The details of the roofing method is a major distinguishable feature for understanding the buildings and how they are formed. The earliest method was corbel courses projecting from walls and supporting horizontal slabs of stone for roof spans less than 3m (FIG. 1). Later the arch was introduced for wider spans and the typical roofing and flooring method then consisted of one or more arches supporting courses of corbels and slabs (see FIGS. 2, 4, 5).

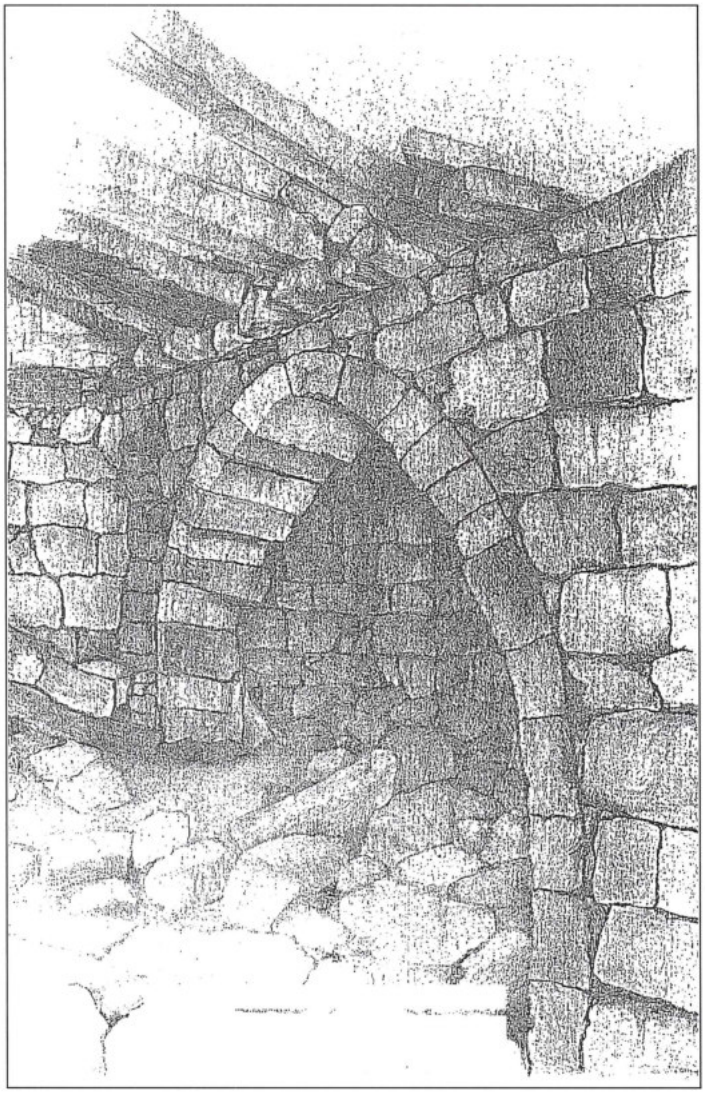
Many archaeologists regard the development of the Ḥawrān arch to be the most important single development in the formation of what has been called Ḥawrān Architecture. If the creative ability of the Nabataeans as masters of the art of construction is taken into consideration, then the development of the arch is one of their own native contributions. This theory of arch development is very much in line with the achievements of the Nabataeans in all fields of their built environment (FIG. 3).

2.1.3. Analyses of Private Houses

Bert De Vries (1982: 20) described the private houses of Umm al-Jimāl (FIG. 4):



1. Corbel courses for roofing, Umm al-Jimāl.

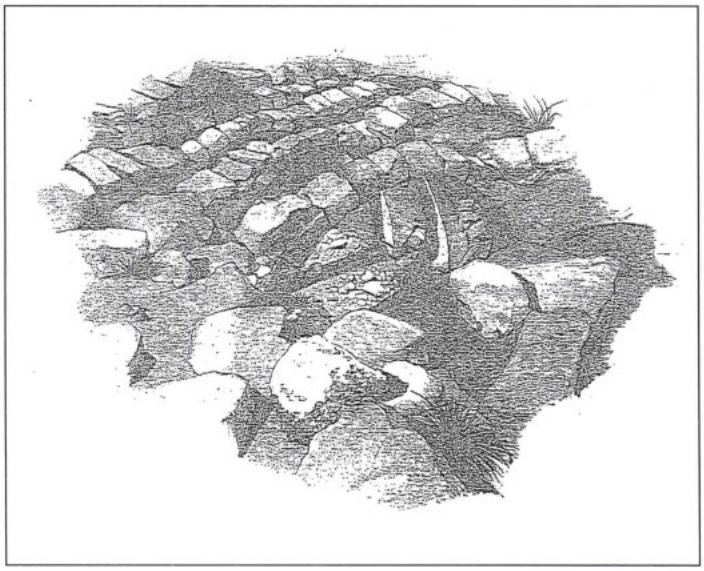


2. Arch supporting corbel courses, Umm al-Jimāl.

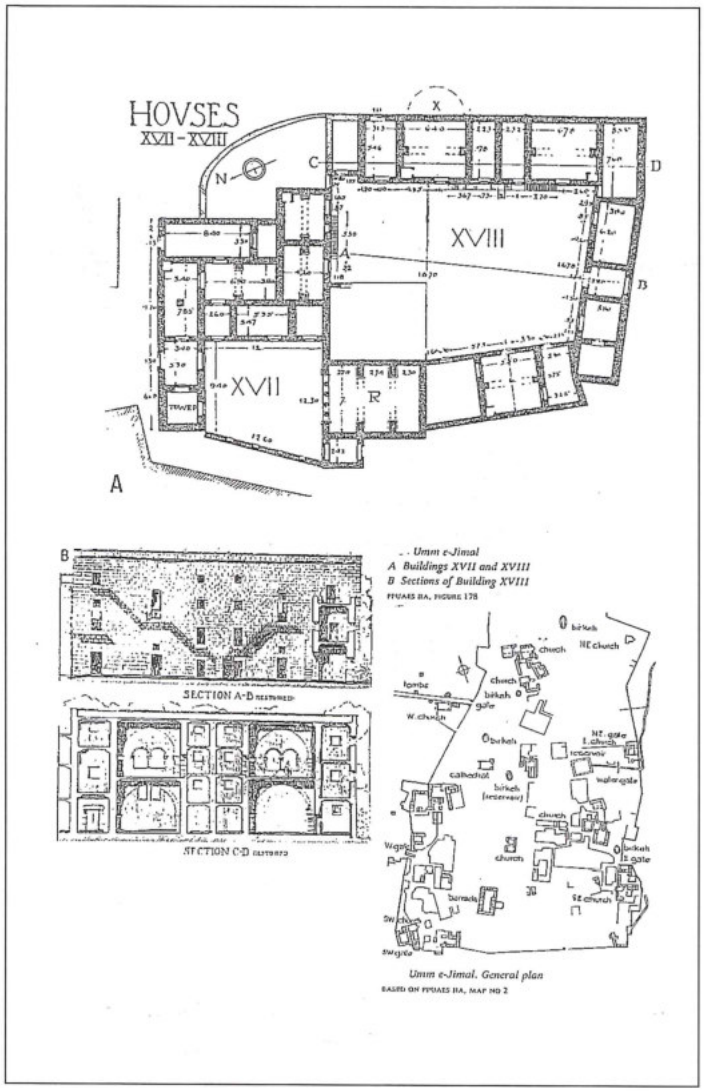
The houses are all of traditional Middle Eastern type: a single entry opens onto a central enclosure or courtyard surrounded by a multi-storied complex of rooms, accessible from the enclosure via doorways and stairways. While the whole complex is closed off from the outside human and natural environment, daily domestic and family activities focus on the sheltered and protected courtyard where family members and animals intermix with intimate familiarity. The houses range in complexity from a relatively small number of rooms arranged on one side of a barnyard to a large number of rooms on four sides of an enclosure (e.g. Houses XVIII and XIII).

The last two houses that De Vries describes as large houses were surveyed by Butler. Both represent good examples for study; they contain most of the major features of the houses of Umm al-Jimāl.

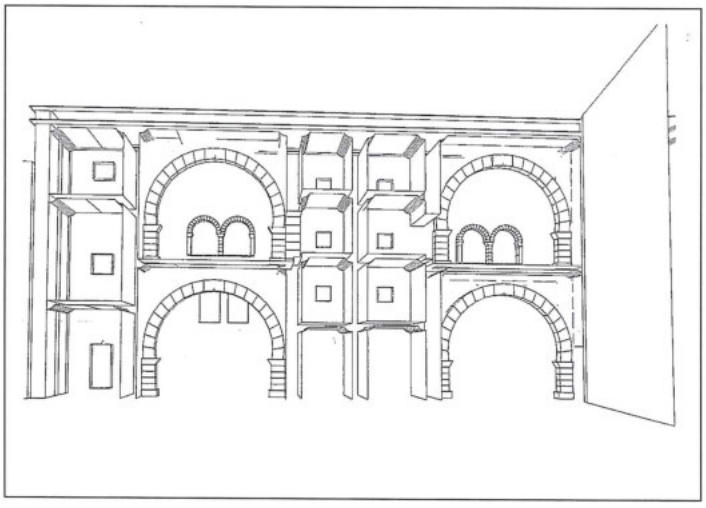
Computer graphic analysis (FIG. 5) shows the fol-



3. Arches for roof of water reservoir, Umm al-Jimāl.



4. Houses XVII-XVIII, plan, elevation, and section, Umm al-Jimāl (after Golany 1980: 24, based on Butler 1913).



5. Section through House XVIII, Umm al-Jimāl.

lowing features:

A. Walls are very thick with almost no window openings on the outside walls; the building complex is a defensible unit. Most openings, of limited area, are located on the inside walls enclosing the courtyard space. Wall construction and window treatment are the vernacular response to the conditions of an arid climate.

B. Entry is through space with lockable doors. Directly above this space, there is another storey with a small opening overlooking the outside space in front of the entrance. The axis of orientation of the entrance space is north-south.

C. Smaller rooms with short spans are roofed with corbel courses. The larger spans (5.5m - 6.78m) of the larger rooms are roofed with arches supporting corbel courses.

D. The two spaces (arched two-storey height) on top of one another have up to four storeys on both sides.
The section shows that the builders knew two facts very well. First, they knew how to handle different volumes and integrate them in one building composition, and second they knew how to handle structural stresses resulting from the large arches by the mass on both sides.

E. Basalt was the universal building material. The builders knew the structural properties of this material and used types appropriate to their location in a building, i.e., dense stone was used for the stairway cantilevered on the east wall (FIGS. 4 and 6).

F. The double arched space located on the south side of the courtyard of house no. XVIII is an example of the triple bay layout frequently found in Umm al-Jimāl. It served as an open space for various functions, such as a private dwelling in its simplest form.

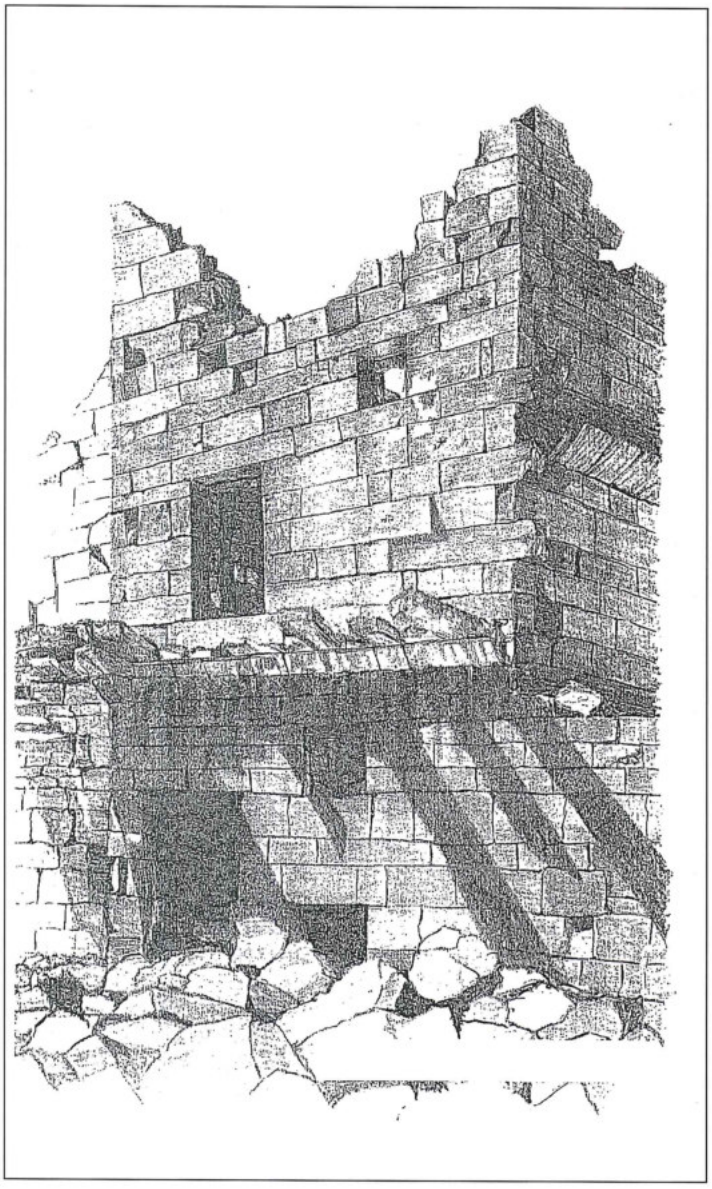
G. The shape of the courtyard is an irregular square, resulting from the skewing of walls on one or two sides. The informal shape of the courtyard contrasts with the rigid basalt blocks. Courtyards are formed by blocks and walls, or by the interlocking blocks of neighbouring houses.

2.2. Quṣayr ʻAmra

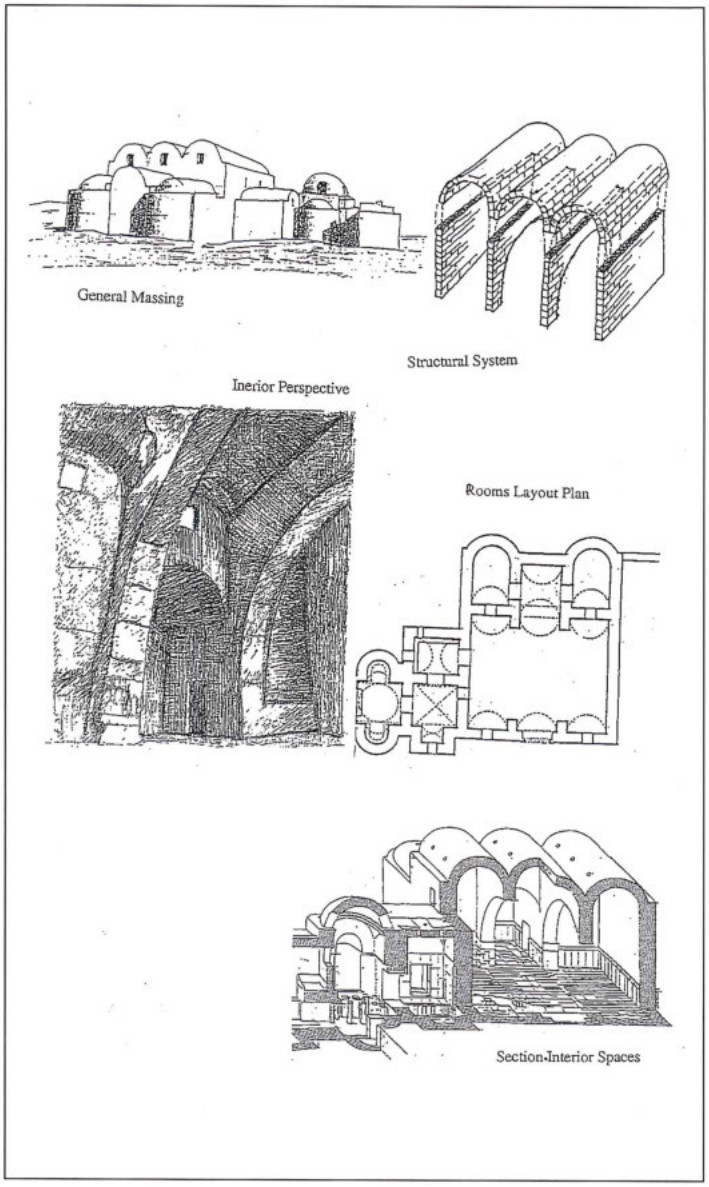
The building is a fine sample of the eighth century AD Umayyad period (Almagro *et al.*1975). The main part of the building contains the throne hall; its plan and structural method are similar to those found in Umm al-Jimāl (FIGS. 7 and 8). Two great arches supporting three barrel vaults span the roof. The barrels are a new development of the roofing system from that known in Umm al-Jimāl.

3. RURAL AND URBAN TYPES

All buildings of the late 19th and early 20th centuries used arches and barrel vaults for the floor or roof structures.



6. Basalt cantilevered stairway, Umm al-Jimāl.



7. Structural method of the throne hall, Quṣayr ʻAmra (based on Almagro *et al.* 1975).

3.1. Al-Ḥuṣn Near Irbid

The houses there are characterized by a simple cubic mass with a triple bay layout forming an open space with two arches (FIG. 8).

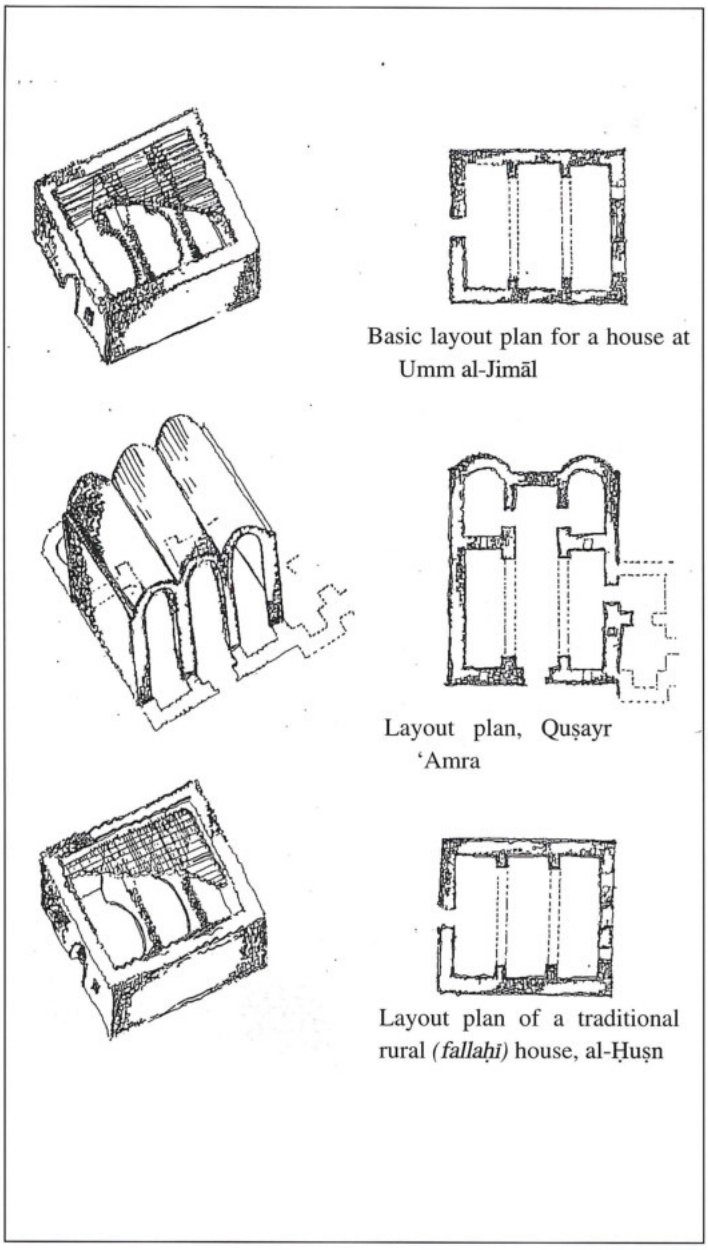
3.2. As-Salṭ Houses

Examples built before 1900 are of three kinds according to the nature of the middle bay space:

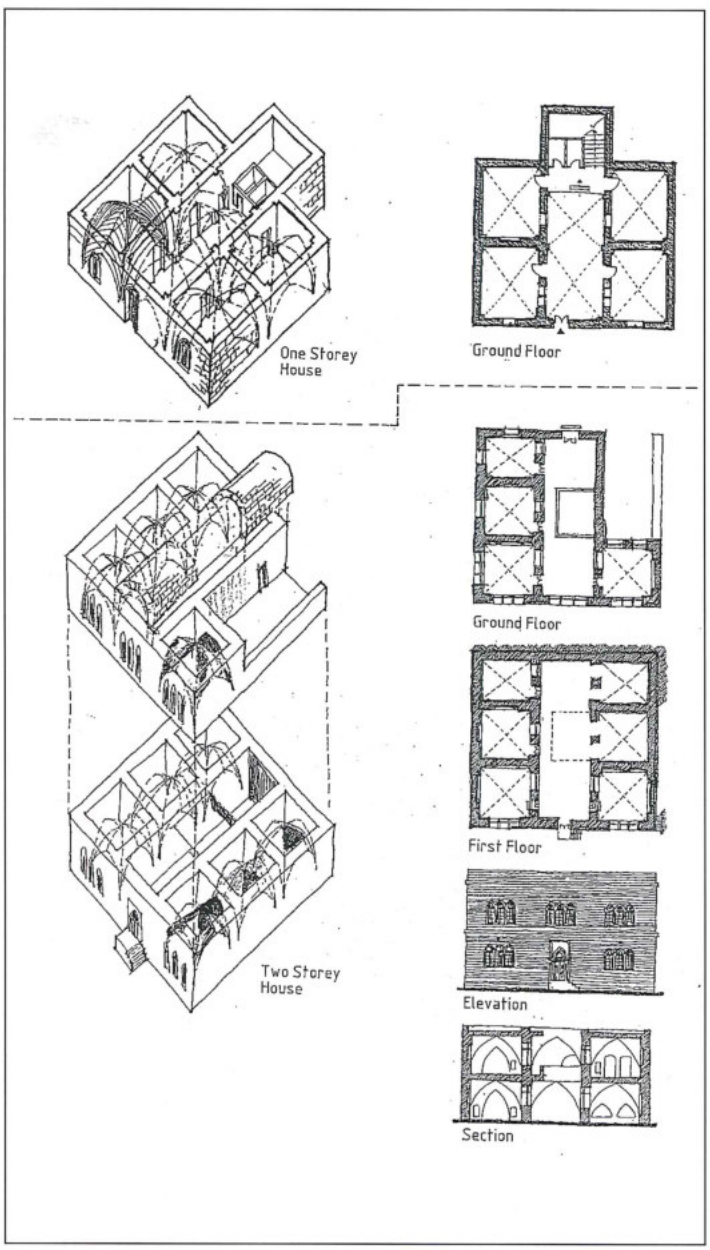
A. Open space formed by building blocks on both sides (FIG. 9).

B. Open space formed by building blocks on four sides. This type may have one or two stories. On the axis of the front entrance space/central open space/īwān space at the back of the house, the entrance and īwān spaces are covered with crossed pointed barrel vaults and both spaces are open to the central space of the court. The same layout of the ground level is repeated at the upper level except for the entry point from the back of the house through the space above the īwān at ground level. The stairway is located within the open courtyard, thus it becomes the transition space between the ground level at the front of the house and the upper level at the back of the house. This type of house can be considered a true courtyard house in terms of spatial and visual relationships, and circulation flows (FIG. 9).

C. Covered Middle Space, a type that inherited all the characteristics of the first two types of houses with the middle bay or central space covered to protect the house from the cool rainy winter of the as-Salṭ region.



8. Traditional house, al-Ḥuṣn, Irbid showing the relationship of plan and structural method between it, Quṣayr 'Amra, and a typical house from Umm al-Jimāl.



9. House at as-Salṭ — relationship of plan and structural method (after the Building Research Centre 1990).

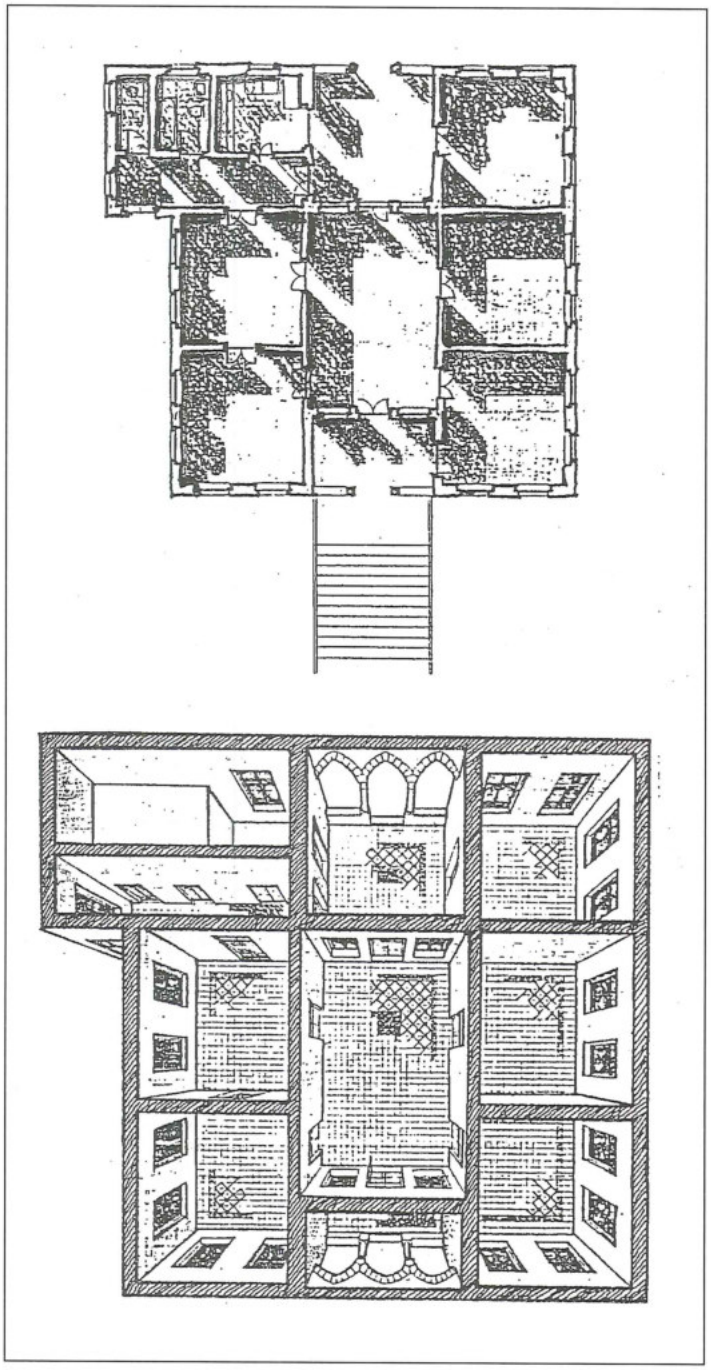
4. INFLUENCES ON MODERN ARCHITECTURE

4.1. Influences on Houses During the 1920s

Qusoos House - 'Ammān 1929 (FIG. 10). The triple bay layout of the house is similar to the basic spatial organization of earlier types found in as-Salṭ (FIG. 9). Entry to the house is through a covered verandah or terrace in front of the middle bay, which becomes a hall for living and circulation. The house is situated as an individual building in an independent plot of land. As a consequence spaces are oriented to the outside open space. As the middle bay replaced the open courtyard space, the relationship with the outside open space is maintained through the covered terraces on the front/back axis of the middle bay.

The simple and pure mass treatment of the house recalls the roots of architectural solutions in Umm al-Jimāl several centuries earlier. The fine proportions and details also recall some of the typical as-Salṭ treatments, such as the triple pointed arches on the front and back terraces.

Steel and concrete are used for construction instead of arches or barrel vaults.



10. Qusoos House, 'Ammān, 1929 — plan and organisation of space (after Rifa'i and Kana'an 1987: 84-89).

4.2. Influences on Contemporary Architecture

Traditional architecture has influenced the proposed design of the National Archaeological Museum - The Citadel, 'Ammān by Michael Brawne and Associates (1979) in the following features (FIGS. 11 and 12):

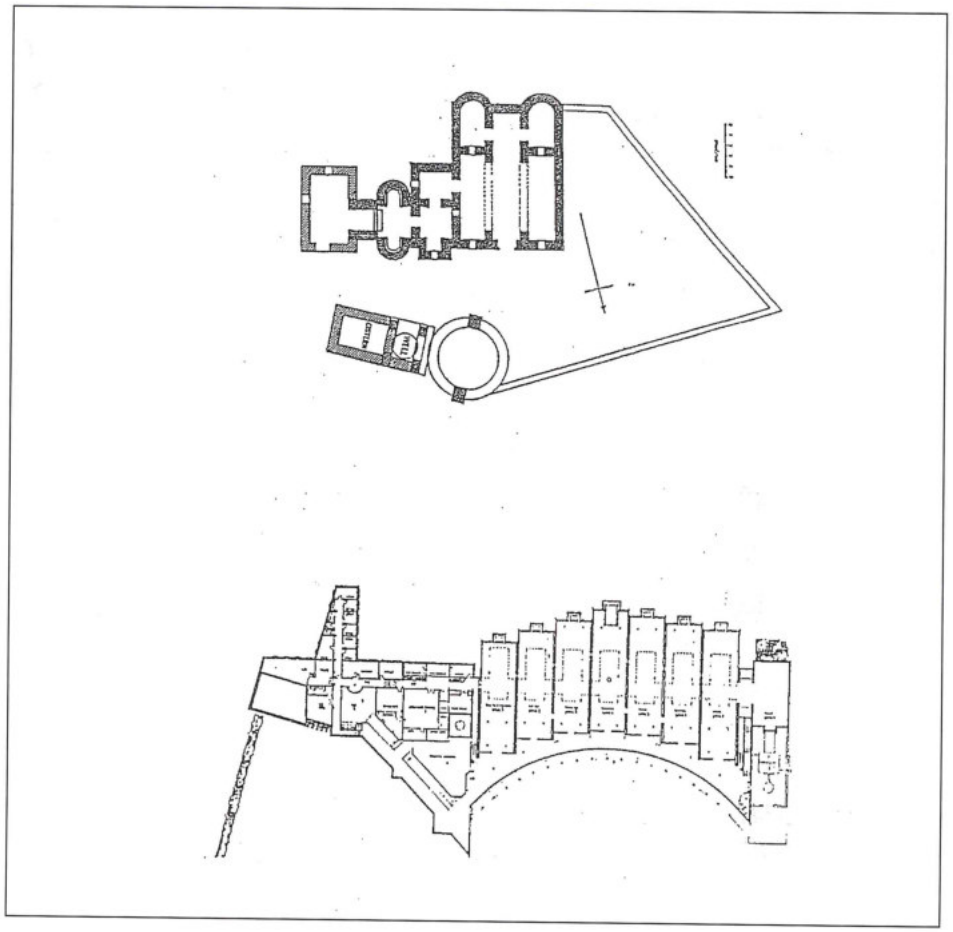
A. The use of the basic bay unit for articulation of space and structural standardization.
B. The gallery on the upper floor within each bay, which recalls the open space and covered iwans on the upper levels of the as-Salṭ houses.
C. The plan similar is to that of Quṣayr 'Amra in a number of details: the multi-bay plan, the proportions of the rooms, the projection and staggered masses, curved and skewed lines, etc.
D. The use of semi-barrel vaults in the roof adapted for directed natural light.
E. Composition and proportions of masses, details, and openings.

5. FINDINGS

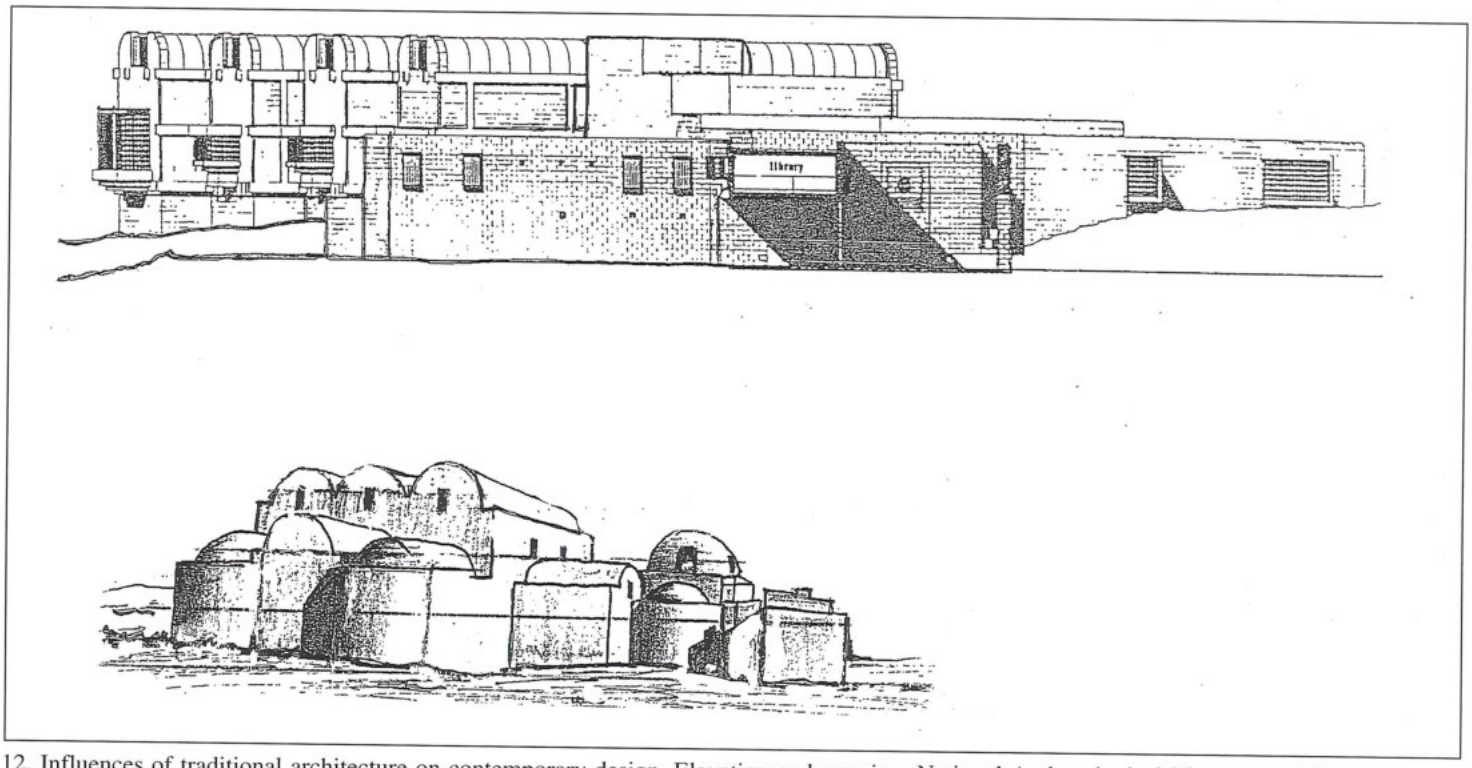
5.1. The rural house in its basic triple bay layout presents a feature and pattern that appear throughout the different stages of Jordanian village architecture from Umm al-Jimāl up to the present, covering a time span of nearly 20 centuries (FIG. 13).
5.2. Materials and construction methods, in particular the roofing system of arches or barrel vaults, have predetermined the sizes of the bays and layout plans, and consequently articulated the outcome of the overall spaces and massing of the house.
5.3. Plan type and structure are organically linked and integrated, by knowing one the other can be defined. They both provide vital information for understanding vernacular architecture.
5.4. Two types of house plans have emerged from this study. The first is the simple multi-functional open space, the second is the courtyard space. They are linked very strongly, the first became a cell in the development formation of the second through structural discipline and mass articulation.
5.5. Spaces with different roof structures have been used for the needs of everyday life, but the crossed barrel vaults (with an effect like a dome) have been used for buildings with important social status or prestige like gathering places (*maḍāfah*), religious places, etc. The barrel vaults have been used in *Maḍāfat* al-Tell and al-Hindawi, etc. The open space plan of the *maḍāfah* is very similar to the open space plan of traditional houses.
5.6. Modern houses built in the 1920s inherited many features of traditional Jordanian houses. The fully enclosed triple houses with different zones of privacy were suitable for the full range of day and night activities.

6. CONCLUSIONS

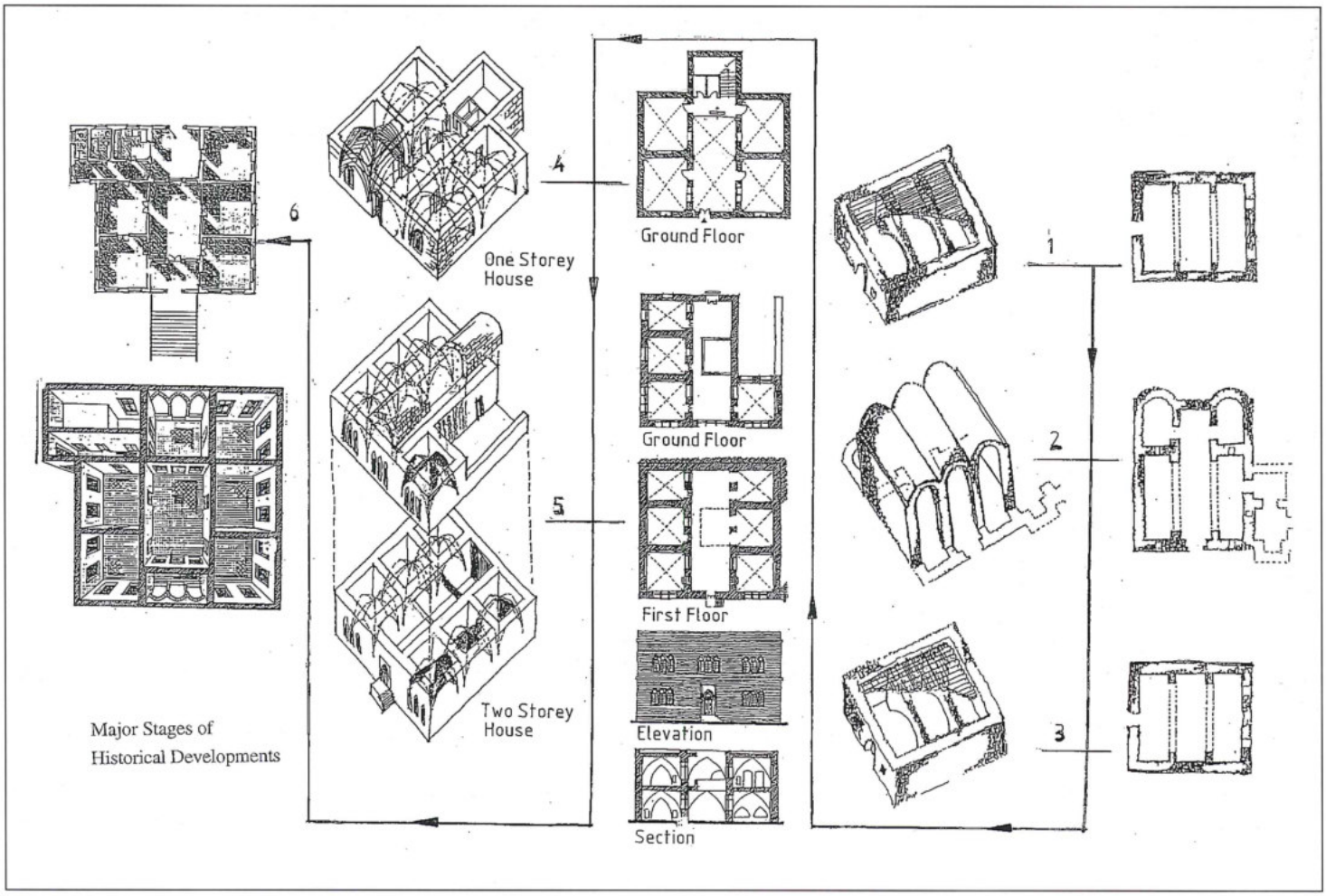
6.1. The integration between forms and structure, the discipline of space and mass through structural articulation, and the expression of human scale are very useful principles for contemporary design.
6.2. The architectural heritage should be treated with care, it is the cultural wealth of the nation. Rural houses are practical solutions to the problems of providing a living environment with very limited re-



11. Influences of traditional architecture on contemporary design. Plans of Quṣayr ʻAmra and the proposed design of the National Archaeological Museum, ʻAmmān (after Brawne and Associates 1979: Phases I+II).



12. Influences of traditional architecture on contemporary design. Elevation and massing, National Archaeological Museum and Quṣayr ʻAmra (after Brawne and Associates 1979: Phases I+II).



13. Summary of relationships in the historical development of houses in Jordan.

sources. They are the recorded lessons and experiences of the past from which one day we may need to learn.

6.3. The traditional environment, including houses, has been used as an inspiration for contemporary design to create and express an image of identity and region.

Acknowledgments

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