PARADIGMS AND STYLES: SAUDI NATIVE ARCHITECTURE

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الخلاصـــة :

المملكة العربية السعودية دولة كبيرة وتشتمل على مناطق جافة واسعة منها صحراء الربع الخالي في جنوب البلاد . ويعود تاريخ المملكة إلى سنة (٣٠٠٠) قبل الميلاد . وتختلف مناطقها من حيث الملامح الطبيعية والإنسانية وكذلك العادات والتقاليد .

إن العمارة التقليدية في المملكة سَواء الحضرية أو الريفية منها إنما هي انعكاس للميزات الثقافية والإجتماعية والإقتصادية والمناخية . وتُبنىٰ أنواع كثيرة من المباني حالياً بما في ذلك المساكن بالنمط المعماري الغربي . وتجدر الملاحظة أن هذه التصاميم لم تكن ناجحة وأنها لاتُـلائم العوامل المناخية والصفات الخاصة بالسكان .

وتوضح هذه الورقة التقاليد والأساليب في العمارة المحلية في عدد من مناطق المملكة . وتُـعرض هذه الأساليب من خلال تصميم المساكن لتوضيح مدى تحسينها للجو المحلي . وإن معرفة تصميم المساكن التقليدية يمكن أن يكون القاعدة المُـلـهِـمـة لعمارة مناسبة للمناطق الجافة .

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ABSTRACT

Saudi Arabia is a large country in size and contains extensive arid zones including the largest single desert of Rub-al-Khali or Empty Quarter in the South of the country. Its important history dates back to 3000 BC. Physical features, human aspects, culture, and traditions vary considerably among the several regions of the country.

All traditional architecture, urban or rural, in Arabia has the reflections of cultural, social, economic, and climatic features of the land. Most or all building types, including dwelling design, presently being built follow western models of architecture. It is recognized that their adaptation to prevailing climatic conditions and other Saudi characteristics is unsuccessful.

This paper highlights traditions and styles in native architecture in several regions of the country. These regional styles are illustrated in dwelling design to explain how they ameliorate the local climate. Knowledge of these traditional dwellings can be the basis of inspiration for more appropriate architecture in arid lands.

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INTRODUCTION

The terms, native, vernacular, traditional, and indigenous architecture all mean one and the same thing in the architectural heritage of a society or place.

The native architecture of a particular region is generally influenced by various factors, such as climate, culture, economy, and available materials. In meeting the conditions of some or all of these factors by physical means, the architecture of a vernacular building evolves. Certain physical features will serve several purposes, whereas others may satisfy one condition only. The building, however, is the physical solution to the various conditions which must be satisfied in order to meet the needs of the people who live in a certain culture, in a certain climate, and under special socio-economic conditions [1].

Although the cultural conditions were almost the same, and the economy similar, nevertheless differences in available materials, and climatic conditions within the regions of Saudi Arabia resulted in quite different house types and means of controlling the harsh environment (Figure 1). The stylistic nature of regional native architecture is captured in a compact and concise statement in Figure 2.

SAUDI ARABIA: REGIONAL CHARACTERISTICS

Saudi Arabia is bordered by Arabian Gulf on the East, Oman and Yemen on the South, the Red Sea on the West, and Jordan and Iraq on the North. On the political map, Saudi Arabia is divided into six regions: the Eastern, Central, Western, Southern, Northern regions, and the largest desert called the Rub-al-Khali (Figure 3). This last will be excluded from our discussion, since it has never supported any settled communities.

The purpose of defining the various regions is to accord with their local characteristics, and to show the relationship between the evolution of various building styles and the way these were influenced by the local conditions. Therefore, the Northern and Central regions on the political map are grouped into one; and this paper will present discussion in terms of the following four regions.

1. Eastern — Hassa and Gulf Coast
2. Central and Northern — Najd
3. Western — Hejaz
4. Southern — Asir

Eastern (Hassa and Gulf Coast)

The coastal strip of the Eastern Region is low, with relatively plenty of ground water. The shore is sandy, with salt flats occurring in depressions. A great belt of sand known as ad-Dhana and a rock plateau called the summan are the region's main topographical features.

The towns in this region are situated along the Gulf coast and between the desert and the Gulf. The climate exhibits high humidity along the coast and persistent uncomfortable heat in summer. Inland areas of Hassa Oasis are hot and dry.

Along the coastal areas, the main building material is coral aggregate taken from the shallow beds of the Gulf. The walls are usually plastered and painted or whitewashed. The houses in Hassa Oasis are built in mud.

The roofing system generally employs wooden beams, palm trunks and palm thatch, and mud insulation. The traditional architecture responds very well to climatic, cultural, and material conditions. Building height varies from one to three storeys as seen in Qatif, Dammam, and Hofuf; and the styles of the buildings are distinguished by fine proportions, in dimensions and decoration. The architecture of this region bears no significant relationship to buildings of other regions, but has a marked similarity to that found in its neighbors: Bahrain, Qatar, and the Emirates.

The wind towers of Bahrain and Dubai do not appear in this region; however, along the Saudi shore, certain rooms are arranged to benefit from the slightest breeze, while others are better suited to cooler winter conditions (Figure 4). In the Qallah of Qatif, houses with several storeys have small windows at the first level for privacy, whereas the upper storeys have large openings piercing the wall for ventilation purposes.

A typical house has the following characteristics (Figure 5):

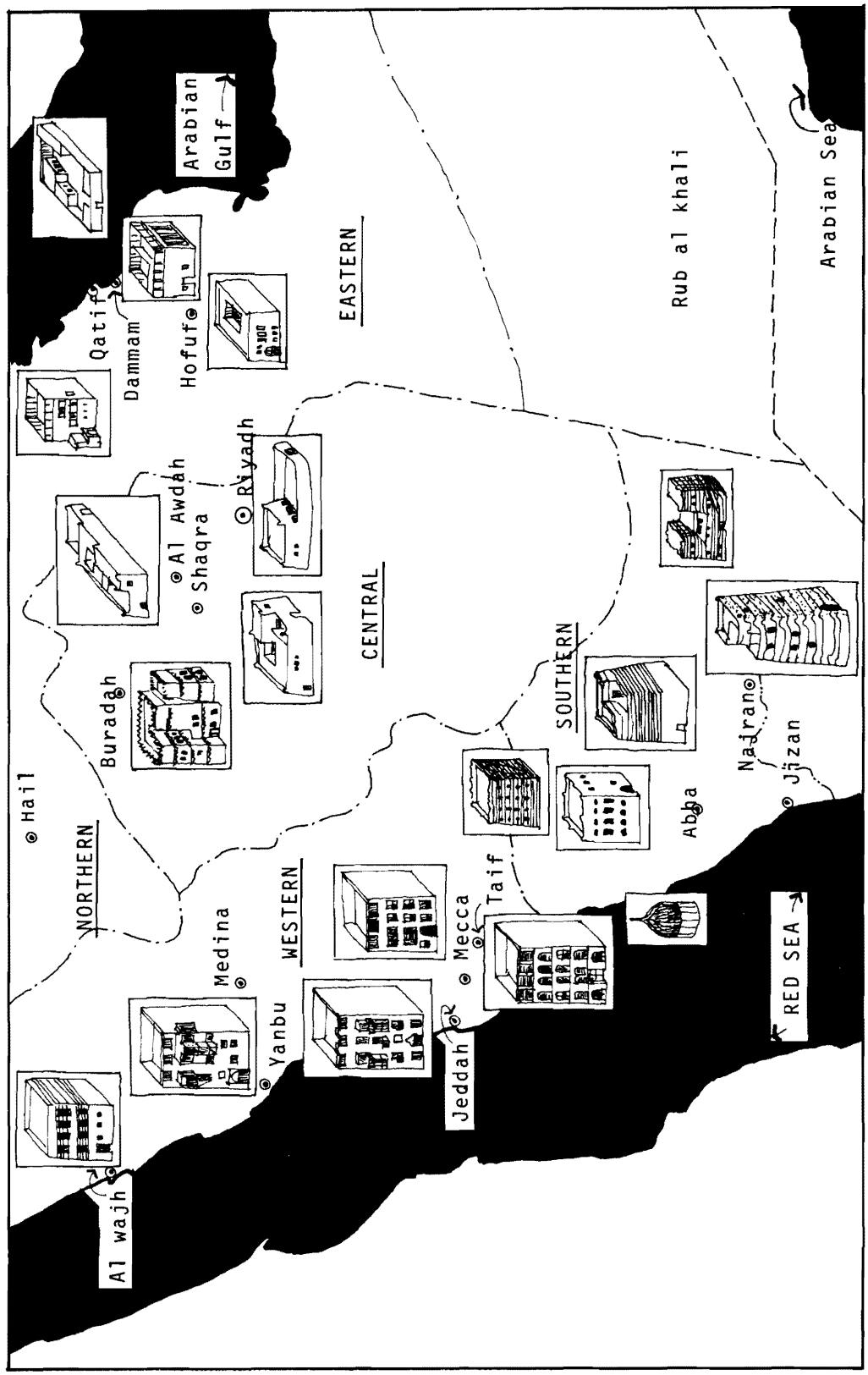


Figure 1. The Main Regional Types of Native Architecture (Source: Idea Center, Research Division, Paris).

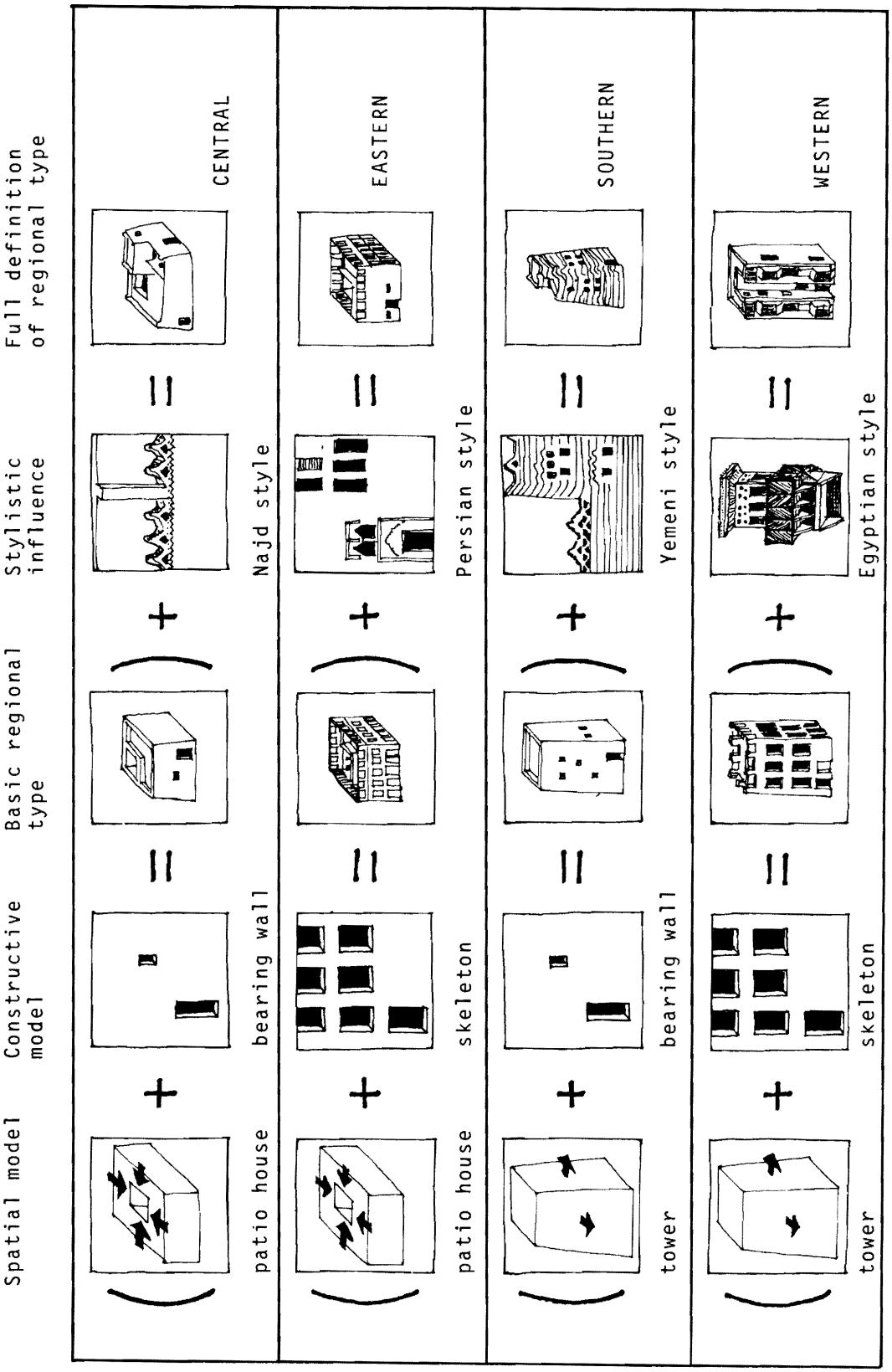


Figure 2. The Basic Equation for Native Architecture (Source: Idea Center, Research Division, Paris).

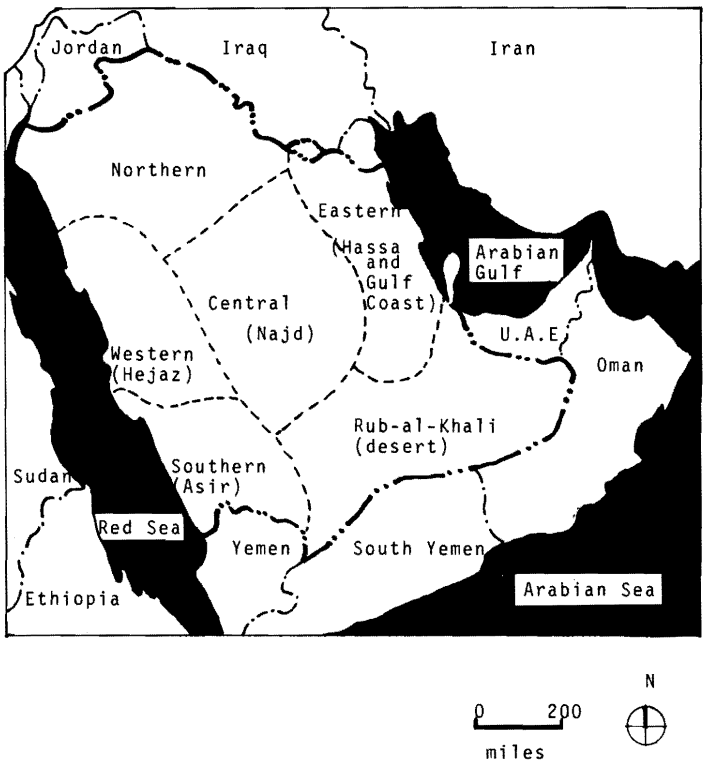


Figure 3. Regions of Saudi Arabia.

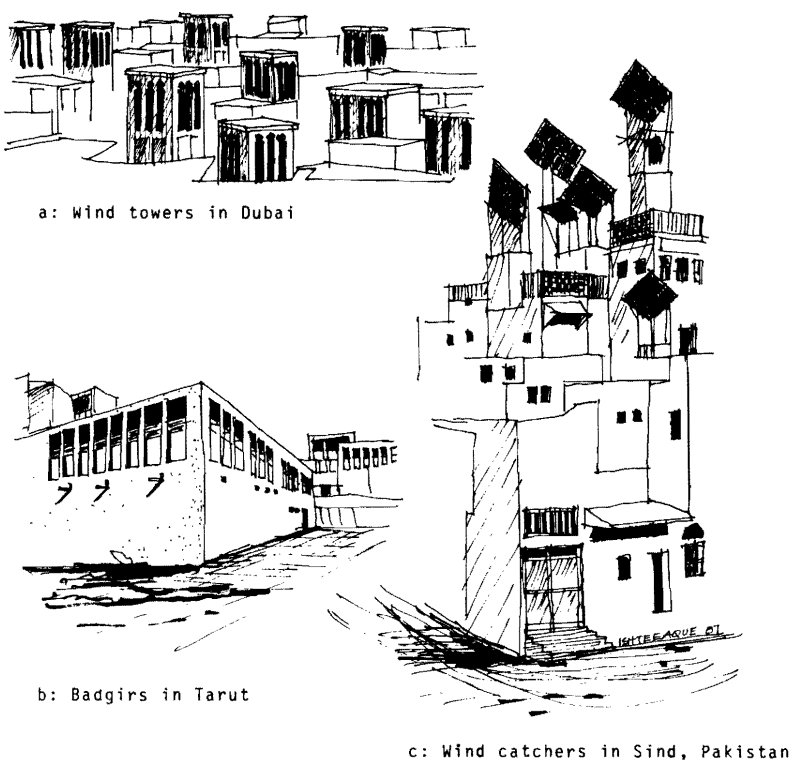


Figure 4. Wind Arresting Devices (General Examples).

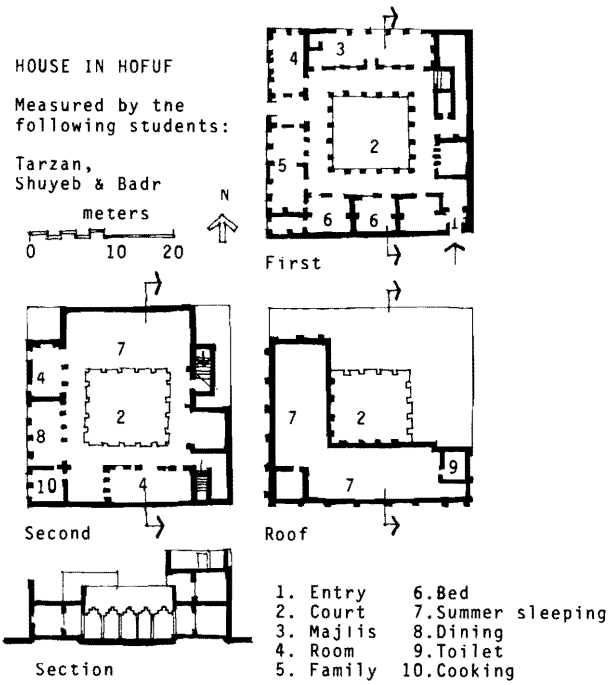


Figure 5. A Typical House in Eastern Region.

Figure 6. A Street in Qatif with Bridge Called Sabat.

Courtyard, with rooms arranged around it.
Thick walls for greater time lag (inland areas only).
Common party walls.
Rooms primarily opening onto courtyard.
Arcaded verandahs around courtyard.
Small exterior openings with grilles or shutters.
Badgirs (wind catching devices) for ventilation.
Roof terrace pavilion for sleeping.

Generally, houses are massed together in closely-knit settlements providing narrow winding streets, shaded alleys and plazas (baraha), and overpasses (sabat) (Figure 6).

Central and Northern (Najd)

The main building material is unfired mud-brick; and the walls are finished smooth by the application of mud plaster. The walls are very thick for greater (thermal) time lag, and provide insulation against the extremes of the prevailing climatic conditions. The roof is made of wooden beams, with palm matting above and covered with an insulative layer of mud. Stone has been used only as the foundation of a house or in fortifications. The Najdi houses are introverted: built around a courtyard, maintaining the privacy of family life. The courtyard or atrium, besides generating a unique private life style, acts also as a climate moderator. Thus the house possesses a unique spatial quality in providing a small outdoor space within the house.

The courtyard house may be looked upon as an earth sheltered living space. Thick walls act as above-ground earth shelter while the court provides the required daylight and airchange. Many houses, when grouped together sharing as many as three exterior walls and leaving only narrow streets in between, create an environmentally consistent solution as a whole.

The building heights vary from one to three storeys depending upon their importance and spatial needs. The entrances have large rectangular wooden doors and the windows are framed by wooden shutters. Both doors and shutters are decorated with

incised geometric patterns and colors. Other external decorations include rows of V-shaped mouldings on the mud walls, and skyline of buildings have crenellations of varied size and shape. A typical wall ornamentation from Darriyah is stacked triangular openings, which also function as ventilators (Figure 7).

The courtyard in a typical house acts as a lightwell and an airshaft. In the summer months, the diurnal temperature range varies from 10°C to 20°C. The courtyard takes full advantage of this diurnal range during summer, functioning in three cycles.

1. During the first cycle, the cool night air descends into the courtyard and fills the surrounding rooms. Walls, floors, roofs and the spaces are cooled and remain so until the late afternoon (Figures 8 and 9).
2. During the second cycle around noon the sun shines directly above the courtyard floor. The cool air begins to rise and also pass through the surrounding rooms. This action sets up convection currents in the rooms affording further comfort. During noon ambient temperature is very high; but thick mud walls with an average time lag of 10–12 hours act as excellent insulators. Thus the house remains protected from any heat gain during the day.
3. In the third cycle, the courtyard floor and inside of the house get warmer resulting in further convection by late afternoon and early evening time. Mostly the houses are protected by shadows in mud conglomerate configurations; and as the sun sets in the desert, the air temperature falls sharply. The courtyard begins to irradiate to the clear blue sky, and cooler air begins to descend into the courtyard and the repetition of a new cycle begins [2].

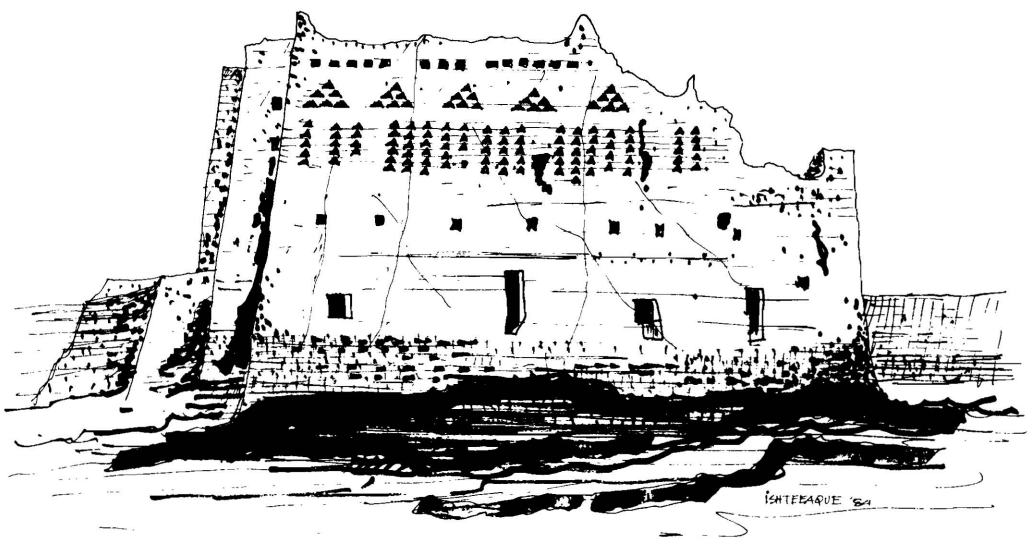
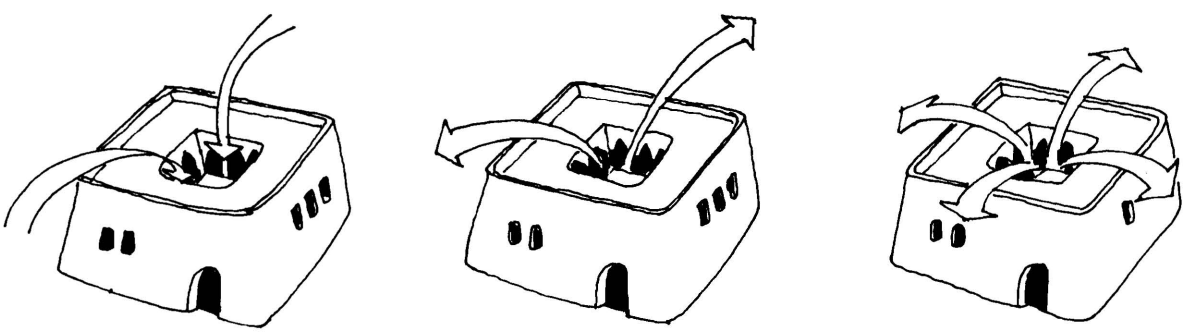


Figure 7. Small and Stacked Openings of Najdi Buildings (Darriyah).



a: Night b: Noon c: Late afternoon

Figure 8. Diagrams Showing the Three Climatic Cycles of a Courtyard House (Najd).

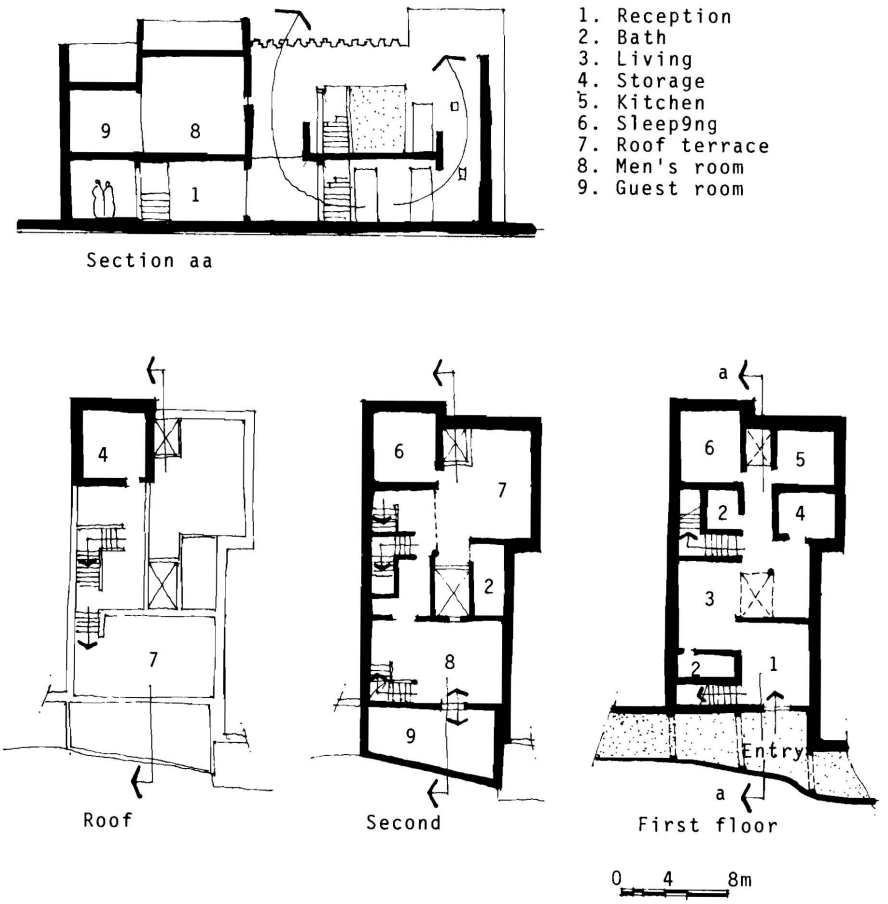


Figure 9. A Typical House in Najd.

Western (Hejaz)

The architecture of this region exhibits uniqueness and individuality as seen in major cities like Jeddah, Mecca, Taif, and Medinah. This quality is attributable to common influences brought about in the area by the pilgrims; and by trading connections to the African coast, and to South East Asia. The buildings common to all these cities are multi-storey (average of four floors), with flat roofs. The entrance is often vaulted by a round or semi-pointed arch; and wooden doors have stylized carvings. The exterior walls are frequently washed white (Figure 10).

Prominent exterior decoration is localized in the elaborate wooden screens (Mashrabiyyas) which cover the face of upper floors of the buildings at windows and balconies. Similar mashrabiyyas are found in Cairo, old Lahore, and Delhi, recalling the age-old connection of this area with other parts of the world (Figure 11).

The mashrabiyyas were developed in response to the hot humid climate along the Red Sea. Cross ventilation is a design necessity. The desire for privacy, however, required that large openings be screened so that one was able to view from within without being seen from the street. From these two needs, climate and privacy, emerged the design of mashrabiyyas and other types of louvered or screened windows called roshawns.

The traditional architecture responds to hot and humid climate of the region in the following techniques [3].

Construction of tall airy structures which allow cross ventilation.

Use of roshawns and mashrabiyyas (projected bay windows enclosed with decorative wood screens)—which provide cross ventilation as well as privacy for family life (Figure 12).

Frame structures with transparent infill facades of mashrabiyyas.

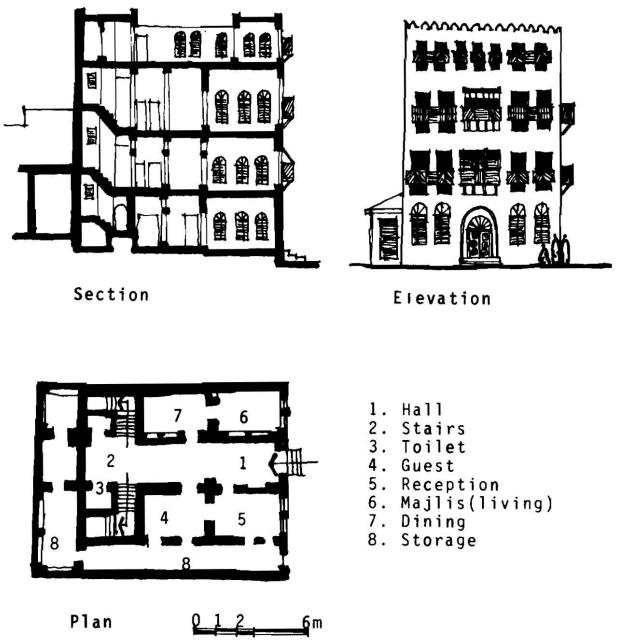


Figure 10. A Typical House in Hejaz.

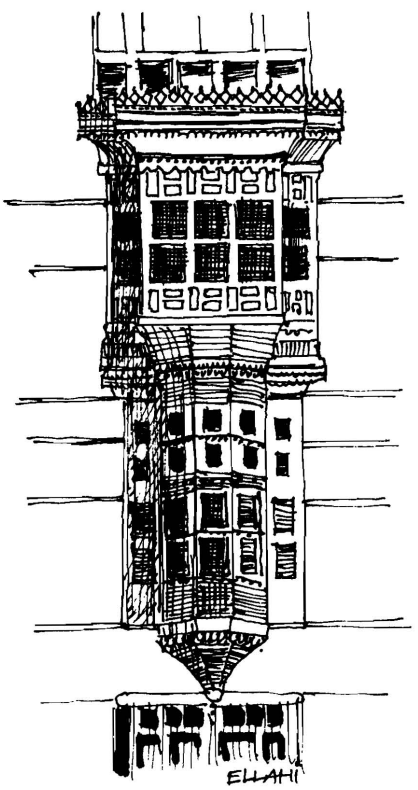


Figure 11. Mashrabiyya Detail.

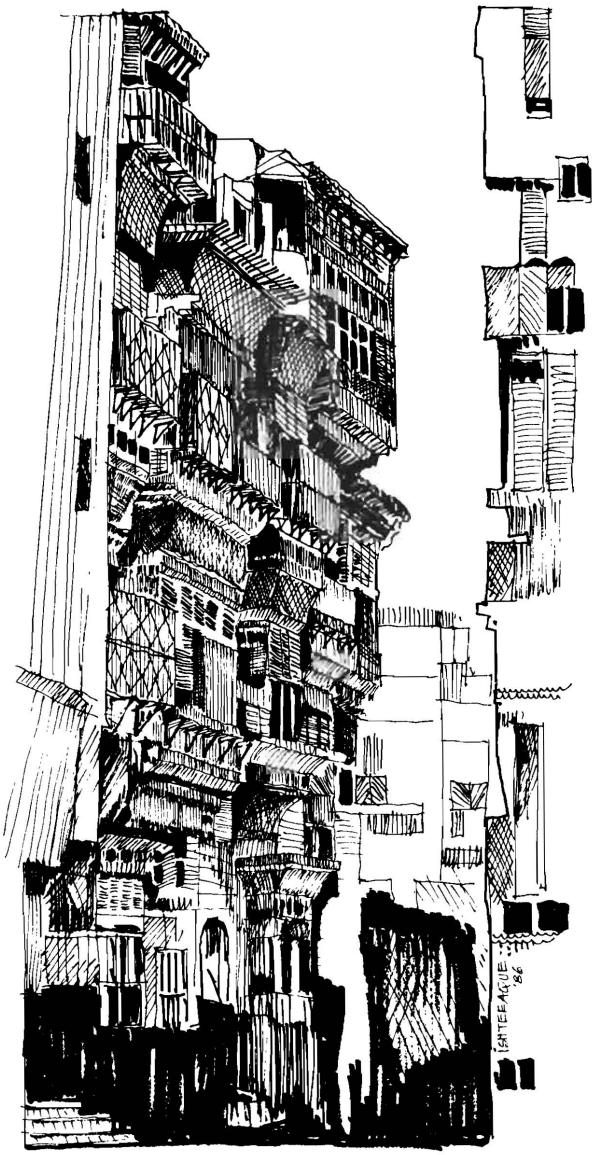


Figure 12. A Facade of Mashrabiyyas in Jeddah (Hejaz).

A skeletal structure of heavy columns built from coral stones and wood frames floors and roof which allows the building to be light and airy.
The use of gypsum as a bonding material in stone construction and as a sealant when used as plaster for water proofing.
An internal plan which gives each room cross ventilation through access to external facades and which places sleeping and family rooms on upper levels to take advantage of land and sea breezes.

The construction of buildings apart from each other, where possible, to allow for free movement of air around the building. Where it is not possible as in congested city blocks, building facades compete with each other to project screened windows. In general building materials used in Hejaz are superior in quality to those in Eastern and Najd areas.

The courtyard, a characteristic in hot-dry regions, is nonexistent here, except for some very large houses which require cross ventilation. The courtyard in such instances is not merely decorative and may contain fountains but also emphasises the interiority of the house.

Southern (Asir)

This region of South Arabia is quite unique in topography, vegetation, and climatic conditions. Most of the region lies at an average altitude of 2000 meters on the Asir mountains. The standard building material is rough-cut stone. Architecture in the Asir mountains is influenced by Yemeni design and methods of construction. The villages on the hills and slopes are very small in size, sometimes including four or five houses. These villages are often defensively and strategically positioned on hilltops; and their towerlike structures give the effect of fortified walls. Elsewhere in the valleys and plains, the villages are larger in size and in less defensible positions. In both locations, however, rectangular watch towers which dot the mountainscape are a constant feature. These have tapered walls, crenellations along the roofline, and small openings, but they have varying heights and proportions.

The houses of Abha area are built of mud or stone or a combination of both. In those buildings constructed of mud, layers are laid successively and each layer is left to dry before another is added. Since the region experiences a much greater rainfall, so horizontal rows of projecting stone (slate) slabs are placed between each mud layer to break up the flow of rainwater, which would otherwise dissolve it.

The mud areas of the houses are oftenly washed white, thus endorsing the horizontal division of their tower-like buildings (Figure 13–15).

The houses adopt a squarish plan. In a three or four storey configurations, the first level is used for storage and animals, leaving the upper floors for reception room (majlis), living, family rooms, and

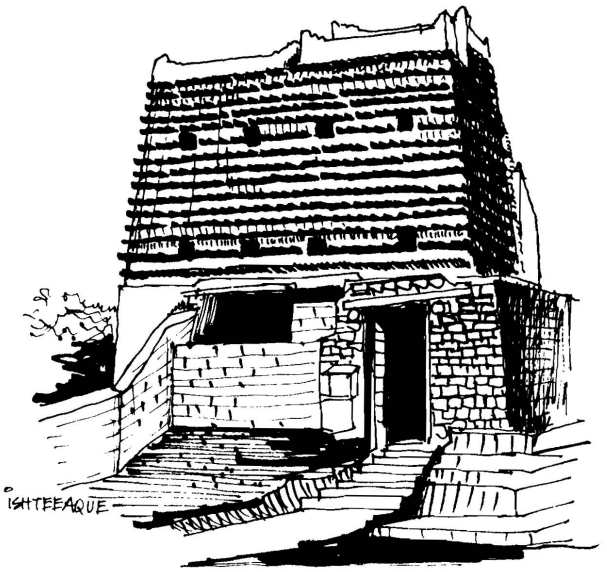


Figure 13. A Mud House with Slate Slabs Projecting from Walls in Abha Area (Asir).

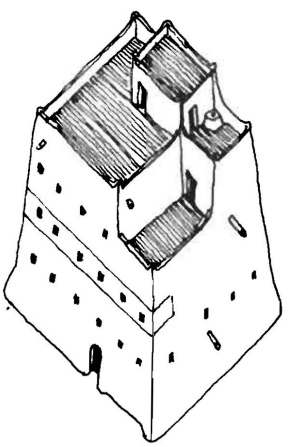


Figure 14. A Mud Tower House in Asir.

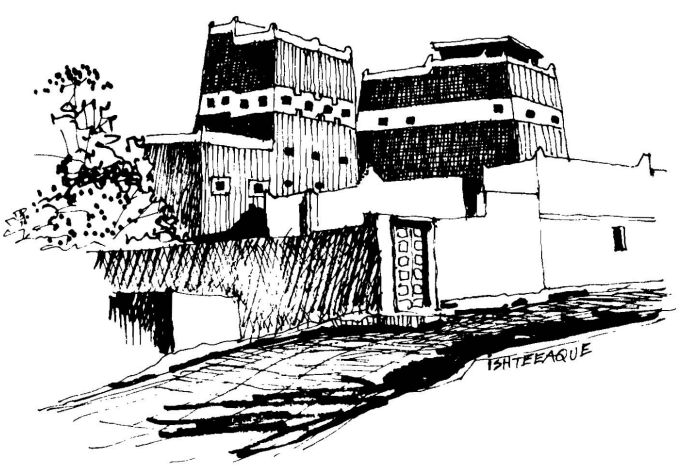


Figure 15. Houses of Asir Valley.

kitchen. Some rooms such as the majlis, are large and may be supported by one or two pillars in the middle of the room. Colors are extensively used in decorating a house. Among interior spaces, the majlis is brightly painted with green, blue, red, and yellow colors. Ceilings and walls are painted in strips and complex geometric patterns. On the exterior, main entry door may be the most decorated element; and along roof tops and terraces the railings and parapets are moulded into sculpturesque forms (Figures 16 and 17).

SUMMARY

Having reviewed the traditional dwelling styles of various regions, we can say that the characteristic architecture and urban pattern is a result of physical and climatic constraints along with the special cultural needs of Saudi society.

These styles as well as traditional or native building stock in general, are to be studied and analyzed by the designers. The technical skills found in climatic control, use of materials, and the perfectly tuned

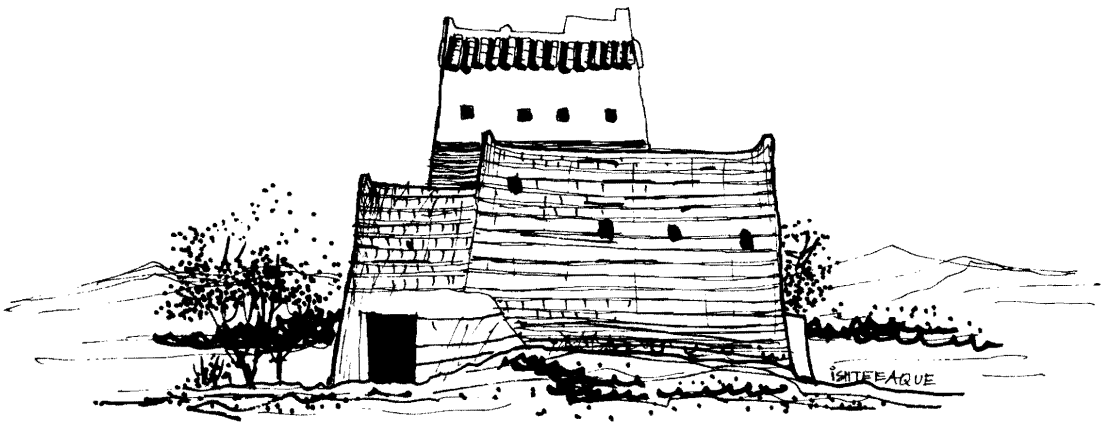


Figure 16. Mud Layered Walls of a House in Asir.

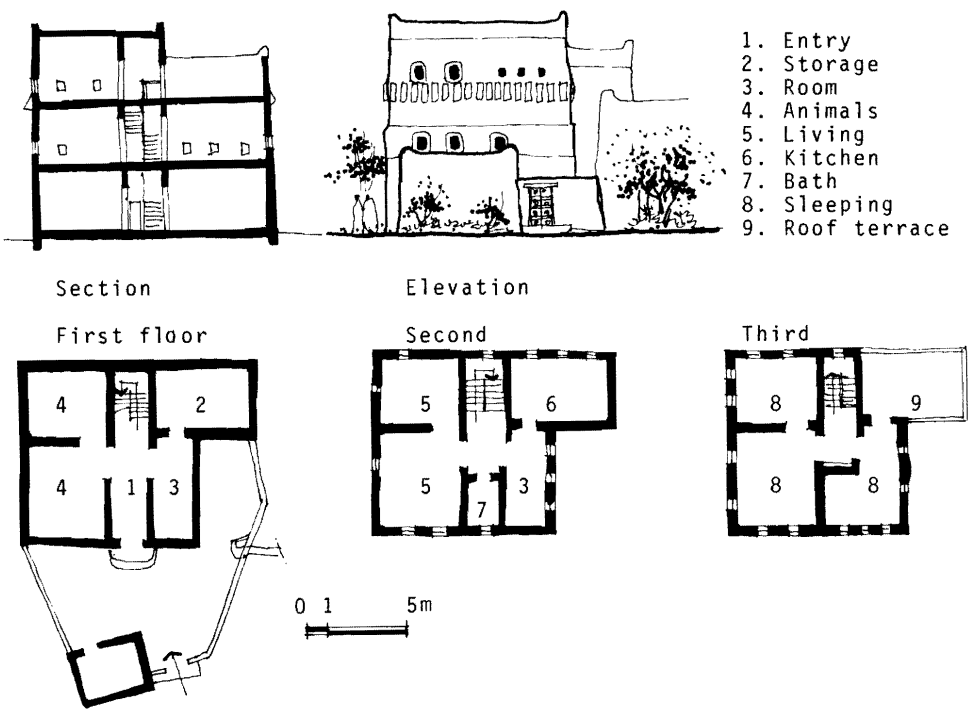


Figure 17. A Typical House in Asir.

response to socio-cultural needs which have evolved over generations should be appreciated.

The native architecture has the visual harmony and human scale which is the product of defined vocabulary of formal and stylistic elements. Most traditional cities in this part of the world, from Pakistan to Morocco, are influenced by rather hot climates, and are the reflections of similar cultural and social aspects. They commonly include courtyard houses in the urban fabric. Internal courtyards play an important role in traditional life as a venue of intimate life, as well as functioning as a climate moderator.

The external walls of the building in cities are party walls and border narrow alleys, and so efficiently reduce their exposure to solar radiation. In essence, traditional and native settlements are thus successful in integrating buildings, urban life, and activities in a socially adapted, functionally balanced, and climatically protected environment [4].

During the last several decades, Saudi Arabia has transformed itself into a society of new and different set of values with the newly-acquired oil wealth. The use of western methods in political, institutional, economic, and educational systems may be rightly imposed in terms of modernization and rapid progress; but to a great extent contradict traditional way of life. This conflict undoubtedly found its immediate expression in the changing environment of urban life.

Saudi Arabia, as exhibited in this paper, possesses a rich and context-sensitive native architectural heritage. Indications from the rapid development and building programs, signal a complete extinction of the traditional environment in another decade unless necessary and immediate actions are taken by the government and related local authorities. The rich and innovative vocabulary of design found in all the regions has a lot to offer to any imaginative design professionals who may be ready to take a good look at the environment and its heritage to learn from the time-tested models and their manifestations.

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