Abdel Sahib Al-Azzawi
Department of Architecture
Abdel Rahim Salim
Department of Architecture
Taisir S. Khedaywi
Department of Civil Engineering
Jordan University of Science and Technology
Irbid, Jordan

Abdel Sahib Al-Azzawi, Abdel Rahim Salim and Taisir S. Khedaywi

The Orientation System in Jordanian Settlements

1. Introduction

Settlements which evolved and developed to human behavioural needs are vivid environments with a strong association with their inhabitants. The built environment is provided with elements or features through which people will understand and communicate with their living surroundings. These elements are cultural, social, physical etc., forming images for an orientation system that will help people to perceive and use the environment efficiently. People will interact and circulate in their environment, finding their direction and location with minimum effort and with self satisfaction in the traditional Jordanian towns and villages. Modern settlements lack this orientation system, consequently people do not identify themselves with their living environment.

2. Research Methodology

2.1. Samples of towns and villages were selected from different locations, regions and time periods to cover a wide scope of study.

2.2. Three traditional settlements and three modern ones were selected for comparison and analyses, these are: Umm al-Jimāl versus Mafraq, Ramthā old town versus the new expansion area, Umm Qays old village versus the new housing area. An-Nu'ayma and Sūf were also included to explain relative features.

2.3. Image elements and devices contributing to the orientation system are identified on their frequent or long duration of existence in the settlements.

2.4. Elements of images were compared with other known theories of images and behavior for the evaluation of the findings.

3. Findings Related to Traditional Settlements

3.1. Physical Patterns

Forms are similarly informal, composed of different groups of building enclosures as clusters (FIGS. 1-12). The pattern structure expresses functional features or image elements on three levels. The first is the overall shape of the village or town which reflects the original purpose of the settlement, e.g. defense, government centre, etc. The second is the shape of major spaces for social activities like religious gathering etc. The third is the shape of spaces within the building clusters or housing areas, for safe pedestrian movement, children's play, neighbours' interactions, etc. (FIGS. 1-3).

3.2. Building Enclosures

Building enclosures are mainly irregular in shape, locations of building complexes, outside spaces, etc. This irregularity is a constant feature which is done in two ways (FIGS. 4, 8, 10, 11):

A- Rotating/skewing the location of one building/ building complex to another. The building or complex may be a regular square but the resultant outside space is irregular in shape (FIGS. 5, 6, 7, 9).

B- Rotating/skewing one wall/building or more to form an irregular inside space (courtyard) and outside space. The result of irregularity in the layout pattern is a (volumetric variation) in the outside space (FIGS. 9-12).

3.3. Social Context

3.3.1. External space represents norms of human behaviour, they indicate important acts and events in the cultural life of the people. The memories associated with them create cognitive images for the comprehension of spatial identity (FIGS. 5, 6, 10, 13).

3.3.2. Each housing cluster or group of clusters represent a social context of family/tribe ownership of land. The external spaces have distinguished territorial boundaries with symbolic entry and exist spaces giving social identity, orientation and protection (FIG. 13).

3.3.3. Enclosures of spaces are hierarchically organized in terms of public, semi-public and private zones of functional and social contexts (FIGS. 1, 2).

3.4. Spatial Flow

External spaces flow into each other to form links be-

tween all clusters of the settlements. The degree or level of flow openings (passages, roads, etc.) is related to hierarchy of function and privacy (FIGS. 3, 10-12). Special flow results in flow of vision and circulation flows in an enclosed and contained sequential manner.

3.5. External Spaces
Spaces have variation in the dimensions of width, length and height. They are composed in volumetric variation in such a way that each space is volumetrically different from other spaces of the same function, in the same built environment (FIGS. 3, 10-12).

3.6. Landmarks
Manmade and site natural features forming reference landmarks are integrated with the other elements already stated above to work as a whole system within the settlements. In Umm Qays at the nodes of street intersections, important buildings are located with high mass overlooking the land below (FIG. 4).

3.7. The General Appearance
The physical appearance is a very pleasant setting, complete harmony integrated with the natural landscape. The overall impression, whether it is in flat land or in a mountain setting, reflects a massing composition mostly made of small comprehensible units with human scale built of unified natural materials. The size of these units is pre-determined by the traditional construction methods of arches, barrel vaults, etc.

4. Findings Related to Modern Settlements
4.1.   All plans are similar in layout, there are no enclosures except in the main streets. The vital elements of traditional settlements are lacking here, particularly the social features. New road networks imposed on existing traditional fabrics of towns and villages resulted in deformation in the existing environment (FIG. 8).

4.2.   Machine aesthetics lead to obsession by "universal societies" for extreme abstraction and standardization of design and planning components, resulting in a characterless environment. This movement affected Jordanian settlements.

5. Comparison with Known Theories of Environmental Images and Behaviour
5.1.   Kevin Lynch in his book, *The Image of the City*, stressed the importance of the orientation systems, referring to them as vital to the better use of the environment. His work is limited to the effects of physical perceptible objects, i.e. the physical forms of the built environment. He glossed over social meaning, function, history and other symbolic references.

Lynch defined the elements of the city image as: Paths, Edges, Districts, Nodes and Landmarks. The scope of his work is related to the much larger cities, this may explain the reason for the superficial work done by him on the social influences which are very strong in the relatively small settlements with a long history in our region. The physical form of an-Nu'ayma old village was developed as a result of social influences of the family/tribe who came from the surrounding areas and inhabited the village (FIG. 13).

The five elements of the city image defined by Lynch are all found in traditional settlements, but some of them are missing in the modern ones. Lynch's theory of image elements does not cover in a clear way the volumetric variation in the external space, found as a strong element in the traditional environment.

Lynch wrote, in the same book (p. 20): "At every instant, there is more than the eye can see, more than the ear can hear, a setting or a view waiting to be explored. Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of the past experiences."

This description is more suitable to the physical environment found in traditional settlements, rather than the open streets of modern settlements or cities.

5.2.   The idea of space which can be protected from crime and vandalism was proposed by Oscar Newman in his book *Defensible Space, Crime Prevention Through Urban Design*. He introduced the concept of territoriality in space and four other requirements in its design to be safe. These are:

A- Surveillance by people's presence.
B- Clear private and public zones.
C- Creation of neighbourhood images.
D- Separation of safe and dangerous zones.

These characteristics are naturally part of the traditional environment, as an outcome of family/tribe land ownership and social behavioural patterns.

6. Conclusions
The building clusters, functional expressions, sequential visual and circulation flows, hierarchy of informal spatial enclosures, social and behavioural contexts, volumetric variations, natural and manmade landmarks, and mass compositions of small units, are all elements forming the images of the orientation systems found since early times in the traditional settlements. These systems contribute to the people's identification with their own environment – an aspect which is very important to the cultural continuity and quality of the people's life. Therefore it is nec-

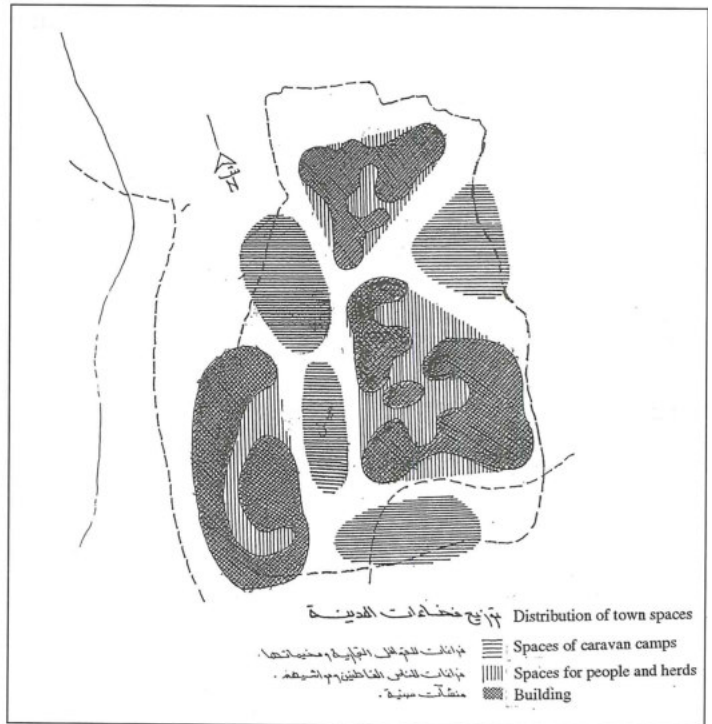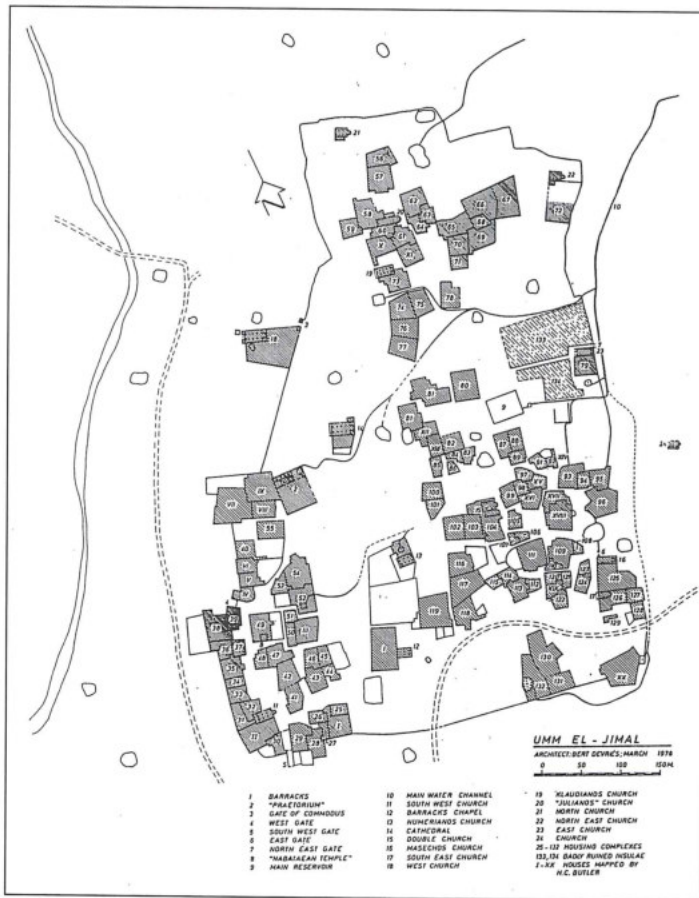essary to introduce this systtem in modern settlements.

Acknowledgments

References

– سليم الفقيه، فكري مرقص أسعد، ياسر الرجال، ١٩٨٩، سوف دراسة معمارية في البيئة المحلية. عمان: الجامعة الأردنية.

– مركز بحوث البناء ١٩٩٠، التراث المعماري في المملكة الاردنية الهاشمية – السلط المجلد الاول. عمان: الجمعية العلمية الملكية.

Al-Azzawi, A.-S. H. and Khedaywi, T. S. 1989. New Roads and Traditional Rural Environment in Jordan. Unpublished paper, Jordan University of Science and Technology.

Gosling, D. and Maitland, B. 1984. *Concepts of Urban Design*. London: Academy Editions and New York: St. Martin's Press.

Lynch, K. 1986. *The Image of the City*. Cambridge, Mass.: The M.I.T. Press.

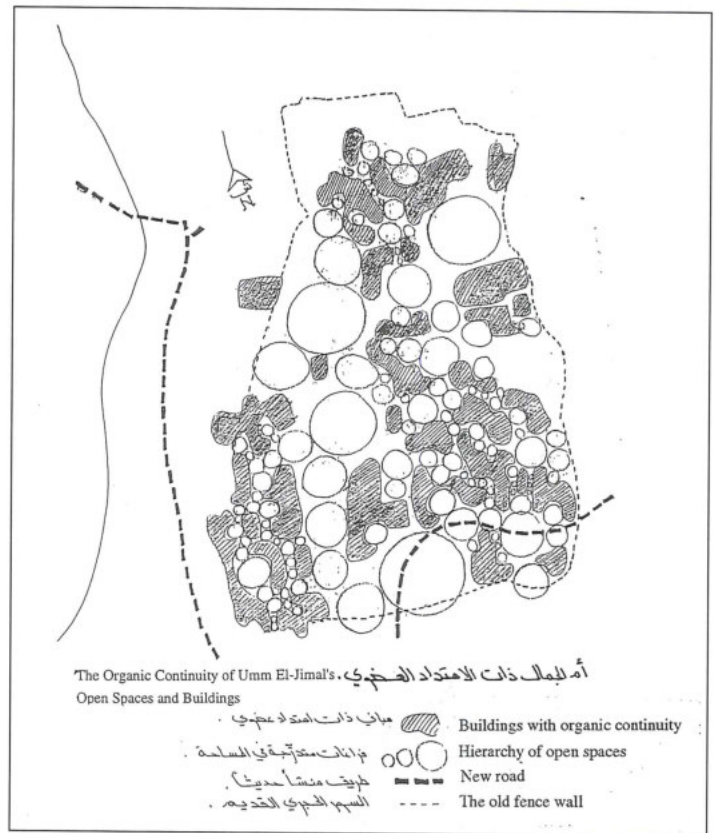Newman, O. 1972. *Defensible Space*. New York: Collier Books.

Schirmbeck, E. 1987. *Idea, Forms and Architecture*. New York: Van Nostrand Reinhold Company.

de Vries, B. 1982. *Umm el-Jimal*. Amman: Department of Antiquities.
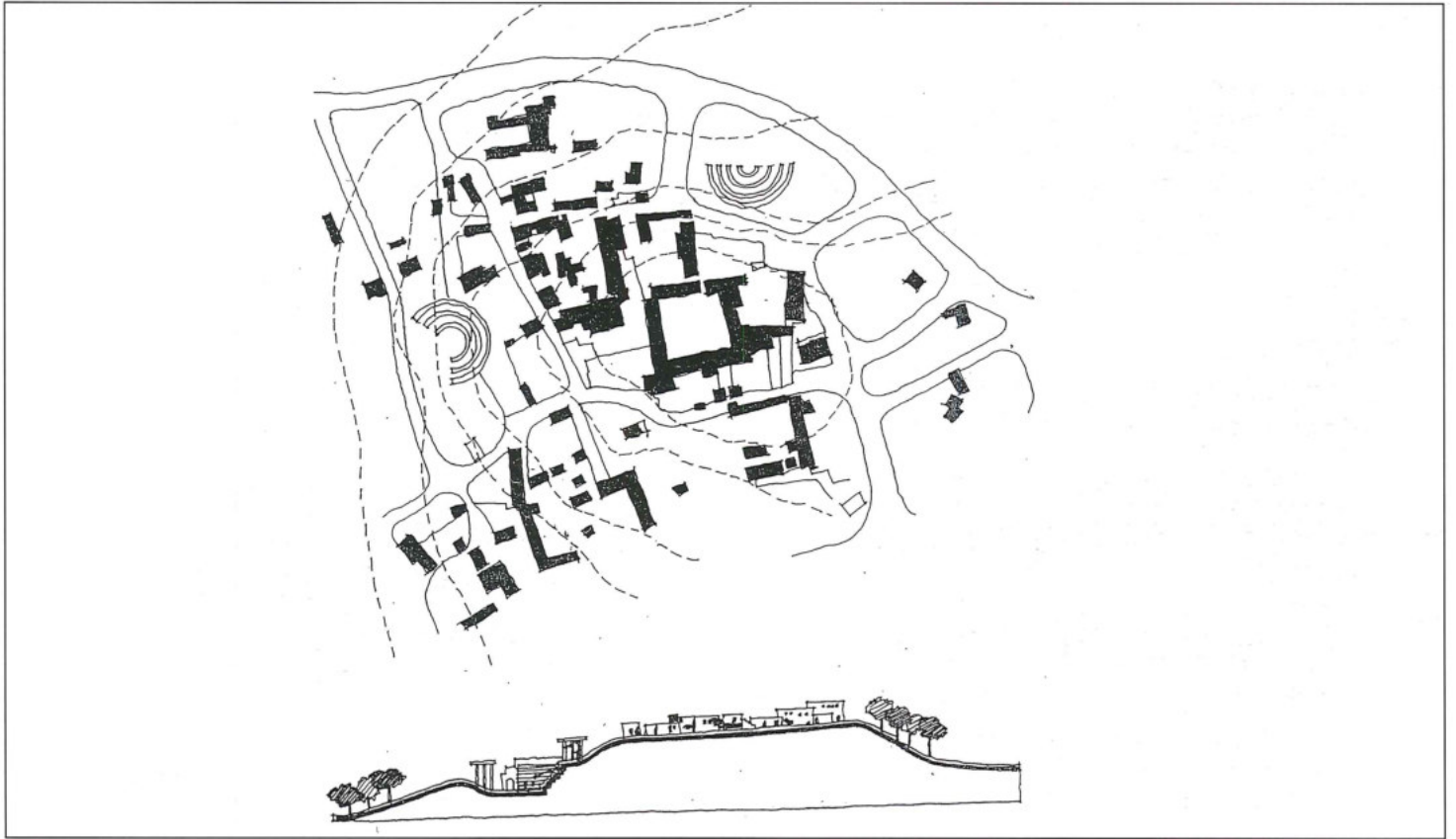

مخطط خطة ذات المدينة — Distribution of town spaces
مخططات للجماعة أهل الحواضر ومنتجعاتها — Spaces of caravan camps
مخططات للناس المخاطبين رعاة المواشي الأشيعة — Spaces for people and herds
منشآت مبنية — Building

2. Grouping of buildings and open space at Umm al-Jimāl.

The Organic Continuity of Umm El-Jimal's أم الجمال ذات الامتداد العضوي، Open Spaces and Buildings

مباني ذات امتداد عضوي — Buildings with organic continuity
مخططات متدرجة في السلامة — Hierarchy of open spaces
طريق منشأ حديث — New road
السور الحجري القديم — The old fence wall

3. Flow of space and building enclosures at Umm al-Jimāl.

UMM EL - JIMAL
ARCHITECT: BERT DEVRIES; MARCH 1976
0   50   100   150M

1	BARRACKS	10	MAIN WATER CHANNEL
2	"PRAETORIUM"	11	SOUTH WEST CHURCH
3	GATE OF COMMODUS	12	BARRACKS CHAPEL
4	WEST GATE	13	NUMERIANOS CHURCH
5	SOUTH WEST GATE	14	CATHEDRAL
6	EAST GATE	15	DOUBLE CHURCH
7	NORTH EAST GATE	16	MASECHOS CHURCH
8	"NABATAEAN TEMPLE"	17	SOUTH EAST CHURCH
9	MAIN RESERVOIR	18	WEST CHURCH

19 "KLAUDIANOS CHURCH
20 "JULIANOS" CHURCH
21 NORTH CHURCH
22 NORTH EAST CHURCH
23 EAST CHURCH
24 CHURCH
25-132 HOUSING COMPLEXES
132,134 BADLY RUINED INSULAE
1-XX HOUSES MAPPED BY H.C. BUTLER

1. Site plan of Umm al-Jimāl (after de Vries 1982).

335

4. Site plan and section. Roman theatres and 18th century Umm Qays.
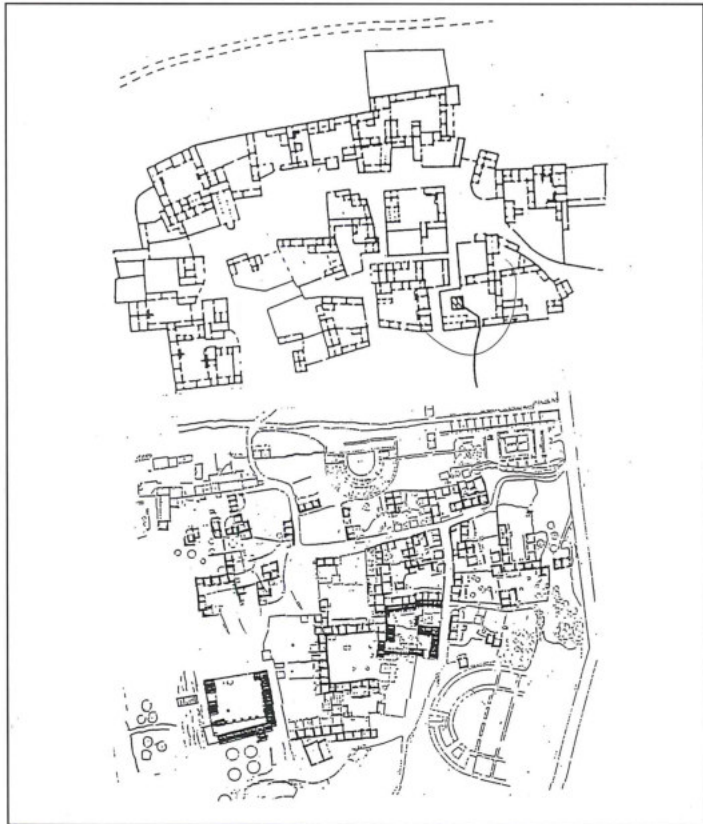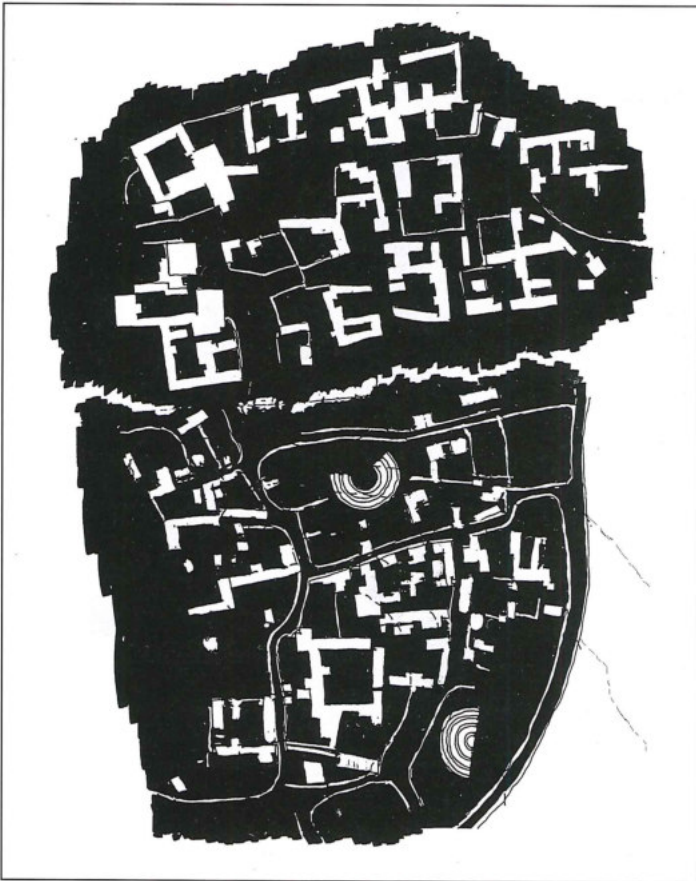

5. Layout plans of buildings and clusters. The southwest part of Umm al-Jimāl and 18th century Umm Qays.
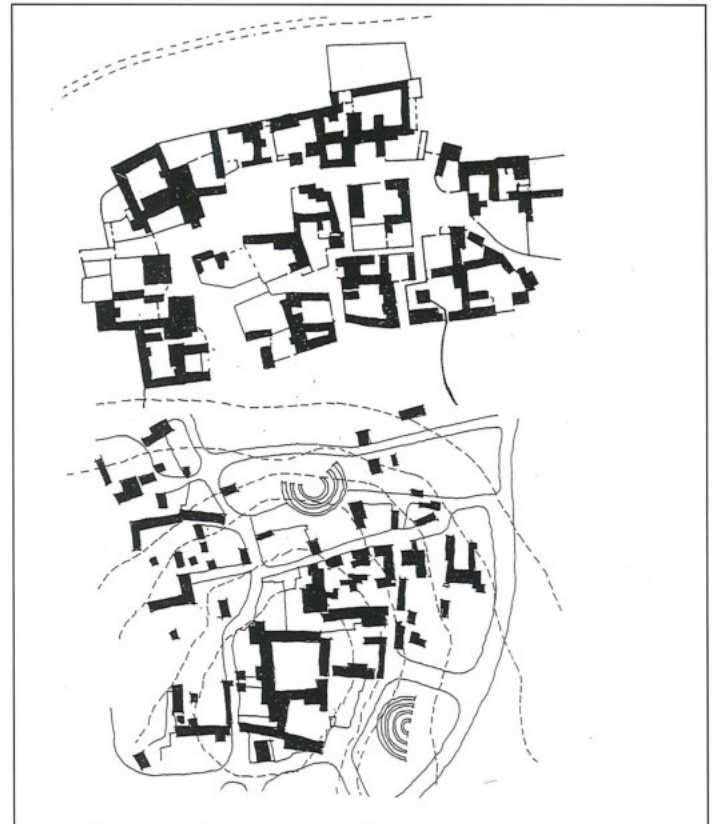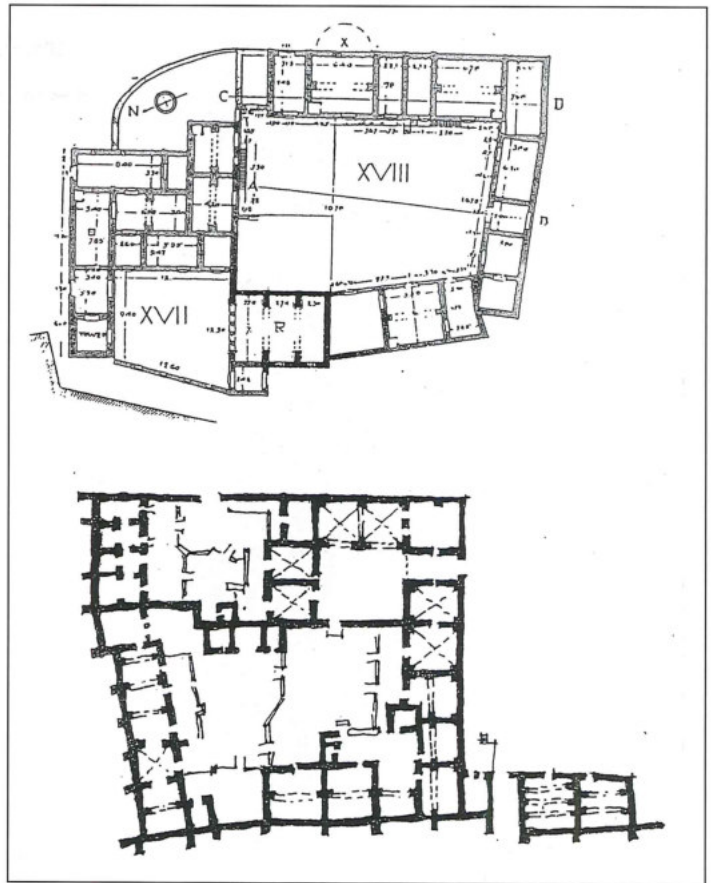

6. Positive and negative spaces. Building clusters in Umm al-Jimāl and Umm Qays.

336

7. Negative and positive spaces of building clusters in Umm al-Jimāl and Umm Qays.

9. Plans of typical courtyard houses in Umm al-Jimāl (Houses XVII-XVIII) and Umm Qays (Bayt al-Rousan).


8. Site plan showing part of Ramthā town. Buildings layout and effect of new roads. (After the development plan for Ramthā, Ministry of Municipal and Rural Affairs and the Environment).
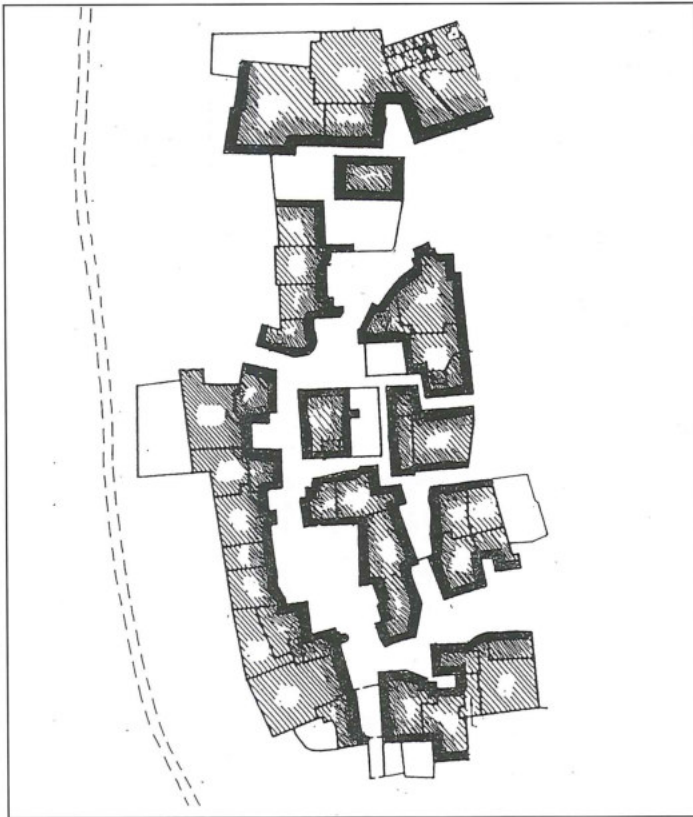
10. Plan showing open space and building clusters in volumetric variation flow (Umm al-Jimāl).

12. Three dimensional drawing – volumetric variation – Salṭ.

متتابعة بصرية في شارع المسجد العمري
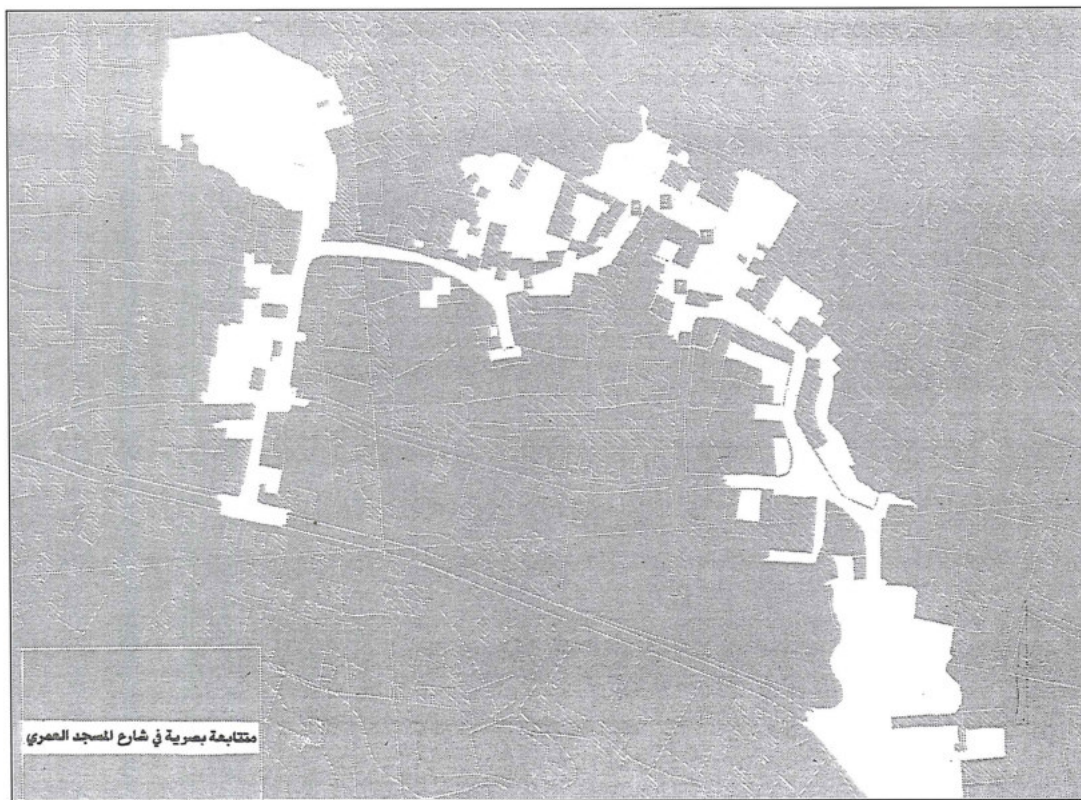
11. Site plan showing flows of vision space and volumetric variation. Sūf near Jarash (based on a survey by the Jordan Royal Geographic Centre).

338

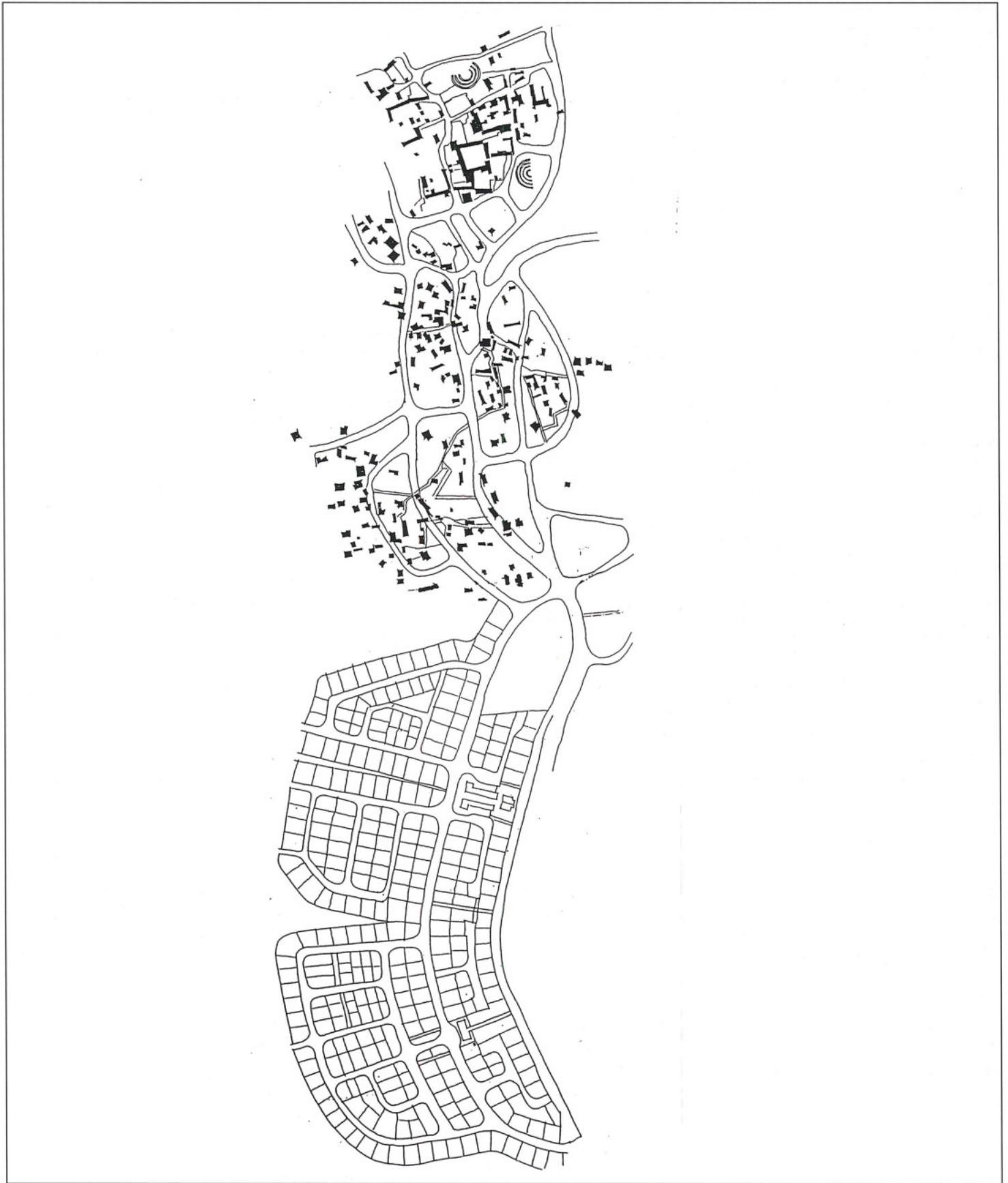13. Diagrammatic plan showing the relationship between social effects, topography and settlement form. An-Nu'ayma near Irbid.
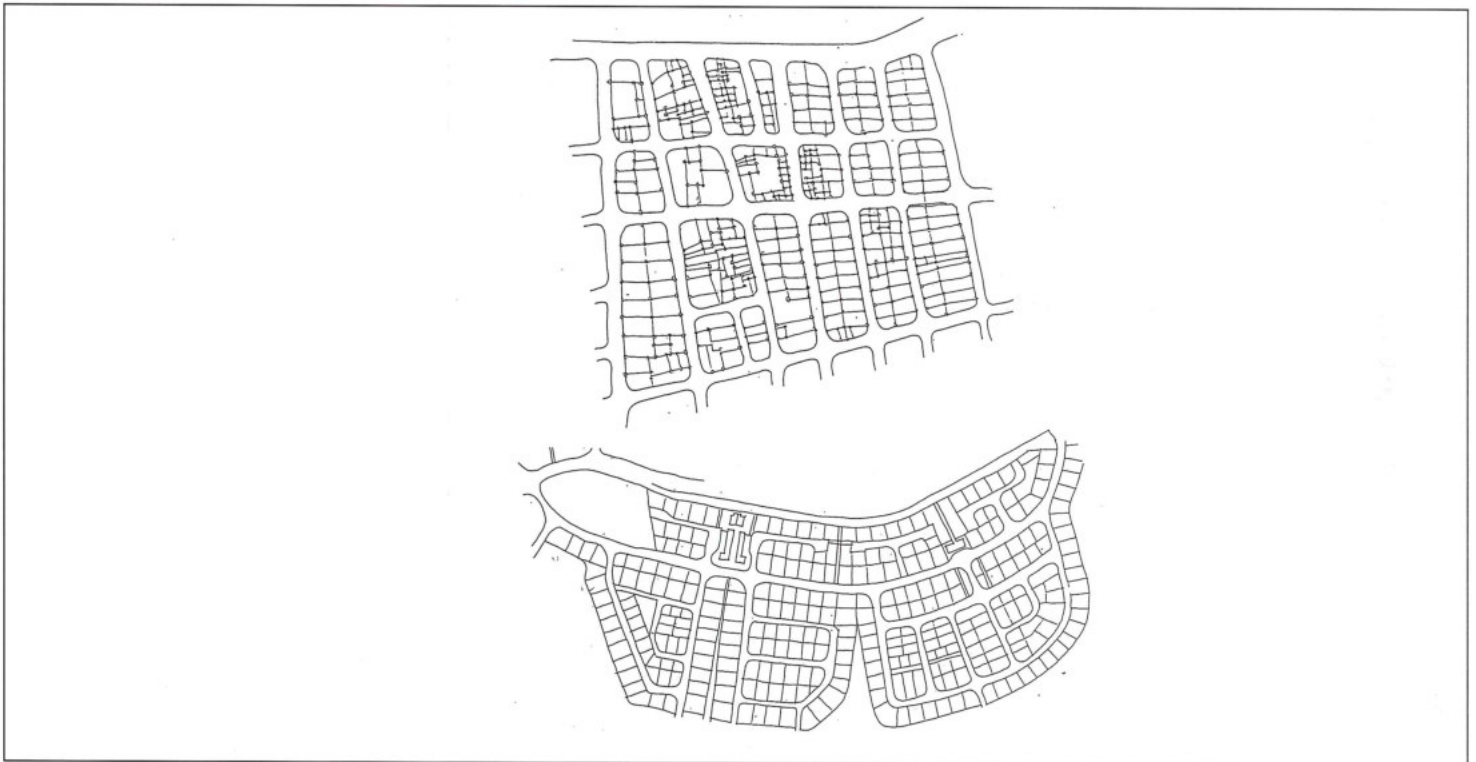
14. Site plans of Mafraq central area and the new housing area in Umm Qays. (Based on the development plans for Mafraq and Umm Qays, Ministry of Municipal and Rural Affairs and the Environment).

339

15. Site plan of developments at Umm Qays, showing three stages of pattern found in most settlements in Jordan.