

An Archaeological Study of Stone Structures in Northeast Riyadh, Saudi Arabia⁽¹⁾

Abdullah M. Alsharekh

Abstract: This paper focuses on the stone structures' phenomenon, which is widespread in central Saudi Arabia, through the fieldwork undertaken by the author in the early 1990's. The character and spatial distribution of stone structures in the AdDougham region, in northeast Riyadh, necessitated devising a proper methodology for recording and documenting these surface archaeological remains. This paper will shed some light on the cultural background of the stone structures' phenomenon and will, hopefully, furnish the way for future research in the Arabian Peninsula.

Introduction

While conducting an archaeological survey 35 km northeast of Riyadh, central Saudi Arabia, I located a large number of surface stone structures (Figure 1) of a type known in the Kingdom and other parts of the world. Apart from the Arabian Peninsula, similar examples were reported from North and East Africa, the Levant, Turkey, and Iran (Avner 1984; Betts 1982; Doe 1983; Milburn 1974). A number of these structures has been found exposed on the surface, and therefore dating them on stratigraphic grounds is not possible. The study of these structures is important because they represent a temporal segment of human occupation, even though it may date tens of millennia after the abandonment of the stone knapping workshops present in the study area. The documented stone structures in the study area were found in a variety of shapes and sizes. A total of 75 structures has been located, of which 41, 42 and 13 structures have been found in zones 1, 2 and 3 respectively. The area of zones 1, 2 and 3 measures about 0.9 km, 1.08 km and 0.375 km respectively (Figures 2, 3 and 4)

The main objectives of this paper are:

1. The documentation of all authentic stone structures encountered in the study area; 2. The investigation of the archaeological significance, function, and cultural context of the structures; 3. Defining and classifying stone structures into coherent groups; and 4. The clarification of the cultural and temporal horizons in the study area.

Definition

The term "stone structure" is used here to denote one of the archaeological features found in the study area, which is formed with the use of blocks of stones erected into vertical or horizontal piles, in a variety of shapes and sizes.

A stone structure can be defined as any human-made structure in the form of a stone arrangement without the use of mortar. It can be on a high or low alttitude, (e.g., on a cliff or in the middle of an intermittent water stream), simple or complex, near or far away from a lithic scatter. Stone structures are regarded as non-portable artefacts; their position and arrangement become affected if removed from their original context (Sharer et al 1979: 71). It should be borne in mind that the structural remains documented in the study area represent only what Cribb (1991: 68) categorized as being durable. That is to say, they have a spatial plan.

Location

The bulk of stone structures have been



An Archaeological Study	of Stone Structures	in Northeast Riyadh
-------------------------	---------------------	---------------------

CAIRN	CIRCLE	LINE
ZONE 1: 2, 3, 13 35, 47, 48, 49, 61, 63, 73, 82,	ZONE 1: 7, 12, 29, 39, 81, 83, 113, 126, 127, 120, 120, 122, 123, 124-	ZONE: 1:36, 37. 94. ZONE: 3:30
89, 92, 117, 118, 119, 136, 138	129, 130, 132, 133, 134, 135, 137, 139.	HOUSE
ZONE 2: 4, 5, 10, 12, 14, 26, 27, 28, 35, 36,	ZONE 2: 2, 6, 9, 19, 37, 53, 62	ZONE: 1:95, 96
54, 59, 60 ZONE 2: 2 4 15 20	ZONE 3: 1, 8, 10, 23, 33	RECTANGULAR
2011E 5: 2, 4, 15, 29, 31, 32, 34	-	ZONE: 1:32.

Table (1): The main types of stone structures in the study area.

STRUCTURE	LENG.	WID.	HEIG.	VTC/HRZ *	S/M **	ASSOC.^
1\2	9	3.6	1	1	1	3
1\3	4.75	4.45	0.85	1	1	2
1\13	1.8	1.7	0.4	2	1	2
1\35	4.8	1	0.45	2	1	0
1\47	3.1	2.9	0.8	1	1	0
1\48	2.05	1.9	0.55	1	1	0
1\49	4.3	1.2	0.75	1	1	3
1\61	2.3	1.9	0.4	2	1	2
1\63	1.9	1.6	0.5	2	1	1
1\73	5.9	4.2	0.8	1	1	3
1/136	1.3	1	0.4	2	1	1
1\82	6.2	4.7	0.55	1	1	3
1\89	1.7	1	0.4	2	1	0
1\92	6.15	5.59	1	1	1	2
	**************************************		n an de Spanie de Talaire and the ar			

 Table 2: The Physical Attributes and Cultural Associations of Cairn Structures.

 ^ Association.

0- No association; 1- Knapped stone blocks; 2- Stone artefacts; 3- Both 1 and 2. *1= Vertical; 2= Horizonal

**1= Single; 2= Multiple

m. long drop significantly. Zone 3 structures, on the other hand, seem to fall between two groups of length measurements; some structures are less than 3 m. in length and the other group have a length between 6 and 9 m.

<u>Width</u>: The width measurement, unlike that of the length shows a more harmonious relationship among the three different zones. The majority of structures in the three zones fall within the 2 m. interval. However, structures with a width over 2 m. have a different pattern in each zone; zone 2 has only one structure with a width over 2 m. unlike zones 1 and 3 where a number of structures shows a width of over 2 m.

<u>Height</u>: Cairns in zones 1 and 3 do not exceed 1.5 m. in height while in zone 2 they extend up to the 2 m. mark. The study shows a close similarity between zones 1 and 2, where most of the structures have a height of up to 1 m. and few structures have a higher measurement. In Zone 3, about two thirds of all structures have a height of no more than half a meter.

In qualitative terms, a number of attributes has been examined.

a- The ratio between vertical⁽³⁾ and horizontal⁽⁴⁾ structures has been looked into, Table (2). Cairn structures in the three zones appear not to have a particular preference for any of the two types, since out of the total number of structures, 18 structures were erected vertically and the remaining 20 structures were laid in a horizontal fashion.

b- The ratio between single and multiple structures was also examined, Table (2). Out of the 38 cairn structures, only 3 structures have more than one unit constituting the same structure, while the majority of structures consists of only one unit each. Of the three multiunit structures, two were found in zone 2, and one structure is found in zone 3. The finding of these multi-unit structures indicates a more complex level of structure construction, and will be looked at more extensively below.

c- The archaeological association of cairn structures with other cultural remains and its overall significance was examined. The main aspects to be looked at here concerns the spatial relationship between cairn structures and stone artefacts and knapped stone blocks that are part of the structure. Seventeen structures do not have any form of relationship with any archaeological remains, especially in zones 2 and 3. Three structures contain knapped blocks of stones. Twelve structures show spatial association with stone artefacts and six structures have both knapped blocks of stone and stone artefacts. To sum up, over half of the cairn structure type shows close spatial relationship with archaeological remains, and the remaining structures lack this form of association.

Shape Classification:

Insofar as the overall shape and size are concerned, the cairn-type structure, although defined generally above, shares further variations with the various structures.

As tabulated in table (3), five sub-types were recognized, which include: 1. Large cairn structures (>5m) (Figure 8); 2. Medium cairn structures (2-5 m) (Figure 5 & 6), 3. Small structures (<2m) (4. Elongated structures, where the length is significantly longer than that of the width (Figure 5); and 5. Cairn series structures, which can be recognized by having more than one unit as part of the same structure (Figure 8 and 9). Small cairn structures appear to have the highest number of structures in all three zones, and represent about 40 % of all cairn structures. Medium structures come next and represent less than a quarter of all cairn structures in the study area. Elongated cairn structures and large cairn structures represent only 15 % of all cairn structures, while the cairn series sub-type represents about 8% of all cairn structures.







Fig. 5: Structure 1/117 at the elongated -cairn subtype.

Looking at the large, medium and small structures sub-types, one can recognize the quantity of each sub-type and how the interval between them is kept in a descending order; the small structure's sub-type stands as having the majority of structure and the large structure's sub-type represents the minority subtype.

Location Analysis:

The number of attributes pertaining to the location of cairn structures has been examined.

The first attribute concerns elevation where two main variables have been used for description. These are raised and low grounds. Since the summits of all three zones in the AdDougham region are not totally flat in physical



Fig. 6: Structure 3/2 of the large-cairn subtype.



terms, the choice made for locating the structure at a raised or a low ground must bear some significance, and in no small part relate to its function. Out of the thirty-eight cairn structures, only 5 of them were erected on low ground, hence emphasizing the importance of erecting the majority of them on a raised ground. Structures that were erected on low grounds were only found at zones 1 and 3.

The second attribute concerns the surface on which the structures stand. A total of 31 structures were found standing on a rather flat surface, while only seven structures are located on sloping surface. A deduction can be made here emphasizing the importance of the durability and survivability of these structures.

The third attribute relates to the position of the structures on the inselberg itself. Apart from structure number 136 in zone 1, all cairn structures are located on the inselberg's summit, again, emphasizing the importance of erecting these structures on high locations.

The fourth attribute looks at the spatial relationship between cairn structures and water run-offs. Highlighting the relationship with present-day water run-offs is meant to give an approximate picture of the possible connection between them and cairn structures. Emphasis was put on entrenched water run-offs that constitute part of the inselberg drainage system rather than short-term run-offs. Fifteen structures have been found spatially related to water run-offs, while 23 structures appear not to be close to water run-offs.

Construction Analysis:

Throughout the surveying stage of stone structures in zones 1, 2 and 3, none of the structures showed the presence of a foundation, nor was there any dressing of the stone blocks used in their erection. The construction method in the case of cairn structures was basically pilling of stone blocks to form a structure of a certain size and shape. The same is also true for other types of structures.

Two main attributes relating to the construction of stone structures were evaluated. One looked into the amount of physical effort⁽⁵⁾ put into the construction of each structure, and whether it was large or small, as indicated by its size. A large amount of effort is defined here as one which is exhausting for one adult to conduct alone, while a small effort is one that can be accomplished without much diffi-

Large >5m	Medium 2-5 m	Small < 2m	Elongated	Series
1/73, 1/92, 2/4, 2/14, 3/2.	1/3, 1/48, 1/49, 2/61, 1/138, 2/12, 2/54, 2/60, 3/31.	1/13, 1/63, 1/136, 1/89, 1/118, 1/119, 2/26, 2/27, 2/28, 2/36, 2/59, 3/15, 3/29, 3/32, 3/34.	1/2, 1/35, 1/47, 1/82, 1/117, 2/35.	2/5, 2/10 3/4.
Total No.	Total No.	Total No.	Total No.	Total No.
5	9	15	6	3
%13.15	%23.68	% 39.47	% 15.78	% 7.89

 Table 3: A general shape classification of Cairn Structures.



An Archaeological Study of Stone Structures in Northeast Riyadh

STRUCTURE	LENG.	WID.	HEIG.	VTC/HRZ*	S/M**	ASSOC.^
1\7	4.7	4.5	0.6	1	1	2
1\12	2.85	2.2	0.7	1	1	3
1\29	2.7	2.1	0.7	1	1	2
1\133	1.4	0.7	0.3	2	1	2
1\134	1.5	1.5	1	1	1	2
1\135	3.4	1.85	0.65	1	1	3
1\39	1.6	1.3	0.15	2	1	2
1\81	4.25	3	0.4	2	1	0
1\83	1.65	1.65	0.1	2 -	1	0
1\113	9.7	5.7	0.5	2	1	0
1\139	7.5	4	0.25	2	1	0
1\137	3	1.8	0.85	1	1	3
1\132	6.7	1.65	0.2	2	1	2
1\126	3.1	2.55	0.2	2	1	2
1\127	3.2	2.3	0.2	2	1	2
1\129	3.5	1.6	0.7	1	1	3
1\130	1.3	1.3	0.25	2	1	1
2\2	1.5	1.5	0.45	2	1	2
2\1	5	4.7	0.9	1	1	3
2\9	5.2	4.7	0.5	2	1	3
2\19	1.6	1.3	0.25	2	1	2
2\37	1.3	1	0.3	2	1	2
2\53	1.9	1.5	0.3	2	1	1
2\62	4.6	4.2	0.15	2	1	1
3\1	9.8	8.4	1.4	1	1	3
3\8	2.65	2.05	0.3	2	1	2
3\10	2.9	2.65	0.2	2	1	1
3\23	1.9	1.7	0.3	2	1	1
3\33	2.7	1.75	0.2	2	1	1

Table 4: The Physical Attributes and Cultural Associations of Circular Structures.

<u>^ Association:</u>

0 - No association; 1- Knapped stone blocks; 2- Stone artefacts; 3- Both 1 and 2.

* 1 = Vertical; 2= Horizonal

** 1 = Single; 2= Multiple



culty.

Sixteen structures of the cairn type looked quite large in their size, and therefore needed quite a large amount of physical effort in their construction, while 22 structures required only a small amount of physical effort.

The second attribute concerns the size of stone blocks with knapping traces used in the construction of these structures. Three main stone sizes are used here: large, which measures >10 kg, medium, which measures between 5-10 kg, and small, which measures <5 kg. A total of 17 structures contains stone blocks ranging in size from large to small, while only 21 structures have mainly medium and small size stone blocks.

An interesting discovery from looking at these two attributes was that out of the 16 structures whose construction called for a large amount of physical effort, 15 contained stone blocks of all sizes. On the other hand, 19 of the structures that needed a small amount of effort had mainly medium and small size stone blocks in their construction.

2- Circular Structures:

This type of structure is not uncommon in the Arabian Peninsula in particular, and the Near East and Africa in general. Here, this type encompasses a variety of shapes more closely relating to the circular form than any other form. These sub-types vary in their overall shape and level of complexity. Over one-half of circular structures in the study area are located in zone 1, while zones 2 and 3 have less than one third each.

Table (4) lists all stone structures included in this type, along with their main measurements and cultural associations. Detailed description of the main measurements, length, width and height, will be undertaken thereafter. These measurements are plotted according to their respective zones.

<u>Length</u>: The length measurement varies between the structures in the three zones.

The majority of structures in zone 1 clusters between 0 and 4 m. interval, then their numbers strings between 6 and 10 m. intervals.

Circular structures in zone 2, on the other hand, have their length clustering between 0-2m and 4-6m intervals. In zone 3, over half of the circular structures were found to have a length between 2 and 4 m., while a single structure was located in the 0-2m and 8-10m intervals. The low number of structures in zones 2 and 3 appears to have an impact on the overall pattern.

Width: Circular structures in zone 1 show a



Fig.7: An example of the medium -cairn subtype, structure 3/31 in the foreground, and an example at the line-type structure, structure 3/30 in the background.





Fig. 8:An example of the large-cairn subtype, seen here next to a cairn series structure, structures 2/14 and 2/10 respectively.





Fig. 9: Another example of the cairns series structures, structure 2/5



Fig. 10: A photo showing the spatial grouping of stone structures belonging to the large-cairn subtype, the cairn series subtype and the complete circle subtype. These are structures 2/4, 2/5 and 2/6 respectively.



Fig. 11: The only example of the rectangular type structure found in the study area, structure 1/32.

maximum width of 6 m. The majority of structures falls in the 0-2 m. interval, then the number of structures drops gradually until it reaches the 6 m. interval. The width measurement of stone structures in zone 2 is very similar to the length measurements of the same structures. The similarity highlights the presence of circular structures that have almost the same length and width measurement. In zone 3, the width measurement shows that the majority of structures has a width of no more than 2 m., and only one structure has a width in the 8-10 m. interval.

Like the length measurement, the width measurements have a clear degree of variation between them, and except for zone 2, the length and width measurements differ clearly in zones 1 and 3.

<u>Height</u>: The majority of structures in zone 1, has a height of up to 0.75 m. and then the number of structures drops to reach a maximum height of 1.25 m. in the whole zone. In zone 2, over one-half of circular structures has a height between 0.25-0.50 m., and the remaining structures go up to a height of 1 m.

The height measurement in zone 3 shows the majority of structures having a height of up to half a meter, and only one structure falling in the 1.25 - 1.50 m. interval. The height of circular structures in all three zones does not show a consistent pattern. This can be said also of the length and width measurements.

In addition to the metric measurements of circular structures, other qualitative attributes are addressed in Table (4).

a- Vertical versus horizontal structures are counted in all three zones. As can be seen in Table (4), over two-thirds of structures have been laid down horizontally, while the rest are laid vertically. The majority of the latter group has been found in zone 1 whereas zones 2 and 3 have only one structure each.

b- Single versus multiple structures were

also looked at in all three zones. No multiple structures were ever found in any of the three

zones in the study area. The spatial relationship between circular stone structures, knapped stone blocks and stone artefact scatters were looked at. Four sites have been found not to have any form of archaeological association. Six structures contained knapped stone blocks, twelve spatially related to lithic scatters, and seven showed an association with both stone structures and lithic scatters.

Generally, the spatial association between circular structures and both knapped stone blocks and lithic scatters was very prominent.

Shape Classification:

Table (5) shows a general classification of circular structures in zones 1-3 according to their shape. The classification may be rather subjective in that it looks at the present-day shape of structures rather than at when they were originally erected. However, since some of these structures are simple in their level of construction, it can be envisaged that simple formation processes may have altered the overall appearance. Seven main sub-types were devised to accommodate the internal variations between the circular type structures.

The second sub-type, partly bedrock structures (Figure 15), consists of probably an



Fig. 12: Examples of the complete circle subtype structures Structure 3/8.

arrangement of half-circular structures laid against a natural stone bedrock. Five structures are included under this sub-type. These include complete circular structures, numbering eight (Figures 12-14).

Two sub-types are distinguished for having one and two openings each, and each one of them has three structures (Figures 15 and 17). The fifth sub-type includes half-circular structures (Figures 17, No. 1/139), which has four structures. Irregular structures represent the sixth sub-type with five structures.

Only one structure represents the circular and cairn sub-type (Figures 18 and 19). Due to its significance, this structure has been included under a specific sub-type. Apart from the complete circle and cairn sub-types, the remaining sub-types range in number from 3 to 5 structures.



Fig. 13: Examples of the complete circle subtype structures Structure 1/29.



Fig. 14: Examples of the complete circle subtype structures Structure 1/83.



%3.45

Complete	PARTLY BEDROCK	WITH 1 EXIT	WITH 2 EXITS	HALF	IRREGULAR	CIRCULAR & CAIRN
1/7	1/12	1/39	1/113	1/139	1/135	3/1
1/29	1/133	3/10	1/126	2/2	1/81	
1/83	1/134	3/23	2/62	2/19	1/127	
1/130	1/129			1/137	2/53	
2/6	1/132				3/33	
2/9						
2/37						
3/8						
TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
8	5	3	3	4	5	1

%10.34

%13.80

Table 5: A general shape classification of Circular Structures.

%10.34

%17.24

Location Analysis:

%27.59

Four main attributes are examined in order to comprehend fully the various aspects relating to the location of circular structures. These attributes include elevation, surface, position



Fig. 15: An example of the partly bedrock subtype circular structure, structure 1/129.

and proximity to water sources (i.e. water links).

%17.24

<u>Elevation</u>: While nineteen circular structures are situated on raised ground, only 10 structures are found on low ground.

<u>Surface</u>: Of the total number of circular structures, 24 have been found on reasonably flat surfaces, and five on sloping surfaces.

<u>Position</u>: Circular structures are mainly positioned on the rocky inselbergs; however, four structures from zone 1 were located off the inselberg.

<u>Water links</u>: The relationship between circular structures and the present-day drainage systems in zones 1, 2 and 3 has been examined. The overall outcome indicates that half

STRUCTURE	LENGTH	WIDTH	HEIGHT
1/36	5.65	0.5	0.3
1/37	4.2	0.35	0.2
1/94	24.6	0.2	0.2
3/30	29.35	1.1	0.35

Table 6: The Main Measurements of the Line-Type Structures.





Fig. 16: Another example of the spatial grouping of structures belonging to the large-cairn subtype, the cairn series subtype and the complete-circle subtype. These are structures 2/14, 2/10 and 2/9 respectively.

of the circular structure type relates spatially to present-day water run-offs.

Construction Analysis

The main attributes looked at here are the

effort put towards the construction of circular structures and the size of stone blocks used. Only eight structures seem to have necessitated a lot of physical effort to undertake in the piling up of stone blocks for circular struc-



Fig. 17:A circular structure with two possible exits, structure 1/113 in the foreground, and a half-circular subtype structure, structure 1/139, in the background.





Fig. 18: The sampled area in site 3/3: The pre-collection setting.



Fig. 19: The sampled area in site 3/3 : The post-collection setting.



tures.

On the other hand, twelve circular structures contain stone blocks of all sizes, and the remaining 17 structures contain mainly medium and small size stone blocks. No mortar of any sort seems to have been used in the construction process.

Linear Structures:

This type includes only four structures, but due to their unique form they have been singled out for detailed analysis (Table 6).

The length attribute has been divided into two main classes. One includes structures with a length of more than 10 m., and the other class includes those less than 10 m. in length. Apart from structure 3/30, all other structures have a width of less than 1 m. As far as height is concerned, all structures are less than half a meter in height.

The shape attribute can be divided into the following sub-types; rectilinear, which encompasses structures such as in 1/36, 1/37, and 1/94; and curvilinear, as represented by structure 3/30 (Figure 7). Structures of this type are all horizontal in their layout and consist of one unit each.

The third level of analysis looks at the construction of linear structures. After examination, the construction of structures 1/94 and 3/ 30 seems to have required a large effort, in comparison to structures 1/36 and 1/37. Medium and small stones from the local surrounding area are used in the construction of these structures.

The fourth level of analysis relates to the location in which these structures were positioned. All these structures are located on inselbergs and linked spatially to water streams. Structures 1/36 and 1/37 have been situated on low ground, and structures 1/94 and 3/30 are found on raised ground. All structures are placed on flat surfaces, except structure 1/37, which is positioned on a sloping surface.

The fifth level of analysis concerns the structures' spatial association with stone blocks that carry knapping traces⁽⁶⁾ and stone artefacts. Structures 1/36 and 1/37 have no cultural associations whatsoever; structure 1/94 is linked to stone artefacts; and structure 3/30 has spatial connection with stone artefacts and stone blocks with knapping traces.

3-House Structures:

Structures 1/95 and 1/96 belong to this type. They are represented by horizontal arrangement of stones, forming a large surface enclosure with internal divisions. Only two structures of this type have been found in the five study zones. However, a similar structure has been documented a few hundred metres to the east of zone 1, and to a large extent resembles structure 1/95.

The main dimensions of structure 1/95 are, in length 6.6 m., in width 5 m., and 30 cm. in height. This structure has a roughly rectangular shape with two small enclosures facing each other on one side. The size of stones used in its construction varies from small to medium, and it appears that part of the main enclosure wall is damaged. One can say that little effort is made in laying down this structure. It is located on a raised flat surface on the inselberg, and is close to a water stream. There are no stone artefacts or knapping debris at or close to this structure.

Structure 1/96, with a number of internal divisions, is also a horizontal arrangement of stones. The approximate measurements of this structure are: 6.35 m. in length, 3.22 m. in width, and 0.25 m. in height. This structure has five separate divisions inside it; each one opens into the other, and there is a main opening to the whole structure. Little physical effort is used in the construction of this structure.

Structure 1/96 is located on a raised flat



surface of the inselberg, with a water stream close by. Evidence of cultural remains are also lacking in this structure (Figure 20).

4- Rectangular Structures:

A single rectangular structure has been found in zone 1, and due to its rarity, it may have a special significance (Figure 11). The main measurements of this structure are 4.2 m. in length, 1 m. in width, and 0.35 m. in height.

This structure has a hollow rectangular area, surrounded by lumps of large and medium size stones. Although this feature is laid horizontally, it has been located on an exposed rock surface. It is located on a raised part of the inselberg, on a sloping surface overlooking a water stream. Little effort is applied for the construction of this structure, and there are no cultural remains associated with it.

Discussion

Throughout the preparation of this paper, various levels of difficulties have been met, and pinpointing areas of difficulty will help future research. It is possible that archaeological investigations of such phenomena are still far from comprehending the various factors related to the function of stone structures.

Three main levels of investigation are linked to a better understanding of stone structures, but they also represent areas of ambiguity and incoherence. The conclusions drawn in this paper are tentative at best, for the following reasons:

1. The lack of cultural remains among the recorded stone structures.

2. The widespread distribution of stone structures through time and space.

3. The absence of any definite typology of the various types of structures and the limited amount of research carried out for understanding this phenomenon in Arabia and nearby regions.

The temporal level

This level examines, from a chronological viewpoint, the relationship between the stone structures themselves as well as their relationship to lithic scatters and epigraphic evidence.

Inter-Structures Associations

Since all stone structures documented during the surveying stage were found on the sur-



Fig. 20: Example of the house type structure 1/96.

face, it is not possible to know whether all recorded structures are contemporary with each other, or date to various periods.

In fact, such questions may never be answered. However, one may be able to apply general criteria which may help reduce the level of uncertainty. It is correct to assume that the size and condition of each structure play an important role in clarifying its approximate time of construction. In other words, if one finds a small structure of the cairn type situated on the edge of a high location, one can confidently reject it, as it could not have withstood the various weathering effects for a long period of time. Thus, such a structure can be dismissed as a relatively recent phenomenon. Eliminated structures in the study area are shown in Table (7).

Within this level of analysis, other difficulties may surface. For example, the size and shape of the structure may not authentically prove that structures of a certain shape or size are contemporary with each other, nor would the opposite eliminate such association.

Structures -Lithics Association

The association between lithic remains and/ or knapped stone blocks with stone structures is very clearly documented. So far, however, the evidence at our disposal proves the spatial correlation between these two types of archaeological remains, but not the temporal one. As we shall see later, the results of the CASP⁽⁷⁾ have shown that the earliest types of surface structures date from about the Third/Fourth Millennium BC. This date is based on studying the correlation between the stone structures and other archaeological remains such as Neolithic artefacts and/or ceramic sherds.

Ronen (1970) has suggested that mobile

Zone 1	Zone 2
SITES: 1, 4, 5, 6, 8, 9, 10, 11, 14,	SITES: 1, 7, 8, 11, 13, 15, 16, 17, 18, 20, 22,
16, 17, 18, 20, 21, 23, 25, 26, 27, 28,	23, 24, 25, 29, 30, 31, 32, 34, 46, 47, 48, 49,
30, 31, 34, 38, 40, 41, 42, 43, 44, 45,	50, 51, 55, 56, 57, 58, 61.
46, 50, 51, 53, 54, 55, 56, 57, 58, 59,	
60, 62, 64, 66, 67, 68, 69, 70, 71, 72,	CANCELLED STRUCTURES: 30, 38, 39,
75, 76, 77, 78, 79, 81, 84, 86, 87, 88,	40, 41, 42, 43, 44, 45, 52
91, 93, 97, 98, 99, 100, 101, 102, 103,	
108, 109, 110, 111, 112, 114, 115,	CANCELLED SITE: 3
116, 120, 121, 122, 123, 125, 128	Zone 3
CANCELLED STRUCTURES:	SITES: 3, 5, 6, 7, 9, 11, 12, 13, 14, 16, 17, 18,
19, 22, 24, 33, 52, 65, 90, 124, 131	19, 20, 21, 22, 24, 25, 28.
CANCELLED SITES:	CANCELLED STRUCTURES: 26, 27.
85, 74, 107	Zone 4
	SITES: 1-7
	Zone 5
	I SITE ONLY

Table 7: A list of archaeological sites, cancelled sites, and cancelled stone structures in the study area.







Arabian Bedouins were possibly associated with stone structures and domesticated sheep, goat, camel, and donkey. Although the date of the domestication of these animals varies, it appears that the last one to be domesticated was the camel around 1500 BC (Bulliet 1975).

As far as the lithic remains encountered in the study area are concerned, a temporal association with documented stone structures is not envisaged, since the lithic material belongs largely to the Palaeolithic horizon.

Any suggestion of a temporal link between these two phenomena has, therefore, to be kept at a minimum. In other words, some stone structures may have been erected at the time of the manufacturing of the Palaeolithic stone artefacts. But this remains a hypothesis in need of evidence, since none has been found in the study area, nor anywhere else in the Arabian Peninsula.

On the other hand, hunter-gatherers of the Palaeolithic period are known to have been in constant movement in search of food and shelter. Nevertheless, structures on a small scale may have been built to serve certain temporary functions, but such structures may have perished soon after their abandonment.

Structures-Epigraphy Association

The presence of a lot of epigraphic and rock art evidence, mainly around the study area, indicates the possible temporal association with the stone structures recorded in the study area. The main components of such remains include rock art, pre-Islamic writing, graffiti and wasms (Figure 20)^{(8).}

On the basis of Anati's studies (Anati 1968a & b, 1970: 100-2, 151-4) four Periods of rock art were identified. The first period was of early hunters which dates to the early Holocene, and the second is of hunting and pastoral communities dating from the Neolithic to the late second millennium BC. The third period is the

Literate period, which dates from the late second millennium till the seventh century AD. This period encompasses rock art styles linked with the South Arabian and Thamudic scripts. North Arabian script is dated to the sixth century BC or a century earlier (Zarins et al 1981). The fourth period dates to the Islamic period.

As far as graffiti and "wasm" evidence are concerned, they may range from the pre-Islamic period till the last few decades. These may not have formal recognized traits that govern them, but the majority may be sketches of various shapes of camels and other local fauna, and/or scrambled signs of no apparent meaning.

Usually rock art and epigraphic evidence are found on sandstone outcrops exposed on the surface. The themes focus mainly on different representations of camels, along with various signs and marks that are used in branding camels by different Bedouin tribes.

The various styles for drawing camels may suggest one of two possibilities: the first interprets the different styles as belonging to different groups (tribes) from different parts of the Arabian Peninsula. The second interpretation suggests the presence of a temporal gap between the different drawing and/or engraving styles of camels. The evidence seems to advocate the first possibility on the grounds that the patination of the rock surface is the same for all encountered drawings. Furthermore, the different camel styles may even represent different styles of drawing by different people during a short period of time.

It is also possible that a further artistic style is also present in these rock drawings and graffiti, which take the form of lines and holes of various shapes.

The Spatial Level

This section aims to examine, as far as stone structures are concerned, the spatial relation-



Fig. 21: A rock face littered with graffiti and possible wasm symbols.

ship between the various archaeological remains.

Although such relationships exist in the present archaeological record, one cannot judge objectively on the basis of this variable alone. However, as far as interpretation is concerned, it can be a highly useful indicator.

Inter-Structures Association

Spatial association between stone structures themselves is clearly noted. In order to clarify

the association between structures on the zone level, a table has been constructed to show those which are situated next to other structures (Table 8).

In zone 1, twelve clusters of structures have been noted, each has from two to four structures. Six clusters have only two structures each, three clusters have only three structures each, and three clusters have four structures each. Three clusters contain only structures of the circular type, three clusters of the cairn



Fig. 22: Animal drawings and pre-Islamic writing found in Zone 1.



type, and cairn and circular structures mainly represent the remaining clusters.

In zone 2, five clusters have been recognized; one of them has four structures, another cluster has only three structures, and the remaining clusters have two structures each. Two clusters have structures of the cairn type only, while the remaining clusters have mainly cairn and circular structures.

In zone 3, three clusters of structures have been found; one with three structures and the rest with two structures each. A single structure type dominates none of these structures.

Structures-Lithics Association

Out of the 75 structures recorded in the study area, there are 26 structures with no stone blocks with knapping traces or stone artefacts, 9 with stone blocks with traces of knapping, 25 with stone artefacts, and 14 have both stone blocks with knapping traces and stone artefacts. As discussed above, no cultural links between the stone structures and the lithic remains in the study area is advocated; however, a possible explanation for such spatial correlation is given below.

The most plausible reason for the spatial correlation between stone structures and lithic remains lies in the choice of some locations which happened to be inhabited earlier by Palaeolithic hunter-gatherers. The latter inhabitants, and builders of these structures, are likely to have been pastoralist Bedouins who grazed animals, such as goat, sheep, and camel, in the open plains.

On the other hand, the presence of some knapped stones in some structures indicates the use of nearby stones for their construction. Such knapping traces would not have meant anything to later settlers in the area.

As far as the association between stone structures and epigraphic evidence are concerned, there have been no cases where both have been found together in the study area. The discussion above, regarding the temporal association between these two types, is therefore sufficient.

The Function of Stone Structures

Without finding any archaeological remains, it is rather difficult to determine the exact function of the various structures recorded during the field survey. Excavation of stone structures in the study area was not undertaken during the conducting of the fieldwork due to the superficial and small size of many recorded structures. Furthermore, the absence of any apparent network of structures in the respective zones makes such effort limited, especially insofar as drawing conclusions is concerned.

Future fieldwork oriented towards problem solving on the regional level would make the excavation, and simultaneously the destruction associated with it, of these structures more arguable rather than just disclosing their contents. Such a stand is meant to avoid unnecessary excavation, particularly when archaeological investigations in Saudi Arabia are just beginning to take place.

From the various surveys and excavations carried out in Jordan (Betts 1982, Helms et al 1987), the Negev desert (Haiman 1992), Sinai (Anati 1986, Finkelstein et al 1990) and parts of North Africa (Milburn 1974, 1976a, 1976b) hundreds of stone structures of different varieties and shapes have been recorded. There are also various types of structures which are related to agricultural uses such as water dams, stone and mud enclosures, and many other types which do not match morphologically and/or functionally any of the structures discovered in the study area.

One has to admit, however, that recorded structural remains span a long time period ranging from as early as the 3rd/4th millennium BC to the last few centuries. In relation to



An Archaeological Study of Stone Structures	in Northeast Riyadh
---	---------------------

Clusters	Zone 1	Zone 2	Zone 3
With 4 Structures	a. 32, 35, 36, 37. b. 39, 133, 134, 135. 3. 92, 94, 95, 96.	a. 2, 4, 5, 6.	
With 3 Structures	a. 81, 82, 83. b. 47, 48, 49. c. 2, 3, 7.	a. 9, 10, 14.	a. 1, 2, 4.
With 2 Structures	a. 12, 13. b. 61, 63. c. 113, 139. d. 118, 119. e. 126, 127. f. 137, 138.	a. 26, 27. b. 53, 54. c. 59, 60.	a. 30, 31. b. 32, 33.

Table 8: The spatial clustering of stone structures in Zones 1, 2 and 3.

the cultural association of these structures, the various surveys and excavations conducted face a number of difficulties, mainly in dating them and determining the functions they are meant to fulfil.

An attempt to understand the role of the documented structures in the study area is undertaken below. Analogies with similarly recorded structures in other areas will be made as a possible guideline to the function of those discovered in the study area.

To reiterate, the determination of the possible function of stone structures can only be tried here. The lack of stratigraphic evidence, along with the absence of cultural remains (e.g., pottery sherds, agricultural implements, etc.) that are clearly associated with the stone structures, asserts the tentativeness of pinpointing the role these structures played in the past.

Since some of these structures may belong to pastoralist communities, one hopes to infer from their general traits the most plausible functions. The total absence of any cultural remains associated with these structures supports strongly the assumption that those who erected them were not leading a sedentary life style. To the contrary, ethnographic observations of Bedouin life patterns indicate that short-term settlement is always the norm and that Bedouins are in constant movement in search of pasture, water and safe grounds.

A functional interpretation of all structures found in the study area is attempted below.

Cairn Structures:

Some of the cairn structures may have been used as "rijm", i.e. markers on high locations for passing caravans, whereas other larger structures may have been erected to be used for observation and reconnaissance of human or animal movements in the area. Another plausible role for the cairn structures may be as lowlevel shelters from strong winds or cold weather. Such structures may have been used as hiding places when trying to capture or trap wild animals. Large cairns have been documented in many parts of Arabia and were either used mainly for burial or part of a burial ritual. Cairn structures have been found throughout Saudi Arabia, South and Eastern Arabia, Sinai, the Levant and throughout North Africa.

A single, apparently disturbed, cairn structure, 1/35, resembles to a large extent, in shape and probably function, a group of structures reported by AlShahri (1991: 184) in the Dhofar



region of southern Oman. These structures, locally known as "maljuf" or "marjum", have an elongated shape and were found, like structure 1/35, blocking a natural cleft in the rock. Owing to the presence of human skeletons, the Omani structures (numbering over 200 in an area of 400 x 20 m.) are interpreted as being used for burial. No date has been given to these structures, but local people suggest that they are not very old.

Cairn series structures (known also as tumuli [or cairn] tails (e.g. Parr et al 1978), or cairn lines, (e.g. Avner 1984) seem to be unique in their character, and a number of possible interpretations may apply to them. One possibility is that these structures may form one part of a group of structures. Such correlation has been established among structures 4-5-6 (Figure 10), as well as 14-10-9 in zone 2 (Figures 16 and 17). Here, structures (4 and 14) are stone cairns, structures (5 and 10) are cairn series structures, and structures (6 and 9) are low-lying stone circles. One can recognize a pattern that indicates that these structures in this manner serve a certain role. Hypothetically, these cairn series may relate to some religious ceremonies or practices. However, such an assumption cannot be confirmed for the lack of material objects relating to such activities, i.e. fire traces or altars.

Many reported examples in the literature have noted the presence of rows of small cairns in many parts of Arabia, Sinai and the Negev. In some places, cairn series may be found all by themselves, associated with one or two large cairns, or with stone platforms.

The results of the CASP (Comprehensive Archaeological Survey Programme) in Saudi Arabia have indicated the presence of cairn series all over the country. Forty-two and twenty-nine occurrences have been reported from the Western and Northern Provinces respectively. The length of the tails varies considerably from 5 m. to over 1 km (Zarins et al 1979; Zarins et al 1980).

Doe (1971) has reported the presence of 33

Structure Type	Eastern ⁽¹⁾	Northern(2) & NW + N(3)	Central(4) & Central + S.W.(5)	Southwestern(6) Western(7)	Riyadh(8)	Study area: N. E. Riyadh
Tumulus	@	@	@	@	@	
Circle		@	@	@	@	@
Cairn		@	@	@		@
Kite		@				
Standing Slabs		@	@	@	@	
Tapered			@	@	@	
Trough			@	@	@	
Platform		@	@		@	
House		@	@	@		@
Cleared Area			@			
Hearth					@	
Subterranean Tomb			@			
Enclosure		@		@		

Table 9: The distribution of the main structure types in Saudi Arabia. (Based on Articles published in (Atlal) the Journal of Saudi Arabian Archaeology).

References:

1. Adams et al 1977 & Potts et al 1978 . 2. Adams et al 1977 & Parr et al 1978. 3. Ingram et al 1981 & Gilmore et al 1982 4. Zarins et al 1979. 5. Zarins et al 1980. 6. Zarins et al 1981. 7. Killick et al 1981 8. Zarins et al 1982.



cairns of the same size and a larger one at one end. The cairns were constructed of rough masonry and measured about three feet high, while the larger cairn measured about four or five feet high, and they were all situated on a narrow ridge of the Jebel Aqabih in Yemen (See Doe 1971: 237, fig. 39). Doe (1971) interpreted this series of cairns as being of recent age and were erected to mark the path to Al-Abr. However, the finding of these phenomena in many locations in Arabia and elsewhere proves wrong such interpretations. Other cairn series associated with a large circular tomb have been found in the western part of Wadi Hadhramaut at al-Alam Abyadh, east of Wadi Jirdan. On the Jol Naja, near Urum in Yemen, a large monument has a tail of fifteen cairns, as well as on ridges on the Wadi Jawf area (Doe 1983). He suggested the plausibility of constructing the cairn-series structures as route markers on ancient caravan routes from southern Arabia through the center and towards Gerrha, near the Arabian Gulf, and then towards the northern frontiers of the Arabian Peninsula (ibid).

Bowen (1958) reported that Van der Meulen, during his travel in Wadi Amd in south Yemen, mentioned having seen rows of stone heaps, similar in shape and pattern, stretching in low rows from two large cairns in two directions. Bowen further reported the presence of about 20 small Cairns, which are spaced 2-3 m. apart and rise 30 to 50 cm. on the high ground near Wadi 'Adim in South Arabia (Bowen 1958: 134, Figures 91 & 94).

Evidence for the presence of cairn series in the Sahara is reported by Tillner (1981: 15) and Milburn (1976b: 122)

Haiman (1992) has reported the finding of rows of small cairns in the Negev, but without the presence of a large tumulus. Some of these cairns were found associated with rectangular platforms or elongated walls. The relationship between the platform and the row of cairns cannot be confirmed as being of the same age. In the southern part of the Negev, rows of small cairns were found erected on high points of the ground so that they can be seen from a long distance. The finding of rows of small cairns near sites dating to different periods does highlight the problem of separating the different remains from each other. A number of cairns at the foot of Har Horesha was dated to the Islamic period (Haiman 1992, See Figs. 15, 16, 18). Platforms found associated with the row of cairns may have been used mainly for burial.

The number of cairns in each series differs from one region to another. The extent to which the number of cairns in each series is relevant to its intended function has yet to be established.

The distribution of this type of structure indicates its wide geographical scope. There are two possible hypotheses for the spread of cairn structures, in general, and cairn series, in particular.

The first may relate to social, economic or religious needs for pastoralist communities from the 4th-3rd millennium BC., and could have been passed from one generation to another, and spread throughout the Arabian Peninsula and North Africa, by means of trade or social contacts.

The second possibility could be the wide geographical prevalence of pastoralist communities throughout the Arabian Peninsula and North Africa, that multiplied over the centuries and split in search of pasture and water. It is beyond doubt that finding similar material culture associated with stone structures from other regions would indicate social or economic connections between the different regions.

It is premature to establish any cultural relationship between the different pastoralist communities in the regions concerned. The



meager amount of cultural remains from these communities makes such hypotheses in need of further proofs.

On the other hand, one cannot rule out the different uses of cairn series and the large cairns associated with them in different regions. Avner (1984) points to the possible cultic association of cairn series structures on the basis of their construction method, the well-worn paths leading to these cairns, and their association with tumuli, nawamis, tombs, rock shelters or open sanctuaries.

It is suggested here that the number of cairns erected in a cairn series may represent the number of people, dignitaries and/or family members, who attended the funeral of an important personality within the community. As a commemoration of their sorrow, each one of them erects a single cairn structure.

Circular Structures:

Circular structures are apparently related to the construction of living spaces, such as hut foundations in the case of large circular structures (e.g. 1/113 and 1/139), or activity areas in the case of small circular or semi circular structures. It is also likely that the circular type of structures may have been used in hunting activities or as hiding locations to surprise wild animals when being attacked. It is also possible that pastoralist communities kept newborn animals in these circular enclosures. Circular structures, which consist of a single line of stones, may indicate the layout of temporary camps.

Gabriel (1987) reported the finding of small circular structures in the Sahara, which measure between about 0.75-3 m. in diameter. These were apparently used by pastoralists who kept cattle, and used those "stone places", as named by Gabriel, as hearths due to the presence of traces of fire in some of them. These circular horizontally-laid circles are common all over Arabia, as well as in the study area, viz. structures 1/29, 1/83, 1/130, 1/126, 3/8, and 3/10. None of the latter structures have any traces of fire. It seems these circular structures were related to temporary hut making, and the stone pieces forming the circle shape were used for the holding of the cover garment over the inside part of the circle.

A parallel for circular structures surrounding a large cairn in the middle, such as structures 3/1, is reported by Milburn (1974) in Morocco, site McB. Palaeolithic implements are found associated with this structure, which are also found associated, spatially, with site 3/1 in the study area. Milburn suggested that the cairn in the middle is likely to have been used for burial.

Linear Structures:

The third type of structure is that of linear structures, which is represented, as discussed above, by rectilinear and curvilinear shapes.

The clear association of these structures with water streams is very suggestive of their aquatic role. Structures 1/36, 1/37 and 3/30 are all situated in the middle of water streams and form a low level dam-like structure. In the case of structures 1/36 and 1/37, the location of these structures is not a flat open area, as in the case of structure 3/30.

However, two possibilities may be suggested for the construction of such structures. First, they may have been erected in order to block rain-water from flowing down the slope, making it possible for domesticated animals to have an ample supply of water. The second possible purpose of making these structures is to lure wild animals (gazelles, wild goat, birds and ostriches), which used to roam the vast plains of Arabia, into these water pools, thus becoming an easy target for hunters. If such strategies were ever attempt-



ed, then one would not be exaggerating when suggesting that structure 1/32, near 1/36 and 1/37, and possibly structure 3/31, next to 3/30, may have been used as hiding locations.

House Structures:

House structures, 1/95 and 1/96, are the most conspicuous structures in the whole of the study area. From the outset, they appear to be related to settlement and living activities. However, no definite function has yet been proven. In my opinion, these structures may only lack perishable material such as wood and wool garments to cover the top and side of the structure.

Evidence of fire, post-holes, or other human remains has not been found. Another likelihood is that they may be recent in date. However, this possibility seems unlikely due to the documentation of such structures in at least two other locations within the Arabian Peninsula. Structures of the "House" type has been found during the surveying activities of the Directorate General of Antiquities in a number of areas. These structures have been found during the surveying of the central and southwestern provinces (Zarins et al 1980). Two types have been recognized as belonging to the "House Type" structure; one structure has the shape of a horseshoe, site 221-24, (ibid. pl. 8B), and the other type has a rectangular shape, site 210-49, (ibid. pl. 10B). Some other structures appear to have subsidiary structures.

At the site of 'Amlah (site 41) in central Oman, a number of "House" structures is documented by De Cardi et al (1976) during their surveying work. One structure, site 4, consists of a single-stone wall alignment built directly on the surface and is situated next to a circular enclosure. Additional single stone structures can be recognized on site 5b (ibid. Figures 21-22) and 'Amlah site 11 (ibid. Figure 38), though none are recorded in detail. The published sketch plans encompass them under the category of "House" structures (Doe 1976).

The difficulty of determining the function of these structures lies in the inability to find any datable remains. Structures related to agricultural activities such as canals or terraced walls do not exist in the study area.

The Cultural Perspective

Due to the apparent absence of material culture from the stone structures documented in the study area, a straightforward explanation of the actual use and role of the various structures is difficult to obtain.

Two main issues are involved here; one concerns the contemporaneity of the various types of stone structures with each other, and the other is the cultural association of these structures as a whole. Insofar as the first point is concerned, one can generally recognize the limited number of structure types present in the study area, making rather arbitrary the distinguishing of certain types from others. On the other hand, the number of similar structure types may also point to their use for similar purposes. Hence, with the exception of smallscattered cairns, one can, with caution, recognize the majority of stone structures as belonging mainly to a single cultural horizon in this region.

It appears that these structural remains are erected by pastoralists who regularly pass through the area and settle for short periods, depending on the availability of water and pasture (Contemporary examples of short-term settlement have been found in the study area, see Figures 23 & 24). The total absence of Neolithic stone artefacts, as well as pottery from this area confirms their late date.

Since pastoralist communities have a visible record in the Arabian Peninsula, one can recognize a cultural distribution of stone struc-



tures over a wide geographical area.

Although many types of structures are not found in the study area, the results of the surveying activities of the Directorate General of Antiquities and Museums in the whole of Saudi Arabia highlight the variety of types present that could complement the interpretation put forward here. This interpretation fits well with that given during the 1980 survey of the Riyadh area, and drawn mainly from the structural remains discovered in the Bir Hima Area.

That interpretation has pointed to the presence of a "desert culture" which is utilizing camel and dating back to the first millennium BC and the early centuries AD. Although the structures found in the study area do not include troughs and tapered structures, nor have there been any traces of ceramic, the overall character of these remains points strongly to a wider geographical connection between the different structures, at least in central Arabia (Zarins et al 1982).

Summary

A number of issues has been addressed throughout this paper, and most of the difficulties associated with the study and interpretation of stone structures lie in the fact that they are surface finds, with no stratigraphic linkage. One is therefore left without an in-depth view of the temporal perspective of these phenomena, making the morphological comparison and the spatial association over-represented.

Although the structures documented here do not have an exact counterpart, in terms of the variety of structures present elsewhere, one has benefited from the various findings reported



Fig. 23: one of the few remaining examples of recent Bedouin settlement in the study area.



An Archaeological Study of Stone Structures in Northeast Riyadh



Fig. 24: The camel, seen here mounting the hilly ground at zone 1. Played a vital role in the lives of those who inhabited the desert during the past few millennia.

from all over the Arabian Peninsula and North Africa.

From the regional investigations of the phenomenon of stone structures, undertaken by the Directorate General of Antiquities and Museums, and later investigations mainly by Zarins (1989b, 1992), it is possible to fit the majority of the structures found in the study area into the chronological model proposed by Zarins (ibid.).

The finding of hearths, one packed with stones, cairn structures, stone circles, "House" structures, rectilinear and curvilinear structures, and tumuli made of piles of stone rubble, all these point to a pastoralist mode of life. The ephemeral nature of the archaeological finds and the epigraphic evidence depicting camels, all point to the use of camel in the study area between the 2nd millennium BC and the 1st millennium AD (Ingraham et al 1981; Zarins 1989b). However, due to the absence of ceramic and lithic material, it is postulated that these structures date to around the 1st millennium AD (Zarins et al 1980)

The significance of these structural remains lies in the fact that they are located in the Arabian shelf, hence extending beyond the Arabian Shield which is thought to be the geographical limit for the cultural development in the Nejd region, as it has commonly been proposed by Zarins et al (1980).

In addition, unlike the structures recorded by Zarins, the structures found in the study area, 35km NE of Riyadh, are largely on lowlying inselbergs, rather than at the base of natural rock exposures. Troughs, however, have



not been found, and there is a possibility that they may lie, along with other types of structures, beneath the thick sand masses on the lower grounds.

Unlike the structures mentioned above, other reported structures from the study area appear to predate them-- particularly, the large tumuli structures, cairn series, large circular structures, and the tumuli surrounded by a wall. In the Nejd, all these structures could be reminiscent of the "Pastoral Nomads Technocomplex", or at least contemporary with it, and could probably date to around the 4th or 3rd millennium BC. (Zarins 1992: 50).

However, due to the low number of structures

thought to belong to this cultural horizon, the absence of associated lithic and ceramic remains, the absence of certain structure types, e.g. kites, and the low density of sites, make any linkage to the "Pastoral Nomads Technocomplex" purely speculative at this stage.

This paper has, hopefully, highlighted both the wider aspects of the phenomenon of stone structures and, more specifically, the structures studied and interpreted in Central Saudi Arabia. Future archaeological investigations into pastoralist communities in many parts of the world will lead to a better understanding of surface stone structures.

<u>Dr. Abdullah M. Alsharekh</u> - Department of Archaeology and Museology, College of Arts, King Saud University, P. O. Box 2456, Riyadh 11451, K. S. A. <u>e-mail</u>: asharekh@hotmail.com

ملخُص: يتناول هذا البحث ظاهرة المنشآت الحجرية، في المنطقة الوسطى من المملكة العربية السعودية، التي دُرست ووثقت، خلال العمل الميداني الذي أنجزه الباحث، في أوائل التسعينات الميلادية. ونظراً لطبيعة المنشآت الحجرية، وانتشارها الجغرافي في منطقة الدُغم، شمال شرق مدينة الرياض، فقد وضع الباحث منهجاً علمياً لتسجيل وتوثيق كافة الظواهر الآثارية الموجودة فيها. كما يسلط البحث الضوء على الجوانب الحضارية المرتبطة بظاهرة المنشآت الحجرية. ويؤمل أن يخدم هذا البحث الدراسات المستقبلية لهذه الظاهرة، في الجزيرة العربية.

Notes:

- (1) This paper is part of my PhD Dissertation, (see: Al Sharekh 1995)
- (2) The evaluation of the amount of effort needed in order to carry out a certain physical activity is meant only to give an approximate estimate rather than a precise one.
- (3) Vertical structures have a height of over 0.50 meter
- (4) Horizontal structures have a height less than 0.51 meter
- (5) This attribute is rather arbitrary, to give an idea about the variation between different structures.
- (6) Stone blocks with traces of knapping are rennats of earlier human occupation of the region.
- (7) CASP stands for the "Comprehensive Archaeological Surveying Programme", which was conducted by the General Directorate of Antiquities and Museums.
- (8) These are special signs that were used by Bedouin tribes to distinguish their herds from those belongin to other tribes, and every tribe has its own unique brand.



Rererences

Adams, R., Parr, P., Ibrahim, M. and Al Mughannum, A. 1977. "The preliminary report on the first phase of the comprehensive archaeological program", **Atlal** 1: 21-40 Directorate General of Antiquities and Museums: Riyadh.

Al-Shahari, A. 1991. "Grave type and 'triliths' in Dhofar", **Arabian Archaeology and Epigraphy** 2: 182-195.

Anati, E. 1968a. "Rock art in Central Arabia", Vol.1. **Bibilotheque du Museon**, Vol. 50, Louvain.

Anati, E.1968b. "Rock art in Central Arabia", Vol. 2, Part I and II, **Bibilotheque du Museon**, Vol. 50, Louvain.

Anati, E. 1970. "The rock engravings of Dahthami wells in Central Arabia', **Boll, del Centro Camuno di St. Preist**, 5: 99-158.

Avner, U. 1984. "Ancient cult sites in the Negev and Sinai deserts', **Tel Aviv** 11: 115-131

Betts, A. 1982. "Jellyfish': Prehistoric desert shelters', Annual Department of Antiquities and Archaeology. Jordan 26:183-188.

Bowen, R. 1958. "Burial monuments of South Arabia", Appendix I, In: R. Bowen (ed.) Archaeological discoveries in South Arabia, PP. 133-138, Baltimore, The John Hopkins Press.

Bulliet, R. 1975. **The Camel and the Wheel**, Harvard University Press, Cambridge, Mass.

Cribb, R. 1991. **Nomads in Archaeology**, Cambridge University Press, Cambridge.

De Cardi, B., Stephen, C. and Doe, B. 1976. 'Excavation and survey in Oman, 1974-1975", **The journal of Oman Studies** 2: 101-147, Ministry of Information and Culture, Muscat, Sultanate of Oman.

Doe, B. 1971. Southern Arabia, Thames & Hudso, London.

Doe, B. 1976. 'Gazetter', **The Journal of Oman Studies** 2: 148-175 Ministry of Information and Culture, Sultanate of Oman.

Doe, B.1983. Monuments of South Arabia. Falcon-Oleander, Italy.

Finkelstein, I. And Perevolotsky, A. 1990. 'Process of

sedenarization and nomadization in the history of Sinai and the Negev", **Bulletin of the American Schools of Oriental Research** 290: 67-88.

Gabriel, B. 1987. "Palaeoecological evidence from Neolithic fireplaces in the Sahara", **The African Archaeological Review** 5: 93-103.

Gilmore, M., Al-Ibrahim, M. and Murad, A. 1982. "Preliminary report on the Northwestern and Northern region surve", **Atlal** 6: 9-23, Directorate General of Antiquities an Museums, Riyadh.

Haiman, M. 1992. "Cairn burial and cairn fields in the Negev", **Bulletin of the American Schools of Orien**tal Research 287: 25-45.

Helms, S. and Betts, A. 1987. "The Desert Kites of The Badiyat Al Sham And North Arabia", **Paleorient** 13 (1): 41-67.

Ingraham, M., Johnson, T., Rihani, B. and Shatla, I. 1981. "Preliminary Report On A Reconnaissance Survey of The Northwestern Province (With a brief survey of the Northern Province)", **Atlal** 5: 59-84. Directorate General of Antiquities and Museums, Riyadh.

Killick, A., Whalen, N., James, N., Morsi, G. and Kamal, m. 1981. "Preliminary Report on the Western Province Survey", **Atlal** 5: 43-58. Directorate General of Antiquity And Museums, Riyadh.

Milburn, M. 1974. "Some stone monuments of Spanish Sahara, Mauritania and the Extreme south of Morocco", **Journal de la Societe des Africanistes** 44: 99-111.

Milburn, M. 1976a. "Two enigmatic constructions of Western Air", I. C.- Nachrichten 21: 2-3.

Milburn, M. 1976b. "On small dry-stone cairns of parts of Arabia, Algeria and Western Air", **Proceedings of the Seminar for Arabian Studies** 6: 117-123.

Parr, P., Zarins, J., Ibrahim, M., Wawchter, J., Garrard, A. Clarke, C., Bidmead, M. and Al Badr, H. 1978. "Preliminary report on the second phase of the Northern Province Survey 1397/1977", **Atlal** 2; 29-50. Directorate General of Antiquities and Museums, Riyadh.

Potts, D., al-Mughannum, M., Frye, J. and Sanders, D. 1978. "Preliminary report on the second phase of the



Eastern province survey 1397/1977", Atlal 2: 7-27, Directorate General of Antiquities and Museums, Riyadh.

Ronen, A. 1970. "Flint implements from south Sinai", **Palestine Explorations Quarterly** PP. 30-41.

Sharer, R. and Ashmore, W. 1979. Fundementals of Archaeology. Menlo Park, London.

Tillner, E. 1981. "Steinzangen monuments und Graber in der Sahara", Antika Welt 12: 14-26.

Zarins, J., Whalen, N., Ibrahim, M., Mursi, A. and Khan, M. 1980. "Preliminary report on the Central and Southwestern Provinces survey: 1979", **Atlal** 4: 9-36, Directorate General of Antiquities and Museums, Riyadh.

Zarins, J. 1989. "Pastoralism in Southwest Asia: The Second Millennium BC.". In: J. Clutton-Brock (ed.) **The Walking Larder: Patterns of Domestication, Pastoralism, and Predation.** pp. 127-155, Unwin Hayman: London.

Zarins, J. 1992. " Archaeological and Chronological

Problems within the Greater Southwest Asian arid zone, 8500-1850 B.C.". In: R. Ehrich (ed.) **Chronologies in Old World Archaeology** . 2 vols, 1: 42-62/ 2: 61-76 (3rd. ed.) The University of Chicago Press, Chicago.

Zarins, J. Ibrahim, M., Potts, D. and Edens, C. 1979. "The Preliminary Report on the Third Phase of the Comprehensive Archaeological Survey Program- The Central Province", **Atlal** 3: 9-42, Directorate General of Antiquities and Musems, Riyadh

Zarins, J., Whalen, N., Ibrahim, M., Mursi, A. and Khan, M. 1980. "Preliminary Report on the Central and Southwestern Provinces Survey: 1979", **Atlal** 4: 9-36. Directorate General of Antiquities And Museums, Riyadh.

Zarins, J., Murad, A. and Al-Yish, K. 1981. "The Second Preliminary Report on the Southwestern Province", **Atlal** 5: 9-42. Directorate General of Antiquities And Museums, Riyadh.

Zarins, J., Rahbini, A. and Kamal, M. 1982. "Preliminary Report on the Archaeological Survey of the Riyadh Area", **Atlal** 6: 25-38. Directorate General of Antiquities And Museums, Riyadh