

**Settlement Patterns and Military Organisation in the Region of Udhruh (southern Jordan) in the Roman and Byzantine Periods**

By

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### **Publications related to this thesis**

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### Abstract

This thesis considers the changes to settlement and landuse that occurred in the region of Udhruh, southern Jordan, following the annexation of the Nabataean kingdom by Rome in AD 106 until the Early Islamic period. The region experienced a long flourishing period of history as part of the Nabataean kingdom in the hinterland of the capital at Petra. Historical and archaeological resources clearly indicate its importance throughout most of the historical periods after the Roman conquest. A legionary fortress is still fairly well preserved at Udhruh and other military structures have long been suspected at Ayl and Sadaqa and elsewhere. Apart from Alistair Killick's study in the 1980s (not yet fully published), the area has received little scholarly attention.

This study provides for the first time a detailed survey of about 336 archaeological sites, most of which were undocumented. These were recorded in the course of two seasons of fieldwork and many of these sites demonstrated continued occupation and activity up to the last century. Overall, there is exceptional preservation and very little disturbance of the archaeological remains from the period under study. The thesis also considers evidence for the region found in historical documents. Udhruh, for instance, was second on the Beersheba Edict list of tax-paying towns in the province of *Palestania Tertia* during the Byzantine period. Udhruh and al-Jerba are also said to have paid the poll tax to the Muslims in AD 630.

Finally, apart from investigating the shifts in settlement patterns, the thesis provides a clear understanding of the military organisation in the region and its relation to the broad system of the *limes Arabicus*. There is also a detailed discussion of the road system and its relation to the imperial road system such as the *via nova Traiana* and the ancient trade routes. This study also presents a detailed investigation of the water supply systems and the techniques used by the inhabitants of the region to overcome the shortage of water resources in a dry zone of Jordan and its impact on the economic situation of the area. Other significant archaeological features such as Khatt Shabib were also considered in this study.

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## Chapter One

### Introduction

#### The importance of study

The historical and archaeological evidence from the region of Udhruh reflects a long history of human activities, not only during the Roman and Byzantine periods but before and after the periods in question. During the Nabataean period, the area seems to have flourished as part of the Nabataean kingdom in the hinterland of Petra. Sometime during the Roman period, a legionary fortress was built at Udhruh, the perimeter wall of which is still fairly well preserved. During the Byzantine and Early Islamic periods the region is well attested in epigraphic and written sources. Udhruh, for instance, was the second in the Beer Sheba Edict which lists the tax-paying towns in southern Palestine. There is also evidence for military units based at Sadaqa according to an inscription dated to the 6<sup>th</sup> century from the Sinai. The communities of Udhruh and al-Jerba are said to have peacefully submitted to Muslims in the 7<sup>th</sup> century. Archaeological investigation would reveal evidence which could add further dimensions to our understanding of the region's past.

Denis Baly once wrote describing Edom: *"the whole Edomite region cries out for more thorough study, both geographical and historical. It is so evidently, even to the casual visitor, a region with its own distinct character, a narrow line of villages perched just below the rim of the plateau, here at by far its greatest height"* (1985: 23). These words can be equally applied to the villages of Rawdhat al-Ameer Rashid, Beir Abu Danneh, Basta, Ayl, Fardhakh and Sadaqa in the study area. Previous fieldwork studies had focused on the ancient city of Petra and the areas to the north, south and west of it. Apart from Killick's study in the 1980s, the region of Udhruh has not been systematically investigated. The results of his fieldwork remain largely unpublished although it was finished twenty years ago. Therefore, this study is intended to fill a major gap of the archaeology of this historically important region. The results of such a study along with the outcomes of other regional projects around Petra would be useful, in a broader context, in understanding the contribution of the

hinterland to the development of Petra as a centre of human activities over many centuries.

Moreover, considerable parts of the study area lie in a marginal area between the heights of the Jebal al-Sherah and the desert. There is a common sense among archaeologists that a different society existed in the marginal areas from that of the agricultural regions or the heavily settled parts of the Jebal al-Sherah. This hypothesis has led some scholars to interpret the presence of military structures between the sown and the desert to be the result of a threat caused by the nomadic groups who lived mostly in the desert. Archaeological evidence from the study area might cast light on the validity of such a view, at least in a region near an important city such as Petra, and provide evidence for the existence or absence of such a marginal society. Two studies have addressed this issue in southern Jordan; the first is Jobling's fieldwork between Ma'an and Aqaba, which is truly a marginal area (1984: 191-201). The preliminary conclusions of Jobling's study prove the presence of such society on the basis of epigraphic and archaeological evidence (1984: 201). The second study initiated by Saidel (2000: 569-580) investigated the archaeology of the Bedouins in an arid zone. The areas chosen for the purpose of the study were located around Ma'an, some of which are within the region of Udhruh. The present study provides new data to test some hypotheses concerning the pastoralist's society in marginal areas.

Although the study area in this thesis does not lie in an industrial region or within an intensively occupied part of Jordan, the risk of losing important archaeological data has significantly increased in the last decade as a result of small agricultural projects supported by the government. Most of those projects were based on the construction of terrace walls. The latter are mainly built of stones normally taken from the nearest archaeological site whether a structure, a wall or a mound which consequently led to the damage and disappearance of ancient ruins important to understand the human history of the region. A large structure to the northwest of Abu Danna, for instance, totally disappeared as its stones were used to build field walls for a would-be farm. Another example is Khatt Shabib as considerable parts of the ancient wall northwest of Jebal al-Jithih disappeared between the author's visits to the site in 2003 and 2004. Another threat to the archaeology of the region comes from tomb robbers who have become very active since the 1990s. Those people have disturbed and damaged many



sites in the study area through random excavations searching for gold and precious materials. A structure, fortunately recorded by the author (Site no. 112) was damaged by a bulldozer in 2004. A systematic survey would document and study significant archaeological evidence necessary to understand the history of the region before it disappears or is destroyed.

#### The study area (Fig. 1.1)

According to the recent administrative changes in the district of Ma'an, the area of survey lies within the borders of five governmental and administrative regions: the Municipality of Udhruh, the Municipality of al-Jerba and al-Manshieh, Ma'an, the Petra Regional Authority and the Municipality of Ayl. Archaeologically, the survey area is better known as the region of Udhruh (see Killick, 1986; 1981); however, it could also be described as Udhruh and its environs.

The modern road network in the regions mentioned above was actively used to delimit municipal zones. This means that in many cases we did not go beyond the asphalt roads for the purpose of survey. Although this strategy might seem weak in terms of losing geographical cohesion and the similarity in archaeological data, it was the most logical way to define the survey area and to finish the work according to the schedule. Moreover, some areas beyond the modern roads had been previously surveyed, especially the area to the west of the Shaubak-Wadi Musa road and the Wadi Musa-Basta road. However, in some cases we had no choice but to cross a road either to record ruins not recorded or visited before, or to find the end (start) of an ancient road, or to keep a straight border line of the study area.

A modern road runs east-west and connects the Shaubak-Udhruh-Ma'an Road with the Shaubak-Wadi Musa Road. This represents the north-western line of the survey area. This road starts at the southern edge of al-Jerba al-Jadeidah and has a length of roughly 10 km. An imaginary (E-W) line starts just a few metres to the north of al-Jerba Fire Station and heads eastward along a desert road for 10 km into the desert; this represents the north-eastern line. From the wells of al-Braikeh a line was drawn to be part of the eastern bordering line, and it extends south/southwest from al-Braikeh until it intersects the Shaubak-Udhruh –Ma'an road at the permanent location of al-



Hussein Bin Talal University. From there down to Ma'an the modern road completes the rest of the eastern line. Most of the area (eastward) beyond the latter line and road is occupied by modern quarries, al-Hussein Bin Talal University, and the city of Ma'an.

The western limit is represented by the Shaubak-Wadi Musa Road and the Wadi Musa-Basta Road. From a point where the Wadi Musa-Basta significantly turns southeast to Basta, an imaginary line was drawn to form the remaining part of this bordering line south/southwest until it reaches Sadaqa. This line crosses the Attayba-Ayl Road and runs horizontally to the west of Basta, Ayl and al-Fardhakh. The southern border line of the survey area extends east-west from Sadaqa and its Rujm along a recently constructed road down to the village of Whaidieh. The Ma'an-Aqaba Road; from Ma'an to the Whaidieh interchange, is the south-eastern end of this line.

#### Climate

Four seasons are recognisable in Jordan, though winter and summer are most distinct. However, winter is the only wet season, the rest are dry. It lasts for almost five months from November to March. This period is usually rainy, the heaviest rain falling from January to March (Hadidi, 1982: 15). The average temperature during these months is 13° C excluding the rift depression and the desert where higher temperatures are expected, especially during the day time. In contrast, summer is dry and hot; 36° C and above is normal during a summer daytime, though, the average is about 32° C, and temperatures usually reach the peak in July and August. A remarkable temporary element in the climate of Jordan is the *Khamesin*. It is a dry, hot, sirocco style wind usually accompanied by great dust clouds as it is produced from the south or southwest (desert) (Shehadeh, 1985: 29).

Throughout the prehistoric periods there was a significant climatic fluctuation. There were long periods of moisture and drought in the eastern Mediterranean including Jordan and Palestine (Shehadeh, 1985: 27; MacDonald, 2001: 595-601). Dependant on historical and archaeological evidence, Shehadeh claims that the first two centuries of the Christian era were moist. However, from the 3<sup>rd</sup> until the end of the 6<sup>th</sup> or the beginning of the 7<sup>th</sup> century AD, rainfall seems to have decreased (1985: 27-28).

During the Islamic period, the first two centuries were moist, from then up to the beginning of the 20<sup>th</sup> century fluctuating periods of moisture and dryness were significant (Shehadeh, 1985: 28).

### Topography

Three topographical zones are easily distinguished when one moves from west to east across the country. They are respectively, the Jordan valley, the plateau and mountains, and the desert (Hadidi, 1982: 15; Al-Eisawi, 1985: 45). The region under investigation falls into the latter two zones. Most of it is part of the highlands or the plateau and mountains region. The rest of the area can be characterised as an arid region; a subdivision of the desert topographic zone. Moving from north to south, two different zones of topography can be seen in the study area; western and eastern. The western zone is part of Jebal al-Sharah. It comprises contiguous rocky hills, usually intersected by small valley systems and rarely by great ravines extending north to south. These valleys flow either eastward or westward, mostly eastward. Those which run eastward form wide valleys on the edge of the eastern slopes such as Wadi al-Dafianih, Wadi al-Jerba and Wadi Qusaib. Other valleys, namely Wadi al-Qa'a, Wadi al-Beir, Wadi Basta, Wadi Ayl, Wadi Abu al-Adham and Wadi al-Jithih are sizeable enough to form significant topographical features. All of them, including these which emerge at the edge of the eastern slopes, flow into the al-Jafr depression.

On the hilltops the elevation ranges from 1400 to 1600 metres above sea level. However, it gradually decreases from west to east. By moving a few kilometres to the east, different topography is easily recognisable. A significant topographic element can be seen on either side of the Shaubak-Udhruh-Ma'an road. A number of isolated hills or low mountains, 1300 and 1200 metres and less above sea level, form a landmark in this area. In addition to these hills, flat, soft and shallow hills associated with flat valley beds form the remaining of the study area.

### Vegetation

Al-Esawi's study (1985: 45-57) of the natural vegetation in Jordan defines thirteen types of vegetation (1985: 51-56). Four of these types at least seem to be exist in the



study area or nearby: 1- Juniperus forest. 2- Mediterranean non-forest vegetation. 3- Steppe vegetation. 4- Hammada vegetation.

From the fieldwork observations, three categories of natural vegetation are, to some extent, still attested within the regions of Udhruh and Petra. A narrow strip, from Malghan in the north to Sadaqa in the south shows a similar variety of vegetation. This mostly comprises small trees or shrubs, hardly rising half a metre above the ground. Some of these are thorny such as the Sir, whereas the most common shrub, the Sheih is without thorns. These two plants are very green and fragrant in the winter and spring, but dry and weathered in the late summer and autumn. Grass and other shrubs, some of them flowering, are very common in the late winter, spring and early summer. Some valleys have distinctive flora and thousand of square metres of land are ploughed with different cereals like barley, wheat, chick peas and lentil. However, clusters of true trees, the Za'ror, still survive in this zone, and this might evidently indicate that these mountains were forested in antiquity. No specific studies of the paleo-ecology of this region have been carried out.

The transitional or pre-desert area has different vegetation. Plants are usually limited to valley beds and springs where they occur. However, rainfall still allows small trees and shrubs to grow. This region has been severely affected by neighbouring villages over the last fifty years since the small trees were specially used for heating and cooking. Today the area is very arid and the springs were found to be extinct. This element is very clear in the area to the east of the eastern lower slopes of ash-Sharah hills, and to the south, and northeast of Udhruh. The region to the east of the Hijaz Railway is evidently similar to the true desert zone. The present study has revealed decisive evidence to show that the pre-desert area saw agricultural activity and landuse associated with settlement in the first millennium of the Christian era.

### **Thesis Structure**

The field data which was collected as part of survey will be discussed in various chapters according to function. The first chapter is an introduction to this study. The second chapter will consist of a brief historical survey of the main periods during which the region flourished and a systematic and critical summary of previous

studies. The third chapter considers the methodological approaches and the type of evidence collected from the study area as well as offering brief information concerning the type of archaeological evidence found in the region of Udhruh. This study is mainly based on the results of the fieldwork and this chapter contains a detailed description of the techniques applied in the field to survey the area.

Chapter Four is a detailed discussion of the water supply systems documented in the study area. Various techniques and strategies were applied in the region throughout its long history to collect, supply and distribute water. The discussion will cover every technique and its significance with examples from the study area. The date when these strategies were used or introduced will be considered. There will also be information about the settlement sites in the vicinity of the water resources.

Chapter Five will consider the road system in the study area. Short and long segments of ancient roads were recorded during the fieldwork in the study area. These roads were well documented and tracked in the second season of fieldwork using a GPS navigation system and marked on maps. The discussion will consider the major routes, their layout, dimensions and topographical and geographical location as well as the secondary routes which were connected to the main or longer roads. There will be also a consideration of the sites which were located along the ancient routes and the evidence from these sites will be taken into account to date these roads. This chapter will also consider the Roman road system, particularly the *via nova Traiana* and the evidence from the study area regarding its path between Petra and Sadaqa. Finally, the discussion will shed light on long-distance trade and its relation to the road network in the region of Udhruh.

Chapter Six will present the data concerning the military and security arrangements in the study area. The structures which were identified as watch towers will be discussed first and these which seem to have been major military or security structures will be considered second. The discussion will include information about the location of the sites, the architectural characteristics of the structures, the potential functions and the dates of construction according to the available evidence. There is also a consideration of significant ruins particularly mounds located on hilltops or high slopes in the pre-desert zone. Finally, this chapter will contain a discussion of the



military and security arrangements in the region of Udhruh and its relation to a broader system known as the *Limes Arabicus*. The discussion of the *Limes Arabicus* will include information about the situation on the frontiers during the study period.

Chapter Seven is a general discussion of the settlement patterns in the study area according to the available evidence and the data collected from the field. The settlement patterns or distribution of settlement sites will be chronologically considered, from the earliest period attested in the region to the latest or most recent period. Maps will clearly illustrate any contrast in settlement patterns throughout the periods under discussion. There are also tables showing the settlement sites, particularly during the major periods, their numbers and names and the potential function of each site.

Chapter Eight considers various archaeological features which have not been presented elsewhere in this study. These features include walls, enclosures and stone circles (one). The discussion of walls will focus mainly on Khatt Shabib or Shabib's wall, a very significant feature in the landscape of southern Jordan. A considerable part of this wall was tracked and mapped by this author in the study area and new archaeological features were recorded along its path. The discussion includes information about the location of the walls, their stonework and their prospective function and date. The second group of archaeological features presented in this chapter is enclosures and the last is a stone circle. The discussion of the last two features will consider location, layout and potential function and date. Chapter Nine presents the conclusions of this study.

Finally, this thesis consists of two volumes. The first forms the data which was presented in eight chapters summarised above in this section. The second part will include all the illustrations, maps, photographs, pottery drawings, and more important the gazetteer which has information about every site recorded in the study area during the fieldwork. This information consists of coordinates according to the UTM coordinate system, dimensions, geographical and topographical location, type of site, its name if available, description of the site and its components, and finally the date or potential date according to the ceramic evidence collected from each site. The ceramic data collected as part of the survey are quantified in another appendix (Appendix 3).

## **Chapter Two**

### **Historical background**

#### **The Nabataean period**

The Nabataean presence in southern Jordan is indisputably attested in the accounts of Greek and Roman sources as early as 312 B.C. According to Diodorus (19.94.3) Antigonos, the Seleucid governor of Syria, launched a military campaign against the land of the Arabs who are called Nabataeans. The seven chapters (94-100) in Diodorus' Book 19 provide invaluable information about Nabataean society, their customs, characteristics and economy. His account specifically points out that the Nabataeans were involved in the spice trade with Arabia Felix and in collecting asphalt from the Dead Sea to be sold to the Egyptians. Their involvement in the long-distance trade, either as middlemen or traders, was the source of their wealth in later periods (Negev, 1977: 524-526; Bowersock, 1983: 15).

As a matter of fact, it is not before the end of the second and the beginning of the first century B.C. that we have a sort of continuity in the Nabataean history and culture (Bowersock, 1983: 22; Schmid, 2001: 367). The period between the first mention in 312 B.C. and the first century B.C. appears to be dark and missing from all but a few written sources. However, hints from written sources and archaeological evidence could help in tracking the Nabataean presence in a certain period and in a certain area. Two papyri of the Zenon archive of the middle of the third century B.C. make a clear mention of the Nabataeans; one of which attests them in the Hauran at that time (Guzzo and Schneider, 2002: 18) whereas a Nabataean inscription dates to the first half of the second century B.C. was found in Elusa in the Negev. It commemorates a Nabataean king called Aretas. Bowersock (1983: 18) identifies this Aretas with the same person mentioned in the books of the Maccabees at about the same time.

From the first century B.C. onwards, the Nabataean presence and history can be continuously tracked not only in Jordan but in many other parts of the region (Palestine, Syria and Saudi Arabia). The continuous attestation of the Nabataean from the first century B.C. onwards is due to the abundant archaeological and literary



evidence. The writings of Josephus in two books; *Jewish Antiquities* and *The Jewish War*, have enriched our knowledge of the Nabataeans in the first century B.C. and AD. The year 65 B.C. was very significant in the region's history. In that year the Roman army of Pompey annexed Syria which became a Roman province. The presence of a great power like Rome in the region forced all the small states of the region to rotate in Rome's orbit. Pompey considered incorporating the Nabataean realm into the new province of Syria, but they saved their kingdom for about 144 years by making a payment of 300 talents to Rome (Negev, 1977: 541; Bowersock, 1983: 32-33).

The three decades following Aretas III reign (62-31 B.C.) saw dramatic changes and events, not only in the Nabataean kingdom but in Rome itself. In Petra, a successor to Aretas III known by the name Malichus became the Nabataean king (Bowersock, 1983: 37). In Rome, the civil war of the 40s and 30s B.C. had strongly affected the foreign policy of the Nabataeans as a client kingdom of Rome. After the assassination of Caesar in 44 B.C., two opponents, Antony and Octavianus directed the struggle. The former controlled the eastern part of the Empire and he recovered the loyalty of Nabataea and Judaea. At that time, Cleopatra was queen of Egypt in alliance with her lover Antony, and she often interfered in Nabataean and Jewish affairs. Moreover, parts of the two kingdoms were given to Cleopatra by Antony (Bowersock, 1983: 38-41). This situation was ended by 31 B.C. when Antony was defeated in the Battle of Actium and a year later, Cleopatra committed suicide. As a consequence of these events, Egypt became a Roman province and Octavian became the first Roman emperor (Bowersock, 1983: 41-44).

Towards the end of the first century B.C., the Nabataeans seem to have settled in many regions outside Petra and its hinterland. Most of which will form the Nabataean kingdom during its golden age under the reign of Aretas IV (9/8 B.C.-40 AD). In north-west Arabia, the Nabataean presence is indisputably confirmed by Strabo's account of the Roman expedition sent to Arabia Felix by Augustus under the first prefect of Egypt in 25 B.C. (Strabo, 16.4.22; Guzzo and Schneider, 2002: 32). On his way to the land of the Sabaeans, Gallus "arrived in fourteen days at Leuce Come in the land of the Nabataeans" (Strabo, 16.4.23). The importance of this place for Nabataean trade is clear in the following words: "New loads of aromatics are



conveyed from Leuce Come to Petra, and thence to Rhinocolura, which is in Phoenicia near Aegypt, and thence to the other peoples” (Strabo.16.4.24). On his return to Egypt, Gallus stopped in a village called Egra (Madain Saleh). Strabo (16.4.24) describes the village to be “in the territory of Obodas”. The same village became a Nabataean centre in the reign of Aretas IV, as we will see (Bowersock, 1983: 57).

The death of king Obodas II in 9/8 B.C. brought Aretas IV to the Nabataean throne. The reign of this king (8 B.C. – 40 AD) was the best in the history of Nabataea in terms of prosperity and the production of material culture (Bowersock, 1983: 59). Bowersock (1983: 65) argues that this king is “*undoubtedly one of the greatest figures in the history of preislamic Arabia*”. This fact is strongly confirmed by the abundance of archaeological and literary evidence besides the intensive Nabataean settlements in the regions mentioned above during this period (Negev, 1977: 567). It is worth pointing out that some of the great monuments in Petra have been tentatively dated to this period. Elsewhere in the kingdom, particularly in Mada’in Salih tombs date to this period are abundant and bear witness to the dense Nabataean presence in the Hijaz in the first century AD. The cities of the Negev- Oboda, Mamphis, Necessan, Elusa and Sobata- also flourished in this period and this is proved by archaeological evidence such as inscriptions, architectural remains, pottery and coins (Negev, 1966: 95; Bowersock, 1983: 60). In Hauran, Bostra was growing as a centre of Nabataean culture and was a prosperous city in the last quarter of the first century AD (Graf, 1992b: 450-452; Graf and MacAdam, 1989: 187-193).

#### **The Roman period: *Provincia Arabia***

The creation of the province of Arabia was the outcome of the Roman annexation of the Nabataean kingdom in AD 106. Why and how the Romans annexed Nabataea is a question that needs to be addressed. Contemporary sources are far from informative about this event, even though some sources mentioned it. Dio Cassius (LXVIII.14.5) writes: “About the same time Palma, the governor of Syria, subdued the part of Arabia around Petra and made it subject to the Romans” (Negev, 1977: 640). A single reason has not been identified to be the direct cause of the annexation (Freeman, 1996: 93-94).

Therefore, it might be useful to review the hypotheses which have been suggested to explain Rome's motivation to annex Nabataea. Scholars who believe in a 'grand strategy of the Roman Empire' look at the event as a pre-planned work (Parker, 1986: 123). In other words, Trajan was waiting for the moment whenever Rabbel II, the last Nabataean king, should die to carry out his plan (Bowersock, 1983: 82). Schmid (2001: 402) rejects this hypothesis since Trajan's army was involved in the Dacian War in AD 106; he instead connects the annexation of Nabataea with the forthcoming campaign against Parthia in AD 114. He argues that Trajan was thinking that the Nabataeans might offer supplies to the Parthians during his campaign against them. There is also a strong possibility that the annexation was carried out by the governor of Syria without getting the emperor's permission (Freeman, 1996: 94). An internal conflict over succession after Rabbel's death might have arisen among the Nabataeans. Consequently, Rome would undoubtedly stop such conflict in a client state like Nabataea (Fiema, 1987: 29).

The economic factor cannot be excluded from this argument. The Nabataeans had controlled long-distance trade routes for many centuries. Rome, under an ambitious emperor like Trajan, might have decided to organise and control this trade with southern Arabia and India, rather than depending on middlemen like the Nabataeans. In this way they could divert trade towards Rome's ports in Egypt which were losing some revenues for the inland routes approaching north and north-west from Aqaba via the Nabataean lands (Fiema, 1987: 30-33; Ghawanmeh, 1986: 311).

Whatever Trajan's motivation in annexing the Nabataean kingdom, the fact that Nabataea was subjected to Rome in AD 106 is now firmly established (Bowersock, 1970: 39). But how did this take place? In the light of the available evidence, we do not know. Many scholars believe that Nabataea was peacefully taken over by Romans (e.g. Bowersock, 1983: 79-80; 1971: 228; Millar, 1993: 414). This for Freeman (1996: 101) might explain the "absence of (literary) references to it in the sources as well as Trajan's failure to take any honorific titles". Moreover, the use of the phrase *Arabia adquisita* on coins celebrating the new province seems more appropriate to a bloodless conquest of Nabataea by Rome (Kennedy, 2000: 36).



However, some recent views suggest that the incorporating of Nabataea was not totally peaceful. Schmid (1997: 413-420) has noticed traces of destruction in the domestic quarters of az-Zantur at Petra, and in other sites outside Petra, particularly in the central part of the Nabataean kingdom. The layers of destruction, according to Schmid, have been dated to the early second century AD. Therefore, Schmid (1997: 420) concludes that “the historical event that fits all conditions to be ascribed to the archaeological data is the Roman annexation of the Nabataean kingdom in 106 AD”. Two Safaitic inscriptions might support this view if they can be dated to the first half of the second century AD. One mentions “the year of the Nabataean war”, and the other mentions “the year when the Nabataeans revolted against the people of Rome”. Bowersock (1971: 229) demonstrates that the first graffito most probably refers to any kind of tribal war, or any conflict between Nabataean and Safaitic, but not necessarily to the Roman annexation. However, he suggests that the second inscription indicates a military action (Bowersock, 1983: 80 note 13).

Whether Nabataea was taken peacefully or aggressively, the annexation of the kingdom was not announced or advertised until AD 111. No inscriptions or coins celebrating the annexation are found before this date (Bowersock, 1983: 82). Bowersock (1983: 83/4) explains this by saying: “Trajan may not have wished to call particular attention to his work in Arabia until it was done. There might have been reason for others to interfere with it if it had been too widely publicised”.

From the discussion above, we learn that the events which preceded and followed the annexation of Nabataea remain unclear and in dispute. What is now beyond any doubt is the transformation of Nabataea into the Roman province of Arabia after AD 106 (Bowersock, 1991: 337). From the words of Ammianus Marcellinus (14.8.13), one learns that Nabataea became a Roman province, obeying the Roman laws, during the reign of Trajan. But was this the situation from the beginning? Freeman (1996: 113) believes that there is a room for arguing that “formal annexation was not even on the agenda in 106: it came later, in the period 111-112, when the need for a permanent Roman presence in Arabia came to be recognised”. Others (e.g. Bennett, 1997: 176) attest that Arabia was formally recognised as a province in the course of AD 107, although it was not publicly announced as a province before 111/112. The presence of Roman legionaries in the region of Petra in AD 107 is now firmly established. Two



letters from Karanis in Egypt confirm this, written in 107/108 and sent by a certain Apollinarius to his father. According to the letters, the legionaries were conducting hard work such as cutting building stones (P. Mich. Inv. 5903; Kennedy, 1980a: 289-92; Speidel, 1977: 692).

### **The *via nova Traiana***

Professor John Eadie (1986: 243) once described the construction of the *via nova Traiana*, or Trajan's road, as 'the only attested artefact of the annexation'. This fact has been attested by the large number of milestones which were established along the road (Bennett, 1997: 177). From these milestones and preserved segments of the road, it is certain that Trajan's road extended from Bostra to Aila on the Red Sea like a backbone for the newly established province of Arabia (Fig. 2.1). The project was completed in AD 114; however, some sections of the road were finished before that. The part between Petra and Philadelphia for instance was completed in AD 111 whereas the northern sector, between Philadelphia and Bostra was finished in AD 114 (Graf, 1997a: VI32; MacAdam, 1992: 37; 1982: 21; Parker, 1987a: 799). Many scholars make a link between the construction of the *via nova Traiana* and the hard work reported by the legionary Apollonarius' letter sent from Arabia to Karanis in Egypt (e.g. Freeman, 1996: 108-109).

The motivation for constructing the *via nova Traiana* as early as AD 107 remains a scholarly debate. There is a dispute over two possible explanations for building this road. The first is its military importance and the second is its contribution to trade. Supporters of the former case cite the project (Trajan's road) as a necessary step to ensure the security of the new province by facilitating the movement of troops (Parker, 1986: 799; Bennet, 1997). Others (e.g. Schmid, 1997: 419) go much further to demonstrate that the road was constructed to work as a supply of the Roman army during its war against Parthia. What make this explanation partly unacceptable are hints from Apollonarius' letters which indicate that communication between Petra and Bostra was already available in AD 107 (Freeman, 1996: 109). However, the rejection of this explanation might be correct since present archaeological evidence indicates that a road already connected the previous Nabataean settlements in Syria with Petra and may be beyond, the road better known as the King's Highway. In other words, the

*via nova Traiana* was merely a reconstructed road rather than a newly created road for specific purposes (Graf, 1997a: VI 32; Bowersock, 1983: 91; MacAdam, 1986: 27-28).

The commercial factor needs to be considered and seems more reasonable since Nabataean settlements are well attested along the same route, and branches of minor trade routes seem to have intersected with Trajan's road. Moreover, the completion of the *via nova Traiana* further south to Aila (Aqaba) highlights the economic importance of that city. One of the frequently repeated objections to this explanation is the fact that overland trade routes via southern Jordan were in decline from the first century AD onwards and in the 2nd century Aila is absent from most accounts of Roman Arabia (Freeman, 1996: 109). Fiema (1987: 34) asserts the economic motivation since firstly a sort of internal trade was in progress between Arabia and Petra through Hisma, and secondly because Aila lies on the trade route to southern Sinai where copper and turquoise mines were exploited. Recent work in Aila has revealed archaeological evidence indicating that Aila witnessed some prosperity during the Roman period (Parker, 1997: 190; Meloy, 1991: 41; see also Aharaoni, 1954: 9-16).

From the points made above, one could reasonably assume that both factors may have been taken into consideration when the road was constructed. There is no obvious reason to believe that the *via nova Traiana* was not used to transport goods, or at least to connect the major settlements of the 2nd century AD since they were focused along its segments. At the same time, the road might have been used to deploy troops whenever there was a need for that. The route's extension throughout almost the entire province should offer the army a smooth movement, most probably during the time of crises, or when mobile detachments of III *Cyrenaica* were protecting and guarding the province (Kennedy, 2000: 47; Parker, 1986: 129). The importance of the *via nova Traiana* is explicitly confirmed through its depiction on the Peutinger Table, the map which shows Roman roads as well as other features (Dilke, 1987: 238; Graf, 1992a: 256).



### **The Third century and the Tetrarch period**

The fifty years between the death of Alexander Severus, the last emperor in the Severan dynasty, and Diocletian's accession in 284 were probably one of the worst period the Roman Empire had ever witnessed (Rostovtzeff, 1957: 433). During that period, the empire experienced severe economic, social, internal and external crises. It is hardly surprising that fifteen emperors came to the throne during that period (Williams, 1985: 18). As Williams argues: "the near-suicidal pattern had become permanent. It was no longer a case of brief civil war followed by consolidation under a new dynasty, as had happened after Nero, for example. Imperial authority and effective central power were now so weak, so overwhelmed by multiple crises and utterly dependent on the volatile moods of the armies, that this had become impossible" (1985: 18).

During that period a very ambitious and ferocious dynasty came to the throne in Persia. These were the Sassanians, who ended and succeeded the Parthians (Dodgeon and Lieu, 1991: 9-10). The third decade of the 3rd century saw what might be described as continuous and bloody military campaigns initiated by the Sassanians on Rome's eastern provinces (Kennedy and Riley, 1990: 32; see Dodgeon and Lieu, 1991: 15-33 for more details). However, the most aggressive attacks on the Roman eastern provinces were launched in the middle of the 3<sup>rd</sup> century by Shapur I, son and successor of Ardashir the founder of the dynasty, which unexpectedly ended with the defeat of the Romans. Major cities like Antioch were sacked and finally the emperor Valerian was captured in AD 259 (Bowersock, 1983: 130; Kennedy and Riley, 1990: 32).

The continuous and aggressive campaigns the Sassanians launched on the eastern Roman provinces increasingly weakened Rome's authority in the region. Consequently, this situation offered a good chance for the regional powers to play a considerable role in the political situation of the region. Palmyra, a desert caravan city and ally of Rome, increasingly became strong and prosperous from the first century onwards due to its strategic location on the trade routes. In the 3<sup>rd</sup> century Palmyra reached the peak of prosperity with a stable political system and considerable force like that of Petra in the first century B.C./AD (Bowersock, 1983: 129). The capture



and defeat of the Roman emperor Valerian in AD 259 was brilliantly understood by Palmyra as a hint of Rome's inability to protect even its emperor. Therefore, the Palmyrenes soon launched attacks against Persia, and were surprisingly victorious over them under the leadership of Odaenathus, the husband of queen Zenobia. Odaenathus was decently treated and honoured as a king by Rome (Dodgeon and Lieu, 1991: 70-81).

The assassination of Odaenathus brought his wife Zenobia to the throne. She was ambitious and brave to the extent that she not only became free of Rome's influence, but went beyond it by starting a programme of expansion finished with occupying Syria, Cappadocia, Egypt and at least northern Arabia in the late 260s and early 270s (Parker, 1986: 132). This time Arabia was definitely effected by the campaigns of Zenobia, particularly Bostra where an inscription from the temple of *Iuppiter Hammon* reads: "...the temple of *Iuppiter Hammon*, destroyed by Palmyrene enemies, which.... Rebuilt, with a silver statue and iron doors" (Dodgeon and Lieu, 1991: 86). However, the glory of Palmyra and Zenobia was soon over when the Emperor Aurelian launched a campaign against Palmyra in AD 271/2. Aurelian was victorious, Palmyra fell, and Zenobia was taken prisoner to Rome (Dodgeon and Lieu, 1991: 96-100).

The most significant change which effected all the administrative and military arrangements in the province of Arabia was initiated by Diocletian. This action seems to have been part of a broader project covering the entire empire in an attempt to overcome the crises experienced in the fifty years preceding his reign. Diocletian held power from AD 284, and after almost ten years, in AD 293, he put an end to the bloody and continuous assassination of emperors by the establishment of a new system based on sharing power among four figures, two *Augusti* and two Caesars known as the Tetrarchs (Cameron, 1993a: 31; Williams, 1985: 63). During the Tetrarchic period Rome was not the centre of power since each emperor took a certain city as his residence. Diocletian, for example, was in Nicomedia (Williams, 1985: 67).

Since the East was the centre of Diocletian's power, it is more reasonable to look at his military and provincial reforms in the eastern provinces and frontiers. Literary sources and archaeological data reveal much evidence for Diocletian's new policy.

John Malalas (see Dodgeon and Lieu, 1991: 138) states that: “the same Diocletian also established along the borders from Egypt to the boundaries of Persia (a series of) camps. He stationed *limitanei* in them, and appointed *duces* for the provinces to be stationed to the rear of these camps with a strong force to keep watch”. Diocletian’s effort to strengthen the eastern frontiers can be understood better through his work in the province of Syria. A road known as the *Strata Diocletiana* was constructed from north-east Arabia and Damascus to Palmyra and the Euphrates, along which military installations were built (Isaac, 1990: 163). A milestone found between Palmyra and Hlehle reads: “to our lord, the most noble Constantine and his family. The Strata Diocletiana. From Palmyra to Aracha, eight (Roman) miles” (Dodgeon and Lieu, 1991: 137).

As Arabia is the concern of this discussion, we should now consider the impact of Diocletian’s reform on this province. Major changes took place in Arabia during the tetrarchic period. First of all, sometime in the 3<sup>rd</sup> century Arabia lost southern Jordan, the Sinai and the Negev to the province of Palestine. The province of Palestine was later divided into two provinces; Palestina Prima and Southern Palestine. The latter became known as *Palestina Salutaris* or *Palestina Tertia* in the 4th century, and to this province the previous Arabian territories belonged. Hence, the region south of Wadi al-Hasa including the study area was no longer considered a part of Arabia by the end of the 3rd century AD. These administrative changes are clearly attested in the accounts of the 4<sup>th</sup> century writers like Eusebius and Jerome (Tsafir, 1986: 77-86; Dan, 1982: 134-37; Mayerson, 1984: 223-30).

Sometime also in the last decade of the 3rd century the tenth legion was transferred to Aila from Jerusalem. This legion was the only garrison mentioned clearly by name in the *Onomasticon* (Isaac, 1996: 161), and was also listed in the *Notitia Dignitatum* under the *dux* of Palestine (Seeck, 1962: 73). Tsafir (1986: 83, 86) asserts that the transference of this legion must have taken place because of the new arrangements, particularly the process of adding southern Arabia to Palestine. He also suggests that if the tenth legion was in Arabia before this change took place, it would be strongly in contradiction with Diocletian’s policy which aimed to decrease the power of the governor of each province.



Apart from the new military and administrative arrangements, Diocletian seems to have carried out a programme of military build up in Arabia similar to that of Severus. Archaeological and epigraphic evidence has revealed the date of many military installations. The evidence from Jordan is now well known to most of the scholars of this period. It is more abundant and obvious in northern Jordan where many forts were either built or reoccupied during the tetrarchic period at the top of Wadi Sirhan. The *castellum* of Deir al-Kahf, for example, is dated by an inscription to AD 306 (Isaac, 1990: 164; Parker, 1986: 137). In central Jordan, the southern part of Arabia in this period due to the above mentioned arrangements, Parker's work (see Parker, 1987a) is fundamental and totally scientific. His work includes regional surveys and more importantly excavations at the fortress of Lejjun and other military installations in the area, and investigations of the signaling system between these sites. Although not a single building inscription has been revealed from the fortress of Lejjun, there are several reasons to date this fortress to the tetrarchic period, including its mention in the *Notitia Dignitatum* and its size and plan which resemble other Diocletianic forts (Parker, 1985: 137; 1987a: 806-807; 1990: 357-376; 1995: 251-260; 2000a: 121-128).

The region east of the Dead Sea in general appears to have received more attention in the late 3<sup>rd</sup> and 4<sup>th</sup> centuries. Many fortifications in the region date to that period (Clark and Parker, 1987: 169). Qasr Bashir, northeast of Lejjun, is for instance dated by an inscription to AD 306, and many other sites have also been dated to the same period, the late 3<sup>rd</sup> and early 4<sup>th</sup> century (Parker, 1986: 137; 1987). The construction of Lejjun (Betthoro in the *Notitia Dignitatum*) was probably necessary to accommodate *legio IV Martia*, the second legionary garrison of Arabia (Speidel, 1977: 699; Parker, 1986: 137; 1990: 359).

Further south in Jordan, possible Diocletianic fortifications are still uncertain. The debate mainly concerns the legionary fortress at Udhruh. Conclusive evidence regarding the date of this fortress has not yet been obtained, although it was excavated in the 1980s. The excavator suggested a Trajanic date for Udhruh (Killick, 1983: 125; 1986: 431-446), whereas other scholars prefer a later date for its construction, particularly Parker who believes that Udhruh was a twin of Lejjun (e.g. Parker, 1986; 1987a; Bowersock, 1976; Gregory, 1996). Speidel has suggested (1979: 172) that *legio VI Ferrata* was moved by the end of the 3<sup>rd</sup> century to Udhruh, then in the

province of Palestine. If the legion did move, a fortress would either have been built or reorganized to accommodate the troops. At any rate, the date of Udhruh fortress remains uncertain until decisive evidence is uncovered. Further south, towards Aila (Aqaba), military structures are well known from the previous period but crucial evidence for reoccupation or refortification during the Tetrarchic period has not yet been uncovered (Parker, 1986: 647; Gregory, 1995: 395-410). Meanwhile, milestones dating to the Tetrarchs point out that the southern section of the *via nova Traiana* was maintained and in use at that time, and likewise the northern sections (Graf, 1995b: 259, 264; Parker, 1986: 137).

In brief, during the Tetrarchic period the province of Arabia including the study area received attention from Diocletian which led to an unprecedented administrative and military reorganisation. Moreover, it is the best documented period in the contemporary sources that are concerned with Arabia (Parker, 1986: 641).

#### **Petra during the Roman Period**

The annexation of the Nabataean kingdom in AD 106 by Rome, and the adoption of Bostra as the capital and garrison base of the new province of Arabia did not mean that Petra was totally abandoned or became a city of lower rank. Archaeological evidence, along with literary sources, reflect the significant status Petra had in the Roman period. In the pre-Roman period Petra was the heartland and capital of the Nabataean realm, and an important caravan city and trade centre in the East (Gogate, 1999: 299-304). An attempt will be made here to outline briefly Petra's fate after the fall of the Nabataean kingdom.

From the beginning, the Romans seem to have taken the importance of Petra into consideration and it was one of the main stops along the *via nova Traiana*. Graf (1992a: 256) presents evidence to show that Petra was not bypassed by the Trajanic road. Moreover, as early as AD 114 the city received the honorific title of *metropolis* from Trajan as proven and marked in a Greek inscription found on the arch at the entrance to what is known as the Market (Bowersock, 1983; Bennett, 1997: 178). The documents of Babatha mention Petra on more than one occasion. From the archive we learn that Petra was a major city in the province of Arabia since the governor held



many assizes at Petra. On certain occasions Babatha herself had to travel to Petra to register her property in the presence of the governor (Bowersock, 1991: 338-339; 1983: 86). During Hadrian's reign many governors of the province of Arabia are known to have routinely visited the city (Eadie, 1986: 450). One of them even chose Petra to be the place of his burial. The tomb of L. Aninius Sextius Florentinus is well known among the Royal tombs in Petra (Graf, 1992a: 254; Mackenzie, 1990: 33).

The difficult political and economic situation of the Roman Empire in the 3<sup>rd</sup> century seems not to have affected the significance of Petra in the region. The Roman emperor Elagabalus (AD 219-222) raised the status of the city to that of *colonia* (Freeman, 2001: 434). One could argue that Petra had achieved this importance for administrative, strategic and commercial reasons. Nevertheless, literary evidence leaves no doubt that Petra had also a cultural and intellectual role in the region. Two sophists, native of Petra, Callinicus and Genethlius, are known to have been active philosophers in Athens during the 3<sup>rd</sup> c. (Bowersock, 1983:135). The city of Petra seems to have been flourishing until the middle of the 4<sup>th</sup> century when about 363 the city was destroyed by an earthquake (Brock, 1977; Hammond, 1980: 65-67; Bowersock, 1983: 86).

### **The Byzantine period**

The Tetrarchic system, created by Diocletian in AD 293, was weakened by the retirements of Diocletian and his colleague Maximian in AD 305 (Cameron, 1993a: 46). Having finished his speech in front of his troops in Nicomedia, Diocletian chose Severus and Maximinus to be the new *Caesars* to succeed the retiring ones (Barnes, 1981: 26; Williams, 1985: 191-192). For almost two decades from Diocletian's abdication, the empire was not stable due to the threats of the civil wars launched by ambitious figures to gain sole and imperial authority over the empire, East and West. Among those was Constantine, the Great, who was raised as *Augustus* by the troops of his father upon the death of the latter (Cameron, 1993a: 48). Constantine's father was Constantinus, a tetrarchic emperor (Barnes, 1981: 28-29).

Constantine became the sole emperor in AD 324, the date many historians see as the beginning of a new era, the Byzantine period. For almost two decades preceding

Constantine was fighting to achieve his goal to be the one emperor of a united empire (Cameron, 1993a: 52; Barnes, 1981: 29). Two ambitious and determined rivals, Maximinus and Licinius, were the real hindrance before achieving this goal. Constantine defeated Maxentius in 312 in a battle known as the Milvian Bridge (Cameron, 1993a: 50; Barnes, 1981: 44-45). Finally in 324 Constantine became the sole emperor after he had defeated his ex-ally and friend Licinius at Chrysopolis (Cameron, 1993a: 52; Barnes, 1981: 76-77).

Having briefly reviewed the general changes of the fourth century, the eastern frontiers and provinces including the study area need to be considered. The reorganization of the frontiers and the administrative arrangements that Diocletian was credited with seem to have remained partly untouched by Constantine except along certain fronts like the Danube where military arrangements were made for security reasons. Constantine's major work was in the army which he was responsible for splitting into two parts: a field army and a frontier army (Southern and Dixon, 1996: 33-38; Parker, 1986: 145).

Recent scholarly investigations in Jordan have shown that the military fortifications and road system continued in use during the 4th century. According to Parker (1986: 145), milestones dating to the first and second halves of the century, particularly to Julian's reign, have been found along Roman roads in Jordan. Towers were also constructed in the Hauran in the 350s at Ināt, al-Meshquq and Salkhad and near Umm el-Jimal. In southern Jordan, including the study area, some military installations were abandoned (Parker, 1986: 145), and no single fort according to Graf (1979: 126) was built in the 4th and 5th centuries AD. However, Parker (1986: 146) tentatively dates the *castella* of al-Hammam and al-Mutrab east of Ma'an to this period according to architectural elements and ceramic evidence. Parker's suggestion regarding the function and date of the structures at al-Hammam and al-Mutrab has been recently challenged by Genequand (2003: 25-35) who believes that the structures are not military but residences dating to the Early Islamic period (Umayyad). The attestation of Humaima (Auaria) and Sadaqa (Zadocatha) in the *Notitia Dignitatum* might confirm the occupation of key sites along the *via nova Traiana*.



### The 5th and 6th centuries AD

This discussion will highlight the situation at Petra and its hinterland including the study area in the 5<sup>th</sup> and 6<sup>th</sup> centuries in the light of the revelation of new data derived from archaeological fieldwork, written and epigraphic evidence (Fiema, 2002a: 192-203). The most recent important source of information concerning this period is the papyri discovered in 1993 at the Petra Church (Fiema, 2002a: 208-209). It will exclude the relationship between Byzantium and the Arab tribes or the Saracens as this issue will be considered in Chapter 6.

However, before considering the evidence from the Petra papyri, an attempt will be made to present the available evidence from other sources. Historically, Petra became the provincial capital of *Palaestina Salutaris* (*Palaestina Tertia* in the 5<sup>th</sup> century AD) from the end of the 4<sup>th</sup> century and throughout the 5<sup>th</sup> and 6<sup>th</sup> centuries. This province had control over the regions of southern Jordan up to Wadi al-Hasa, the Negev and the Sinai (Fiema, 2002a: 192 and 213; 2001: 112-113). According to archaeological and historical information, Petra significantly suffered as a result of a catastrophic earthquake which hit the region in AD 363 but the city appears to have survived and have not been abandoned according to the Petra papyri (Graf, 2001: 229, Fiema, 2002a: 192; 2001: 113; Russell, 1980: 47-63; Hammond, 1980: 65-67). The construction of an important church at Petra by the middle of the 5<sup>th</sup> century may reflect continuity of urban life (Fiema, 2002a: 200; 2001: 113). However, there is no attestation in historical documents of bishops from Petra attending major Church Councils. Petra on the other hand served as a place of exile for ecclesiastics and common criminals from approximately AD 490 to AD 527. Fiema (2002a: 193) explains this saying: “*either Petra was considered a safe and loyal city to house individuals dangerous to the central government, or a distant and insignificant place where the presence of the exiles would be harmless to the interests of Constantinople.*”

The evidence from the papyri is valuable and needs to be considered. The papyri are carbonized and consist of 152 rolls found together in a storage room in the northeast corner of the Petra church (Koenen, 1996: 177 and 179-180). The documents mainly contain information about private issues concerning an extended family such as the

inheritance and registration of properties, loans, sworn and unsown contracts, disputes over settlements and other matters (Fiema, 2002a: 208; Koenen, 1996: 180-183). The scrolls date from AD 528 to the end of the 6<sup>th</sup> century (Koenen, 1996: 178; Fiema, 2002a: 209). Although most of the documents still await analysis, important information concerning Byzantine Petra and its hinterland is revealed from the analyzed scrolls. First of all, there are hints indicating Petra was still somehow in contact with the central authority in Constantinople as according to Koenen (1996: 187): “*an imperial edict of 537 on dating by regnal years was immediately implanted in Petra, while in Egypt it took years*”. The papyri also clearly show that there was a tax collection office based in Petra responsible for tax collection not only for the lands of Petra but for registered lands in nearby regions such as Augustopolis (Udhruh) (Fiema, 2002a: 215-216; Kaimio and Koenen, 1997: 459).

Petra was a *metropolis* for a long time after the Roman annexation in AD 106, however, according to Fiema (2002a: 215 and 2001: 114-113) the city appears to have experienced ‘a transition to a system of municipal government’. This system was dominated by the local notables, landlords and bishops or simply upper class families. Members of this social class were involved in tax collection, the registration of properties or lands for taxing purposes or as witnesses (Fiema, 2002a: 216). According to the Petra papyri, agriculture was the backbone of Petra’s economy in the 6<sup>th</sup> century, particularly in its hinterland. The people whom the scrolls deal with their possessions had orchards, vineyards, threshing floors, grain-land and other properties of an agricultural nature such as farmsteads and farmhouses (Fiema, 2002a: 226; Koenen, 1996: 180-186). The documents present no information about the international trade in spices and aromatics for which Petra was a consuming and distributing centre in the centuries before and probably after the Roman annexation (Fiema, 2001: 117; Koenen, 1996: 187). There is also no mention of Petra as a trade centre in other Byzantine documents which might indicate the decline of the long-distance trade via Petra in the Late Byzantine period (Fiema, 2001: 117).

More importantly there is a clear mention of places in the study area. In Scroll 60 a man registered a vineyard in the tax office at Petra, the property was previously registered in the local cadastre of Augustopolis (Udhruh) by his grandfather (Koenen and Kaimio, 1997: 459). In Scroll 83 the text explains the settlement of a dispute over



properties located in Zadakatha (Sadaqa) (Koenen and Kaimio, 1997: 462). The tax office at Petra was responsible for collecting tax on lands registered in Udhruh (Fiema, 2002a: 216 and note no. 239) which may clearly indicate Petra was still the main administrative centre in southern Jordan up to the 6<sup>th</sup> century AD. However, Petra is absent from all the accounts concerning the 7<sup>th</sup> century events, particularly the Islamic conquest (Fiema, 2001a) and this fact requires serious explanation.

### **The Islamic period**

From the middle of the 7<sup>th</sup> century AD the entire region of the Middle East experienced significant political, social and economic changes as a result of the Islamic conquest. However, before the Arab Muslims controlled the region the first half of the 7<sup>th</sup> century had witnessed dramatic events. From the beginning of the century until almost the end of its first quarter, the Persians gradually controlled the region including its most sacred place, Jerusalem (Greatrex and Lieu, 2002: 182-197). By the end of the third decade of the 7<sup>th</sup> century, the Byzantines under Heraclius managed to recover the occupied land and proceeded eastwards to the Persian capital, Ctesiphon (Greatrex and Lieu, 2002: 198-228).

During the same period, the first quarter of the 7<sup>th</sup> century, the Prophet Muhammad was calling to Islam in Arabia and was able to establish a political-religious state particularly after the conquest of Mecca in AD 630 (Donner, 1981: 62-82). The attempt to spread the message of Islam northwards to Bilad al-Sham (Greater Syria) led to military clashes with the Byzantines and their allies in the region. The first major contact between the two rivals was in southern Jordan near the Dead Sea (Mu'tah AD 630). The Muslim army marched to Mu'tah upon the killing of al-Harith bin 'Umayr al-Azdi, the messenger of the Prophet Muhammad to Byzantium, by the Ghassanids (Schick, 1995: 57; 68; Kaegi, 1992: 71-74). However, the earliest contacts between the Muslims and the region of Greater Syria were with flourishing towns or villages in southern Jordan such as Ayla (Aqaba), Udhruh and al-Jerba. These contacts were peaceful and led to the capitulation of those communities to the Prophet Muhammad and consequently obtaining the protection from Muslims against any potential enemy (Musil, 1907: 306; Schick, 1994: 148-154; Kaegi, 1992: 82). The second important evidence for Udhruh from early Islamic sources is the event of the

arbitration between Mu'awiya and Ali (two caliphates) in AD 657. Udhruh was chosen to be the neutral soil to sign an agreement between the two rivals (Schick, 1994: 149).

Shortly after securing the unstable political situation which emerged after the death of the Prophet Muhammad, the Muslim armies were fighting the two great powers at that time, Byzantium and Persia. The Muslims were victorious in many successive battles against the two empires, particularly against Byzantium. In AD 634, they marched towards Gaza through Aila and it was just near Gaza that a Byzantine force from Caesarea met them, where they failed to stop the Muslim army (Kaegi, 1992: 93/4). In the same year, the Muslims were also victorious at the Battle of Ajnadyn in southern Palestine. The Byzantines faced another disastrous defeat at the Battle of Fihl, in northern Jordan at the end of 634 and the beginning of 635 (Schick, 1995: 68; Kaegi, 1992: 98-100; 112)

The Byzantine presence in the entire region was decided in the Battle of al-Yarmouk which took place near the River al-Yarmouk in northwest Jordan in AD 636. The Byzantine army was defeated and within ten years the lands of the modern countries of Jordan, Palestine, Egypt, Syria and Iraq came under the Islamic rule (Whittow, 1996: 86; Donner, 1981: Ch 3 & 4; Kennedy and Riley, 1991: 35). Politically, the newly conquered regions were under the caliph who was in Medina. However, a governor known as a Wali, who ruled on behalf of the Caliph but was subject to his authority, was appointed to these areas.

For about half a century Medina was the political capital of the Islamic state. However, soon after the assassination of the fourth Caliph, Ali (AD 661), Damascus became the new seat of the caliphate of the Umayyad dynasty which ruled for about a century (AD 750). The conquests continued and new regions were added to the new empire as far as Asia Minor and throughout North Africa. In AD 750/132 Hijri the Abbasids dynasty took over the rule of the Islamic world and the seat of the caliphate was moved to Baghdad (Ball, 1994: 23-26).



## Previous Studies

Since the appearance of Bowersock's article "A Report on Arabia Provincia" in the *Journal of Roman Studies* (1971) the amount of scholarly research in Jordan has increased and this might be seen as a response to Bowersock's call to consider the importance of Arabia as a Roman province (Bowersock, 1971: 219). However, most of the work which was conducted in the course of the 1970s and 1980s concentrated on the military arrangements in the province. It was implemented either to consider the defensive system better known as the *Limes Arabicus* in the region, or to investigate the road system, especially the Roman highway, the *via nova Traiana* (Parker, 1986: 3).

A handful of fieldwork projects before 1970 made a substantial contribution to the development of the archaeology of Jordan. Three studies should be considered with this respect. The first is *Die Provincia Arabia* published in three volumes (1904; 1905; 1909). It consists of important archaeological data collected by two German scholars, Rudolf Brünnow and Alfred von Domaszewski, in the course of field survey for the region from the Hauran in Syria down to Ma'an in southern Jordan conducted in the 1890s. Some sites in the study area were visited, described, planned and photographed by Brünnow and Domaszewski. However, although the importance of that study is undeniable as they took photographs, planned and described sites when they were *in situ*, it remains far from being considered systematic. In their expedition, Brünnow and Domaszewski investigated only the sites which lie along the traffic routes at that time or those which were described to them by local people. Much attention was given to the sites on the desert fringe as both scholars were clearly interested in studying the Roman frontiers in that part of the empire. Therefore, many of the structures they identified were dated to the Roman period judging from their masonry, location and plan. There was no attempt to consider other dating evidence such as ceramics which were not collected from any site.

Another important early field study was initiated by Nelson Glueck during the first half of the 20<sup>th</sup> century through a series of expeditions in many parts of Jordan. The results of his investigations and surveys were published in four volumes in the *Annual of the American Schools of Oriental Research* between 1934 and 1951 (Glueck, 1934-

1951). Glueck's contribution to the archaeology of Jordan is significant as he discovered and documented hundreds of ancient sites throughout the country. Many sites in the study area described by Glueck were previously investigated by Brünnow and Domaszewski. However, there are some reservations that limit the utility of Glueck's work. His investigations based on textual information derived from the Bible, therefore the sites which were mentioned in the Old Testament received much attention and careful investigation. Glueck's interest in the biblical archaeology seems to have influenced his reading to the archaeological evidence, and too many sites were dated to the Iron Age (Edomite) and Nabataean period. In some cases, the surface evidence according to Glueck indicates the absence of a certain period whereas later studies have proved otherwise.

In the fourth decade of the 20<sup>th</sup> century, Sir Aurel Stein initiated a survey to explore the Roman frontiers in Iraq and Transjordan. Stein's research is more significant as he used a combination of aerial and ground reconnaissance for the regions he investigated (1940: 428-438). The report of Stein's survey was published by Kennedy and Gregory (1985). The utilisation of aerial survey is a significant and useful approach to any archaeological investigation and this distinguishes Stein's study. The percentage of coverage and the number of sites documented through aerial investigation seems far more than a ground exploration. However, Stein's work, particularly on the ground, clearly reflects his interest in the Roman frontier studies and the Roman road system in the region, especially the *via nova Traiana*. The date given to many sites appear to have been based on general observations such as the plan of the structure or the layout of a road rather than on a typology of the ceramic evidence or excavations.

In brief, the contribution of the studies reviewed above is significant in terms of recording, planning and describing new archaeological sites when they were in situ. However, those studies were clearly implemented to investigate one theme, the Roman frontiers for Brünnow and Domaszewski and Stein and the biblical archaeology for Glueck (Kennedy, 1992: 474; Findlater, 2002:137). Those themes clearly influenced the interpretation and the dating which seems to have been based on general observations. None of them can also be considered systematic and this can



be understood if the security conditions in the region, the surveying tools and the means of transportation during the first half of the 20<sup>th</sup> century are considered.

After the appearance of Bowersock's article about Arabia some European and American scholars responded to his call concerning the history of Roman Arabia. Parker was probably the first of these and since 1976 he has undertaken major projects mainly in Jordan. The first was the archaeological survey of the *Limes Arabicus* in 1976. Detailed analysis and final results of this survey were fully discussed in Parker's major work *Romans and Saracens* published in 1986. Although Parker's intention was clearly to write the history of the Arabian frontier depending on epigraphic, literary, and archaeological evidence, he also surveyed the southern end of the frontier, the area between Ma'an and Aqaba which was not covered by Brünnow and Domaszewski (Parker, 1976: 19). Moreover, he offered a basic ceramic typology for the sites he visited (1976: 21). Another major work by Parker was *The Roman Frontier in Central Jordan* (Parker, 1987a). The latter includes the results of surveys, soundings, and most importantly the excavation at al-Lejjun fortress.

Parker's explanation of the function of the military installations raised a scholarly debate over the relationship between Rome, represented by her forces in the region, and the local people (e.g. Mayerson, 1989: 71-79; Parker, 1987b: 35-51). In his work *Romans and the Saracens* (1986) Parker made it clear that he considered "the primary purpose of the entire Arabia frontier was to control the movements of nomadic Arab tribes" and "control the raids of tribes along the frontier" (1986: 8-9). This interpretation has been long reviewed and sometimes rejected (e.g. Mayerson, 1989; Isaac, 1990, 1998). Banning suggested a different relationship between the settled people and nomadic groups during the Roman period on the basis of archaeological evidence from the Wadi al-Hasa survey in southern Jordan which showed a degree of interdependence (1986: 25-50). Kennedy, in reviewing the two major studies of Parker (1986 and 1987a) took issue with a number of Parker's explanation, particularly regarding the relationship between Romans and Saracens or the nomadic people (1992: 473-89). According to Kennedy (1992: 477), there are many parts of Roman Arabia, within Syria, Saudi Arabia, and Palestine, which have not been investigated by Parker who mainly concentrated on the large sites, especially those which were previously visited by Brünnow and Domaszewski. Moreover, Kennedy

pointed out that Marcellinus' passage cited by Parker (1987a: 806) concerning the fortifications which were built to resist the raids of nomadic tribes in Arabia is unclear and questionable (Kennedy, 1992: 479).

Parker, like many of the Roman Arabia scholars seems to have been influenced by the accounts of the travellers who visited the region during the nineteenth and early decades of the twentieth centuries. Those scholars coincidentally witnessed the hostility of nomadic people towards the settled people, who had their towns raided and were forced to pay the booty (Arabic *Khaweh*) (Parker, 1986: 8). That situation and the existence of what were identified as major military structures, on the edge of the desert, most likely encouraged the acceptance of that interpretation by some scholars. Social, political and economic conditions must have facilitated the presence of that situation in the nineteenth and early twentieth centuries. In contrast, these conditions should have been different in the Roman and Byzantine period.

David Graf's investigations revealed more information about the Roman road system in Jordan, particularly the *via nova Traiana*. His research was clearly concentrated in southern Jordan for a number of factors, the least of which is that this area received less consideration in comparison with the northern parts of the country (Graf, 1979: 121). Graf conducted surveys in that area as early as 1978. The most relevant study to the area under consideration was his field investigations on the Roman road, the *via nova Traiana*, in Arabia Petraea (Graf, 1997a). He reasonably suggested three possible routes for the *via nova Traiana* between Petra and Sadaqa. Two of them are supposed to pass some parts of the study area (Graf, 1997a). However, because the main purpose of Graf's study was to investigate the road network between Petra and Sadaqa, it does not offer a clear picture concerning the landscape exploitation for other reasons such as settlement or economic needs. Moreover, the roads which Graf documented were dated according to evidence from a few uninscribed milestones and previously known sites. However, his contribution to the ancient road system in southern Jordan remains scholarly and valuable.

Findlater (2003) thoroughly reviewed the previous research and theoretical framework concerning the Roman frontier in Arabia and particularly in southern Jordan. The review considers all the existing models, starting with Parker's, Graf's,



Isaac's and others (Findlater, 2003: 17-52). He clearly sees considerable weaknesses in the suggested models and therefore concludes that "...it is an inadequately articulated debate which neither fully engages with the wider issues of imperialism or imperial strategy, nor effectively rationalise the local archaeological context. While there are clear divisions within these debates, with explicit notions of two camps resulting in a very polemic interchange of views, neither side uses archaeological data in a rigorous manner." (2003: 60). Therefore Findlater suggests that the military installations or the frontier system can be better understood through the consideration of the influence of landscape and the model of imperial resource control (2003: 52-60).

Recent approaches seem to have virtually shifted the scope from the defensive system to other important aspects (Findlater, 2002: 137). Fiema's thesis *Economics, Administration and Demography of Late Roman and Byzantine south Transjordan* (1991) is a significant example of this transformation. Although the study still considers the military arrangements during the periods under discussion, it emphasises the role of trade in the development of southern Jordan which seems to have been largely exaggerated since other factors such as agriculture should have been significant for the flourishing of the region. However, according to Findlater (2003: 219) Fiema's thesis was based on archaeological evidence from MacDonald's survey in Wadi al-Hasa which shows serious problems in the methodology that affects any broader conclusions. Fiema's recent study of *Late-antique Petra and its hinterland* (2002a) has also offered new interesting topics such as the settlement patterns, the religious factor and the impact of natural disasters (Fiema, 2002a: 213-252).

#### **Previous research in the study area**

##### **Surveys**

Only one large-scale and systematic archaeological project was previously conducted in the region of Udhruh. It was initiated by Alistair Killick from the British School of Archaeology at Amman in the 1980s. His work included excavations at Udhruh and surveys to adjacent areas in five seasons. Most of the areas he explored lie within the

geographical definition of this study's region (Killick, 1987a; 1987b: 173; 1986: 431-432; 1983: 231-244). Unfortunately, final publication of such a comprehensive study has not yet been completed. What has been published are a few journal papers and a handbook for tourism purposes (Killick, 1987b). Therefore, this study cannot benefit from Killick's work in Udhruh in terms of comparing the results and supporting the evidence collected by this author.

Killick's preliminary thoughts, although he has not published the final analysis, seem explicitly influenced by the approach of the frontier studies with little attention to the importance of trade in the history of Udhruh (i.e. 1986: 431). Sixty sites, out of 200 sites recorded in the survey area, were identified as watch towers by Killick (Killick, 1987a: 176, 1986: 440). The remaining sites would fall into two categories: forts and settlements, and roads and walls. The two types of sites (watch towers and forts) were considered to be part of a defensive frontier system (Killick, 1987a: 178). Although none of Killick's published reports contains a description of his methodological strategy, it is obvious from his discussion that the most visible sites, especially these which were located on hilltops, were carefully investigated (1986: 438 and 440). This clearly reflects Killick's interest in the frontier in the region of Udhruh. In other words, he was examining pre-determined hypotheses with little consideration of other important aspects (1987a: 178).

Moreover, on many occasions, Killick appears to have missed significant archaeological sites in the region. Particularly worth mentioning are the well preserved stretches of ancient roads found by the present author. Killick first paid closer attention to the clearer roads/walls to the south-southeast of Udhruh, and secondly he assumed that these roads, especially the one which connect towers with small farmsteads, would not survive the ravages of time (Killick, 1987a: 175; 1986: 432-36). Moreover, Killick reasonably suggested the presence of two north-south roads in the study area, with at least three east-west routes to join them (Killick, 1987a: 175). This author was able to track a main north-south road on the hills overlooking Petra, and parallel to the modern roads of Shaubak-Wadi Musa and Wadi Musa-Basta. Amazingly, many junctions of secondary roads which run in an almost west-east direction were found along the road.



A final point, regarding Killick's interpretation of the watch-towers, should be made here. He distinguished four vertical chains of towers (Killick, 1986: 440). According to him: "the vast majority of the towers are ideally sited with a clear view not only to the next tower in the chain, more importantly it seems, to the next but one tower in the chain. Where possible the towers have been so constructed as to get a clear view of the fort at Udhruh" (1986: 440). The evidence for the date of the Roman fortress at Udhruh has not been firmly established. Therefore, Killick's assumption that this type of defensive structures was coincidentally constructed with the fortress at Udhruh seems unreasonable. In fact, the ceramic evidence collected by this author from the alleged watch towers shows a variety of periods, most of which predate the Roman period. Moreover, the similarity in the architecture material or geographical location and ceramics do not necessarily imply features were contemporary.

Another important study touched considerable parts of the study area, but cannot be considered systematic, was the Wadi Musa Water Supply and Wastewater Project ('Amr *et al*, 1998; 'Amr and al-Momani, 2001). It was mainly initiated to protect and document any archaeological sites affected by the layout of the pipelines ('Amr and al-Momani, 2001: 283). Due to the fact that the project was following the construction of the planned pipeline in different areas, the recorded sites were given a name and number referring to the sector where they were found ('Amr *et al*, 1998; 'Amr and al-Momani, 2001). Three sectors of the pipeline were located within the study region: the Ayl sector, the Jithth (al-Jithih) sector, and the al-Qa' sector ('Amr and al-Momani, 2001: 275-83). A total of 39 archaeological sites were recorded in the abovementioned sectors; 30 sites at least are located in the region of Udhruh ('Amr and al-Momani, 2001: 275-83). Final analyses and results have not yet been published, however, one can conclude from the published reports that the landscape was exploited by an agricultural society and that the Edomite, Nabataean-Roman and Byzantine periods are well represented archaeologically. The ceramic evidence collected from many sites is similar to the corpus identified by this study.

## Excavations

Three excavations were carried out throughout the region of Udhruh. Killick conducted the first excavation at the site of Udhruh and adjacent sites such as Tell Udhruh (1983). Little is known about the initial results through preliminary reports and final conclusion has not yet appeared (Killick, 1982: 415-416; 1983: 110-131). A German team excavated the Neolithic village at Basta in 1986/87 (Nissen *et al*, 1987: 79-119). The project revealed the remains of a considerable Neolithic village, most of which seems buried underneath the modern houses. At Sadaqa, Graf (1997a: VI 14) conducted a small-scale excavation, the final results of which has not yet been published.

## Systematic Surveys in Adjacent Areas

There are two reasons to consider the systematic surveys in adjacent regions to the study area. First, most of the studies reviewed above were purposive and designed to investigate one theme and therefore do not reflect the human exploitation of the landscape throughout the historical periods. The results of systematic surveys in the region of Udhruh (Killick's study) have not been published and other surveys were purposive (the Pipelines and Wastewater Project) and thus are of limited value for supporting and evaluating the conclusions of this thesis. Second, some surveys in adjacent areas are systematic and deal with the archaeological evidence regardless of the period it represents or the function of the site. Moreover, many of the investigated areas have topographical and climatic features and natural resources similar to those in the Udhruh area. The results of these studies are therefore important for comparison with the present study.

In the 1980s Hart (1986; Hart and Falkner, 1985) conducted archaeological surveys in southern Jordan in a region he called Southern Edom, from Sadaqa down to Ras Naqeb. The northern part of that area is adjacent to the southern end of this study's region which is the area around Sadaqa. Although Hart's study seems systematic as he dealt with any archaeological materials he found on the ground, the Iron Age (Edomite period) and the Nabataean period are the main concern of his investigation. According to preliminary analyses, Hart's study area had intensive human settlement



in the Edomite and Nabataean periods (7<sup>th</sup>-6<sup>th</sup> century B.C. and 1<sup>st</sup> century AD) with a third stage of flourishing activity identified in the Ayyubid-Mamluki period. Between these periods human activity in southern Edom declined according to Hart (1986: 51-58; Hart and Falkner, 1985: 256, 258 and 268). Hart explained the intensity of settlement during those periods to be the result of the region's inclusion within strong political systems, those of the Assyrians in the 7<sup>th</sup> and 6<sup>th</sup> centuries and the Nabataeans in the 1<sup>st</sup> (1986: 58). This conclusion seems questionable as recent fieldworks (e.g. this study and Findlater, 2003) show that the drop in settlement, particularly after AD 106, is not as significant as suggested before. Judging from Hart's hypothesis concerning the presence of a strong political system as a factor of development, one would expect that the whole area should have thrived when Arabia was under Roman control.

Jobling conducted systematic surveys in the 1980s in the region between Ma'an and Aqaba (1981; 1983; 1984; 1987). The main purpose the study was to investigate and document the archaeological evidence in a marginal area where human activities were thought to be minimal or unattested. The type of the archaeological evidence seems to have directed the focus of this survey in its later seasons. Much attention was given to the epigraphic evidence and rock carvings (e.g. 1987: 211-219). Some settlement patterns were recognised in some parts of the study area but the study lacks the chronological sense which is important for comparison with the conclusions of this thesis. In this respect, Jobling's research does not offer enough data concerning human settlement throughout the historical periods, but remains significant in terms of recording valuable evidence in a marginal area to understand the degree of integration between the more settled areas and the pastoral regions (Jobling, 1981: 111).

To the north of the Udhruh, the most recent fieldwork, known as the Dana Archaeological Survey, was conducted by George Findlater between 1998 and 2000. Findlater's project emerged from a previous field study undertaken by the Centre for Field Archaeology of the University of Edinburgh in 1994/5 and 1996 (2002: 137-138; 2003: 145-147). "The aim of the project is to produce a record of the relationship between state/military sites and settlements within a landscape setting of resource areas" (Findlater, 2002: 137). The study area extends from Wadi Dahal and the Gharandal in the north to Wadi Arja in the south, a total of almost 1750 square

kilometres (Findlater, 2003: 145). The southern boundary of Findlater's study region nearly touches the northern limit of the Udhruh project, a few kilometres north of al-Jerba. The data that the Dana Archaeological Survey accumulated was presented and discussed thoroughly in Findlater's PhD thesis (2003) *"Imperial control in Roman and Byzantine Arabia: a landscape interpretation of archaeological evidence in southern Jordan."*

Because Findlater attempts to present an alternative interpretation or new model for understanding the landscape archaeology of southern Jordan during the Roman and Byzantine periods, his thesis contains prolonged and critical reviews of the major military sites, textual and archaeological evidence for each site, and discussion of previous hypotheses concerning the relationship between the imperial authority and local people. The second part of the study contains analyses and interpretations of the archaeological evidence collected by Findlater, and in this section he critically reviewed the results of four major archaeological surveys carried out in southern Jordan for the sake of comparison and assessment and to highlight the significance of his study regarding the continuity of settlement or landscape exploitation from the Iron Age up to the early Islamic period (2003: 214-232). Findlater concludes that the results of those projects support the outcomes of his research which indicate that settlement patterns in his area strongly continued from the Iron Age throughout the Roman and Byzantine periods with a clear decline in the early Islamic period (2003: 232-235). However, unlike the other studies, Findlater's study shows significant continuity from the Nabataean to the Roman period and a less drastic fall in the early Islamic period (2003: 234). The latter conclusion does support the results of the Udhruh survey presented in this thesis (see Chapter 8).

Findlater's thesis shows high scholarly standards in terms of the methodological approaches, ceramic analysis, reviews of previous work and more importantly the conclusions concerning the continuity of human activity and the impact of the imperial authority on the region's landscape. Some notes, however, can be made here. First, he often made it clear that spatial sites, standing structures and roads, were the concern of his survey to achieve the goals of his study. Scatters of artefacts or ceramic sherds were deliberately not included in his analysis. The exclusion of such material may not affect the main question of Findlater's research, but would affect the



conclusions regarding the rate of continuity from one period to another since the surface evidence is the method he used to date all sites. Moreover, as Findlater observed, the surveys he used to support and evaluate his conclusions suffered from problems in the methodologies applied to collect data and recognise the surface evidence (2003: 214-232). Nevertheless, he correlated the outcomes of those studies and drew some conclusions concerning settlement continuity (Findlater, 2003: 232-234).

To the west of the study area, the most recent archaeological investigation, known as the Jabal ash-Sharah survey, was carried out in 1996 and 1997 by Laurent Tholbecq (2001: 399-405). The main aim of the survey is “to characterize the occupation of Petra’s hinterland from the Edomite to late Islamic times”. (Tholbecq, 2001: 399). The fieldwork was limited to the natural extent of the Wadi Musa drainage basin, so its eastern limit is contiguous with the western periphery of the Udhruh survey for about 16 km. The surveyor used mainly aerial photographs to collect data as he worked alone and it was therefore difficult to systematically investigate the region. Sites spotted in the photographs were visited and investigated and ceramics collected (Tholbecq, 2001: 400). Tholbecq’s area is relatively small (72 square kilometres) and cannot reflect the fluctuation of human settlement from the Edomite to the late Islamic periods. Nevertheless, his preliminary remarks do match to some extent the results of Findlater’s and the conclusions of this thesis. Judging from surface evidence, Tholbecq’s study shows that the region was heavily settled during the Nabataean period and that Roman control of the region did not significantly affect the settlement intensity. He also cited a gradual decline towards the end of the Byzantine period (7<sup>th</sup> century) and unlike the evidence from Udhruh a gap in human activity from the early Islamic to the Ottoman periods (2001: 402-405).

## Conclusion

The first part of this chapter was a brief historical review outlining the main periods during which the whole region including the study area developed. It traced the formation of the political systems throughout the first millennium AD. The second part of the chapter considered previous research in the region of Udhruh as well as a review of some fieldwork conducted in adjacent areas. Apart from Killick’s project,

the study area has not been the subject of a systematic study. However, the results of Killick's study remain largely unpublished. Some parts of the region, particularly the major sites, were considered by large-scale projects such as the *Limes Arabicus* or *Provincia Arabia* but none has treated the region as a coherent landscape. Topics like the settlement patterns, the water-supply system, the communication network, agriculture and the cultural development of the region of Udhruh in the first millennium AD have not been the theme of any comprehensive study. Archaeological projects in areas neighbouring the study area either lack final publications or their results cannot be fully integrated as they focus on the archaeology of one period. However, the initial conclusions of some studies (e.g. Hart, 1986) support the results of this study. Findlater's study (2003) is the most recent systematic project that deals with the archaeology of the region through its landscape. Its conclusions concerning settlement continuity also support the outcomes of this thesis.



## **Chapter Three**

### **Introduction**

This chapter will present information about the survey of Udhruh, the study area and its universe including the sub-areas. It also contains detailed explanation of the techniques this author used in the field to survey the study area and record the data collected from the region. There is an assessment of the surveying methods in comparison to techniques utilised by some other projects. The discussion considers other important issues such as the treatment of ceramic data and the type of archaeological evidence found in the region of Udhruh.

### **Methodological Approaches and the Type of Evidence**

#### **Period and Team**

The survey of the region of Udhruh was conducted in the period between 15/10/03 and 15/12/03. A second visit was made to the study area in May 2004 to take GPS points of roads, channels and walls. The team consisted of the author and the hire-car driver, and sometimes volunteers. However, as none of them was an archaeologist, their participation was restricted to simple jobs such as taking measurements and collecting pottery sherds. The work of these volunteers was appreciated since they effectively helped in accomplishing this project.

#### **Methodological Approaches**

Due to the relatively large area the survey intended to deal with (about 700 square kilometres) it was difficult to cover the whole region as one geographical unit. Dividing the region into small areas was a necessary strategy to finish the work according to the schedule, and to cover each area systematically by looking at small geographical units. The survey area is horizontally and vertically divided by modern road network (Fig. 3.1). Major asphalted roads were used to identify the borders of each area which are also criss-crossed by agricultural or dirt roads. The intensity of the latter is not the same in each area. However, they were utilised practically and

made a vehicular survey very effective. In other words, there was relatively easy access to every hill, mountain and valley.

#### Area I (Fig. 3.2)

This area is enclosed by four modern roads; three of them are major whereas the fourth road is secondary. The latter is the northern line of this area which connects the Shaubak-Wadi Musa Road to the west with the Shaubak -Udhruh-Ma'an Road to the east. It starts at the south-eastern corner of al-Jerba (the new) and heads westwards for almost ten kilometres with a zigzag direction. The southern line is represented by part of the Wadi Musa- Shaubak Road. The western and eastern lines are respectively parts of the Wadi Musa- Shaubak Road and the Shaubak -Udhruh-Ma'an Road. Both roads are roughly heading north-south.

#### Area II (Fig. 3.3)

This area is less well defined compared with the other areas. Its northern, and eastern border lines were drawn on the ground. The first extends for nearly ten kilometres along a desert track eastwards to the modern wells of al-Braikeh. It is worth mentioning that this line starts just about twenty metres to the north of the al-Jerba's Fire Station and is not straight. From al-Braikeh a south-southwest, a line was also drawn to be the eastern border of this area. It intersects the Shaubak-Udhruh-Ma'an Road at the permanent location of al-Hussein Bin Talal University. In fact, the whole area eastwards down to the desert highway, was intended to be investigated but the presence of industrial activities, mainly modern quarries, was a real obstacle. The Shaubak-Udhruh-Ma'an Road forms the western fringe of this area.

#### Area III (Fig. 3.4)

Area III is well defined as it is encircled by four modern roads, two north-south and two east-west. The two vertical are respectively the Wadi Musa-Udhruh Road to the north and the Dhra' Qusaib Road to the south and southeast. From the west, the bordering line is the Udhruh-Rashid-Abu Danneh-Basta-Ayl Road, while the Shaubak-Udhruh-Ma'an Road is the border line from the east and northeast.



#### Area IV (Fig. 3.5)

This area is encircled by four roads; the Wadi Musa-Udhruh Road to the north, the Wadi Musa-Basta Road to the west and northwest, the Udhruh-Rashed-Abu Danneh-Basta-Ayl Road to the east and southeast, and the Umm Hilal Road to the south. The latter heads west to northwest from Abu Danneh and intersects with the Wadi Musa-Basta Road at about three kilometres. The modern settlements at Rashid (al-Qa') and Abu Danneh lie within this area.

#### Area V (Fig. 3.6)

This area is bordered by the Udhruh-Rashed-Abu Danneh-Basta-Ayl Road to the east, the Wadi Musa-Basta Road to the west, the al-Tayyibeh-Ayl Road to the south, and the Umm Hilal Road to the north. From the point where the Wadi Musa-Basta Road significantly changes its direction to intersect the Udhruh-al- Rashed -Abu Danneh-Basta-Ayl Road at Basta, a virtual line was drawn to form a straight end for this road. Therefore, for most of the southern end of the western border line of the study area, it was decided not to go beyond certain landmarks.

#### Area VI (Fig. 3.7)

This area is enclosed by four roads; the Shaubak-Udhruh-Ma'an Road to the east, the Udhruh-Rashed-Abu Danneh-Basta-Ayl Road to the west, the Dhra' Qusaib Road to the north and northwest and the Ma'an-Ayl Road to the south and southwest.

#### Area VII (Fig. 3.8)

This area is enclosed by the al-Tayyibeh-Ayl Road to the north, the Ayl-al-Fardhakh-Sadaqa Road to the east and northeast, the hills south and southwest Sadaqa, and by the extension of the virtual line drawn in Area VI from the west.

### Area VIII (Fig. 3.9)

This area is encircled by the Ayl-Ma'an Road to the north, the Ma'an-Aqaba Road to the east and southeast, the Ayl-al-Fardhakh-Sadaqa Road to the west, and the newly constructed road between the Ayl-al-Fardhakh-Sadaqa Road and the Ayl-Whaideh Road to the south.

### Surveying Methods

It was mentioned in the previous section that there is an intensive presence of desert roads or tracks in the study area in general. This is the case in almost every area. The topography is a determining factor in the existence of these tracks. Generally speaking, there were no real obstacles to impede vehicular investigation for any hill or valley and vehicular survey in areas like area II, VI and VIII was particularly helpful due to the high degree of visibility in these areas. Thus, our truck was effectively used in the field. Even so, foot-based survey was inevitable and necessary to explore inaccessible and hard terrain like deep valleys and very high hills, and more importantly to cover the area between any two sites and to investigate and record the archaeological remains which cannot be seen from a distance. A horizontal and vertical visual search from any site was enough to recognise another site in the area, and this is particularly true in areas I, IV, V and VII.

It is worth noting that these areas (I, IV, V and VII) lie within the eastern upper slopes of Jebal Shera with an elevation of at least 1400 metres above sea level. A common topographical feature among these areas is the contiguous hills which run north to south with gradual extensions to the east interrupted by many east-west small valleys. Therefore, the strategy of survey applied in these areas was almost the same. East-west and north-south agricultural roads (not asphalted) are abundant. The vertical ones usually run along hilltops or valleys whereas the horizontal ones run along the lower slopes or bases of hills wherever access is possible to the next hill or valley. The existence of these tracks not only offered an access to any site but eased the work by dividing each area into small zones identified by certain bordering lines, usually the tracks themselves or the valleys.



Once a certain area was selected for investigation, the survey team started from its north-eastern corner. From there the team moved westward to explore whatever the type of landscape they started with until reaching the westernmost borders of the area, from there also they returned back to the eastern border line. However, sometimes we had to stop at a point and then started surveying horizontally and this was especially inevitable with the ancient roads and tracks which usually run in a north-south/southeast direction. It is worth pointing out that the hills or valleys do not extend from the eastern to the western line without interruption. In many cases valleys end at the base of a hill far away from the western border line and vice versa. However, this change in the topography did not affect the direction of the team.

Although most of the western parts of areas III, VI, and VIII have the same topographical features, their eastern halves have a different landscape. In these areas, visibility and accessibility were very high; consequently, archaeological remains of a considerable size and even small mounds were easily recognisable from a distance. Moreover, separate and isolated hills are very significant especially in area III and VI. These hills were mostly associated with archaeological remains either on the top of the hill or on the lower slopes. Many sites were recorded during the process of tracking the so-called Khatt Shabib or Shabib's Wall in these areas. Long valleys like Wadi Basta and Ayl and others were walked completely. This strategy was effectively useful since some sites were found on the edges of these valleys (Fig. 3.10).

In addition to the systematic coverage of each area, interviewing the local people particularly those who live close to the area under investigation was a very fruitful approach. About fifteen people were interviewed during the two-month survey; some of them were accidentally met near an archaeological site. The experience of those who breed cattle is priceless since they keep moving around in the region throughout the year. They not only told us where archaeological remains could be found or used to exist but sometimes guided us to certain sites. Without the contribution of the indigenous people we would not have known the names of many places. In some cases we had to return back to some areas to record archaeological sites we had missed following new information from the local people.

1: 10,000 scale aerial photographs, taken in 1978, were intended to be used during the survey but unfortunately they are not available for the region of Udhruh. What was available are the 1: 30,000 scale photographs which are not helpful since identifying an archaeological site in a photograph with that scale is certainly extremely difficult. However, a handful of aerial photographs of certain sites are available and these will be used as illustrations in this study. These photographs were taken by the French Institute in 1981 and bought from the Royal Geographical Centre. Finally, a GPS navigator (hand-held) was used to specify the coordinates of each site to be incorporated with the GIS.

### **Assessment of Survey Techniques**

In a normal practice of a modern systematic fieldwork, one would expect that the survey area is covered by dividing the region into transects investigated by pedestrians located at intervals from a few metres to tens of metres. However, there are a number of factors that limit the utilisation of this method of survey. Time available for the team, number of surveyors, financial issues, the nature (topography) of the area intended to be investigated and the aims a survey is trying to achieve all influence the survey techniques. The application of a pedestrian survey in the region of Udhruh was extremely difficult for the following reasons: first, according to a contract signed between the author and the sponsor of the study (al-Hussein Bin Talal University) the author was only permitted to spend three months engaged in fieldwork. Second, the surveyor worked alone in the field and the volunteers were unfamiliar with archaeological materials. Taking these facts into consideration, it seemed impossible to apply a walking survey. On the other hand, as mentioned above, the high visibility in the study area as well as the abundance of dirt tracks made a car-based survey possible and successful. Above all, the author, as a local of the region, has a good knowledge of the archaeological sites in the area. Nevertheless a pedestrian survey was used on many occasions at large sites to collect artefacts and investigate the individual components of the site. Walking the terrain was also a technique used in the field to investigate inaccessible areas and valleys.

The survey methods of two studies will be considered here to compare with the techniques applied in this study. First is the UNESCO Libyan Valleys Archaeological



Survey conducted in Libya in the 1980s (Barker *et al*, 1983). The reason for considering this project is the fact that its study area topographically resembles substantial parts of the region around Udhruh, being an open area with high visibility and designated as a pre-desert zone (Barker *et al*, 1983: 21-27). Barker *et al* (1983: 27) suggest that field-walking or a pedestrian survey through transects was not possible in his large area (50,000 km<sup>2</sup>) but can only be applied in an area ranging from a few square kilometres to a few hundred square kilometres at the largest. Three methodological approaches were combined by that project to carry out the survey: “reconnaissance surveys of the study area as a whole; more systematic surveys of a representative sample of wadis; and detailed investigations of individual settlements or group of settlements...” (Barker *et al*, 1983: 28). However, vehicles seem to have been frequently used throughout the seasons of the project and proved to be vital to collect archaeological data in an open area with considerable visibility. In a region like Udhruh (about 700 km<sup>2</sup>), the possibility to miss archaeological sites by a car-based survey would be even lower compared to a huge area such as the Libyan valleys. Second is Findlater’s study in the area between Udhruh and Dana (2003). His study area is not only adjacent to the region of Udhruh but shares climatic and topographic features with the area considered in this thesis. Findlater used both vehicular and pedestrian methods to cover his study area. However, vehicular survey was clearly the main technique used in the field to collect data. In some areas, due to the topography of the area and the high visibility of sites, only car-based survey was applied. Nevertheless, some areas or sites were walked and traversed for sampling purposes and others were not surveyed using the same technique as it was a time consuming process. Findlater also utilised the knowledge of local people to locate ancient sites (2003: 153-154). Using those survey methods, Findlater was able to record more than 400 archaeological sites and consequently offered some hypotheses concerning the Roman military presence in the region and drew some conclusion regarding the continuity of settlements (2003: Chapter 7 & 8). The survey methods applied in the present study are therefore comparable to those used in other recent fieldwork studies.

## Recording system

The data revealed from every site was documented in a notebook and on A4 sheets. Once an archaeological site was found the following procedures were implemented:

- Taking GPS readings.
- Closely investigating the components of the site and recording them as features of that site. Every site was given a number whereas letters were given to the features.
- Exploring the area around each site in a circle of at least 100m diameter.
- Measuring all the architectural remains at the site, including the length, width and height of walls. Finds, other than architecture such as ancient roads and rock-cut cisterns, were also measured.
- Producing sketch plans whenever it was possible, especially of the architectural features at the site. This process was time consuming since our very small team had no draughtsman.
- Describing the site and its features. The description usually contained information about the geographical and topographical location of the site, the type and size of stones and material used if the site had architectural remains.
- Collecting pottery sherds from each site, if available. The nature of the site was a significant factor in how the sherds should be collected. Random and systematic collection was intended. Systematic means covering the whole site while random means any sherds were meant to be collected regardless of the period they represent. Sites on flat hilltops or in wadi beds were divided into transects. Each transect was then walked and the sherds were collected. Sherds from sites on isolated hilltops were collected by walking around the hill in circles from the base to the top. However, at some sites pottery sherds were very abundant whereas a small number of ceramic sherds were collected at many sites. At certain sites (e.g. Udhruh and Rujm Sadaqa), the lack of diagnostic sherds is due to the systematic collection of ceramics by previous fieldwork studies.

At the end of each day during the survey period, the ceramics which were collected from the sites were cleaned and washed to ease the process of dating. After that, the pottery sherds from each site were carefully examined by the author and the severely weathered and undateable sherds were not passed to the ceramicists. The remaining



sherds from each site were counted and the number from each site is provided in this study (Appendix 3). However, one of the shortcomings of this study is the absence of a detailed breakdown that shows the number of sherds designated to each period at each site. There was also no attempt to look for ceramic parallels from other areas similar to these from Udhruh. These limitations were clearly due to the restricted time the author had to finish his study.

At the end of the survey season, all the ceramics were passed to two scholars, Dr Khairieh 'Amr (Department of Antiquities of Jordan) and Dr Hamzah Mahasnah (University of Mu'tah), for the purpose of dating. The ceramics from the sites which appeared to be prehistoric were given to Dr Mahasnah since he is a prehistorian and has conducted fieldwork including excavations in southern Jordan. He also has a good knowledge of the historical period's ceramic wares as a student of James Sauer and through his subsequent research. The rest of the pottery was identified by Dr 'Amr who has exceptional experience and knowledge of the archaeology of southern Jordan including the study area. Many of her studies (e.g. 1987; 1991; 1992) consider the ceramics from Petra and from other sites in southern Jordan. Dr 'Amr has also conducted and been involved in fieldwork studies, surveys and excavations in the region since the 1990s (e.g. 'Amr *et al* 2000). One of those studies has touched considerable parts of the study area ('Amr and al-Momani, 2001; 'Amr *et al*, 1998). The pottery sherds from each site were carefully examined by the ceramicists. Each sherd from each site was closely investigated and given a date and the sherds from each period were put together. In many cases the ceramists, especially Dr 'Amr, cross-referenced and referred to similar examples of ceramics she has found or seen at other sites in southern Jordan.

### Ceramics Data

Surface artefacts, particularly pottery sherds, collected from archaeological sites have long been the main dating tool of ancient sites in Jordan. This methodology was rarely used before the 1930s and was first introduced and applied by Glueck during his surveys in the country (e.g. 1935). However, Glueck's reading of ceramics in Jordan was based on the ceramic typology produced in Palestine by Albright (Findlater, 2003: 158). Since then this technique has been broadly accepted and practised by all

fieldwork studies in Jordan. In Jordan, the first stratified ceramic typology was presented by Sauer as a result of his excavations on Tell Hesban which shows continued human settlement from prehistoric times up to the Ottoman period (1973). Parker (1986: 12) tested Sauer's typology by comparing the dates given to some sites by Sauer according to ceramics with evidence from building inscriptions and coins he (Sauer) was unaware of. The dates of the inscriptions and coins fell within the occupation periods suggested by Sauer. Moreover, Parker (1986: 12; 1987a: 525-547), through stratified evidence gained from excavations by the *Limes Arabicus* and his excavation at Lejjun in southern Jordan confirms the validity of Sauer's chronology. Although this chronology is broadly used since its introduction, particularly in northern Jordan, it does not acknowledge the Nabataean period which had significant cultural and archaeological impacts in the region. Instead, it was included within the early Roman period which starts in 63 B.C. and extends to AD 135. Therefore, some projects (e.g. Findlater, 2003) refer to the Roman period from AD 106 when the region politically came under a direct Roman control.

In southern Jordan, such a typology is not available for the archaeologist to date ancient sites and Sauer's chronology does not seem applicable in that part of the country as it was based on stratified evidence from a tell site in Hesban. Tell sites in southern Jordan are very rare and no attempt was made to create a chronology on the basis of stratigraphic evidence from a tell site. Parker (1987a: 525-619) is the only study in southern Jordan that tested the validity of the surface evidence (pottery sherds) through the excavations at Lejjun fortress and other adjacent sites. In the last fifty years, the focus was on the Nabataean ware and its development on the basis of excavations particularly conducted at Petra (Khairy, 1982: 275-283; Schmid, 1997: 413-420; 'Amr, 1987). No study has thoroughly attempted to trace the changes that happened to the ceramic ware from the 2<sup>nd</sup> century AD onwards, therefore, the next section will consider this issue.

### **Ceramic Wares and Site Continuity**

In this study, like many recent studies, the date of sites was based on the surface evidence of pottery sherds. Thus, the continuity or abandonment of sites is derived from the surface evidence and this makes the conclusions concerning settlement



patterns and site continuity provisional and need to be confirmed by excavations and stratified evidence. However, many studies (e.g. Parker, 1987a; Findlater, 2003: 161) have shown clear correspondence between the surface and stratified evidence.

The important issue that needs to be considered here is the continuity of Nabataean ceramic ware up to the 5<sup>th</sup> or 6<sup>th</sup> centuries as suggested by some scholars (e.g. Parr, 1978; 'Amr, 2004). This matter has not yet been thoroughly treated, but 'Amr (2004: 237-245) has shed some light on the issue. 'Amr based her conclusions on archaeological evidence from Petra and other sites in the area among them the pottery kilns at az-Zurrāba. Twelve kilns have so far been discovered there and the site is the only known centre of Nabataean pottery production, particularly the fine painted ware ('Amr, 2004: 240). She mainly considers (as an example) the painted ware which is the most known and recognisable Nabataean pottery ware. The evidence that 'Amr presented is stratified and based on excavations carried out at az-Zurrāba kilns, Gaia (modern Wadi Musa), Petra and Khirbet an-Nwāfla (2004: 237-240; Schmid, 1997). The latter site is significant as it shows a continuing settlement from the 1<sup>st</sup> century to the Ottoman period ('Amr, 2004: 240). Throughout the study and through considerable archaeological evidence including comparison of parallels from the sites mentioned above, 'Amr shows that the Nabataean tradition ware continued after the annexation up to the 5<sup>th</sup> or 6<sup>th</sup> centuries. These wares have also been found in other sites in southern and northern Jordan. However, the study clearly shows that there was a traceable development, probably from the 1<sup>st</sup> century B.C., in the wares and forms. It also notes that the style of paintings, although resembling the classical Nabataean styles, do not retain the same quality and accuracy. Some of the forms which were never painted in the earlier Nabataean ware had paintings in later periods ('Amr, 2004: 237-240).

The discussion above clearly shows that Roman control of the region did not significantly affect the local production of material culture including pottery. Accordingly, it seems quite difficult using political periods to specify the end or beginning of material culture as local traditions may have continued further beyond the political change. However, this study benefited from the knowledge and experience of Dr Khairieh 'Amr as she analysed most of the ceramics collected from the region of Udhruh. Her awareness of the problem of continuity and her experience

in southern Jordan, particularly Petra and its hinterland, make the dates given to the ceramics from the study area more secure and precise. The presence of traceable (in terms of date) ceramic wares constantly at many sites does indeed reflect continued human activity. And the scale of utilisation may also vary according to the site's function. In addition, the preservation of many structures at many sites in the region of Udhruh can also be an indicator of continued use. Moreover, the evidence from the landscape around these sites suggests considerable exploitation for agriculture probably for many centuries.

### **The Type of Evidence**

The discussion of the type of evidence collected from the region of Udhruh will lead to the crucial issue of the type or function of the sites with special attention to these with architectural features. In fact, it was and still is very difficult to identify firmly the type or function of many sites. Square, rectangular, and irregular structures of different sizes, some of them are fairly well preserved, were recorded. The size of the site has been used by scholars elsewhere in the Mediterranean to determine the type of the site (e.g. Armstrong, 2002: 347-349). However, the size of the site is by no way a decisive factor in identifying the function of the site with certainty. Many factors could effectively limit the size, not least the topographical location and the number of people who utilised the site, however size may be a realistic indicator of the volume of human activities conducted at the site.

In addition to the size of site, this study will consider other factors to categorise the type or function of sites. These factors include the topographic location, architectural materials, associated features, and the relation between this site and other major sites in the area. However, before any criteria of the type of evidence of this study should be implemented, it is worthwhile presenting the different types of evidence collected from the region.

At the end of the fieldwork, it was apparent that the types of evidence would fall into the following categories:

- Architectural remains.
- Ancient roads and tracks.



- Agricultural remains.
- Water-supply systems.
- Industrial sites.
- Inscriptions and rock carvings.
- Walls, enclosures and circles.
- Others.

The following discussion will consider each of the abovementioned types.

1- The architectural remains: these will be discussed with special attention to their size, topographic location and relation to other types of evidence.

A- The size: the architectural remains at the sites recorded during the study showed a variety of sizes, and they can be categorised as the follow:

- Very small structures; do not usually exceed 20 square metres.
- Small structures; do not exceed 100 square metres.
- Medium structures; do not exceed 300 square metres.
- Large structures (complex); do not exceed 1000 square metres.
- Very large structures (complex), above 1000 square metres.

B-The topographic location: the architectural remains were found on different topographic locations:

- Hilltops and upper slopes of hills.
- Middle and lower slopes of hills.
- Beds of valleys.
- Flat ground.

C-the relation to other types or sites: most of the sites which had architectural remains clearly showed a relation either with features at the site itself or with other sites. Many of them were found in association with courtyards, caves, threshing floors and stone circles. Others were found just on the edge of an ancient road or connected with a secondary road. Some sites, especially of small size, were located very close to water resources, mainly to springs, whereas in certain areas, Area I for instance, the presence of two separate structures together at the same site was observed. However, a handful of structures were established in remote areas. Finally, it is worth pointing

out that most of the structures were located within a relatively fertile zone and terracing walls and agricultural fields can be seen abundantly in that zone.

2- Ancient roads and tracks: roads with a considerable width (3-8m) were easily recognised if they were, in particular, associated with curb stones. However, sometimes it was very difficult to make a distinction between a long line of a stone wall and a track. In some cases a stone wall connects two sites in the same area, so such a wall was considered as a track by this study especially if it did not encircle a particular area. These walls seem to have been built to define the path of a dirt track. On some occasions, even the well defined road ended with a dirt track due to the hard terrain which probably impeded the construction of the road. Roads and tracks were also found along beds of valleys, and again the existence of a wall in the wash of a valley was problematic since walls were used in association with roads and terraces. In fact, most of the roads recorded in the study area are bordered by two stone walls.

3- Agricultural remains: this type of evidence includes threshing floors, terraces and terracing walls, field walls and cupholes. These features are definitely a reflection of the long history of human settlement in the region.

4- Water-supply system: this type of evidence includes aqueducts, reservoirs, wells, springs, and rock-cut cisterns.

5- Industrial sites: this sort of evidence mainly consists of quarries. Some of them were found very close to the structures which were built of their stones. At one quarry (Site no. 157) the cut stones were arranged into rows ready to be taken some where. Marks of cutting tools were also noticed on some stones (Fig. 3.11).

6- Inscriptions and rock carvings: complete inscriptions were very rare, but many short marks and letters were recorded predominantly on stones at archaeological sites. Rock carvings were also noticed at some sites; of special importance were these which found on the rocks near Khirbet Du'aïj as they show many types of animals and may show riders in hunting scenes.



7- Others: this type of evidence refers to the features which are not of vital importance to the periods under investigation in this study. This includes natural caves, mounds and stone walls.

Having presented a brief introduction to the different types of evidence the author collected during the fieldwork, it is now necessary to explain the criteria for the type or function of each site, mainly these which had architectural features since there should be no argument in identifying the function of a reservoir or a road. Hence, the present author would deal with the evidence according to the following criteria:

- 1- Sites of very small and small sizes on significant hilltops or near water resources or on roads were identified as watch towers.
- 2- Sites of medium sizes are generally farmsteads especially if associated with threshing floors and enclosures. However, some of them might have been *caravanserai* particularly if they were located close to a major road and associated with courtyards, or forts if strategically located, and here the plan and stonework should be considered.
- 3- Sites of large and very large sizes are predominantly hamlets, villages or small towns.

#### **Settlement Hierarchy**

Two methods were used to measure the area of each site according to their archaeological components. At sites where only a structure exists not associated with other archaeological features, the external walls were measured. At the large sites where the archaeological features are distributed on the surface around a structure or a complex structure, the whole area was measured where appropriate. However, in some cases the dimensions given are approximate, due to the irregularity in the site shape.

Apart from the water supply system sites, roads and watch towers, it was very difficult to determine the function of the structural sites in the field. The majority of the structures were constructed of large stone blocks, and in many cases the external

and internal walls consist of two faces filled in with small stones and rubble. This masonry for the first time indicates a defensive or military function. Moreover, the majority of the settlement sites, including the large settlement sites, were either located on hilltops or upper slopes of hilly areas. The builders of al-Jerba, for instance, located their village on the hill rather than on the relatively flat ground westward where the modern village lies at present.

However, there are some useful indicators should be considered. First is the location of the site and the nature of the landscape around it. The presence of agricultural fields, terrace walls and clearance mounds all indicate the agricultural nature of the site (Fig. 3.12). Second are the archaeological features associated with the site such as threshing floors or animal pens or a watch tower. Third is the masonry and plan (below) of the structure or structures at the site. Finally, and more importantly, is the size of the site, as the size of the site reflects the scale of human activities conducted at the site. Since the majority of the sites seem to have been agricultural, the size would be decisive in determining the function of each of them. Therefore, the following criterion was set up according to the size of sites with the consideration of the other three factors mentioned above.

1. 1-100 m<sup>2</sup> is a simple farming structure or pastoral structure.
2. 101-1000 m<sup>2</sup> is a farmstead or a farmhouse.
3. 1001-10000 m<sup>2</sup> is a hamlet.
4. 10001- 30000 m<sup>2</sup> is a small village.
5. 30001 m<sup>2</sup> onward is a large village or small town.

There are some precautions which should be taken into consideration before applying these criteria to any site in the study area. First of all, in some cases although the site falls under the third or fourth category due to its size, the archaeological evidence might not support this designation. Secondly, in many cases, the sites categorised as a village might have consisted of one structure in its initial period and developed into a village in later periods, thus, only excavations can determine which structure was found at a certain period in a large settlement site. A site such as Udhruh is attested as a town in historical sources while the archaeological evidence clearly reflects the military importance of the site since a Roman fortress dominates the ruins at the site.



Finally, a farmstead or a simple farming structure might have been reused for security or military purposes due to its strategic location.

### **Masonry and Plan**

The majority of the structures at all the settlement sites categorised above were constructed of hewn stones, either limestone or flint. The latter can be constantly seen at the sites which were located on the hilly areas. The type of stones used to build a structure depends on the type of stones available in the landscape around the site. The majority of the sites seem to have been built of stones quarried from bedrock or a rocky hill nearby. In many cases, quarried stones were either found in the area between the quarry and the site or collected somewhere around the structure at the site. Limestone rocks are much easier to cut and shape than flint, so the walls of the structures which were built of limestone blocks are more rectilinear and organised (Fig. 3.13a & b). The size of the stones varies considerably from one site to another according to its function, period, architectural style and the local materials available to the builder. The security and military sites usually have large and very large blocks (Fig. 3.14). However, even settlement sites were constructed of large stones. Uncut stones were also used along with the hewn stones to fill a gap in a wall or to fill the gap between the two-face walls which are attested at most of the sites in the study area. Rubble and clay were also used for the same purpose. Therefore, the thickness of the walls, external and internal, ranges between 70 cm and 100 cm. Finally, the masonry and lay out of structures appears to reflect the construction techniques used by the sites' settlers throughout the historical periods each site had witnessed.

Unfortunately, due to the limited resources and relatively short time the author had when he conducted the fieldwork, proper plans were not produced for the settlement sites in the study area. A great effort is required even to draw plans for the large sites such as Khirbet al-Jerba or Khirbet al-Rwaiha. However, sketch plans were drawn for many sites in the study area, particularly for those which consisted of only one structure. In such cases the main body of the structure is well defined by the enclosure wall or external wall, and the area within the enclosure wall was often divided into internal units varying considerably in size. In many structures, the internal divisions were located around a courtyard in the centre of the structure. However, in some

cases, the courtyard was located in the front part of the structure (Fig. 3.15) or outside the main body of the structure. Most of the structures are either rectangular or square. However, kinks were noticed in the enclosure walls of many structures (Fig. 3.16).

A different situation was noticed at the large sites such as hamlets, small villages and villages. Many of these sites appear to have grown from a single structure. Unfortunately, the archaeological evidence from the sites believed to be large settlements not always informative on the distribution of buildings at the site due to the construction of modern (traditional) settlements at the same location (e.g. Ayl, Abu Danna, Basta and al-Fardhakh). However, there is still tangible evidence to illustrate the general outline or plan at a large settlement site. Two types of settlement arrangements were observed at these sites. The first category is non-contiguous structural sites where the site consists of two, three or more structures constructed separately. Good examples of this type are the settlements at Khirbet Sabbah, Khirbet al-Rwaiha and Khirbet Malghan. The second type is the contiguous structural sites where the site consists of many adjacent structures extending over the area of the site. A good example of this type is the settlement of al-Jerba (Fig. 3.17). However, the second type does not necessarily mean that the site was founded in one period. In some cases, the site became of this type simply because new structures were added in later periods. Finally, it is worth mentioning that similar examples to these features were found in adjacent provinces such as Palestine (Hirschfeld, 1997: 33-71; Tate, 1992).

At some of the large sites, a long and rectangular structure, with internal divisions, is the core of the site but associated with other structures on one or either sides of the long axis of the structure. However, these structures could also be found along the short axis. This architectural organisation was attested at many sites but was clearly seen at three sites: Khirbet al-Hazahzeh (Site no. 106) Khirbet Abu Qumrah (Site no. 223) and Khirbet Umm al-Jarad (Site no. 133). Predominantly, rectangular structures are the main features at the three sites. Rectangular and square small structures were attached to one side or more of the main structures. The added structures are well organised and seem to have been constructed to perform a certain function. The floors of these structures, particularly at the first two sites, were paved (Fig. 3.18). Eight



paved structures or divisions were found at Khirbet Abu Qumrah along the east axis of the structure.

### **Caves**

The consideration of caves in this section of the study is due to the large number of them found in the study area, particularly in association with the settlement sites, small and large. At least one cave is to be found in association with the majority of the sites. At some sites, the cave was included within the enclosure wall of the structure whereas at other sites the cave is just outside the external wall. However, in many cases, particularly in the hilly areas where the site is located on a hilltop or on upper slopes, the cave lies somewhere on the slopes around the site. More than three caves were found at large settlement sites such as al-Jerba, Khirbet Malghan, Khirbet Sabbah, Khirbet al-Rwaiha and Tell Jraideh (Udhruh). Some of these caves seem to have been naturally created whereas others seem to have been partially man-made. Thus, caves appear to have affected the process of selecting the location of a site which would consequently influence the settlement patterns. Caves can be used for many purposes, for example as animal pens (especially in the winter) stores (particularly those included within enclosure walls), or as shelter in adverse weather. In some cases, a cave was modified to be used as a cistern if its location was appropriate to collect rainwater.

### **The two-structure sites**

Four sites in the study area revealed a slightly different type of settlement organisation. The sites are Khirbet Qrah (Site no. 017), Khirbet al-Akhshan (Site no. 024), Khirbet al-Trabsieh (Site no. 025) and Khirbet al-Qmaid (Site no. 010) (Fig. 3.19). Two structures were found at each of these places. The stonework, the general layout and the direction of the two structures at each site is almost the same and this might indicate that the structures at each site were built in the same period. The distance between the two structures at some sites does not exceed ten metres. However, the size and plan of the structures vary at each site. One structure is usually bigger than the other and accordingly has more internal divisions (Fig. 3.20).

The function of these sites does not seem to be different from the general agricultural sites of the whole region. It is assumed they were settlements of farmers on the basis of their locations in cultivable areas. Terrace walls and threshing floors were also found in the immediate vicinity of these sites (Fig. 3.21). The presence of two structures at each of those sites might indicate that the occupants were related, a father and son for example, or an extended family. Alternatively, if not relatives, the founders could have been partners in the property and have cultivated their land near the site. In this case, we might suspect that a central authority arranged the process and that certain regulations governed landholding or construction of farmhouses. Further investigations are required to explain the distinction of these sites.

### Conclusion

This chapter has defined the geographical universe of the study area. It has also discussed the various techniques and methods used to survey and record the data collected from the region. Similar methods have been used in other fieldwork studies in Jordan and elsewhere and are valid for exploring the landscape, particularly in an open area like Udhruh. The classification of the data in this study into groups was based on clear archaeological evidence. In this study, the dating of sites was mainly derived from the ceramics data the author collected from the region of Udhruh. The criteria concerning the settlement hierarchy where a structure or a group of structures form the site was based on the size of sites taking into account the landscape within which the site was located and the evidence from adjacent sites. This criterion is an attempt to understand the function of various sites with structures and to understand the variation in the size of site which clearly reflects the volume of human activities present.



## **Chapter Four**

### **The water supply systems in the region of Udhruh**

#### **Introduction**

This chapter discusses the different strategies and techniques of water supply which were used in the study area throughout the various historical periods the region has seen. Each strategy or system of water supply will be explained and examples from the available evidence will be given. It will also consider the purposes for which the water was supplied, stored and consumed. The discussion will also include a comparative study with similar examples from Jordan and elsewhere in the Middle East. Finally, there will be a discussion about the chronology of each technique.

#### **Springs**

Two types of springs were identified in the study area:

- A- Springs not associated with any water distribution or storage techniques such as reservoirs and channels.
- B- Springs associated with water diffusion and storage techniques such as reservoirs and channels.

Ten springs of type A were recorded by GPS points in the study area (Fig. 4.1). However, it is conceivable that other springs of this type were missed either because they are no longer active or due to their topographic locations. It is also understandable that one might argue that since this type of spring was not associated with any ancient water distribution and supply strategies, it cannot be safely considered as an ancient water resource as springs can start discharging at any time. Such an argument can be easily disregarded as all of these springs were either directly associated with ancient human activity or located near an ancient settlement site (Oleson, 2001: 604). It is worth mentioning that, even near those which were found in remote areas, ancient structures were recorded. In this chapter, there will be a discussion to link all the springs to ancient settlement sites.

Springs of type B are the most important type as they were found near most, if not all, of the sites which had large and historical settlements. It is interesting that all the modern settlement clusters were located near this type of spring. Good examples are the modern settlements at al-Jerba, Udhruh, Basta, Ayl, al-Fardhakh and Sadaqa. At each of the above mentioned sites there is an ancient settlement cluster known locally as Khirbet.

As mentioned above, type B springs were associated with reservoirs and channels (surface and ground-level channels). The construction of these water supply, storage and distribution features was necessary to fulfil the needs of the population. Reservoirs can store water for a long time and provide it to nearby fields through channels. At the same time people can obtain fresh water at the point where the water flows into the reservoir. One more reason that might have made it essential to build reservoirs is the fact that the source of water lies somewhere in the mountains, not close to the settlements. Hence, certain techniques were used to bring the water to the reservoirs. These techniques will be discussed below with particular reference to each spring and reservoir.

#### **Ground-level channels and tunnels**

Spring water is originally rain water absorbed by soil and then gathered in aquifers in particular geological elements. This type of water is also called ground water (Hodge, 1992: 67-68). Springs usually come up to the surface at certain points, especially where the geology allows that to happen, and this usually occurs at the bases of mountains or hillsides. However, spring water could be also tapped at its underground source and then delivered to a reservoir by an aqueduct or ground level channel or tunnel, where gravity is the critical factor behind the water flow (Hodge, 1992: 72-79).

The length and size of the latter depends mainly on the spring's location and discharge. Other factors, such as the need to clean the tunnel or channel regularly, might affect its size. Hodge (1992: 79) mentions that 'with springs located on a hillside, more often tunnels would be driven parallel, side by side into the hill....the resultant tunnel was often much larger than needed for tapping the water'. Ground-



level tunnels, as we will see below, are available in the region of Udhruh and called *Sarab* or *Serdab* by the local people. Other evidence supporting this argument is the absence of surface vegetation, with some exceptions, near these reservoirs. Such vegetation is abundant near the springs which were spotted in the same place. Finally, it is worth noting that all the documented reservoirs in the study area were located in lower areas in comparison with the water source location. They were constructed in places facing the eastern slopes of hilly areas.

#### **Springs of type B in the region of Udhruh**

1-‘Ayn al-Jerba: the spring of al-Jerba lies about 2.5 km to the south of Udhruh. The spring is currently dry and no traces of ancient reservoir or channel were seen in the area around the spring. However, a modern reservoir and cistern were constructed at the site, and it is not clear if one of them overlapped an ancient structure. It is worth mentioning that this spring is known as ‘Ayn al-Jerba al-Kaberah ‘the big spring of al-Jerba’ since there is another spring a few hundred metres to the south of the former spring, known as ‘Ayn al-Jerba al-Sagherah ‘the little spring of al-Jerba’. It is also unknown if this spring flowed in antiquity, or it just emerged later when the course of the main spring changed.

Having referred to the observations and comments of earlier travellers, no mention was made of a reservoir or a channel in Wadi al-Jerba where the spring used to flow. Gray Hill (reported in Brünnow and Domaszewski) wrote: “*forty minutes further towards Shobek we noticed rough remains of a wall or buildings on the top of a hill close at hand to the east, and a copious spring of water in the valley*”. Glueck (1935: 77) wrote: “...on top of a high hill, are the featureless ruins of Kh. el-Jorba, with ‘Ain el-Jorba on the south side of the small wadi below it”. It is worth noting that none of the above references mentions another spring in Wadi al-Jerba which might support the claim that the second spring was probably the same spring after its course changed.

The spring at al-Jerba seems to have played a key role in the long history of settlements in the area. Its abundant and strong discharge may have prolonged and intensified the settlement there. Hill (reported in Brünnow and Domaszewski)

described it as ‘a copious spring of water in the valley’. On the hilltop to the east of the spring, a large ancient settlement site can be seen from a distance. The ruins above the hill extend for almost five hundred metres in a north-south direction (Site no. 029), and to the west of the spring the local people have built their modern houses. The archaeological and historical evidence reflects a long history of settlement on the hilltop, at least from the first century AD; however, the site might have been abandoned in later periods (Glueck, 1935: 77).

The spring’s water was apparently utilised by the inhabitants of Khirbet al-Jerba whenever it was occupied. In addition to the utilities required for daily life such as drinking, cooking and washing, its water was definitely used to irrigate the agricultural fields and probably farms in the valley below it. The agricultural activity in al-Jerba’s valley has been well attested until recently. Moreover, traces of ancient field walls can still be seen in the valley, particularly in the wide area to the east of the hill (Fig. 4.2). Therefore, the author believes that channels must have distributed the water to the fields, these channels might have disappeared due to recent agricultural activities. Al-Jerba is historically attested as a flourishing town or village in the seventh century. It submitted and paid the poll tax for the Prophet Muhammad in AD 630 along with Udhruh and Ayla (Aqaba) (Schick, 1994: 149; Musil, 1907: 306 and 309).

2-‘Ayn Udhruh: the spring of Udhruh was mentioned and described by many explorers as early as the 1820s (Burckhardt, 1822: 444). The importance of ‘Ayn Udhruh lies not only in its flow and quality, but also in its location very close to, if not within the walls of, a Roman legionary fortress. Doughty (reported in Brünnow and Domaszewski, 1904: 462) wrote: “...after fifteen miles is a principal ruined site Utherah; the ancient town built at a strong spring, welling forth in a great waterbrook.” A useful description by a traveller called Wallin is reported in Brünnow and Domaszewski (1904: 462). He (Wallin) says: “after a march of 5 hours in a N.N.W direction from (el-Ma’an), we arrived at a spring called Udhruh, whose clear and abundant water is collected in a large pond at the foot of an elevated hill.” Gray Hill (reported in Brünnow and Domaszewski, 1904: 462) confirmed this when he says: “...below this Khan is a stream of clear water issuing from the hillside and falling into a pool a little lower down at the bottom of the valley.”



Both Wallin and Hill confirm the presence of a large reservoir below the spring of Udhruh. Wallin's observations are more accurate regarding the location of the reservoir 'at the foot of an elevated hill'. This is in fact applicable to two hills; Tell Udhruh and Tell Juraidieh, but the former was most likely the one meant by Wallin. It lies approximately five hundred metres to the east of the spring (Parker, 1986: 95). The spring was probably a strong factor behind selecting the site to build the fortress. Gregory (1995: 384 and 387) believes that the spring was probably within the walls of the fortress. Not too far from where the spring used to rise, in front of the presumed Ottoman fort and within the fortress' walls, a circular and walled cistern was found. It has been recently maintained by The Petra Antiquities Office.

At present, the spring is dry and none of its ancient components are traceable on the ground. Only a modern water supply and distribution feature exists there. If a reservoir was present on the northwest base of Tell Udhruh, it must have been buried beneath the modern houses constructed in that area. Moreover, it seems very probable that the original water supply and distribution features were replaced or overlapped by modern ones, due to the continuous agricultural activity in the valley up to date. In antiquity, the agricultural fields fed by 'Ayn Udhruh extended several hundred metres further east in the valley, below the spring and the legionary fortress. Traces of these fields in addition to the accounts of local people confirm the existence of fields. Some elders from the community report that they found ancient remains of fruit trees in the valley.

The town of Udhruh is historically attested in many sources. Ptolemy mentions a town called Adrou in Arabia Petraea. It also came second on the list in the Beersheba Edict, paying the second amount of tax among the towns of *Palaestina Tertia* (Gregory, 1995: 383; Killick, 1983: 110). Early Islamic sources reveal some information about the town of Udhruh for it submitted and paid the poll tax to the Prophet Muhammad in AD 630 (Schick, 1994:149; Musil, 1907: 306 and 309). These historical attestations undoubtedly shows that Udhruh had a strong economic source depended on cultivating the arable lands, and the spring was obviously utilized to irrigate these fields.

3-‘Ayn Malghan: the spring of Malghan lies about 3 km to the west of al-Jerba. Again no ancient feature, part of a channel or a reservoir, can be seen near the site. The spring still flows into a modern rectangular reservoir. It must rise somewhere up in the valley, from the hillside. The following description is of the modern system which most likely replaced an ancient one. The spring discharges from the hillside to southwest of the reservoirs. Its course was then directed by a ground-level channel or *Serab* to a settling tank, from where a surface channel interrupted by a small settling basin directed the water into the reservoir. Two surface channels, on either side of the valley, distributed the water to the fields below the spring. The author believes that this system retains the ancient strategy. Generally speaking, few changes have taken place in the ancient water systems in the region after they have been maintained and may be just the construction material was replaced.

The spring clearly supplied water to the large ancient settlement site on the hilltop to the northwest of the reservoir (Site no. 007) and for sites no. 005, 006, 008 and 010 (see Gazetteer). An ancient road (Site no. 004) connected these sites to the spring; passers-by could have also provided themselves with water from it. The soil in the valley below the reservoir is indeed fertile and suitable for crops and growing trees, therefore, it is believed that it was cultivated and irrigated by the spring to offer the needs of the inhabitants of the nearby sites’.

4-‘Ayn Muhaidhrat: the spring of Muhaidhrat is almost 2 km to the west of Basta. The spring is now dry. The spring itself, a reservoir and channel are the components of the water supply system in that area. The area around the spring is still marked by vegetation. The spring was spotted at a hill base approximately 500m to the west of the reservoir, whereas the latter was constructed in a gulley near the remains of two traditional houses. Its location, at 1380m above sea level, must have eased the water flow from the spring at 1416m above sea level through a ground-level tunnel. The tunnel is approximately 50cm in height and width and built of ashlar and it is very clear in the centre of the lower course of the western wall of the reservoir (Fig. 4.3).

The existing reservoir measures 12 × 12m. The masonry materials show that it had two stages of construction. The first stage is represented by fine ashlar masonry, and this can be seen in the lower courses. The second stage can be seen in the upper



courses which are built of multi-sized stones, most of them not hewn. This change in the masonry material may have been due to a reconstruction initiated by the inhabitants of the traditional houses.

Two sites; Sites no. 184 and no. 185 seem to have utilised the water supplied by the spring and reservoir at Muhaidhrat. Site no. 185 is a rectangular structure on the hill to the northeast of the spring whereas Site no. 184 is the traditional houses near the reservoir which is apparently built over or near ancient structures. Ancient walls were seen above and below these houses and a cave was also found near them. Nabataean and Roman ceramic sherds were collected from both sites. The reservoir should have also been utilised to irrigate the agricultural fields below it (Fig. 4.4).

5-‘Ayn Qusaib: the spring of Qusaib lies 6 km to south of Udhruh just on the western base of Tell Qusaib (Site no. 197). It is currently dry and cannot be identified without the vegetation around it. The available evidence (intensive vegetation) indicates that the spring was still rising in the same place. The second visit to the site revealed rectilinear walls very close to the point where the spring used to flow, and they have been speculated as walls of a reservoir. These walls were exposed by the erosion caused by the temporary flood in the valley during the winter of 2003/2004. The state of the presumed reservoir does not allow for further discussion.

The presence of the spring seems to have required some work in the valley below it. Terracing walls were seen in the southern side of the valley, and some walls in the valley bed itself. This type of work is usually associated with agricultural activity. Up on the hill, a relatively small building was constructed, and most of its walls are still buried. This structure could have been a watch-tower to guard the spring. A very clear view in all directions is obtainable on the hilltop. The site was occupied during the Roman and Byzantine period. There is ceramic evidence for other periods pre- and post-dating that time as well.

6-‘Ayn Basta: the spring of Basta lies about 13 km to the southeast of Petra just below the Wadi Musa-Ma’an road. The spring still flows in the Wadi Basta, feeding modern farms. The history of settlement near this spring is indeed long, and goes back to the Neolithic age represented by a small agricultural village on the slope overlooking the

valley of Basta, 200m to the north of the spring (Nissen *et al*, 1987: 76-119). A hundred metres further north, a traditional village was founded upon most likely an ancient settlement site (Glueck, 1935: 74). The modern village radiated and expanded in all directions around the spring.

The following accounts of earlier travellers and archaeologists about the spring of Basta were reported in Brünnow and Domaszewski (1904: 467): Wallin wrote: “...*We reached the end of the valley at the spring of Basta, whose abundantly flowing water is of the most excellent quality*”. Glueck (1935: 74) in his visit to the site saw the spring rising in the valley not too far to the west of the ruins. Stein (Gregory and Kennedy, 1985: 337) wrote: “*on April 29<sup>th</sup> we took the road again for Petra. After diverting near the ruined village of Ayyil [Ayl] from the road leading to Sadaqa I was able to examine at Bosta [Basta], some 15.5 miles from Ma'an, a well-built ancient circular reservoir fed by a spring. it measures 27 feet [8.23m] in diameter and is lined with a very solid revetment wall 5 feet 3 inches [1.73m] thick. Its masonry consists of large dressed slabs set in regular courses with intervening layers of small stones. The reservoir is 11 feet [3.35m] deep to its silted up bottom covered with high grass. From it water was discharged into an underground canal or karez of which the first well is now open. A second reservoir less solidly built and about 35 feet [10.67m] square, lies near by on the opposite side of the road*”.

At present, the spring flows into a surface channel from three metallic pipes inserted in a cement wall. This technique is definitely not ancient. It might have emerged fifty years ago when all the major water sources in the region received special maintenance by constructing reservoirs and organising the water flow. The spring in prehistoric times probably flowed from its source directly into the valley to form a small pool. Bones of lake-dependant birds were reported from the Neolithic village at Basta (lecture given by Hansen Nissen at Mu'tah University in 1996).

The archaeological evidence indicates that the spring had a different situation in later periods. Channels and a reservoir were constructed in the valley below the spring. None of them, apart from the assumed channel between Basta and Ma'an (above), was reported in the accounts of explorers or in any archaeological field work. An ancient reservoir was found further east in the gulley about 1km from the current



position of the spring. Apart from the southwest wall, the remaining walls are still fairly traceable. They were built of large hewn limestone blocks, each course consists of two rows filled in with small stones and concrete. They are almost one metre thick. The reservoir measures 12 x 12m. The channels will be discussed below under the channels and aqueducts section.

It is now obvious from the discussion above that the spring of Basta contributed to the long history of settlement in the area. It also participated in creating agricultural societies. Agricultural fields are abundant in the area, particularly in the valley below the spring where three lines of surface channels were recorded by the author. Moreover, as a possible station on the Roman road, the *via nova Traiana* (Graf, 1995b: 248), and a nexus of many regional roads (recorded by the author), it should have provided water for traders, armies, peasants, and villagers.

7-‘Ayn Ayl: the spring of Ayl lies about 2 km to the south of Basta, and was as important as the spring of Basta. It still has a reasonable flow into a modern reservoir, where a ground-level channel brings the water from its source. However, nothing looks ancient near the spring due to the consequent campaigns of maintenance. Referring to the accounts of earlier travellers, very little information is mentioned. Burckhardt (1822: 444) listed Ayl along with other ruined sites in Jebal Shera. Glueck (1935: 75) wrote: “...and the ‘Ain el-Ail, which rises at the point where the Wadi el-Ail and the Wadi el-Mabraaq come together”.

A traditional village was located on the hill just above the spring (Site no. 292). Some scholars believe that an ancient settlement site in addition to a Roman military structure, probably a *castellum*, existed on the same hill (Brünnow and Domaszewski, 1904: 667-668; Glueck, 1935: 74-75; Parker, 1986: 98-99). Two broken milestones were found by Glueck in the valley below the spring (1935: 75 with Fig.28).

An unreported ancient reservoir was found by the author a few hundred metres to the northeast of the modern reservoir. Although it was known to the local people, it seems to have been exposed by a bulldozer, therefore the southern and western walls are totally disturbed. However, the remaining walls show that it was built of hewn limestone blocks, its walls were thick (1m) as they were built of two rows of stones

for each row. The reservoir would have fed the agricultural fields around it. 'Amr and al-Momani (2001: 278) recorded a five-kilometre channel along the road between at-Tayybieh and Ayl. The channel starts at 'Ayn Mabrak and is associated with many cisterns. Dr 'Amr believes that the channel may have ended at the modern reservoir on 'Ayn Ayl (2001: 278). If that channel continued down to the valley of Ayl, it would have ended at the ancient reservoir not at the modern one. It is worth mentioning that this hydraulic system (the channel and cisterns) was dated to the Nabataean period ('Amr and al-Momani, 2001: 278).

8-'Ayn Abu al-Adham: the spring of Abu al-Adham is 2 km to the southeast of Ayl. It is still flowing fairly well into a very big modern reservoir, which might indicate the spring had abundant water in the past. Brünnow and Domaszewski (1904: 468) and Glueck (1935: 76) visited the spring, and the latter mentioned that 'there was a large Arabic Birkeh (reservoir) by 'Ain Abu 'Atam'. However, no evidence of ancient settlement was found near the spring (Glueck, 1935: 76).

It is not known if the current reservoir is the same one seen by Glueck in the 1930s, as a plaque commemorates the construction of the reservoir in the late 1960s was fixed on a cement wall near the reservoir. However, a rectilinear wall was seen just on the edge of the north wall of the modern reservoir and parallel to it (Fig. 4.5). This wall could be a one to the ancient reservoir. An ancient reservoir was definitely constructed somewhere beneath or near the current reservoir on the basis that a ground level tunnel or channel is still carrying the water. Therefore, the spring must have been tapped somewhere to the west of the reservoir as the channel was running west-east.

Four walled shafts were found to the west of the reservoir. The closest one is about a hundred metres further west. Most of them were elevated above the ground when they may have been maintained fifty years ago. During the field work we were able to investigate one of them. It was walled from the bottom to the top with approximately 75cm in diameter. The channel for the running water could not be seen due to the shaft's depth which can be estimated at more than four metres. These shafts can be used for two purposes: they give access to the channel at intervals and this eases the maintenance and cleaning of the channel, and allows the air to reach the channel to



facilitate the water flow which naturally happens by gravity. Finally, it is worth mentioning that this technique is practiced in the *qanat* system (Hodge, 1992: 20-24).

9-‘Ayn al-Dirbasi: the spring of ad-Dirbasi is less than 1 km to the east of al-Fardhakh. It was seen by Brünnow and Domaszewski (1904: 469) on their way to Sadaqa, but they made no mention of an ancient reservoir. Glueck (1935: 76) seems to have by-passed the spring when he proceeded directly westward to al-Fardhakh.

The spring still flows into a modern reservoir feeding a small farm below it. Although there are no traces of an ancient reservoir, a big hole associated with some walls to the east of the spring, on the base of an elevated hill, was suspected as a possible reservoir. This cautious assumption may be supported by the probable presence of a structure to the southeast of the spring. Pottery sherds collected from that area date to the Nabataean- Roman (1st-2nd c. AD), Late Byzantine (5th and 6th? c. AD) and Late Mamluk/Ottoman.

10-‘Ayn al-Unaiq and al-Fardhakh: the spring of al-Unaiq lies on the southern edge of the modern village at al-Fardhakh. The site was mentioned by Burckhardt (1822: 444). The spring is still flowing into a large modern reservoir. No traces of ancient structure were seen there, however, there is no doubt that it was used in antiquity. During a campaign to maintain the water springs in the district of Ma’an in the early 1990s, underground tunnels were reported near al-Unaiq. These tunnels, according to some workers, were big enough to allow a man to walk inside them (local men, 2003). If these accounts are correct, the spring should rise somewhere on the hillside to the west of it.

On the north edge of al-Fardhakh is the traditional and ancient village of al-Fardhakh with a spring just to the west of it. The site was visited and mentioned by earlier explorers (Burckhardt, 1882: 444). More details are reported by Glueck (1935: 76). A modern reservoir was constructed on ‘Ayn al-Fardhakh. The water of both springs, al-Fardhakh and al-Unaiq, was utilized in antiquity by the inhabitants of the neighbouring sites. Agriculture had also its share since the area is suitable to grow both crops and trees.

11-‘Ayn Sadaqa: the spring of Sadaqa is well known to the scholars of the Roman period as it is just a few tens of metres to the north of a possibly Roman site (i.e. Bowersock, 1983; Parker, 1986; 2001; Graf, 1995b; 1997a; Fiema, 1991; 1995; 2002). Some explorers also visited Sadaqa, Burckhardt (1822: 435) wrote: “...passed the fine spring called *El Szadeke* (the name in Arabic), near which is a hill with extensive ruins of an ancient town consisting of heaps of hewn stones.” Brünnow and Domaszewski (1904: 469) described the springs as a good source of water where remains of ancient settlement lies to the south and west of it. Glueck (1935: 71) mentioned that the spring irrigates a considerable area of cultivated ground. However, no mention of an ancient reservoir or channel was made by those scholars.

The significance of Sadaqa’s spring lies in the historical attestation of Sadaqa in Roman sources like the *Notitia Dignitatum* and *Tabula Peutingeriana* (Miller, 1962; Seeck, 1962: 72-73). The spring, as in other sites in the region, must have attracted ancient settlement before the Romans came to the region. A high demand for the spring water was created not only by the inhabitants of the ancient village, but also by the fact that Sadaqa was located just on the Roman highway, the *via nova Traiana* (Graf, 1995b: 246-250). The spring would have also supported an agricultural based-economy due to the availability of fertile fields around the town, particularly to the east and north of it.

Finally, it is worth mentioning that other springs near or on the borders of the study area have not been recorded due to the lack of time. Springs also played a key role in determining the settlement patterns in ancient times. More discussion regarding this point will be expanded elsewhere in this thesis.



### Isolated reservoirs

The reason why the reservoirs discussed below come in a separate section, not with the springs of type B, is the fact that these reservoirs were not found in association with natural springs and a different system of water supply seems to have provided them with water.

1-Birket Udhruh (Site no. 048): the reservoir of Udhruh is approximately 5 km to the southeast of Udhruh. It was built on a very low hill between two valleys. This reservoir cannot be definitely linked to a particular water source. The closest source is the spring of Udhruh 5 km to the northwest. No channel was found between the two sites to associate each other. Thus the reservoir was fed from somewhere else. A potential source was speculated to the west of the reservoir, about 1 km to the south of Udhruh on the east base of Tell Abara (Abu al-Ra'a, Site no. 055). More details will be presented below when the *qanat* system is considered.

The reservoir is still relatively well preserved and measures 50×50m. However, it is not a free standing structure. A large hole might have been dug into the ground and then the walls were built. Therefore, the external side of the walls cannot be seen whereas the interior face can be clearly seen and still standing up to 120cm. The walls seem to have been elevated to rise above the ground and this would consequently decrease the risk of erosion. The interior faces of the walls were coated with a white layer of hydraulic concrete. The water flowed into the reservoir through the western side, and a settling basin was found 1.5m apart from the wall. A channel running west to southwest must have brought the water to the site (see channels below).

An aerial photograph (Fig. 4.6) clearly shows the function of this reservoir. It was constructed to irrigate a large cultivable area to the east of it. Field walls are still in a good state and can be easily recognised in the aerial photograph. The northern field wall runs east-west in a straight line and starts a few metres apart from the northeast corner of the reservoir. The southern field wall is not rectilinear and runs parallel to it. The area between the two field walls seems to have been organised into two areas by horizontal walls. The photograph also shows other field walls in the valley north the

reservoir, these walls have not been investigated on the ground. All of this evidence clearly indicates a considerable agricultural area.

To judge from the ceramic evidence, the site appears to have been utilised from the first century AD until the Ottoman period. The following periods were well represented by the ceramic evidence: the predominant periods are Nabataean, Roman, Late Byzantine and Early Islamic, and Ottoman. A precise date for the reservoir cannot be given without further analysis, mainly by excavations. However, Killick (1987b: 28) dates the reservoir to the Nabataean period. This date is logically acceptable since the Nabataean period is the earliest among the other periods, and Nabataean settlements are well attested in neighbouring areas, particularly at Udhruh (Killick, 1987b). In later periods, especially the Late Byzantine and Early Islamic period it seems to have been in use and received much attention and maintenance. However, it is worth mentioning that similar agricultural features including reservoirs, aqueducts and field walls have been recently investigated northeast Ma'an, at al-Hammam and al-Mutrab. The surveyor dates these features to the Early Islamic period, particularly the Umayyad (Genequand, 2003: 25-35).

2-Birket al-Fiqai (Site no. 042): the reservoir of al-Fiqai lies about 1.5 km to the southeast of Birket Udhruh. It was located just on the eastern base of a very low hill. The architectural material and the way in which it was laid out are similar to Udhruh's reservoir. The structure was built of quarried limestone blocks. Their exterior faces can not be seen as they are buried except in the eastern side where the wall was elevated to the same level with the western wall. It is therefore believed that part of the hill was dug to prepare the area to build the reservoir, a big mound of probably excavated soil was seen outside the northern wall. A channel runs west to northwest providing the reservoir with water (Site no. 043).

This reservoir irrigated a large area in the Wadi al-Fiqai. The valley seems to have been fertile and cultivable in antiquity. A well defined area (Site no. 041) was divided into what were probably small agricultural units by many horizontal and vertical field walls, and about twelve units were counted there. Random sample measurements for some of the units gave roughly the same dimension which is 90×60m. Having



calculated the whole area of the units, a total of 64,800 square metres would have been cultivated. The following account by Stein (1940:435) may apply to this site:

*“Near the small oasis of Ma’an, the last place which the Hejjaz Railway, derelict farther south, still reaches, a close plane-table survey allowed us to determine the true character of an interesting and extensive old irrigation scheme which had puzzled former observers. A large area of flat desert ground between two wadis (valleys), some 4 miles in circumference, had been enclosed with rough walls and laid out into fields. They were to be watered from a canal brought with great labour and skill from the distant hill above the ruined Roman cantonment of Odhrah (Udhruh)”.*

Going back to the chronology, four periods are present at both the reservoir and the agricultural fields. Nabataean, Late Byzantine and Early Islamic and Ottoman pottery sherds were collected from the sites. The Nabataean period is poorly represented whereas the evidence for the other periods is strong. However, it is still very difficult to date securely these features. Some soundings or even excavations might confirm the date.

#### **Note on the date of Birket Udhruh and Birket al-Fiqai**

The archaeological evidence from adjacent sites creates more questions rather than giving precise answers. However, an attempt will be made here to draw some conclusions about the date of the two reservoirs. The closest ancient settlement site to both features is Khirbet al-Fiqai, Site no. 044. It was located between them, Birket Udhruh is to the northeast whereas Birket al-Fiqai is to the southeast. The site seems to have been an industrial settlement site. In addition to the remains of a rectangular complex structure at the site, it has also four walled shafts with a considerable amount of unidentifiable slag and over-fired stones on the surface around them. These structures were tentatively speculated as kilns of unknown material. The relationship between this site and the two reservoirs is also very strong. The channels of both reservoirs approach the valley just below it. To judge from the ceramic evidence, the site was occupied from the 1st to the 3rd century AD. The site was then abandoned for roughly nine centuries when it was resettled, or at least reused, during the Ayyubid-Mamluk period.

So, how can the abundant presence of Late Byzantine and Early Islamic ceramic at both reservoirs and the lack of this type of pottery at Khirbet al-Fiqai be explained? It is very likely that the reservoirs were constructed by the first or second century AD, coincidentally with Khirbet al-Fiqai or after, at least when the site was settled. The abandonment of the site sometime in the 3rd century AD does not mean that the two reservoirs failed and the agricultural fields near them ceased to be cultivated. The ceramic evidence suggests that the reservoirs and the agricultural fields were revitalized in the Byzantine and Early Islamic period when the main settlement concentration shifted to this zone, the area between Udhruh and Ma'an.

Udhruh (Site no. 050), al-Jerba (Site no. 029), Jebel al-Tahuna (Site no. 216) and Ma'an were settlement centres during the Late Byzantine Early Islamic period (Schick, 1994: 145-149, Killick, 1983: 231; Watson, 2001:469). In brief, the reservoirs may have been constructed in the Nabataean/Roman period but requisitioned in later periods when agriculture became the backbone of the economy of that period. Roman sites to the east of Ma'an (Parker, 1986: 100-102; Brünnow and Domaszewski, vol 2: 3-6) were utilised as agricultural clusters in the Late Byzantine Early Islamic period (Genequand, 2003: 25-35). However, inspite of all the above hypotheses, other assumptions or suggestions remain indeed acceptable.

3- Birket Jebel al-Tahuna (at Site no. 216): the site of Jebel al-Tahuna is very significant in the region of Udhruh. The site is unique in its components and location. It consists of a large enclosure, settlement structures, agricultural fields, and water supply and storage systems. Most of these features including the two reservoirs were located within the enclosure.

Two reservoirs were documented at Jebel al-Tahuna; the first, which is the bigger, lies about 300m northeast of the base of the mountain whereas the second is just on its northern base. The main reservoir is still in a very good state, and measures 26m north-south and 24m east-west. The walls were built of hewn limestone blocks; the blocks in the eastern wall are dressed. The blocks were laid down in two rows filled in with small stones and concrete. A white layer of hydraulic concrete was coated on the interior face of the walls. This reservoir was first reported by Killick (1986: 438). The second reservoir is much smaller and not as well preserved as the first. Only one



course of the limestone walls is visible on the surface, and it measures approximately 10×5m. This reservoir has not been reported before.

Both reservoirs seem to have been supplied by a qanat system to the west of Jebel al-Tahuna (below). A surface channel connected them with the system. The construction of these cisterns served not only to supply the inhabitants of the small village at the site, but obviously to irrigate the agricultural fields to the east and southeast of the main reservoir. The fields are well organised, and have rectangular shapes. David Kennedy (2000: 173), from an aerial photograph, suggests that one of them was a buried *castellum*. The reservoirs were also the best features to store the unused water.

### The Qanat System

What is a qanat system? The following quotations clearly explain the exact meaning of the term qanat:

*-“The qanat is a tunnel driven into a hillside to tap an aquiferous stratum deep inside it. the tunnel has just enough of a downward slope for the water tapped to run down it and into the open air by gravity, and is punctuated at intervals of 20 m or so by vertical shafts to the surface” (Hodge, 1992: 20).*

*-“Qanats are a form of subterranean aqueduct-or subsurface canal-engineered to collect ground-water and direct it through a gently sloping underground conduit to surface canals which provide water to agricultural fields or oases” (Lightfoot, 1996b: 321).*

*-“An underground irrigation system, differing from a normal aqueduct in that the water is already there and being tapped. A qanat is constructed by tunnelling into a cliff, scarp or base of a mountainous area, following a water-bearing formation. The purpose is to bring water to surface where it can be utilised in irrigation of agricultural areas. Note, the water is not brought UP to the surface but rather OUT to the surface. The tunnels are roughly horizontal, with a slope to allow water to drain out” (Baird, 2001: 1).*

The qanat system is very significant and important because it is probably one of the earliest and most common hydraulic techniques in the world, particularly in Middle East countries (Baird, 2001: 1). Scholars are, generally speaking, not in dispute about the origin of the qanat system. Many of them point out Iran as the place where this strategy was first invented, and it was in use at least from the eighth century B.C. (e.g. Hodge, 1992: 21; Lightfoot, 1996b: 324). From Iran, the qanat system travelled westward until it arrived at North Africa. The cultural interactions, and most likely the military occupation of neighbouring areas, such as Syria, Palestine, Jordan and Egypt by the Persians, must have eased this distribution (Lightfoot, 1996b: 324; Hodge, 1992: 21-22).

Although the word “qanat” is the most common word for this technique, other names such as *foggara* (North Africa; French translation), *karez* (Iranian), *khettara* (Morocco) and *aflaj* (Oman) are also known. This contrast is due to the difference in the language, dialect or the country in which the word is used. However, the word qanat is the most applicable to the system. Hodge (1992:21) asserts that the word is derived from the Akkadian *qanu* which means reed whereas Baird (2001: 1) refers to it as an Arabic word. Qanat is a very common word in Arabic and the word itself, or words derived from the same root *qana* are well attested in classical Arabic poems. However, since some Arabic words are derived from other ancient languages, the origin of the word remains open to question.

#### Where and how?

Rainfall, topography and geology are the factors considered most in laying out a *qanat* system. A comparative study for the qanat system in three countries; Iran, Syria and Jordan shows the following:

- Qanat systems are found in areas where the average annual rainfall ranges from 100-300 mm per year. In Iran, where the system originally developed and concentrated, the annual rainfall average is approximately 242mm (Haeri, 2003: 3) whereas in Syria, according to Lightfoot (1996b: 327), 75% of the qanats were constructed in semi-arid regions with 100-300 mm average annual rainfall. In Jordan, qanats have been recently studied by Lightfoot (1996a). He found that 22 of 32



galleries were located in semi-arid regions receiving 100-300 mm average annual precipitation.

- In terms of topography, the shafts of qanat systems are usually found in a roughly flat landscape at the base of or near mountains or hills, or along the margins of larger valleys where the tapped aquifers normally exist and can be seasonally fed (Hodge, 1992: 23). The qanat clusters in the three countries are available in areas with relatively the same topography (Lightfoot, 1996b: 328; Baird, 2001).
- The type of geology could save the qanat builder much time, cost and effort. Shallow aquifers which facilitate the tapping of water, for instance, lie from a few, to tens of metres deep. In Syria, limestone and chalk aquifers are relatively shallow whereas in Jordan groundwater, with some exceptions, can be tapped at depths of more than 100 metres (Lightfoot, 1996a: 328-329).

Once an area is chosen to tap its groundwater, the work starts by digging a sloping tunnel to drain the water by gravity. Therefore, the tunnel, as Hodge (1992: 23) states, is the heart of the qanat system. Without it the qanat will not deliver water. However, the shafts have also an important role to play. Through them, the excavated spoil can be evacuated, and the work can continue in two directions. The debris is usually located in rings around the shafts which consequently prevent the shafts being filled in during the seasonal floods of river beds. Moreover, the shafts provide ventilation for the tunnel. The shafts were usually laid out at intervals and could be as deep as 300m. The tunnels were normally unlined and the channel runs in its floor (Hodge, 1992: 23-24; Baird, 2001: 3).

#### **The Qanat System in the Region of Udhruh**

Two sites in the study area exhibit strong evidence for using the qanat system. The discussion below considers each of them.

1- Dhawwi Udhruh 'the lights of Udhruh', Site no. 054: this local name given to the three galleries of the qanat system to the south of Udhruh. The word *Dhawwi* refers mainly to the shafts which to the local people look like lights. The soil colour indeed supports this designation. However, this site was first reported by Alistair Killick (1987b: 28) and then studied by Lightfoot (1996a) along with other qanat sites in

Jordan. The present author went twice to this site and took GPS points for each recognisable shaft.

Dhwawi Udhruh is about one kilometre to the south of the fortress at Udhruh and to the east of Tell Abara. Significantly three lines of vertical shafts were dug in a relatively flat terrain. An aerial photograph (Fig. 4.7) amazingly shows them as they were in 1981. For study purposes the author gave them names from north to south, therefore, there is the northern line, the central line and the southern line of shafts. All the three lines seem to intersect at one point; at the edge of the modern road between Ma'an and Udhruh. They were also laid down at the bases of hills and on the margins of Wadi Abara (Abu al-Ra'a).

The shafts are currently filled in but easily recognisable by the earth circles around them, the latter should have protected the shafts from being eroded when they were in use as they still stand for a considerable height. These circles were formed when the excavated spoil was being evacuated during the construction of the tunnels. The area within each circle is about 2m in diameter. One of the local people mentioned that he, at least forty years ago, saw some of the shafts *in situ*, and mentioned that they were very deep to the extent that if a stone was thrown in, its echo, when hitting the tunnel floor, could not be heard. Finally, it is worth mentioning that to the west of Tell Abara and on top of the southern line of shafts, a modern cistern is still tapping the groundwater in that area.

One of the questions that has not been answered so far is where does this qanat system go or deliver the water? Killick (1987b: 28) mentioned that the system near Udhruh could end at a Nabataean reservoir (Site. 048) further east. Killick's assumption seems more than reasonable for the following reasons:

- First of all, the three strings of shafts meet at one point to most likely form one tunnel. This tunnel presumably continued eastward and it must have appeared somewhere on the surface like a spring, an artificial spring.
- Secondly, the available evidence indicates that the tunnel ran across the Wadi al-Fiqai where, according to the local people, a spring used to flow in the valley just below the Khirbet (Site no. 044). This spring should have been the tunnel's opening.



- Finally, the archaeological evidence collected from the valley, below and to the north of Site no. 044, shows that an aqueduct connected Site no. 048 (the reservoir) with a water source at a point in the Wadi al-Fiqai. Very thick walls, probably to store the water from the qanat system, were also seen in the valley bed. Another aqueduct or channel seems to have also connected Site nos. 042 with the same source (Fig. 4.8).
- In conclusion, this qanat system supplied Sites no. 044, 048, 041 and 042.

#### **Date of construction**

The lack of datable materials, in association with the system near Udhruh, duplicates the burden if the attempt is made to establish a precise date for the system there. Apart from Lightfoot (1996a), there are no suggestions concerning the date of this system. However, Lightfoot based his conclusions on general data rather than on systematic field work. He found that the majority, if not all of the qanat system sites in Jordan, were constructed near Roman military sites or outposts. In contrast Graf (1990: 137) sees the presence of this system in north Arabia and the Hijaz as an Achaemenid influence.

It has been established above that the qanat system near Udhruh was supplying water for four sites; two reservoirs, agricultural fields and an ancient settlement. To judge from the ceramic evidence, the Nabataean/Roman period is the earliest at these sites, particularly at the settlement site. Accordingly, the qanat system was at least in use by the second century AD when the Romans annexed the Nabataean kingdom, and it continued to be utilized until perhaps the eighth century AD. Therefore, it is not impossible that some of the shaft galleries were repaired or even constructed during later periods. The area is well attested in the Late Byzantine and Early Islamic period (Watson, 2001: 487-488). Hodge (1992: 24) states: “with qanats, it was the qanat that came first and the settlement it served grew up afterwards, while with aqueducts it was the other way round”.

2- Qanat system near Jebel al-Tahuna (Site no. 216): little data, from the fieldwork, is available about the qanat system near Jebel al-Tahuna. Although the author saw one of the shafts on the ground, David Kennedy (pers.comm, 2004.) pointed out the

presence of the qanat system as it appears in an aerial photograph (Fig. 4.9). On the ground, the qanat's shafts are not as clear as the ones at Udhruh. This is probably due to the erosion caused by seasonal floods in addition to the similarity in colour between the shafts and the ground on which they were constructed.

The qanat system was located to the west of Jebel al-Tahuna, and this is naturally appropriate as the receiving point (reservoirs) has to be at a lower elevation since gravity is the decisive factor in the water flow. Moreover, the area to the west and north of the site is a large natural catchment area, and is still a remarkable area for tapping underground water (Killick, 1986: 438-439). At the north base of the Jebel there is a major pumping station providing the city of Ma'an with water. Many wells were also recently dug in the area around Jebel al-Tahuna.

The qanat system near Jebel al-Tahuna seems to have been the motivating factor to have a significant settlement site like Jebel al-Tahuna in a remote area, or at least on the borders between the desert and the sown. A large enclosure encircled settlement structures, agricultural fields, and two reservoirs to the east of Jebel al-Tahuna (Fig. 4.10; Kennedy, 2000: 173). The latter were constructed to receive the water flowing from the tunnel of the qanat. Surface channels were also built to take the water from the ground tunnel to reservoir no. 1 and then to no. 2 (see below).

As usual, there is no decisive evidence to date precisely al-Tahuna's qanat system. Therefore, we again rely on the ceramic evidence from the site itself. The Late Byzantine Early Islamic period, according to the ceramic evidence, is the best represented period at the site. Thus, the system was possibly initiated by the founders of the Late Byzantine and Early Islamic town or village at the base of Jebel al-Tahuna. However, Kennedy (2000: 173) tentatively identifies al-Tahuna as *Theman*; the garrisoned village according to Eusebius which means that al-Tahuna at least existed in the third century AD. However, Killick (1986: 438) refers to the site as a Byzantine town, because according to him 'several Byzantine towns and agricultural systems were located on the desert side of the survey area'.

Although a qanat system can be used at any time if the system is repaired and maintained, there is also enough evidence in Syria and Jordan, to show that new qanat



systems were constructed during the Early Islamic period (Lightfoot, 1996a: 325). Therefore, according to the ceramic evidence from Jebel al-Tahuna, and the archaeological evidence from adjacent sites, it is more secure to date the system at al-Tahuna to the Late Byzantine Early Islamic period.

### **Rock-cut cisterns**

Rock-cut cisterns seem to have been one of the main water supply techniques in the study area. Twenty eight rock-cut cisterns were documented at twenty-three sites. During the field work, it was noticed that there is a strong relationship between the location of the rock-cut cisterns and both the topography and geology of the place. It is worth mentioning that this type of water resource depended mainly on rainwater, principally run-off water. In other words, no springs or ground water races were associated with the cisterns. At the same time, without rain, these features would have been useless and unsustainable.

One might ask why the topography and geology were important to the rock-cut cisterns? Technical and theoretical factors made them important. Technically, a rock-cut cistern would not be valuable if it was not located on a point where large amounts of the run-off water can be naturally or artificially collected. It is known that not every point on the ground could do this job and this explains why topography was important (Oleson, 1995: 710). Theoretically, the people who initiated this strategy either were unlikely unable to build cisterns for that purpose, or brilliantly requisitioned the landscape around them by using the cheapest material, which is naturally available, to make their cisterns.

Geologically, the area where most of the cisterns were found belongs to the limestone and flint region, the highlands and interior deserts. In many cases, the limestones contain significant amounts of hard chert (or flint) which is less easily eroded than the limestones. Cutting the limestone layers is relatively easier than cutting other types of stone. Therefore, most of the rock-cut cisterns in the region of Udhruh were cut into limestone layers, and this is also attested elsewhere in Jordan.

## Historical Survey

It is worth looking at the historical records concerning this type of water collecting strategy. However, the discussion will generally consider the use of cisterns with particular attention to the rock-cut cisterns, their provenance, beginnings and typology. The first historical and textual attestation concerning the construction of cisterns is probably in the Moabite stone of King Mesha around 830 B.C. He obviously initiated a national project when he says: “and there was no cistern inside the town at Qrchh, so I said to all the people, ‘make yourselves each one a cistern in his house’” (Ullendorff, 1958: 197).

However, cisterns, cut and built, seem to have been in use for at least two millennia before the time of the Moabite king. Negev (1972: 332) says: “*the first cisterns were dug in the Middle and Late Bronze Age. The rainwater that collected in them during the short rainy season would be enough for at least one dry season*”. Other scholars (Oleson, 1995: 709) believe in earlier use. In the Iron Age, the use of cisterns appears to have increased considerably, and the walls of these cisterns were lined with a waterproof plaster which might have consequently affected the quality of water and the period of storage (Negev, 1972: 332; Wåhlin, 1997: 233-249). Cisterns remained in use throughout the following centuries until they were totally abandoned or rarely used by the second half of the twentieth century. However, the shape and construction techniques as well as the intensity of use and distribution varied with time (Wåhlin, 1997: 233-249; Oleson, 2001: 606).

The archaeological record from southern Jordan shows that rock-cut cisterns were used in key ancient settlement sites. At Petra, many rock-cisterns were found on the top of Jebel Umm al-Biyara; an Iron Age settlement site (Oleson, 1995: 709; 2001: 606). At Humaima (ancient Auara), Oleson (1997: 176; 1992: 269-275) recorded 41 rock-cut and built cisterns. Diodorus Siculus described how the Nabataeans make a cistern: “*they have prepared subterranean cisterns lined with plaster...As the earth in some places is...of soft stone, they make great excavations in it, the mouths of which they make very small, but by constantly increasing the width as they dig deeper, they finally make them of a such size that they can be one plethron (27 metres! Ed.) wide*” (19.94.7).



As mentioned above, 28 rock-cut cisterns were recorded at 23 sites in the study area. The cisterns vary significantly in design, size, access, and the architectural components and construction methods. The following is a brief explanation for the variation in these elements:

- The design: Four shapes were identified: bottle-shaped, rectangular, circular and irregular cisterns. Diodorus' account (above) obviously applies to the bottle-shaped form. Oleson (2001: 606) identifies this type as 'a deep, round, rock-cut reservoir that tapers upwards to a small entrance hole'. The irregular cisterns were originally natural caves but modified into cisterns after being carved and plastered.
- The size: Size usually varies according to the design. Bottle-shaped cisterns, for example, had roughly the same dimensions, 6m height and 3-4m diameter on the floor.
- Access: Cisterns which cut vertically into the rock, including the bottle-shaped form, were laid out without access, in other words, the cistern cannot be entered with the normal facility such as steps or permanent ladders. However, other cisterns were associated with steps, therefore, access was available to the core of the cistern.
- The architectural components and construction methods: cisterns vary in the way by which they were constructed. Bottle-shaped cisterns were usually dug vertically into bedrock whereas the other cisterns were horizontally cut into bedrock. Architectural elements were usually found in association with the latter since a side-wall or a roof was necessary to keep the water clean. Sometimes, a terracing wall was built and elevated in front of the cistern to direct the run-off water into it. This technique was particularly noticed in the cisterns which were located on slopes. Settling basins were also constructed in front of many cisterns.

Due to the relatively large number of rock-cut cisterns recorded in the study area, a full discussion for every single cistern cannot be presented in this part of the study. Therefore, the discussion below considers some significant examples.

1- Site no. 059: Three cisterns were found at this site; one of them will be considered here. It lies just on the southern base or slope of the low hill where the site was located. The cistern seems to have been originally a natural cave converted into a cistern after being vertically deepened, and because it had a side-opening, a wall was built to prevent any sediments or debris entering it (Fig. 4.11). The latter was fed by

rainwater by an earth channel running east-west along the southern slope of the hill. The walls of the cistern were coated with a white waterproof layer. The height of the cistern is approximately 3m whereas the diameter is 2m.

2- Site no. 069: the main feature at this site is a two-room traditional house. However, there is strong evidence to claim that this house was built on the substructures of an ancient farmstead; some of the original walls are still visible in its lower courses. The farmstead was obviously associated with a roughly square bedrock courtyard; a cistern was cut vertically within this courtyard (Fig. 4.12). Its dimensions are as follows: approximately 3m high and 3m in diameter on the floor whereas its opening is 2m. The walls of the cistern were coated with waterproof or hydraulic plaster. The cistern appears to have been seasonally fed, mainly from rainwater. Two possible sources might have supplied the cistern with this water; the courtyard itself and/or the roof of the ancient building. This technique of collecting water is attested elsewhere in Jordan and in the Middle East in general (Wåhlin, 1997: 233-249).

3- Site no. 070: this is a very typical bottle-shaped rock-cut cistern located on a moderate slope of a hilly area. A long earth channel clearly fed this cistern with rainwater, the same channel seems to have fed other nearby cisterns. The cistern was cut vertically into limestone bedrock with a flat floor and small opening shaft (Fig. 4.13). The height and the diameter of the shaft were measured whereas the diameter at the floor was not measured as there is no access to the floor. The height is 6.5m, the opening shaft's diameter is 70cm whereas the diameter on the floor may be approximately 3-4m.

4- Site no. 095: this cistern is probably the most significant rock-cut cistern in the study area. It was located on the moderate slope of a rocky hill, where elevation gradually decreases from southwest to northeast. The cistern was found near the north-eastern base of this hill, and the area where it was cut consists of relatively soft limestone layers associated with chalk. A long earth channel (about 150m) running southwest to northeast along the hill's slope must have directed the rainwater to the cistern, the course of the channel is very clear near the cistern where the exposed rocks were cut to lead the channel. A rectangular settling basin was built at the end of



the earth channel, in front of the cistern to clean the water from sediments and debris, and finally a short stone -channel fed the cistern from the settling basin.

The cistern appears to have been cut between two horizontal bedrock layers from the side. The diggers made a large, round and deep hole into the bedrock which is partly roofed by the bedrock itself, therefore, a wall, approximately 1m in height, was built on the edge of the hole to carry the artificial roof. The short stone-channel and the only entrance to the cistern were located in the north side of this wall. The entrance is quite small, approximately 80cm high and 50cm in width. However, it gives access to the floor through 17 steps cut into the right-hand side of the bedrock (Fig. 4.14).

The interior of the cistern is roughly round and has approximately a 9m diameter including the side which has the rock-cut steps. The diameter at the bottom of the cistern is approximately 7m. Although some debris has collapsed from the roof and stones have been thrown on the floor by local shepherds, it is 6m high. Apart from the roof, all of its interior including the steps, were coated with a waterproof layer. It is therefore highly likely that the water level would have reached a point close to the entrance in a good rainy season. The steps must have given access when the water level was low or during the dry seasons when the cistern was being prepared for the next season.

5- Site no. 099: this cistern was partly cut as the site was originally a natural cave. Some parts of the cave seem to have been cut to make a roughly rectangular cistern. The cave was located on the southern lower slope of a low hill. A wall was built on the southern side or the opening of the cave to close the cistern. However, a small entrance was left in this wall to give access to the cistern. A round stone-column was built inside the cave, near the eastern wall, to support the roof (Fig. 4.15). The column as well as the walls of the cave were coated by a waterproof layer.

Traces of an earth channel can be seen on the slope of the same hill to the east of the cistern. The channel ran east to west and entered the cistern through the roof near the south-eastern corner. The dimensions were found as follows: 8m in length and 6 in width, the current height is approximately 2m but it could be more as the floor of the cistern has some sediment and debris.

6- Site no. 103: this is another significant rock-cut site because it consists of two cisterns and a settling basin. The site is located on a moderate slope in a hilly area. The most recognisable feature at the site is the square settling basin (5×5m) which was built of large flintstone blocks. Two openings were seen in the walls of the basin: one in the north wall close to the northwest corner and one in the south wall near the southeast corner. The first allowed the rainwater, brought by an earth channel running east-west along the hilltop, to enter the settling basin whereas the second directed the settled water into a cistern just behind the southern wall of the basin. This cistern was vertically cut and had a waterproof layer. It is now full of debris, therefore, no measurements were taken.

To the east of the basin and cistern, a few metres apart, another cistern was found. It is also a vertical rock-cut cistern. The opening shaft of the cistern is currently closed by many slabs, accordingly, the dimensions of this cistern were also not obtained. About two metres to the east of this cistern, a stone wall was built to form half a circle or a curve, this wall, though shallow, seems solid enough to prevent any water leakage as it might have worked as a collecting basin for the second cistern.

7- Site no. 104: this is a bottle-shaped rock-cut cistern associated with a settling basin, and located on the upper slope of a rocky hill. The cistern is approximately 6.5m in height and 5m in diameter at the bottom. The settling basin was constructed very close to the opening shaft at the end of an earth channel running south to north (Fig. 4.16). Finally, it is worth mentioning that the walls of the cistern were coated with a waterproof layer.

8- Site no. 125: a round cistern cut into a limestone layer on the lower slope of a rocky hill. It was obviously cut from the north side of the limestone façade. It is 5m in diameter and 3m in height and the walls had a hydraulic plaster layer (Fig. 4.17). A wall appears to have been originally built to close the north opening of the cistern. Three rock-cut steps were seen in the northeastern part of the cistern. An earth channel, rocky near the cistern, fed the cistern; the course of this channel can be seen on the south-eastern slope of the hill, particularly after a rainy season.



### Note on the Date, Distribution and Use of the Rock-cut Cisterns

Date: As mentioned at the beginning of this discussion, the technique of cutting cisterns into rocks was known at least from the Middle Bronze Age (Negev, 1972: 332). In southern Jordan, this strategy was attested in Petra, Auara and elsewhere from the Iron Age till the classical periods (Oleson, 1995: 708; 1997: 176; Wåhlin, 1997: 233-249). No dateable materials were found in association with most of the rock-cut cisterns. Therefore we should rely on general conclusions and some observations from the field work.

Geographically, the cisterns lie within the hinterland of the Nabataean capital, Petra. The archaeological evidence from the study area clearly demonstrates that the region reached a peak of flourish during the Nabataean period. In some areas, the Nabataean evidence had even weakened the presence of evidence concerning earlier periods (Hart, 1986: 51). The Nabataeans also developed unique water management systems suitable to the area in which they lived in (Koenen, 1996: 179). Therefore, it is quite reasonable that this technique of water supply was initiated by Nabataeans.

The data collected allows us to relate every each rock-cut cistern in the study area to an ancient settlement site (Fig. 4.18). They were found either within the site itself or in the nearby landscape. It should be taken into consideration that the location of the cistern is subject to the topographic and geological factors; therefore, it is not unlikely that the founders of these sites looked at the landscape before they chose a site to build their dwellings. The ceramic evidence shows that the Nabataean period is the earliest and best documented at the sites which have direct relations with the rock-cut cisterns ('Amr *et al*, 1998: 540-543). A Nabataean inscription was also seen, but could not be reached, on the walls of the cistern at Site no. 095. However, later periods are also well represented in many ancient sites adjacent many rock-cut cistern sites.

The fact that these cisterns were reused in later periods cannot be denied. Many of them, especially the bottle-shaped cisterns were in use until the 1980s. Proper doors or covers were made for them and small square openings replaced the original circular opening shafts using small stones and cement (Fig. 4.19). Therefore, there is no

reason to believe that this type of water supply system was not reused during the Roman and Byzantine period ('Amr *et al*, 1998: 540) as the region seems to have flourished in the Byzantine period in particular (Killick, 1987b). A variation in the colour and material of the waterproof plaster was noticed in many cisterns, and this could illustrate later reuse for these features. The diversity in the colour, the mortar types of the hydraulic plaster and the methods of plastering were used in an attempt to date aqueducts in Israel depending on this difference (Porath, 2002: 25-36).

#### **The distribution and use**

Figure 4.18 clearly shows that the recorded rock-cut cisterns in the study area are concentrated in one area to the southwest of Udhruh. This phenomenon might be explained according to the following observations:

- 1- First of all, the area was relatively far from natural water resources; therefore, the ancient people had to look for alternatives.
- 2- The landscape, in terms of geology and topography, was suitable for this type of water supply strategy.
- 3- The abundant presence of natural caves in this area near natural catchment areas encouraged the ancient people to utilize this technique.
- 4- Having a water source near someone's settlement site or farm would have saved the time and effort required to bring water from a remote natural water source.

It is quite obvious from the examples given above that the capacity of most of the rock-cisterns is limited. Although many of them were found near ancient agricultural fields, it seems highly unlikely that they were used for irrigation due to their limited capacity. Moreover, these cisterns were seasonally fed as they are mainly dependant on the rainwater during one season; the winter. Thus, a seasonal water source does not support a continuous irrigation system. A considerable number of the recorded cisterns show that the quality of water was very important to the ancient people, this fact can be evidently seen in the cisterns themselves. Their walls were carefully coated with waterproof plaster, roofs and side walls were constructed whenever it was necessary, and settling basins were also built.



This degree of care might reflect the nature of use, and it can now be said that the water stored in those cisterns was consumed for human and household purposes such as drinking, cooking and washing. A settling basin would have guaranteed that at least no considerable quantity of sediment or debris entered the cistern. Minor material would most likely stay at the bottom of the cistern as the water stayed still in it for a long time before it was totally consumed. Finally, it is worth mentioning that the majority of these cisterns can be reused again if they are maintained, they would be of great benefit at least for agriculture and animal stock in a very dry area, particularly during the hot summer.

#### **Aqueducts and channels**

The evidence for ancient aqueducts or channels in the study area was found at only four sites; the discussion below considers each of them:

1- Site no. 049: this channel was first seen just on the western edge of the reservoir at Site no. 048. It runs, for approximately 1km, from that point until it ends at the southern edge of Wadi al-Fiqai just below Site no. 044 (Fig. 4.20). The course of the channel, in terms of path and construction methods, exhibits a significant variation. It heads west to southwest on a flat desert ground of a very low hill, and then it dramatically runs northwest along the slope of that hill until it ends on the northern edge of Wadi al-Fiqai. From there it runs south across the bed of the same valley to its far end.

Architecturally, most of the channel appears to have been constructed of multi-sized slab stones; two lines of contiguous and most likely plastered stones. The space between the internal faces of the two lines is the real width of the channel, which is about 30cm in some parts. For a considerable distance from its start near the reservoir, it is covered with uncut stones. Along the slope, the channel can hardly be seen, however, there is enough evidence to claim that this stretch of the channel was not covered and it is very similar to that in the wadi bed. A very significant change in the channel's physical appearance can be seen in the middle of the valley, where a solid wall was built to carry the channel.

This wall could have done two jobs; protecting the channel from being eroded and keeping the same level across the valley. The wall is still standing for about 1.5m in height, and it is built of uncut limestone cobbles (Fig. 4.21). However, about four to five metres of the original wall were completely eroded and disappeared because of recent floods. The top of the wall, where the channel was running, is lined with a thick layer of waterproof plaster. The height of the wall gradually decreases southward and northward.

2-Site no. 043: this channel is shorter than the one at Site no. 049; the traceable part is approximately 150m long. The ancient channel seems to have fed the reservoir at Site no. 042 from the qanat system that might have delivered its water in the valley below Site no. 044. The channel is not well preserved; a very short part is still in situ (Fig. 4.22). The archaeological evidence shows that it was constructed of two parallel lines of uncut Nari stones giving an 70cm external width and approximately 35cm to the width of the channel between the stones.

3-site no. 216 (Jebel al-Tahuna): the channel at site no. 216 does not look too much different from the other channels. It was laid down by small slabs in two parallel lines, each line was made with two rows of stones, the external rows were mainly to support the main body of the channel (Fig. 4.23). The channel ends in a well preserved and plastered rectangular settling basin and then in a big reservoir. The easily traceable part of the channel is relatively very short, may be about 40m long. The difficulty in tracing the original channel is due to the existence of many stone walls which extend in rectilinear lines similar to the channel. Those walls could be the result of agricultural activity in later periods at the site.

However, the author had the chance to trace the ancient channel to a certain point on the northern base of Jebel al-Tahuna where another reservoir was also found. No traces of a channel can be seen to the west of the second reservoir. The course of the channel changes significantly. It runs southwest in a straight line for a short distance from the reservoir, and then turns north for another short distance and finally heads west to northwest towards the second reservoir (Fig. 4.24). A qanat system to the west of Jebel al-Tahuna was most likely the source of water supplied to the reservoirs.



4-Site no. 224 (Wadi Basta): Three channels were recorded at this site, two on either edge of the valley and one in the wadi bed (Fig. 4.25). They are respectively: the southern channel, the northern channel and the central channel. For a considerable distance, from the location of the current spring to the ancient reservoir, the area is intensively occupied by modern small farms; therefore, there was no hope of finding ancient channels. However, traces of an ancient channel were found just on the southern edge of the valley. This channel appeared to be the one that fed the reservoir and continued on the southern edge of the valley until it ends about 1.5 km further east. The channel course followed certain topographic features, probably to ease the flowing of water by gravity.

The northern channel runs roughly parallel to the southern channel, and significantly ends at the same point where the southern channel ends. Both channels, although they do not follow a straight path, seem to have been deliberately directed to meet at that point in the middle of the valley. Despite the fact that the start of the northern channel is not known, as it suddenly disappears, judging from its topographic location at the edge of the valley, it should start possibly from the reservoir or most likely from the spring of Basta. However, a local man suggested this channel comes from a spring north of Basta. The technique of constructing two channels, on the edges of a valley below a spring, is still maintained in the region. It prolongs the irrigating period and covers more fields. The central channel, although given the name central, is closer to the northern channel, but for a considerable distance it runs just in the middle of the gully. Amazingly, there is very strong evidence to claim that this channel was also deliberately ended at the same point where the other two channels meet.

The three channels have recently suffered, and been disturbed by modern agricultural activities, mainly ploughing. A long part of the southern channel has been cleared off, and the stones were reused to build terracing walls in the neighbouring fields. Therefore, the available evidence is not clear enough to conclude that these channels were constructed coincidentally depending on the similarity of layout. However, the path of the three channels, which clearly meet at one point, might hint that they were constructed, or at least in use, at the same time.

The fact that the three channels in Wadi Basta meet at one point is indeed interesting. It means that they might have ended in a reservoir or in one aqueduct. And since there are no traces of a reservoir in the area where the channels meet, it is very probable that they were flowing in an aqueduct running further east in the valley. Brünnow and Domaszewski (1904: 467) reported that two earlier explorers mentioned that an aqueduct from Basta supplied Ma'an with water. Some of the local people at Basta still confirm the presence of this channel. Moreover, a very short part of a channel was found during the field work in Wadi Basta (Fig. 4.26), about 1.5 km from the point at which the channels coincide. The remains of small structures were also recorded along the edge of Wadi Basta. These were possibly to guard and look after the aqueduct

The strategy of supplying water for a town or an ancient site from a distant source is well attested in southern Jordan. A 26 km conduit carried the water from its source (springs) to the settlement at Humaima (Oleson, 2001: 608). 'Amr *et al* (1998: 538; 2001: 278) recorded a channel between Ayl and al-Ttyyiba, the length of which was estimated to be approximately 5 km. thus, if a channel between Basta and Ma'an had ever existed, it would have been the second longest documented channel in the region.

### The Date

Because of the lack of epigraphic evidence, the abovementioned channels cannot be dated without considering the other water supply features found in association with them, in addition to the evidence from the ancient settlement sites and agricultural fields fed by these channels.

On the basis of the ceramic evidence from the reservoirs fed by the channels at Sites nos. 043 and 049, and the evidence from the sole settlement site (Site no. 044) in the nearby area, two periods are significantly represented, the Nabataean/Roman and the Late Byzantine/Early Islamic. Therefore, it can be tentatively suggested that these channels were initially constructed during the Nabataean/Roman period, and maintained and reused intensively during the Late Byzantine/Early Islamic period. It is worthwhile to repeating that the qanat system (Site no. 053) was dated to the Roman period by Lightfoot (1996a).



The channel at site no. 216 was basically constructed to convey the water to the two reservoirs at the site from the qanat system to the west of Jebel al-Tahuna. In fact, all of the water supply system components at the site could have been coincidentally initiated with the establishment of the agricultural village at the site. To judge from the ceramic evidence, the site initially flourished during the Late Byzantine period and continued to thrive in the Early Islamic period, mainly under the Umayyad dynasty. The Nabataean/Roman period, unlike at the majority of the settlement sites in the region, is significantly absent.

Dating the channels at site no. 224 is more problematic due to the gradual disappearance of the original evidence caused by modern intensive agricultural activities in the valley of Basta. Moreover, there is an accumulative evidence for a long history of human settlement near the spring of Basta, from the Neolithic up to the present. However, on the basis of the architectural elements of the reservoir in Wadi Basta, the Nabataean and Roman period seems to have been the period during which this system was instigated. Glueck (1935: 74) dated the ancient settlement at Basta mainly to the Nabataean period, but he also considered the potential presence of post-Nabataean periods such as the Roman, Byzantine and Mediaeval Arabic.

The field work revealed that Basta was a nexus of many ancient roads including the *via nova Traiana* (Graf, 1995b:248), and the evidence for Roman and Byzantine settlement in the surrounding areas is abundant. According to an earlier traveller (reported in Brünnow and Domaszewski: 5), the presumed aqueduct from Basta might have also fed the reservoir at al-Hammam, east of Ma'an. Al-Hammam has long been identified as a Roman military site and was tentatively dated to the 4th or 5<sup>th</sup> century AD (Parker, 1986: 102; Brünnow and Domaszewski, 1904: 3-6; Kennedy, 2000: 174-176; Genequand, 2003: 25-35 demonstrates otherwise). Putting these facts together, it seems safe to suggest that the channel system in Wadi Basta was at least maintained and reused if not developed, during the Roman and Byzantine periods.

## Wells

Hodge (1992: 51) identifies a well as follows: "*the word 'well' should be confined to man's attempts to obtain water from the earth, vertically below the spot where it is*

*required, when it is not obviously present at the surface.*” Therefore, the well was always vertically dug, and consequently, a round and deep hole is the outcome of digging. This round hole was usually and necessarily lined with stone, brick or even wood, this process would in return prevent the well’s walls from falling. Unlike the shafts of the qanat system, the well’s shafts had to be lined as it gives permanent access permanently to the water at the floor of the well whereas with the qanat system, the tunnel is the most important part as it transfers the tapped water to wherever it was required. According to Hodge (1992: 52), the wells, lined with masonry, either with mortared joints or of dry-stone, are the commonest type in the Roman Empire.

In the study area, only two ancient built wells are still in situ although they have been in use for centuries. Both have been recently associated with modern structures and basins to protect them. Other wells were reported by the local people and found by the author, but have been totally filled in (Fig. 4.27).

1- Beir al-Bitar: the well (beir) of al-Bitar lies about 30m to the south of the Wadi Musa-Udhruh road and to the east of the village of Beir al-Bitar (Site no. 336). It is not clear if the well was originally a surface spring deepened by time and then the well was built to give access to the water, or a spring tapped at its ground source. However, the well currently looks completely different from what it was in antiquity, a modern cover built of cement enclosed the shaft of the well, and two basins were added to water the herds of the local people. Architecturally, the well is round; approximately 2.5m in diameter and 6m in height. The walls were built of hewn limestone cobbles. A hole can be seen in the western side of the well, in the lower course and this is probably the source of the spring.

The well is still fairly deep, and was known for a long time for the abundance and quality of its water. It was one of the main water supply sources, for human and animal consumption, in the study area before the construction of the modern water wells and pipelines. The local authorities, in the 1940s and 1950s for instance, had to deal with legal issues caused by conflicts between the local people over using the water sources, particularly wells. Most of these clashes happened at or near a well, when many animal flocks awaited their turn to be fed. The picture may be different in



antiquity; it seems that every group of people or cluster of settlements managed to have their own water sources. Most of the recorded settlement sites were associated with a water source or located near it. We have seen above that those who found themselves at a distance from a natural water source, managed to have rock-cut cisterns or house-based cisterns (see below).

Many ancient settlement sites were found in the vicinity of Beir al-Bitar, which might mean the presence of this water supply source was taken into consideration by the ancient people. It can be directly related to an ancient settlement site on a hilltop to the west of the well (Site no. 336). According to 'Amr *et al* (1998: 543) the ceramic evidence shows that it was occupied during the Iron II (Edomite), Nabataean (1<sup>st</sup> and 2<sup>nd</sup> century AD), Late Byzantine-Early Islamic (6<sup>th</sup> and 7<sup>th</sup> century AD) and Late Islamic periods. On the hilly area southwest and south of the well, the author recorded five ancient settlement sites which were clearly supplied with water from Beir al-Bitar (Fig. 4.28). Moreover, a dirt track heading south from the well would have also connected the well with other settlement sites further south in the region.

2- Beir Abu Danna: the well of Abu Danna lies in the centre of the modern village. A square structure, approximately 10m each side has been built on the well. The shaft of the well lies in the centre of the structure's floor, the latter is paved and a cover was made for the well. A metallic ladder was fixed in the walls of the well to give access to its floor for maintenance purposes. A long cement-basin, connected to a channel near the shaft of the well, was also constructed. Most of these modifications were added during a campaign to rehabilitate the ancient water sources in the governorate of Ma'an in the 1990s. However, the ancient form of the well is still well preserved; it is round, approximately 2m in diameter and 4m in height. The walls were built of cut limestone cobbles.

This well seems to have also attracted ancient settlements. On a hilltop to the west of it, there is a traditional village (khirbet) evidently built on an ancient settlement site (Site no. 218). To the east of the well, about 300m and between two hills, there is also another ancient settlement site, which was identified by Killick (1986: 438) as a Roman fort. In the valley below the well, an ancient road (Site no. 204), which comes probably from Udhruh, was tracked for about 1 km in the valley, and ends at the well.

Two branches of this road, one heading westward and the other eastward, seem to have passed the well. The branch that heads east passes the fort (Site no. 219), and intersects with a south-north ancient road heading southwest to Basta. The archaeological evidence and the accounts presented by local people indicate the importance of this well as a water supply resource in antiquity as well as in the 19<sup>th</sup> and 20<sup>th</sup> centuries.

### Dams

No dams were found during the fieldwork in the region of Udhruh. However, a dam at Jebel al-Tahuna (Site no. 216) was seen by Alistair Killick during the course of an archaeological survey conducted in the 1980s (Killick, 1986: 438 and fig. 24.13). The existence of this dam was also confirmed by the local people who saw it many decades before Killick when it was *in situ*. Killick only reported the presence of the dam; there is no architectural study or detailed description of it. The dam was constructed on the southern most base of Jebel al-Tahuna where a geological fault or anticline made a very typical catchment area to the southwest of the mountain. Interestingly, a modern earth dam was built in the same area, therefore, the ancient dam cannot be traced at all. The dam, in antiquity as today, would collect hundreds of cubic metres of the run-off water during the rainy months, small tributaries seem to have also flown in the same area.

The water collected behind the dam appears to have been used for irrigation and very likely used to feed the animals raised by the site's settlers. Traces of field walls can be seen in the ground to the east of the dam; moreover, many agricultural fields were located within the large enclosure at the site (Jebel al-Tahuna). Although the relationship between the dam and these fields is not clear, it can be assumed that some fields, especially those along the southern side of the enclosure were irrigated from the dam. An earth channel would have simply done this job. Killick (1986: 438) dated the site, including the dam, to the Byzantine period. The archaeological evidence, mainly the ceramic, supports this date. The site was founded during the Late Byzantine period and continued to flourish in the Early Islamic period.



### House-based cisterns

Building a cistern within the house was one of the water supply strategies in the region of Udhruh. In antiquity, house-based cisterns were supplied by the roof run-off water whereas in present times, pipes and modern wells are the source of water. Moreover, the ancient people had to build their cisterns as water resources were either very limited or located away from their settlements.

In the study area, five ancient settlement sites were associated with this type of cisterns. However, more field investigations should reveal more evidence. Only one of these cisterns was found in a relatively good state (at Site no. 023). These cisterns can still be, although filled with debris and collapsed stones, identified through the round opening shafts and the circular courses of their walls which in some cases have the waterproof plaster. They were, generally speaking, located within the walls of the house or structure, and this might confirm they were provided by water from a roof catchment area. However, a cistern can also be fed from the ground run-off water, especially if located within the courtyard (Hodge, 1992: 58-60). The collected water would be safely used for household purposes such as cooking, drinking, and washing.

### Stone piles

Stone piles form a very significant feature in the landscape to the east of the modern villages at Rashid, Abu Danna, Basta, and Ayl (Fig. 4.29). These heaps seem to have been made as a result of an intensive field clearance; each pile consists of tens of small stones. The intensity and form of the heaps vary from one area to another. In some areas the piles are very intensive in number and located in a relatively small area whereas in other areas, the piles are small in number and located over a wider ground. In some cases, they look like lines of piles whereas the majority of them do not show a regular form. Finally, the size also varies from one heap to another (Fig. 4.30).

According to Oleson (1995: 712): *“Everywhere around the Late Nabataean cities of an-Naqab, the gravelly slopes are covered with man made patterns formed by piling field stones in regular heaps or lines. These laboriously-constructed heaps probably*

*were intended to serve two purposes. Removal of the surface stones allowed the soil to crust over almost immediately after it was moistened by rain and thus fostered unimpeded runoff from the slopes, increasing the yield of water”.*

Oleson (1995: 713) claims that such techniques of water and soil conservation are very rare in southern Jordan. However, the evidence from the study area shows hundreds of stone piles, particularly in the pre-desert zone to the east of the abovementioned villages. They were remarkably concentrated on the slopes of hills; lines of stone walls were also sometimes associated with the stone mounds. The presence of small structures in the areas where these heaps are concentrated might support the suggestion that arable lands had advanced, sometimes in antiquity, to the semi-arid areas.

The available evidence is not enough to date these features precisely. However, judging from the archaeological evidence from the nearby settlement sites, it appears that this type of water management might have been primarily introduced during the Nabataean period. Moreover, the evidence from the Negev, where heaps of stones are abundant, comes from areas near to well documented Nabataean sites (Oleson, 1995: 713). Finally, there is no reason to believe that arable land in the pre-desert zone in the study area was totally abandoned by the end of the Nabataean period; the region is well attested in the Late Byzantine-Early Islamic period.

## Conclusion

The multiplicity of the water management strategies in the study area clearly reflects the fact that we are dealing with a semi-arid region. Every possible technique was used to overcome the shortage of water. These strategies, particularly springs, affected the settlement patterns in the region of Udhruh up to the 20<sup>th</sup> century. In many cases a cluster of settlement sites was found within a walking distance from a water source. However, since there were other factors which might have determined the location of a settlement site such as agricultural fields and road networks, the inhabitants of the region initiated and used various techniques of water supply. Rock-cut cisterns, wells and reservoirs are very good examples in this respect. Other techniques were used mainly for agricultural purposes such as field walls and stone piles. Although the



Nabataean period is the most obvious period in the region of Udhruh, it cannot be suggested that these strategies of water supply were first introduced during that period. Some of the water supply systems were known many centuries before the Nabataeans and some techniques even originated outside the region. However, many of the water supply strategies documented in the region of Udhruh remained in use up to the 20<sup>th</sup> century.

## **Chapter Five**

### **The Road System in the Study Area**

#### **Introduction**

This chapter considers the road system in the region of Udhruh in the light of data produced by fieldwork. After a brief introduction to previous studies which have considered the topic, a detailed discussion will consider all the routes; their directions, characteristics and starting points and ends, and the archaeological finds discovered in association with these roads. Part of the discussion will be devoted to investigating the presence of the Roman highway, the *via nova Traiana*, in the study area and its true path between Petra and Sadaqa. An attempt will also be made to give a rough date for the use of these roads on the basis of archaeological evidence from sites associated with the road network. The final part of this chapter will investigate the involvement of the road system in the study area in the long-distance trade between the East and West.

#### **Previous Studies**

Previous studies on the road network system in the region of Udhruh are very scarce. So far; no single study has been initiated to consider this topic. Data regarding the road system of the region is usually obtained from the accounts and observations of earlier travellers, or from some recent field reports initiated mainly to trace the Roman road, the *via nova Traiana*, between Petra and Aqaba. However, a few roads were recorded by Alistair Killick (1987a: 173 and 175) during a field survey in the same study area.

Certain publications, although the study area was not their concern, deserve to be briefly traced as a source of information regarding the existence of ancient roads in the region. First of all, the work of the German scholars Brünnow and Domszewski; *Die Provincia Arabia* (1904: 433-479) contains valuable information as they recorded segments of ancient roads and milestones as we will see below. Very little information came from Thomsen's milestone corpus of 1917 which listed Roman



milestones from Syria, Arabia, and Palestine (Thomsen, 1917: 1-103). Nelson Glueck's investigations in the region in 1930s (Glueck: 1935: 72-78) revealed some useful finds. For instance he discovered a broken Roman milestone at Ayl (1935: 75, published by Graf, 1995a: 418). Much more data was revealed by Sir Aurel Stein during his field examinations of the *via nova Traiana* between Aqaba and Petra (Stein, 1940: 436-438; Gregory and Kennedy, 1985: 304-352).

Much important data about the road network in the study area was obtained from the large-scale scholarly project, the *via nova Traiana* in Arabia Petraea, initiated by David Graf in four seasons between 1986 and 1989 (1995b: 242). The current author re-recorded and investigated the roads found by Graf in the area between the two sites, and recorded new roads. The sole study initiated in the 1980s to examine the archaeological sites in the region of Udhruh by Alistair Killick, also accumulated important finds in this respect (1987a: 173 and 175), but little has been published. 'Amr *et al* (1998) and 'Amr and al-Momani (2001) will be a good supporting study to the evidence collected by the author. Finally, it is the field survey initiated by the author in 2003 (October, November and December) and 2004 (June) which uncovered the ancient road network in the study area.

### **The Evidence**

More than thirty sites which show evidence of the ancient road system were recorded by the author. Few of them were previously recorded although some of them are still visible and traceable for long stretches. In terms of the direction of the courses of these roads they can be classified into two categories: north-south/northwest-southeast roads, and east-west roads. Most of these roads were marked by stone walls on either side, in some cases; the road was marked by one wall. A handful of them show evidence of a pavement, and no single milestone was recovered along any of the roads. The physical appearance of each road and its relationship to other roads and ancient settlement sites will be carefully considered below.

### North-South/Northwest-Southeast Roads

1-Site no. 011 (Du'aij road): this is one of the longest traceable roads in the study area. It was traced for roughly 8 km. It was deliberately located over the tops of relatively contiguous series of hills to the northeast, east and southeast of Petra in a north-south direction. However, it sometimes had to descend and ascend slopes of hills due to natural interruptions. The topographical location may not only have eased the construction of the road because of the similarity in the terrain, but also made a look-out point, for a distance along the road, very possible. This road was first seen near Khirbet Du'aij (Site no. 012). Its start lies somewhere further north outside the study area. It was traced for almost 1 km to the north of Site no. 012 where it suddenly disappears. A local man confirmed that the road heads northward up to Negel (Shaubak).

Physically, the road exhibits variable characteristics along its course. It is marked by two low and high stone walls near Khirbet Du'aij whereas only one line of stones marked it over a rocky terrain on the western edge of a hilly area to the north of Jebel al-Qulaiah (Fig. 5.1). The other line might have been recently cleared during the construction of a modern road parallel to the ancient one, or may have not existed at all. From a point about 200m to the north of the Wadi Musa-Udhruh road, to its end, it is marked by two stone walls; one high, the other low. The road was disturbed twice; by the Wadi Musa-Udhruh road which cleared about 20m of it and by a modern agricultural road constructed on the ancient one. The bulldozer in some parts uncovered the walls which defined the road. A pavement was noticed in the lowest stretch of it, to the east of Jebel al-Qulaih, and this might have been necessary to prevent any possible erosion by runoff water from the slopes of the nearby hills.

Stein seems to have seen a considerable stretch of this road during his investigations into the Roman road between Aqaba and Petra (Gregory and Kennedy, 1985: 341-342). He traced the road from a point just east of Jebel al-Qulaih to an unknown point further north. Stein wrote: *"...on May 1st we left Elji (modern Wadi Musa) by the motor track leading to Shobak. It brought us after 4.5 miles from 'Ain Musa up to a saddle at an elevation of about 4,900 feet, overlooking the valley to the north which holds the spring of 'Ain al-Mikwam. On ascending the range to the south-east we*



*came to after a mile and a quarter upon the roman road well defined between double line of stones and showing a width of 18-19 feet ...the line of the road can be seen clearly coming from the south along the crest from al-Qlaya (Jebel al-Qulaiah). It keeps to the western edge of the crest except where the steepness of the rocky slope causes it to wind round to the east. From this height it was now seen that the Roman road further to the north leaves the crest of the range and after descending to the above mentioned saddle runs westwards for some distance across a broad spur on the side opposite to the main eastern range."*

Stein incorrectly refers to this road as a stretch of the Roman road; the *via nova Traiana*, which he traced between Aqaba and Petra (Gregory and Kennedy, 1985: 341-342). There are many reasons to refute Stein's suggestion. First of all, the road seen by Stein to the east of al-Qulaiah is no more than a regional road connecting settlement sites near the top of mountains overlooking Petra to the west (see below). Second, its southern end is not too far from Jebel al-Qulaiah, it ends on a west-east secondary road. Finally, a stretch of the Trajanic road to the northeast of Petra has been recently rediscovered by Graf to the north of the modern village of al-Hai (Graf, 1995b: 243).

#### **West-East Roads on Du'aij Road (Fig. 5.2)**

Although the road was not tracked at its beginning the evidence documented by the author and the data from Stein's investigations designate the Du'aij road as one of the major north-south regional roads in the hinterland of Petra. The builders brilliantly noticed the topographical features of the hills, where the road is constructed, which allowed it to be relatively level for long segments. More importantly, the road connected many sites located on the hills along the course of the road. The following discussion will consider the branch roads and the sites they connected with the Du'aij road.

1- Khirbet Du'aij (Site no. 012) was significantly located just on the eastern edge of the road. The site might have been a *caravanserai* on the road, a large mound of about 50m diameter indicates that a circular structure existed there. A square structure and two rainwater collecting cisterns were seen about 60m to the south of the mound. The

square structure could have been a guard and controlling outpost. Traces of a west-east road were noticed between the square structure and the cisterns, this road heads eastward via the Wadi Du'aij where abundant terracing walls can be seen on the slopes on either side of the valley which must have been an intensely cultivated area.

2- The next junction on Du'aij road connects Khirbet al-Trabsieh (Site no. 025) with the road. The junction is not well preserved, but the branch road can be easily seen near the site; it is marked by two low stone walls and has a width of 4m. Khirbet al-Trabsieh consists of two rectangular structures.

3- The third junction on the Du'aij road is very significant as two roads, east-west and west-east, intersect the main road northeast of Jebel al-Qulaih, and approximately 30m south of the modern road between Petra and Udhruh. The first road heads westward to a site on the upper slope of a hill overlooking Petra west. The site consists of a cave and the remains of a small structure; the latter could have been a watch-tower. The road is marked by two stone walls and was 3m in width. The southern wall was deliberately elevated to prevent the erosion of the agricultural fields above it. Traces of the second road can hardly be seen, but an aerial photograph taken in 1981 confirmed the existence of this road. It was probably disturbed by the Wadi Musa-Udhruh road, and could be the ancient road between Udhruh and Petra which has long been presumed.

'Amr *et al* (1998: 543 and figure 33) rightly suspected the presence of a junction of three ancient roads: one from Udhruh, the second from at-Tayyiba, and a third from Wadi Musa. However, 'Amr seems not to have been aware of the existence of the Du'aij road as she suspected the junction was further west at the top of the first road whereas the real junction was located on Du'aij road about 200m further east. In fact, there is enough evidence to suggest that a west-east road between Udhruh and Petra existed in antiquity. First of all, traces of this road were seen by the author above, and sometimes parallel to, the modern road between Udhruh and Petra. Secondly, the road should have been constructed to connect the important ancient sites at Udhruh and Beir al-Bitar with Petra.



4- The fourth junction is still very well preserved due to the good state of the road there. A west-east road connected el-Juri 1 (Site no. 088) with the Du'aïj road and is as usual marked by two stone walls with approximately 3m width and 100m length. The junction was carefully defined by hewn blocks and almost looks like a built entrance to a structure.

5- The fifth secondary road was vertically constructed between the Du'aïj road and el-Juri 2 (Site no. 092). Its course is not straight; there are many bends as it seems to have followed a certain terrain, probably to avoid the agricultural fields. The junction of this road appears to have been recently bulldozed. For about 50m to the north of it, the main road is not marked by any walls due to the presence of exposed bedrock. The secondary road is approximately 3m wide and marked by two low stone walls. It can be easily recognised by the bushes along its path.

6- This is probably the last junction on the Du'aïj road. However, a close investigation of the terrain, particularly along the presumed extension of the road, revealed no traces of the Du'aïj road. Moreover, the terrain in that area is quite steep for a road and lies on the edge of hilly area. The assumed junction was located about 100m from that edge, therefore, it can be safely suggested that there was no junction as the road does not continue southward. The proposed junction is not a secondary road, but the course of the Du'aïj road. It significantly changes its path from north-south to west-east; it heads eastward for about 500m from the point where a junction was speculated. This segment of the road retains the general features of the road; approximately 6m wide and marked by two stone walls. It might have intersected another north-south road passing the modern village at Rashid (previously al-Qa'); ancient sites were located on either side of the road.

2- The Zharah Road (Site no. 123) (Fig. 5.3): This road is one of the roads which have been severely disturbed by modern constructions, mainly the road system between Wadi Musa and Basta. Many portions of this road were totally cleared during the construction of the above mentioned road. It was first seen just on the eastern edge of the Wadi Musa-Basta road, and then traced to its end near Basta further south. The general direction of its course is from northwest-southeast, and it seems to have emerged from Petra. From the point where the road was first seen down to Petra, there

are no traces of it; it can be tentatively presumed that the road was destroyed during the construction of the modern road. The path of the latter is indeed very suitable to the ancient road.

From the first point and for about 400m the road is continuously traceable. However, a short portion, approximately 40m, was cleared by the modern road. About 500m to the south of that cut, the modern road damaged approximately 15m of the ancient road; 70m further south another cut was seen. The frequent damage to the ancient road was caused by the bends in the ancient and modern roads. The last damage to the ancient road was seen about 1.5 km further south. Generally speaking, it has many common characteristics with the Du'aïj road; most of its route was marked by two low stone walls, but in some cases only one wall or an exit cut into a rocky layer was found (Fig. 5.4). The width of the road ranges between 3m and 5m, and no pavement was seen in any part. However, pebbles seem to have been distributed over some stretches. Finally, many junctions and secondary roads were recorded along its course.

#### **Archaeological Sites, Junctions and Roads in Association with the Zharah Road (Fig. 5.3).**

The number and the state of junctions and secondary roads on the Zharah road are very significant. Unlike the junctions recorded on the Du'aïj road, the junctions on this road vertically connected two-direction roads, east-west and west-east, with the Zharah road. The following discussion will briefly consider these junctions and roads as well as other archaeological finds along the road.

1- Shortly after the first traceable portion of the road, the first junction was found. It connected two secondary roads to the Zharah road, one heads east and the other heads west. The one that heads west seems to have joined the Kafr Ass-ham road further west whereas the one that heads east ends at an ancient site on a hilltop about 150m from the junction (Site no. 122).

2- The next junction is not preserved, but there is very good evidence to suggest its former existence. Well preserved portions of a west-east road head roughly east to the modern village at Beir Abu Danna were seen about 60m below the modern junction on the Wadi Musa-Basta road. It can be clearly seen in the valley bed to the right hand



side, very close to the asphalt road, on the way to Abu Danna. The ancient junction must have been cleared or buried beneath the modern road to Basta, approximately 20m to the south of the modern junction. The modern road that connects Abu Danna with the Wadi Musa-Basta road was and is still the shortest route to Petra and has long been known as Tareq Umm Hilal (Umm Hilal Road). In addition to the settlement site at Abu Danna (now the traditional village or the Khirbet), four other settlement sites (Khirbet Umm al-Jarad, Umm 'Arreir 1, Umm 'Arrier 2 and Umm Hilal) were located on the hills near this road.

3- The third junction is very confusing. A very significant stone wall, heading west-east, was deliberately constructed to intersect the main road. The wall gets much thicker (c. 1m) and high (c. 1.5m) near an ancient quarry (Site no. 142). In fact; the wall at that point is part of the stone wall which encircled the quarry. Traces of an ancient road or track were seen in the area between the southeast corner of the quarry and the site of Umm Arr'ier 1. From the northeast corner of the latter, an ancient road marked by two low stone walls heads northeast, descends the gentle slope below the site and then ascends the relatively steep slope of a hilly area above the Umm Hilal road. It might have intersected the road from Udhruh (Site no. 220) at the modern village of Rashid. The stone wall mentioned above seems to have been built along an ancient track connecting Umm Arrier 1 with the Zharah road.

4- The fourth junction is extremely significant. It joins three secondary routes with the main road. The first route (Site no. 306) heads northwest and then northeast to Khirbet al-Maen, and descends the north slope of the hill where the junction was located. It is defined by two low stone walls, and is approximately 4m wide. It is fairly well preserved on the upper slope, but hardly traceable near the Khirbet and about 350m long in total. The second route (Site no. 161) approaches southwest from the junction, and was tracked for approximately 300m until it completely disappeared at the edge of the Wadi Musa-Basta road to the south of a mobile phone signalling tower. A very well preserved short portion near the junction (Fig. 5.5) shows that it was laid down using the same technique; between two stone walls and without pavement. This road might have intersected the Kafr Ass-ham road.

Identifying the true path of the Zharah road was problematic as two routes are heading south and southeast respectively from the junction. One of them should be the main road. A close investigation of both routes revealed that the one which heads southeast is not the Zharah road; it is a secondary route running southeast and then eastward via Khirbet 'Elli (Site no. 148) to Abu Danna where it might have joined another road at the well there. A junction joining two short north-south routes was seen on this road to the northwest corner of Khirbet'Elli. The true path of the Zharah road continues southward from the junction and then eastward for a short distance and then southeast to Basta. The road is well preserved over the hills southwest of the modern village of Beir Abu Danna.

5- This is the last proper junction on the Zharah road. It connects two roads with the Zharah road; the first heads westward descending the slopes of a hilly area until it evidently intersected with the Kafr Ass-ham road. This road, after descending the slopes, had to cross Wadi al-Dinarieh; therefore, a low bridge was built in the middle of the gully to carry it (Fig. 5.6). The second route heads northeast from the junction over the middle slope of a hill for about 300m, it then approaches east and southeast until it becomes totally untraceable on the edge of the modern road between Abu Danna and Basta to the east of Tell Zharah. There is enough evidence to suggest that it ends on the ancient north-south road between Udhruh and Basta (Site no. 220). A few hundred metres southeast of Tell Zharah there is a very significant site known as Khirbet Abu Qumrah (Site no. 223). Traces of a long stone wall, probably belongs to the road, were seen below the site. The above mentioned Khirbet, in addition to three more sites was located along the course of the road.

Both roads were constructed using the same technique; two stone walls running parallel and the space between them formed the path of the road. No traces of pavement were seen on any of them; however, the solid and clean ground seems to have been enough to use the road. The course of the roads, straight or not, was controlled by the terrain; it is straight on a relatively flat hilltop, and had bends if faced by hard terrain. There were many bends in the second road due to the nature of the landscape it followed. The width of both is not standard; it varies from 3m to 5m. Well preserved portions of each are still visible on the ground.



6- This is not a junction, it is merely a stone wall deliberately intersecting with the Zharah road. It heads westward to a well preserved ancient site (Site no. 168). Therefore, it was meant to connect the site with the main road with possibly a track along the wall.

Many archaeological sites were recorded along the course of the Zharah road, they were found on either side of it; some of them just on the edge of the road. The following discussion will briefly consider each of them:

1- Site no. 144: a rectangular structure located about 300m east of the road. Its plan and strategic location may indicate a military function for this structure. It may be the structure described by Stein on his way from Basta to Petra (Gregory and Kennedy, 1985: 337, 340 and figure 38). The information given by Stein is typically applicable to the site; he refers to it as a small *castellum*. Two names were given by Stein to the site; Umm Mekhlan and Umm Hilal (1985: 337). The latter is the current name of the area where the suspected structure was located to the east of the Wadi Musa-Basta road.

2- Site no. 145: this is located just on the western edge of the Zharah road. It is a rectangular structure built of hewn flintstone blocks; the external and internal walls can be easily traced; four units or rooms and a courtyard make up the internal divisions. The structure cannot have been more than a farmstead.

3- Site no. 335: the remains of small square structure measures approximately 4×4m located just on the edge of the road. It can hardly be seen due to recent agricultural activities, but some of the foundation stones can be seen on the surface. Similar structures were also recorded on this road and on other roads.

4- Site no. 157: the site lies on a hilltop about 400m to the south of the fourth junction on Zharah road. It is a small flintstone quarry; tens of quarried stones were found there. The stones were organised into rows as if they were ready to be taken somewhere else; probably to construct the walls of the road.

5- Site no. 158: a rectangular stone wall built on the eastern edge of the road, the western side of the structure is the wall of the road. The enclosed area could have been used as a temporary stop for by-passers, or was merely a later structure. It is worth mentioning that another structure, almost the same, was recorded further south on the eastern edge of the road.

6- Site no. 156: this site lies about 5m from the western edge of the Zharah road. It is very significant since a square structure was constructed at the site. It was built of cut limestone blocks, although only one course can be seen on the surface. A rectangular wall was built to encircle this structure, most likely to protect it. In fact, it looks like a water cistern, however there was no water source near the site (Fig. 5.7). A cave (Site no. 155) consists of two rooms and seems to have been a man made shelter, and obviously used in antiquity was found to the south of it.

7- Site no. 159: another remarkable site located just on the edge of the Zharah road, about 800m to the southeast of the previous site, approximately 70m north from the last junction. It is a small square structure built of large hewn limestone blocks has collapsed, and looking like a high mound. It was constructed on a very strategic point with a very clear view in all directions for tens of kilometres. More importantly, it controls and watches most of the Zharah road and the secondary routes on it. Accordingly, it has been safely identified as a watch tower and probably a checkpoint.

3- The Kafr Ass-ham road (Site no. 332) (Fig. 5.8a & b): during his investigations into the route of the Trajanic road between Petra and Sadaqa, David Graf (1995b: 246) recorded an ancient road between Petra and Basta. For his purposes, Graf (1995b: 246) named that road 'the eastern route' and nominated it as a very possible course for the *via nova Traiana* between Petra and Sadaqa. The course of the route according to Graf (1995b: 246 and figure 2) corresponds fairly well to the Kafr Ass-ham road recorded by the author.

Graf (1995b: 246) tracked the suspected route from the spring of Musa to Basta whereas the author did it the other way round, but did not track it down to the abovementioned spring as the northwest half lies outside the study area. However, an aerial photograph (Fig. 5.9) taken in 1981 clearly shows the road approaching Wadi



Musa via the valley below the well of Kafr Ass-ham. It can be continuously traced from the slopes southeast of the latter well down to a point above the modern houses in Wadi Basta. A short break, about 30m, was caused by the construction of the modern road between Basta and Wadi Musa.

The road was marked by two stone walls on either side with approximately 5-6m width. High walls were also built along some parts of the road to prevent soil erosion from the adjacent fields, particularly where the road is lower than the fields (Fig. 5.10). Traces of thick terracing walls were seen in the valley bed above Basta, very likely to protect the road from possible floods during the rainy months. More importantly, traces of a pavement were clearly seen on some segments of the road (Fig. 5.11). Only one secondary road was recorded along this route which heads westward and shortly ends at site no. 175. The junction of it can be seen on the western edge of the modern road, precisely where it cuts the main road to Basta.

4- The road to Sadaqa (Site no. 278) (Fig. 5.12a & b): Referring to the Roman road project initiated by David Graf (1995b: 248), an ancient road between Petra and Sadaqa was traced by the project team. The same route was previously seen by Nelson Glueck (1935: 77-78), but he did not trace it further south to Sadaqa as Graf did. The former traced the route only to Dhaha whereas the latter traced it down to Sadaqa (Graf, 1995b: 248-249). At a certain site, named Khirbet al-Sa'ud by Graf, a fork in the road was seen. Two branches, one heads south and the other southeast, consequently emerged. The latter approaches southeast to Sadaqa and is said to have been the main branch (Graf, 1995b: 249).

The author was unaware of the presence of this road, most of which was not located within the study area. However, the segment between this junction and Sadaqa was traced. A rectangular structure, probably Khirbet al-Sa'ud, was located at the point where the road branches off. From there and for a considerable distance the route bends in a relatively flat bed between two low stone walls, 4-6m wide. Getting closer to Sadaqa, curb stones and preserved pavements were frequently seen, especially in the flat areas (Fig. 5.13).

Apart from Khirbet al-Sa'ud, Graf (1995b: 249) did not mention any other archaeological sites along the route down to Sadaqa. However, a very significant site, given the name of Khirbet Rwaiha (Site no. 276), was found on a low hilltop on the left hand side above the road. Abundant archaeological finds including rectilinear walls of dwellings cover the hilltop for about 400m in a northwest to southeast direction. A well preserved stretch of an ancient road ascends the hill from the southeast base and ends at the entrance of the main complex structure at the site. It seems to have originally come from al-Fardhakh and is very likely an extension for the route recorded over the hills northeast of al-Fardhakh (Site no. 263).

On a hilltop a few hundred metres southwest of Khirbet Rwaiha, a small tower was constructed to watch and control the road and the Khirbet. It was deliberately located on that hill as the course of the road can be seen all the way down to Sadaqa and for a considerable distance southwest from that point. More importantly, it controls the traffic to Khirbet Rwaiha from Sadaqa south and al-Fardhakh east. The pottery sherds collected from Khirbet Rwaiha range from the Roman to the Byzantine periods.

5- The Udhruh-Basta road (Site no. 220) (Fig. 5.14): traces of an ancient route between Udhruh and Basta were first seen and mentioned by Brünnow and Domaszewski (1904: 465-467). Graf and Killick before him (1987a: 175) correctly speculated the presence of this road. Graf (1995b: 246) states: "*at Basta, where the remains of a Roman-Byzantine farming settlement are still visible, a branch road leads on past the fort at Abu Danna, the settlement at El Qa' (Rashid), and Rujm Bitar (10 m square) to Udhruh and beyond*". He also claimed that this route is no longer visible as it is 'evidently buried beneath the modern asphalt road that runs between Udhruh and Basta' (Graf, 1995b: 246).

In contrast, the field work conducted by the author revealed traces and fairly well preserved short stretches of an ancient road between Udhruh and Basta. Its course fairly corresponds to the one suggested by Graf. It was evidently a branch off the road between Udhruh and Petra mentioned above, a very short portion can be seen about 40m southeast the modern junction which vertically connects the Udhruh-Basta road with Wadi Musa-Udhruh road. From there, southward to the modern cemetery between Rashid and Abu Danna, there are no visible traces of this road. Traces of the



same road associated with a very thick wall were found in Wadi al-Beir (Beir Abu Danna) just about 150-200m south of the above mentioned cemetery.

This part of the road is indeed significant; it strongly corresponds to the road and wall observed by Brünnow and Domaszewski (1904: 466 and figure 541) on their way from Udhruh to Basta. Figure 541 in Brünnow and Domaszewski (1904: 467) most likely shows the 3m thick wall (2.5m according to the German scholars) in Wadi al-Beir. The wall is still well preserved and is about 30m long. Traces of a low wall can also be seen further up in the bed of the valley. Some of the elders in Abu Danna had the chance to see this road when it was in a much better state, and they were surely aware of it. This portion of the route as well as the wall was not recovered since Brünnow and Domaszewski's visit.

The function of such a thick wall cannot be firmly determined, even though, some points can be suggested. Firstly, the wall was constructed in the narrowest point of the valley where even light rains on the nearby slopes could cause a flash flooding. Therefore, it might have been built to protect the road from possible floods, it even resisted the floods in the 1990s. Secondly, the thickness of the wall could have allowed using the wall itself as an exit whenever the water in the valley was running; either end of the wall was gently sloped for that purpose.

The road or a branch of it continues further up in the valley until it becomes totally untraceable at the well in the centre of Beir Abu Danna. At that point, two branch roads seem to have emerged from this route in the Wadi al-Beir. One heads westward to Petra and the second ascends the slopes eastward passing the fort of Abu Danna and then intersects with two other roads at a junction about 300m southeast of the abovementioned fort. The first approaches eastward from the junction over a hilly area and then descends a gentle slope to extend further east in the Wadi Maqum Yusef, most likely to Ma'an. The other road deserves further discussion, it is fairly traceable from that junction to down Basta southwest, and for about 150m north-northwest of the junction.

The 150m segment needs to be explained. It is definitely part of the route to Basta, but how can we link it to the road in Wadi al-Beir? It appears that there was a fork in this

road just above the wall in the valley which consequently created two branches: one continued in the valley bed up to the well of Abu Danna and the other ascended the gentle slope southeast of the wall until it intersected with the other roads at that junction. The total distance between the junction and the presumed fork cannot be more than 800m; thus, this assumption is indeed logical. Moreover, the account of the German scholars indicates that they did not reach the well of Abu Danna, rather they ascended a hilly area following the ancient road to Basta (Brünnnow and Domaszewski, 1904: 466-467). The caravans or travellers who used this road had the chance to get some water if they needed from the well and then they could have returned to the road eastward and continued their journey, both to Basta and beyond or further east to Ma'an and beyond.

#### **Archaeological sites along the Udhruh-Basta road**

Most of the archaeological finds along the course of the Udhruh-Basta route have been previously seen and recorded. They were mentioned by Brünnnow and Domaszewski (1904: 465-469), Killick (1987a: 173-179) and Graf (1995b: 246). Unfortunately, the sites mentioned or described by the German scholars were not named. However, the information they provided about the sites themselves and the nearby landscape do not contradict the archaeological finds on this road.

A very remarkable site between Udhruh and Basta was reported by Brünnnow and Domaszewski (1904: 465 and figures 538-540). It is an unnamed rectangular structure (41×39.5m) with projecting towers, internal divisions around a central courtyard and a gate in the eastern wall (Parker, 1986: 98). In fact, this structure has not been re-discovered yet, but the German scholars clearly refer to it on the ancient road south of Udhruh on the way to Basta, and more importantly before the wall and road in wadi al-Beir. No single structure retaining the above mentioned characteristics was observed during the survey in the area between Udhruh and Basta.

However, a site known as Khirbet al-'Ejami (Site no. 202) might be the structure which was seen by Brünnnow and Domaszewski. Unfortunately, the site is now completely destroyed. The original structure was bulldozed and only two mounds of stones can now be seen at the site. There are reasons to suggest that this Khirbet was



the one observed by the German scholars. It lies just on the alleged road to Udhruh and on the entrance to Wadi al-Beir. Secondly, the next ruin seen by the same scholars after the unnamed *Zwischenkastell* was the road and wall in Wadi al-Beir, the former is approximately a few hundred metres south of Khirbet al-'Ejami, and finally there are no other structures maintaining the same features on the ancient road to Basta. Pottery sherds collected from the site date from the 1st century AD throughout the Late Roman and Early Byzantine periods.

Apart from Khirbet al-'Ejami, there are other structures located along the course of our road. They are as follows from north to south: Rujm al-Bitar, el-Qa' (Rashid), and the fort of Abu Danna (Graf, 1995b: 246). The first is still fairly well preserved on a hilltop overlooking Rashid from the north whereas traces of ancient settlement at Rashid itself can hardly be noticed due to the fast and intensive growth of the modern village. The fort of Abu Danna located on a low hilltop between two elevated hills overlooking the well and settlement of Abu Danna to the west and the junction of roads east and southeast. It was identified as a Roman fort by Alistair Killick (1986: 438-439; Kennedy, 2000: 170).

6- The road to al-Fardhakh (Site no. 263) (Fig. 5.15): this road was found over the hills southwest of Khirbet Ayl. A short stretch, about 1.5 km, of the original length is still well preserved. It was undoubtedly heading south/southwest passing Khirbet al-Fardhakh and then southward to Sadaqa. Traces of the same road were seen for a few hundred metres on the hills northeast of Khirbet al-Fardhakh. The road seems to have been approaching the latter site from Khirbet Ayl a few kilometres northeast. Two junctions associated with branch roads were recorded along the short segment of this road. From the first junction a short preserved route descends a steep slope and heads northwest. More importantly is the second junction from which a well preserved stretch of another branch clearly heads westward to Khirbet al-Hajareen (Site no. 264). The main road and the branch roads were marked by two stone walls without pavement, and their widths range between 3-5m.

In fact, there is enough evidence to suggest that this road was an extension of at least one of the three routes approaching Basta from the north (the Udhruh-Basta and the Zharah roads) and northwest (the Kafr Ass-ham road). It has long been established

that a road connected the settlements at Basta, Ayl, al-Fardhakh and Sadaqa in antiquity (Killick, 1987a: 175; Graf, 1995b: 246-248). Previous and recent finds confirm the existence of this road. A broken milestone was found by Nelson Glueck (1935: 75, figure 28) in the fields below Khirbet Ayl. Graf (1995b: 246; 1995a: 418) found a painted text on the stone unseen by Glueck. On the basis of speculated names mentioned in the text, Graf (1995a: 418; 1995b: 248) suggests a date around AD 236.

Recent fieldwork, initiated by 'Amr *et al* (1998) and 'Amr and al-Momani (2001) during the construction of a pipeline network, revealed a 200m long stretch of a paved road just south of Khirbet Ayl. A junction with two branch roads, one heads west and the other heads southeast, were also seen on this road ('Amr and al-Momani, 2001: 275). The branch which heads westward is most likely part of the road to al-Fardhakh. The very significant site of Khirbet al-Hajareen (Site no. 275) about 300m west of the road designates the importance of it. The site was connected by a secondary route with the main road. The plan and the location of the structure at the site clearly suggest a military function.

Again, it is worth mentioning that the road between Petra and Sadaqa via Basta, Ayl and al-Fardhakh, was claimed to be a segment of the Trajanic road between the two sites (Graf, 1995b: 246; 'Amr and al-Momani, 2001: 275). The road evidently left Khirbet Ayl and ascended the hills southwest of it and then heads south to al-Fardhakh. From the latter, the road seems to head westward to Khirbet Rwaiha. A branch of this road might directly approach southward passing al-Unaiq and then to Sadaqa.

7- The Malghan road (Site no. 004) (Fig. 5.16): Many short segments of this road are reasonably preserved, and are still easily traceable. Because it extends further north of the study area, its direction cannot be definitely confirmed. However, the available evidence indicates that this road approaches Khirbet Malghan (Site no. 007) from the northeast/east. From there, it heads southward and then southeast, most likely to Udhruh. During the course of the survey, this route was tracked from Khirbet Malghan to a point to the west of the quarry of Udhruh. A well preserved stretch of the same road can be seen running over a hilly area northeast of Khirbet Malghan.



The road is predominantly marked by two low stone walls and sometimes by curb stones. However, in some parts only one line of the bordering stones was seen.

The archaeological record along the course of Malghan road confirms its importance in antiquity as one of the main regional network routes. Many sites are passed by this road, and some of them were connected to it by secondary routes; three junctions were obviously constructed for this purpose. Unfortunately, since the road was not traced in the area northeast of Khirbet Malghan, we lack any information concerning the archaeological finds along that part. However, traces of what is most likely the same road were seen to the west of al-Jerba and parallel to the modern road that connects Shaubak-Udhruh road with Shaubak-Wadi Musa road. This fact might suggest that our road intersected a north-south road further east; the latter would have connected the ancient settlements between Shaubak and Udhruh. Killick (1987a: 175) suspects the presence of an ancient road between Negel (at Shaubak) and Udhruh. The existence of milestones on the western base of Jebel al-Ash'ari may support this claim.

In the study area, it firstly passes Khirbet Malghan along the eastern side and then continues southward. For about 400m between the Khirbet and the next traceable segment, the road is totally missing due to the construction of the modern road and annual agricultural activities in the area around the spring. The road is traceable again just a few metres southwest of the significant bend in the modern road to the south of the spring. The first junction was also found there; a short branch road heads westward off the junction to Khirbet al-Qumaid (Site no. 010). The next junction was found approximately 500m further south on the best preserved segment of the road, from which, a secondary road, heads east and then southeast to Khirbet al-Zhaqiat (Site no. 003). About roughly 100m further on another junction was seen; a secondary road heads westward from this junction. It seems to have ascended the hills to the southwest and west of Khirbet al-Qumaid until it intersects the Du'aij road. From the last junction, the Malghan road dramatically changes its direction to head east and then south passing Khirbet Mghair Zaid and finally southeast.

### The *via nova Traiana* in the Study Area

It has long been suggested that the *via nova Traiana* is the most attested artefact of the Roman annexation for the Nabataean kingdom in AD 106 (Freeman, 1996: 92). It was constructed to connect the capital of the new province of Arabia, Bostra, with the port of Ayla (Aqaba) on the Red Sea, a distance of approximately 430 km (Graf *et al*, 1992: 783; Wiseman, 2000: 14; Graf, 1992a: 256). On the basis of information; derived from inscribed milestones found along the highway, it appears that the *via nova Traiana* was constructed in segments; the earliest of which was finished in A.D 111 (Fiema, 1991: 84). However, the whole project; initiated by the emperor Trajan, was completed in AD 114 (Graf, 1992a: 256; 1995b: 264).

From the beginning of the last century, many field work studies were initiated mainly to track the course of the Roman road (i.e. Brünnow and Domaszewski, 1904-1909; Stein, 1940; Graf, 1995a). In addition to the fact that most of its route is now known, important archaeological finds and about 240 milestones have been recorded along its path (Wiseman, 2000: 14; Graf, 1995b: 241). Most of the total length of the Trajanic road lies in the modern state of Jordan; therefore, well preserved stretches are found in different areas of the country, namely in north east Jordan and near Tafila in the south (Kennedy, 1997: 74; Fiema, 1993: 549; see also Figure 9.10A in Kennedy and Bewley, 2004). However, long stretches of the same road are no longer traceable due to the fast development and land exploitation near the major cities of Jordan in the last decades (Kennedy, 1997: 74).

Scholars have long relied on two sources to trace the itinerary of the *via nova Traiana* and to identify the main stations on it. The first is the *Tabula Peutingeriana* (Miller, 1962: 12-13), the second is the Madaba Map. The former is a medieval manuscript whereas the latter is a sixth century mosaic map in Madaba (northern Jordan) (Graf, 1995b: 242-243 for more details see Bowersock, 1983: 164-186). There is a general agreement that the information in both sources was derived from earlier sources; most likely early and late Roman documents (Bowersock, 1983: 169 and 181). Accordingly, the N-S route depicted on the *Tabula Peutingeriana* is the Trajanic road, and the towns and cities on the Madaba Map were the main stations along its route (Graf, 1995b: 242-243).



The archaeological evidence in addition to the information from the *Tabula Peutingeriana* clearly shows that the *via nova Traiana* passed through the study area. However, there is a dispute among scholars about its path, particularly from the area north of Petra and Udhruh to Sadaqa. Some scholars, like Killick (1987a: 173-175) and Parker (1986: 87), believe that the Trajanic road by-passed Petra, heading to Sadaqa via Udhruh and Ayl. In contrast, Graf (1995b) believes that Petra was a major station on the Roman road. The argument of the first group is based on the fact that Udhruh was the base of a Roman legion, and milestones were found 2 km north of Udhruh (Killick, 1987a: 174; Parker, 1986: 87-88). Graf (1995b: 242-244; 1992a: 256) presents about five logical reasons to support his argument.

Graf's hypothesis regarding the route of the *via nova Traiana* seems reasonable and convincing. The road approached Petra from Nejl (modern Shaubak); well preserved and paved segments of the road were discovered 5 km northeast Petra (Graf, 1995b: 243). Moreover, Bowersock (1983: 174), on the basis of information derived from the *Tabula Peutingeriana*, asserts that the Trajanic road heading northeast to Nejl from Petra. The same document is a priceless source for the road's itinerary between Petra and Aqaba, where Sadaqa (ancient Zadagatta, Zanaatha and Zadocotha) is the next southern station after Petra (Bowersock, 1983: 174).

The latter part of the road, between Petra and Sadaqa, is the concern of this discussion. It has been mentioned above that Graf (1995b: 241-264) investigated two ancient roads; either of them could have been the route of the Roman highway. Interestingly, both of them were seen and recorded by the author; the Kafr Ass-ham road and the road to Sadaqa (Graf's central route). The second road is the best candidate according to Graf (1995b: 249); '*its length corresponds precisely with the 18 M.P. of the Peutinger Table*'. In fact, milestones and well preserved pavements were found and seen along the path of each road and these features were usually attached to Roman roads.

However, it seems reasonable to suggest that the Kafr Ass-ham road (Site no. 331) is the best candidate for the path of Trajan's road. From Petra, it heads southeast to Basta and then to Ayl, al-Fardhakh and finally to Sadaqa and beyond to Aqaba. More than one reason makes this hypothesis reasonable:

- 1- The archaeological record shows that this road is more Roman than the other route. The preserved pavement has been seen and recently uncovered on different segments of the road ('Amr and al-Momani, 2001: 275-276).
- 2- The painted text on the milestone found at Ayl suggests a mid 3<sup>rd</sup> century date for this piece of evidence (Graf, 1995a: 418). The milestone could have been set up on the road after being maintained in later periods.
- 3- The milestone as well as the well preserved stretch of the Roman road ('Amr and al-Momani, 2001: 275) was found in the vicinity of Khirbet Ayl. A Roman military outpost, probably a *castellum*, has long been suspected at this site (Brünnnow and Domaszewski, 1904: 466; Parker, 1986: 98), where a garrison, as Parker suggested (1986: 99), would have guarded this portion of the *via nova Traiana*.
- 4- The assumed path of this road clearly passes the villages of Basta, Ayl and al-Fardhakh before it reaches Sadaqa. The archaeological evidence from these sites indicates that they were, as today, major settlements and probably administrative sites in antiquity. A Roman road such as the *via nova Traiana* would not bypass such important sites.
- 5- Considering the security of the region, it is always presumed that the desert was a source of threat for the urban and agricultural centres. The defensive and military importance of the *via nova Traiana* has long been considered (Fiema, 1987: 34). Accordingly, the builders would not have neglected this point, not only because the above mentioned sites were major settlement sites, but also due to the fact that they overlook the whole desert terrain to the east.
- 6- Water resources along the suspected route are abundant, springs were associated with big reservoirs. The latter can still be seen at Basta, Ayl and al-Fardhakh. A major road such as the *via nova Traiana* would not have bypassed important water supply stations like these.
- 7- Basta was evidently the nexus of the 3 N-S routes, including the assumed road, and this clearly shows the importance of this zone in antiquity (Graf, 1995b: 258).



### The date and use of roads

One of the most difficult issues to deal with is the date of construction of all the above mentioned roads. Most of these roads lack epigraphic evidence from inscribed milestones, and there is no evidence from written sources concerning the construction of the road network in the study area. The date of some roads has been already established above, however imprecisely. Three major periods are under speculation; the Nabataean, the Roman and the Byzantine/Early Islamic. Many of the roads appear to have been constructed, repaired and used throughout these periods. The following facts should be taken into consideration before deciding which road was Nabataean, Roman or Byzantine:

1- The study area lies within the hinterland of Petra, the capital of the Nabataean realm, and was part of that kingdom. Like many parts of the Nabataean kingdom, the region must have experienced long periods of prosperity. Roads must have been constructed during that period, not only to connect a significant trade centre such as Petra with international and regional trade centres, but also to connect the abundant regional settlement centres with the capital and to each other. In fact, scholars are agreed that the Nabataean road system was seized and reused by Romans after the annexation of Nabataea in AD 106 (Graf *et al*, 1992: 783). There is even a general impression that the *via nova Traiana* was constructed on a previous road known as the King's Highway (Graf *et al*, 1992: 779; Wiseman, 2000: 14).

2- Petra evidently remained the nexus of international and regional roads for a long time after the Roman annexation of the Nabataean realm (Graf, 1992a: 256). Thus, roads were either newly constructed or reused and repaired in the subsequent periods.

3- The construction of roads in the study area by the Romans is now beyond any doubt. Milestones were found north Udhruh, at Ayl and between Petra and Sadaqa (Graf, 1995b: 241-268; Killick, 1986: 432). At the same time, many roads lack these milestones. The absence of milestones is not a strong indicator of a pre- or post Roman date as most of the roads discussed here were within a regional network. Milestones were usually set up to mark a Roman highway (Graf *et al*, 1992: 778).

4- Most of these roads lack the pavement which is one of the technical characteristics of Roman roads. Again, the absence of a pavement does not imply that any of them was constructed during the Roman period. It is suggested that the Roman roads in frontier regions and over difficult terrain lacked this feature (Bowersock *et al*, 1999: 672).

5- Finally, the archaeological evidence from the sites near and along these roads is critical for suggesting some dates.

**The archaeological evidence and possible chronology**

Two roads: the Kafr Ass-ham (Site no. 332) and the road to Sadaqa (Site no. 278), are not considered in this part. Both show typical Roman characteristics such as pavements in addition to the fact that both roads were also speculated as possible paths for the *via nova Traiana* between Petra and Sadaqa (above Pp 18-21).

The Du’aij Road (Site no. 011): as mentioned above, there are many sites recorded along the route of this road. Secondary routes (west-east) connected many of the sites with the main road which roughly heads north-south. The following table shows the sites which were recorded near or along this route and the main periods represented at each site according to the ceramic evidence.

Site/area name	Site number	Periods
Khirbet Du’aij	12	Edomite, Nabataean, Roman, Byzantine
Khirbet al-Trabsieh	25	Nabataean, Roman, Late Byzantine, Early Islamic
Al-Juri 1	88	Nabataean, Roman, Byzantine
Al-Juri 2	92	Nabataean, Roman, Byzantine
Umm al-Futtus	107	Roman
Umm al-Futtus	108	Nabataean, Roman, Late Roman-Byzantine
Umm al-Futtus	109	Nabataean, Roman, Byzantine
Umm al-Futtus	111	Nabataean, Roman, Late Roman-Byzantine
Umm al-Futtus	112	Nabataean



The table clearly shows that three periods are present at the sites which were located either on the road itself or linked to it by secondary roads. It is also very clear that this road was constructed to fit in a regional network connecting settlement sites with the major urban and administrative centres. The ceramic evidence in addition to architectural elements from most of these sites demonstrates that the Nabataean period is strongly present at almost every site. This fact makes the writer suggest that the Du'aij road was first built by the Nabataeans. However, it might have remained in use throughout the later periods, mainly the Roman and Byzantine, as indicated by the ceramic evidence.

Some of the west-east routes on this road appear to have been constructed in the later periods. An important west-east road, which intersects the Du'aij road at the second junction, is the route between Petra and Udhruh. There are many historical and archaeological hints to believe that it was a very important road during the Roman and Byzantine eras. Roman officials and high ranking military leaders might have used this road whenever they wanted to travel to Petra from Udhruh and vice versa. Udhruh was the base of a Roman legionary fortress whereas Petra retained some of its previous glory in the Late Roman period when it became the capital of the new province of Palestina Tertia (Fiema, 2002a: 239; 1991: 128-133; Freeman, 2001: 434).

The recently discovered papyri in the Petra church revealed important information concerning the relation between Petra and Udhruh in the 6<sup>th</sup> century (Fiema *et al*, 1995: 299-300; Koenen, 1996: 177-188). Byzantine tax collectors and other officials seem to have also used this road to travel between Petra and Udhruh as indicated by the fact that 'in 540 the collection of taxes for land registered in Augustopolis (Udhruh) was administered by the collegium of tax-collectors in Petra' (Koenen, 1996: 178).

2- The Zharah Road (Site no. 154): this road was first picked up southeast Petra on the edge of the modern road between Wadi Musa and Basta, and was tracked until it totally disappeared at the north edge of Basta. Many sites were recorded along it, and many branch roads heading west-east connect other settlement sites with this road.

The following table shows the ceramic evidence from the sites located on or connected to the Zharah road.

Site/area name	Site number	Periods
Ras al-Hatteh	122	Nabataean, late Roman, Byzantine
Umm 'Arier 1	140	Nabataean, late Roman, Byzantine
Umm 'Arier 2	143	Nabataean, Roman, Byzantine
Umm Hilal	144	Nabataean, Roman
Umm Hilal	145	Nabataean, Roman
Khirbet al-Ma'en	146	Edomite, Nabataean, Roman, Byzantine, Ottoman
Khirbet Telle'et 'Eli	147	Edomite, Nabataean
Telle'et 'Eli	152	Nabataean, late Roman, Byzantine
Ras al-Mshubash	155	Nabataean, Roman
Ras al-Mshubash	156	Nabataean, Roman
Ras al-Mshubash	159	Nabataean, Roman
Zharah	160	Nabataean, late Roman, late Byzantine, early Islamic, Mamluk, Ottoman
Zharah	163	Nabataean, Roman, Byzantine, late Byzantine
Zharah	164	Nabataean, Roman, Byzantine
Zharah	166	Nabataean, Roman, Byzantine, late Islamic
Zharah	167	Nabataean, Roman
Al-Dinarieh	168	Nabataean, Roman
Al-Dinarieh	170	Roman
Khirbet Abu Qumrah	223	Nabataean, Roman, late Roman, Byzantine, Ottoman



From the table, it seems that these sites, which were originally created and settled during the Nabataean period, continued to be occupied during the subsequent periods, particularly the Roman. The Roman period at these sites is also well represented. Therefore it seems secure to assume that the Zharah road and its east-west branches were at least repaired and used during that period. Two branch roads (Site no. 162 and 172) head west, off junctions on the Zharah road and clearly intersect the Kafr Assham road a few hundred metres westward. It has been suggested above, following a previous assumption by Graf (1995b) that the latter route was a very possible path of the *via nova Traiana* between Petra and Sadaqa. The link between the two north/northwest-southeast routes by a secondary road indicates that the Zharah road remained in use for a long time. Moreover, the good state of these roads might reflect the degree of maintenance and care they received in antiquity.

3- The Malghan Road (Site no. 004): although the northern end of this road lies outside the study area, there is still enough evidence to conclude some facts about the date of this road. The evidence comes from the sites located along this road, and it is mainly from the ceramic sherds found at these sites. The following table summarises the evidence:

Site/area name	Site number	Periods
Khirbet Malghan	007	Edomite, Nabataean, Roman, Late Roman/Byzantine
Malghan	006	Edomite, Nabataean, Roman, Late Roman/Byzantine
Al-Zhaqiat	003	Nabataean, Roman
Malghan (Khirbet Qumaid)	010	Nabataean, Roman, Late Roman/Byzantine
Khirbet Maghair Zaid	008	Nabataean, Roman

The archaeological evidence from the ceramic sherds clearly indicates the continuity of settlement at these sites throughout the first half of the first millennium AD. The strong presence of three periods at these sites makes it difficult to date precisely this route according to this evidence. Excavations are required to support the ceramic evidence. However, it also seems reasonable to presume that this road and its tributaries were initially dirt tracks laid out by the Nabataeans, and then converted by the Romans into proper roads marked by stone walls. The ceramic evidence from all the sites along or near date Malghan road indicates that settlement at these sites had started by the first century AD, at the same time the Nabataean kingdom reached the peak of glory and thrived under Aretas IV. However, shortly after the turn of the next century the same kingdom came into the hands of the Romans who seem to have erected many roads in the region including those under discussion.

Taking into account the relatively short distance between Malghan and Udhruh, a route connecting the two sites must have been constructed, or at least repaired if it existed before, by the Romans. Khirbet Malghan appears to have been one of the major settlement sites in the vicinity of Udhruh during the Roman period. Moreover, a handful of pottery sherds which date to the first and second century AD were found scattered along the path of Malghan road. The road remained in use during the Byzantine era and was probably abandoned by the beginning of the sixth century AD. A modern desert road overlapped considerable parts of the ancient route as the spring of Malghan was a major water resource in the region in the last century.

4- The Udhruh-Basta Road (Site no. 220): previous and recent investigations confirm the presence of this road (Graf, 1995b: 246; Killick, 1987a: 175). Traces of the same route were seen by Brünnow and Domaszewski in the late 1890s, and they refer to it as a Roman road (1904: 466-67). Very short portions of this route are still traceable. therefore, little information regarding the date can be derived from the physical remains of the road. However, the ceramic evidence from the sites passed by this route is helpful. Although some scholars see this road fitting into either a regional or national road system (i.e. Killick, 1987a: 175), the available evidence indicates that the Udhruh-Basta road was most likely a branch heading south to Basta off the Petra-Udhruh road.



A handful of sites lie along the presumed path of this road. These are respectively, from north to south, as follows: Udhruh, Rujm al-Bitar, Khirbet al-‘Ejami, the fort at Abu Danna and Basta. The Nabataean, Roman and Byzantine periods are well represented at Udhruh and Basta (Graf, 1995b: 246; Glueck, 1935: 74-77). Nabataean and Roman sherds were found at Rujm al-Bitar, and Nabataean, Late Roman and Byzantine sherds at Khirbet al-‘Ejami. Nabataean and probably Roman sherds were seen at the fort of Abu Danna (see also Graf, 1995b: 246). Graf (1997b: 279) calls the latter site a *castellum*. However, it seems common sense that this route continued further north beyond Udhruh as designated by the milestones at the west base of Jebel al-Tahkeem north of Udhruh (Graf, 1995b: 246; 1997b: 279; Killick, 1987a: 175). In conclusion, the road between Udhruh and Basta appears to have been in use during the Roman and Byzantine period.

#### **Long-distance trade and the road network in the study area**

Due to the historical and well attested involvement of Petra, particularly under the Nabataeans, in large-scale and international trade, it seems reasonable to suggest that some of the ancient roads recorded by this study were utilized for this purpose. Generally speaking, inland trade routes experienced periods of flourish and decline throughout the first three centuries AD. Therefore, a brief historical survey seems appropriate before considering the roads which might have been part of the long-distance trade road network.

Before the Roman annexation, the Nabataeans were frequently attested as traders and middlemen in the accounts of travellers and historians, where Petra was a trade centre and a meeting place of foreign traders (Strabo, 16.4.21; Gogte, 1999: 299-304). They were especially known for their role in providing the markets in the West with important goods such as spices and aromatics from the East (Fiema, 1991: 111). Four parts of the ancient world; India, the East African coast, China and southern Arabia, were the sources of these products (Fiema, 1991: 69). Both, maritime and overland trade routes were used by the Nabataeans to bring these goods from the resource areas to their markets, and for a long time, Petra was a nexus of these routes before the merchandise was taken northward to Damascus or westward to Gaza (Charlesworth, 1924: 39; Negev, 1966: 89-98).

Certain caravan routes leading to Petra from southern Arabia are attested in historical sources (reported by Fiema, 1991: 71, see also Potts, 1999: Appendix A). The following routes (Fig. 5.17) seem to have been used by the Nabataeans to carry the goods from Arabia and beyond to Petra and beyond:

- 1- This road started in northeastern Yemen and approached northward to Ma'in and Najran, passing the region of Mecca and Medina to Dedan (al-Ula oasis) in northwest Saudi Arabia. From there, and via Tabuk, the route continued to southern Jordan (Fiema, 1991: 70). According to Fiema (1991: 99 note no.12) "the caravan tracks led through Mudawwara and along the eastern side of the Hisma in the direction of Ma'an and Petra, or through the Wadi Rumm and northern Hisma to Petra joining the King's Highway between Quweira and Khalde". The same area, northwest Arabia or the Hijaz, where the Nabataeans had settlement and trade centres (Bowersock, 1983: 48-49 and 70), was also connected with Gerrha, the major trade centre on the eastern shores of the Arabian Gulf (Fiema, 1991: 70).
- 2- There is also a historical reference which indicates that the Nabataeans had communication with the head of the Arabian Gulf across the desert via Wadi Sirhan, a natural traffic corridor between Arabia and Syria. This was achieved either through Petra, Ma'an, al-Jafr and Bayir or through Tyma (Fiema, 1991: 71 and 89). A Roman military road, probably following the line of the ancient trade route, is known in that area (Speidel, 1987: 213-221).
- 3- Sea trade routes were also used along with overland tracks. In this respect, the Red Sea was the only maritime route between south Arabia and southern Jordan at the port of Ayla, modern Aqaba (Charlesworth, 1924: 39). However, according to historical accounts (Strabo, 16.4.24; Negev, 1977: 561; Bowersock, 1983: 70-71), another harbour called Leuke Kome on the eastern shores of the Red Sea in northwest Arabia played a key role in the long-distance trade. Ships from India or South Arabia stopped at Leuke Kome to empty their loads, and from there, overland tracks approached Petra (Negev, 1977: 561; Charlesworth, 1924: 39). These tracks were, according to Fiema (1991: 71), going from Leuke Kome "to the oasis of al-Bad' and northward through the Wadi Abyadh (known also as Ifal/Afal) to Haql and Ail/Aela, or along the Wadi Zaita to Wadi Ramm and Petra."

A decline and a diversion in trade routes during the first century A.D, particularly the overland tracks which led via northwest Arabia to southern Jordan and Petra, has long



been suggested by scholars (Bowersock, 1983: 70-75; Negev, 1966: 97). A number of factors have been suggested in contributing to or causing this decline. On top of these was the discovery of the monsoon winds by which consequently facilitated and probably intensified the maritime trade with India and Arabia (Bowersock, 1983: 21; Fiema, 1987: 30). It is also suggested that inland trade routes, connected to the Nabataean ports on the Red Sea such as Ayla and Leuke Kome, lost their importance due to the Romans effort to shift the long-distance trade to the Egyptian ports on the Red Sea after they failed to exert direct control over South Arabia (Fiema, 1991: 72-73; 1987: 32). Other factors, such as the rise of Palmyra in Syria as a trade centre and the risk the nomadic tribes might have imposed on trade routes have also been suggested (Graf, 1992a: 253).

However, this hypothesis has been recently rejected on the basis of archaeological and historical facts (Fiema, 1991; 1987; Graf, 1992a). First, the impact of the discovery of the monsoon winds on the Nabataean trade route seems to have been exaggerated. These routes might have been in use at the same time when the sea routes were dominant (Fiema, 1987: 30). It has been suggested that there was a high demand for Arabian incense in Nabataea by the end of the first century B.C., and this necessitated certain arrangements to get this product even during the seasons when sea transport was difficult; therefore, overland trade routes must have been the alternative (Fiema, 1991: 73-74). Archaeologically, there is enough, if not abundant, evidence concerning the Nabataean presence in settlement centres along some of the proposed trade routes to presume their later use (Fiema, 1991: 91).

Convincingly enough was the status of Petra during the Roman period (post AD 106) and the continuous use of the Petra-Gaza road until the third century A.D as indicated by archaeological evidence from sites on this road (Fiema, 1991: 90). Moreover, ceramic objects used for trade purposes such as the unguentarium (perfume container) continued to be made in Petra between the first and third centuries (Fiema, 1991: 112; 'Amr, 2004: 237-245 for the continuity of Nabataean ceramics).

The Roman presence in the region as far south as the Hijaz should have increased the security level against any nomadic menace to caravans passing through the area. It is also well known that the last destination of the Roman highway the *via nova Traiana*

was Ayla (Aqaba) at the head of the Red Sea. This indicates the importance of Ayla as a trade port during the early Roman period. The road itself should have also been used to carry commercial products northwards and westwards via Petra. Caravan tracks from Arabia could have also intersected this road somewhere in the Hisma (Freeman, 2001: 449; Fiema, 1987: 34; Parker, 1997: 25). It is also worth mentioning that *legio X Fretensis* was transferred from Jerusalem to Ayla by the end of the third century (Aharoni, 1954: 9; Mayerson, 1964: 169). All of this implies that the overland trade routes via southern Jordan including the study area did not dry up overnight. They remained in use with most likely some small-scale long distance trade until at least the third century A.D.

During the Byzantine period or from the 4th century AD onwards, historical events and socio-political factors affected the scale and nature of the international trade between the West and East (see Fiema, 1991: 161-192 for more details). During this period, maritime trade was intensified and became dominant whereas caravan trade gradually and noticeably lost its previous significance. This era was also marked by the tangible competition between Byzantium and Persia over the sea routes, particularly in South Arabia and the Arabian Gulf (Watson, 2001: 486-487). The outcomes of this competition were shortly seen in the fourth century when the Persians controlled the western shores of the Arabian Gulf, and by the end of the 6th century AD they occupied the important ports in South Arabia (Yemen) (Fiema, 1991: 164-167).

Byzantium also had commercial relations with East Africa, particularly Ethiopia (ancient Auxm). East African involvement in international trade was not previously attested, and this might have been due to Byzantine influence on one of the areas which accepted and converted to the new religion (Fiema, 1991: 167-171). The Red Sea remained the main route for carrying goods either from India and South Arabia, or from East Africa. The importance of this route is clearly reflected by the abundant attestation of its ports, especially in the north, in the Byzantine sources. Among these was Ayla (Aqaba) which seems a significant maritime station during the Byzantine era. It, for instance, provided 15 ships for the campaign against Dhu Nuwas of Himyar who tortured many Christians in the 6<sup>th</sup> century AD (King, 1994: 201), and



was a flourishing town by the Early Islamic period (Fiema, 1991: 166 and 172; Schick, 1994: 151-154).

However, the superiority of maritime trade routes in the Byzantine period, by no way means that overland communications between Levant and Arabia totally ceased. On the contrary, there are archaeological and historical hints which imply that these routes remained in use with a shift in the nature and scale of use. Some scholars (i.e. Fiema, 2002; 1991) suggest that these routes were now engaged in inter-regional commercial relations instead of the international trade they previously experienced. The evidence for this comes from sites, particularly in the Hijaz area, along the known routes between Arabia and Levant. The evidence of Byzantine settlements in that area and in southern and northeast Jordan is well established (Watson, 2001: 488; Fiema, 1991: 121 and 184-191).

By the end of the 6th and the beginning of the 7th century, some of the ancient trade routes seem to have revived due to the involvement of the people of Mecca in the Hijaz in what seems like a long-distance trade between South Arabia and Syria (Fiema, 1991: 178-183). Although some scholars (Fiema, 1991: 178 and 182; Donner, 2005: 518) still have reservations on the scale and importance of this trade, early Islamic sources and more importantly the Holy Quran (Chapter 106) clearly mention this commercial activity conducted by Qurriesh, the honourable Arab tribe at Mecca. The Quran talks about two trips: the winter and summer trip. It is believed that the former trip was directed to South Arabia when the weather in the Levant was very cold whereas the second trip was directed to Bilad Asham (Levant) in the summer. The Prophet Muhammad himself had been to Bostra on a business trip with his uncle when he was a child (al-Mubarakpuri, 1995: 60). Moreover, according to Mayerson (1963: 171) a *khan* or *caravanserai* attested in the Nessana Papyri "might have accommodated merchants, guides and guards of one of the smaller caravans which originated in Mecca and travelled to Gaza."

A possible communication system, between the Hijaz and Levant during the late Byzantine period, has been recently reconstructed on the basis of information derived from Arabic sources and the accounts of earlier travellers in addition to archaeological evidence (Fiema, 2002a: 233-234; 1991: 183-191). The theoretical reconstruction

suggests that two central and one western routes were used to travel between the two areas. According to Fiema (2002a: 233): “*one ran north of Tyma through Fajr and Kilwa toward al-Jafr and Bayir; the other central route ran from Tabuk toward Mudawwara, and thence to Ma’an, Udhruh, al-Jafr, and Bayir....the westernmost route from Hejaz ran from Tabuk through Qurayya, Mudawwara, and Ramm toward Humeima and central Hisma, or from to Aila. Merchandise would then have been transported through the Negev to the port of Gaza*”.

It is worth mentioning that many of the 19th and 20th century travellers recorded some of the stations along the central routes in their accounts in the way from Levant, particularly Jordan, to Arabia ( for the accounts of travellers see Philby, 1920: 446-68; 1923: 241-59; Carruthers, 1910: 225-48; Wright, 1927: 177-206). More important was the pilgrimage route or the Hajj route which seems to have probably followed ancient caravan tracks. The last major station on the Syrian hajj route in Jordan is Ma’an; from whence it continues southward to Tabuk via Mudawwara to its last destinations, Mecca and Medina (Walmsley, 2001: 517-518 and Figure 15.2; Petersen, 1994: 47-49). The utility of these routes as late as the 20th century should be seen as a strong indication of a long history of existence and continuation of use.

After this discussion one might ask: what was the position of Petra as a trade centre in the Byzantine period? Recent archaeological investigations and discoveries have revealed significant information about the city in the Byzantine era. The promising work starts with the discovery of the Petra Church in 1991, and more remarkably the recovery of tens of papyrus scrolls dating to the 6th century AD (Fiema *et al*, 1995: 293-303; Koenen, 1996: 177-188). The available information reveals nothing concerning the contribution of Petra to the long-distance trade via southern Jordan, and this for some scholars confirms the absence of Petra from the international trade map, and probably the interregional (Fiema, 2002a: 234; 2001: 117; 1991: 117). The scrolls show that agriculture was the core of the city’s economy in the Late Byzantine period (Koenen, 1996: 183-185). However, the city might have benefited from a small commercial exchange with the flourishing towns in southern Jordan such as Udhruh and Humaima.



In the study area, at least four routes seem to fit in the road network of long-distance trade. However, since the scale of the long-distance trade via southern Jordan gradually decreased from the first century AD and due to the insignificant role Petra played in this trade after the third century AD, the function of these routes seems to have declined to local use in later periods. The following discussion considers the routes under investigation.

It has been suggested above that two routes between Sadaqa and Petra were speculated as the possible paths of the *via nova Traiana* between the two destinations. The first runs from Sadaqa northwards to the east of Attyyba and finally to Petra (the central route in Graf 1995a: 248) whereas the second route runs also from Sadaqa to Petra via Ayl and Basta (the eastern route in Graf, 1995a: 246). The involvement of these routes in the long-distance trade is highly likely as the Roman highway itself was used to carry goods from the port of Ayla on the Red Sea to Petra and beyond. Moreover, it has been suggested above that overland caravan tracks coming from the Hijaz intersected the Roman road somewhere in the Hisma. The involvement of Nabataean in the spices and aromatics trade for a long time before the Roman annexation would suggest that a Nabataean version of the *via nova Traiana* existed between Petra and Ayla, and this might explain the presence of many routes between Sadaqa and Petra.

Two desert tracks coming from Arabia were suggested to have approached Ma'an southeast of Petra and Udhruh. The first came from the Hijaz via Tabuk and Mudawwara to Ma'an and then to Udhruh and from there westward to Petra whereas the other road is a branch of a major road commencing at the shores of the Arabian Gulf and approached westward and then northward via al-Jawf and the Wadi Sirhan. This branch headed westward off the Wadi Sirhan to the wells of Bayer, al-Jafr and then to Ma'an, and from there to Udhruh (Fiema, 1991). It is worth noting that, apart from the Udhruh-Petra road, no suggestion was previously made concerning roads to Petra from Ma'an.

However, the current study and recent archaeological finds indicate that two routes approached Petra from Ma'an. The first route was seen and recorded by Khairieh 'Amr ('Amr and al-Momani, 2001: 275) to the east of the modern village at Ayl. A

two kilometres long stretch of this road with pavement is still preserved. However, there is enough evidence that this road continues eastward to Ma'an and probably beyond. A small structure was found further east of this road, which was speculated as a watch tower on the same road by 'Amr ('Amr and al-Momani, 2001: 280). Two more structures, at Khirbet Whaideh (Site no. 289) and Khirbet Wahdan (Site no. 290), were found by the author to the southeast of the preserved stretch of this route. The sites might have also been located along the path of this road. Nabataean and Roman pottery sherds in addition to a water source (springs) were found at each site. A sketchy reconstruction for this road could be as follows: Tabuk, Mudawwara, Ma'an, Ayl, Basta and Petra.

The second route was found and recorded by the author in the course of the field work in the region of Udhruh. It intersects the Udhruh-Basta road at a junction about two hundred metres southeast of the so-called fort at Abu Danna. A very short stretch of this route is still fairly well preserved; however, it can be traced for a distance in Wadi Maqtum Yousef. And it is, like most of the roads in the region, marked by two lines of stones, one on either side. A very possible reconstruction for this road can be suggested here. The road seems to commence at Ma'an and from there it heads northwest and then westward to Abu Danna passing the fort and the well there. From Abu Danna, it approaches westward until it meets the Zharah road somewhere below the modern junction at the top of Umm Hilal road, and from there it should have followed the path of the Zharah road which must have approached Petra.

This road could also have been a branch of the Ma'an-Udhruh road if the latter had ever existed. An ancient route between Ma'an and Udhruh has long been suggested due to the importance of Udhruh throughout most of the first millennium A.D. however; traces of this route have not been reported yet. The presence of this road was assumed due to the evident flourishing of Udhruh and nearby sites in the Late Byzantine and Early Islamic period probably as a result of interregional trade with the Hijaz (Fiema, 1991: 189). The archaeological evidence along the presumed path of the road between Ma'an and Udhruh supports its existence. It is also worth mentioning that the Muslim army on their way to the region of al-Kerak in AD 630 camped for a couple of nights at Ma'an (Schick, 1994: 148). This fact undoubtedly



indicates that a route from the Hijaz to central Jordan via Ma'an was known at that time.

### Conclusion

The current study has been able to distinguish two groups of roads in terms of their directions: the north-south and northwest-southeast roads, and the east-west roads. The former are usually longer and seem to fit into a regional and probably international road system whereas the latter are more or less branch routes connecting local settlement sites with the major roads. It has also been observed that the road network influenced the settlement patterns in the study area as many sites were deliberately located near or on the edge of an ancient road.

Giving a precise date for the road system in the study area is quite difficult in the light of the absence of epigraphic and written evidence. Therefore, the study has relied on the archaeological evidence which was collected from the sites associated with the roads. According to this evidence, the road system in the region of Udhruh appears to have been actively in use in three periods: the Nabataean, Roman and Byzantine, with of course a contrast in the scale of use throughout these periods. However, the Roman period was probably the most influential due to the fact that a considerable portion of the Roman highway, known as the *via nova Traiana*, is still preserved in the study area as well as scattered milestones. Technically, most of the roads lack the evidence of pavement, proper curb stones and inscribed milestones.

The road network in the region of Udhruh appears to have been laid down to suit more than one purpose. Roads were basically used to travel between the rural settlement sites and farmsteads and the major urban and administrative centres in the region. Farmers may have also used these routes to reach their farms and probably to get to major water sources as many springs and reservoirs were connected by roads to the settlement sites. Troops would also have utilised the road system to move from one area to another or to patrol the road itself whenever there was a central authority looking after the security of the region. The archaeological record along or near some of these roads strongly supports this assumption. Watch towers and defensive structures were found everywhere in the region. The road system also contributed to

the economy of the region through the very possible involvement of certain roads in the international and inter-regional trade carrying spices and aromatics and other goods between the East and West since Petra was for a long time an international trade centre.



## **Chapter Six**

### **Military Organisation**

#### **Introduction**

Previous studies and the fieldwork study conducted by the author, in addition to some historical documents, reveal important data concerning the security of the study area, particularly after the Roman annexation of the Nabataean kingdom in AD 106. In addition to the sites previously identified as military structures by the *Limes Arabicus* project, many more new structures were recorded for the first time by this programme of fieldwork. This chapter aims to present the old and new data regarding the security and military arrangements in the study area in the light of the presence of the second largest Roman fortress in Jordan at Udhruh.

Those previous studies have clarified sites which were suspected as security and military installations according to their location or physical appearance. Thus, the discussion will firstly consider the watch-towers; their significance, architectural and location description of every tower, and their function and date. Secondly, major military sites such as forts, fortresses and castella will be considered. An attempt will be made to identify their function and the construction date taking into account the evidence from historical documents such as the *Notitia Dignitatum*. Thirdly, the discussion will consider significant archaeological finds represented by mounds on hilltops, usually associated with epigraphic evidence. Finally, there will be an argument to consider the relationship between the frontier system and the data from the region of Udhruh.

#### **Watch Towers (Fig.6.1)**

An important consideration in the study of watch towers is to establish criteria to decide whether a site is a watch tower or something else and to consider the significance of the sites. The following facts about these sites should help answer these questions:

1- Location: This includes both the topographic and geographic location of a watch-tower site. Topographically, the majority of the suspected structures were located on hilltops with a clear view over the surrounding landscape for a distance or on the edge of a hilly area overlooking a valley. Geographically, they were located near a cluster of ancient settlement sites or adjacent to natural resources sites such as springs and cisterns or wells, and around a very agricultural area. In some cases, this type of structure was found in association with the ancient road network, on the edge of a route or before a junction of many routes.

2-The architectural characteristics: Besides the location there are architectural features commonly found in the structures which were identified as watch-towers. The following are the most distinguishable architectural characteristics: A- generally speaking, they are relatively small rectilinear structures; square or rectangular. B- The structures were built of very large and large hewn stones, probably for defensive purposes and to resist the weathering factors which obviously affect the high places more. C- While they are also found not associated with other architectural features, stone walls and circles are found in some cases, probably for animals. D- The walls of these structures are usually very thick, and sometimes supported by buttress walls. E- Internal divisions are in many cases rare, and this might give an indication that these structures were not constructed for settlement purposes, rather they were built to perform a certain function.

#### **Location, Architecture, Function and Date**

This section is a close investigation of all the structures which fall under the category of watch towers, it will include a brief description of the location, the architectural characteristics, and the possible function of every tower. Previously known sites will be considered first.

##### **1- Rujm Sadaqa (Site no. 286):**

**Location:** This structure was located on a hilltop about 1 km to the east of Ayn Sadaqa, and is easily recognisable from a considerable distance (Fig. 6.2). There is a very clear view over the surrounding landscape, and for a distance in all directions.



Architectural characteristics: Fortunately, the site was visited a long time ago by earlier explorers. Therefore, very important data concerning the plan and architectural materials have been accumulated. The plan which most scholars still use was originally produced by Brünnow and Domaszewski (1904, 468, figure 544). The site was also visited later by other explorers; namely Stein (Gregory and Kennedy, 1985: 334) and Nelson Glueck (1935: 71-72). The site was better studied by Thomas Parker when he was conducting the *Limes Arabicus* Project in the 1970s (Parker, 1976; 1986: 99-100). The structure is rectangular; measuring 19.5×17.75m, and was built of dressed limestone blocks. Mortar and chink stones were used in the circuit wall which is about 1.25m thick (Parker, 1986: 99). Although the plan produced by the German scholars shows internal divisions, none of them can now be seen as the internal area is filled in with collapsed stones and rubble. A gate was suggested in the centre of the east side (Gregory and Kennedy, 1985: 334). This author noticed a vault near that side. Finally, it is worth mentioning that modern graves were made with the external wall and around the structure.

Function and Date: Since no excavation has been conducted at the site, the function and date of the structure at Rujm Sadaqa will remain a controversial issue, and some hypotheses will remain valid for years to come. One of the outstanding hypotheses suggests that Rujm Sadaqa was a military site; a watch tower in particular, as the topographical location of the site is suitable for a watching and signalling system (Gregory and Kennedy, 1985: 334). Glueck (1935: 72) wrote: "Rujm es-Sadaqa occupied a key position in the extensive system of Nabataean watch-towers and settlements, which extended within signalling distance of each other all the way down to the edge of the Neqb esh-Shtar."

Parker (1986: 100) like other scholars, sees the tower at Rujm Sadaqa fitting in the Arabian frontier or the *Limes Arabicus* on the basis that the *Notitia Dignitatum* lists a military unit; namely the *equites promoti indigenae*, at Zodocatha (modern Sadaqa) (Seeck, 1962: 72-74; Kennedy, 2000: 176; Graf, 1997a: VI14; Fiema, 1995: 263). Parker (1986: 100) suggests that a detachment of that unit was in charge at the tower to keep an eye on the *via nova Traiana* and the desert to the east. Kennedy (2000: 177) suggests that the structure might have been a shrine, and was probably used as a

tower in later periods. Kennedy based his interpretation on the fact that a recent excavation revealed a Nabataean tomb near the tower (Kurdi, 1972: 85-87).

Apart from the potential military role the site played in what is known as the *Limes Arabicus*, it seems more appropriate to interpret the function of the tower within a regional security system to watch and protect the natural resources, agricultural fields, and the settlements. Many springs lie in the vicinity of the site, particularly to the north and northwest, and one of these springs was found just about 200m from the north base of the hill where the tower was located. The security of water resources must have been a priority for the community and the authority in the area. Agricultural fields are quite abundant in the area to the north and northwest of the site, and the archaeological evidence indicates that these fields were, as now, heavily cultivated. The scrolls from the Petra Church indicate that the area around Sadaqa was of agricultural nature (Kaimio and Koenen, 1997: 462; Koenen, 1996: 183-86). In addition, many settlement sites of agricultural nature associated with threshing floors were also found in the area between al-Fardhakh and Sadaqa.

A precise date for the construction of this structure seems difficult to establish unless excavation is conducted. However, to judge from the ceramic evidence, the site appears to have been in use roughly from the 1st century AD until the 5th century AD (Parker, 1986: 100; Graf, 1997a: VI 14). Glueck (1935: 72) suggests that the tower was originally built in the Nabataean period. The strategic location of the tower seems to have attracted the Ottomans to reuse the site. In addition to the few Ottoman sherds found at the site, Glueck saw traces of a Turkish road below the site leading from Ma'an to Ghandal in the Wadi 'Araba.

## 2- Tell Udhruh:

**Location:** The site was located on a hilltop about 500m to the east of the legionary fortress at Udhruh. It was visited and described by earlier explorers (Brünnow and Domaszewski, 1904: 462; Glueck, 1935: 76).

**Architectural characteristics:** Although the site was visited and mentioned as early as the 19th century, little information is available about the architectural character of the



alleged tower at the site. The first major scholarly study at the site was initiated by Alistair Killick in the 1980s (Killick, 1983: 127; 1986: 444) as he conducted an excavation there. Killick's excavations revealed 'a two-storied tower structure of Roman foundation built on top of an Iron II settlement' (1986: 444). However, the final results of Killick's excavations at Udhruh still await publication, and no plan has been produced for this tower. The current author investigated the site in 2003. Many rectilinear walls in addition to a ditch running around the hilltop can still be seen on the surface. The walls seem to form a roughly rectangular structure measuring 23×16m, built of limestone cobbles and slabs. However, some walls might have been part of an earlier structure. No internal divisions or walls can be seen in the northern half of the structure whereas some can be seen in the southern half. In the centre of the south side and against its wall lies what Killick (1986: 44) identified as a tower; a small and elevated structure. The walls of the structure in general and the presumed tower in particular are very thick (1.1m). Finally, it is worth mentioning that many modern graves were seen on the northeast slope of the hill below the tower.

**Function and Date:** As mentioned above, there is secure evidence that the site was occupied in the Iron Age; however, since Killick did not publish the results of his excavations at the site, no suggestion can be made concerning the function of the Iron Age structure. Killick (1986: 444) dates the tower on Tell Udhruh to the Roman period according to stratigraphic evidence. A Roman structure at the site is not unexpected as there is a large Roman legionary fortress at Udhruh about 500m to the west of the site. To judge from the ceramic evidence collected by the author, the site was in use during the Edomite, Nabataean and Roman (2<sup>nd</sup> century AD) periods.

In contrast, Glueck (1935: 76) saw Roman and Byzantine sherds at the site, but the majority of the sherds he picked up were Nabataean. A tower at Tell Udhruh would have done more than one function: an alert could be easily passed to the fortress if an unexpected threat emerged from the desert to the east and south or from the west. The tower would also keep an eye on the fields and farms which evidently existed in Wadi Udhruh. These fields and farms seem to have been a source of wealth to the people of Udhruh in the 6th century to the extent that Udhruh was the second on the Byzantine tax list known as the Beer Sheba Edict for the towns of southern Palestine (Mayerson, 1986: 143-4; Killick, 1982: 415). It is also possible that the security of the fields,

reservoirs and settlement in Wadi al-Fiqai to the southeast was considered by locating a tower on Tell Udhruh since an alerting signal could be easily received if sent from the former site.

### 3- Rujm al-Bitar:

**Location:** The site was located on a hilltop less than 1 km to the north of the modern village at Rawdhat al-Ameer Rashid (previously al-Qa'). The site commands a very strategic point with a wide view in all directions.

**Architectural Character:** The main, indeed, feature at the site is a collapsed structure which looks like a huge mound from a distance. Previous studies concerning the architectural character of this structure are almost absent. The site was mentioned by Graf (1997a: VI 7) as one of the sites located along the path of the ancient route between Udhruh and Basta. The current author's investigations revealed that a rectangular structure stood at the site. Unfortunately, the state of the structure does not allow production of a plan or presenting a detailed architectural description as a huge number of collapsed stones and debris cover the lower walls. However, some walls can still be seen in the west, east and north sides. The structure was built of hewn limestone cobbles and boulders. The amount of stones and debris indicate that it was standing to a considerable height; probably 4-5m (Fig. 6.3). Accurate measurements seem unobtainable unless an excavation is conducted at the site. Graf (1997a: VI 7) does mention that the site is 10 square metres. The measurements taken by the author show that the ruins at Rujm al-Bitar, including the structure, occupy an area measuring 19×17m.

**Function and Date:** As usual and in the light of the lack of excavations, the ceramic evidence remains the only dating evidence. The pottery sherds collected from the site date to the Nabataean and Early Roman period, but this by no way means that the structure was constructed in that period. In fact, a precise date, if possible to establish, would offer reasonable suggestions regarding the function of the structure. However, the strategic location of the site and the fact that a structure occupied the hilltop suggest that a watch tower was probably the function of this structure.



Numerous ancient settlement sites were recorded in the area around the site, particularly to the northwest, west and southwest of the Rujm. Moreover, the whole area in the vicinity of the site seems to have been heavily cultivated in ancient times. In addition to the above, many rock-cut cisterns were located in the area to the north of the tower; two cisterns for instance were respectively found east and northeast of the site. The security of the agricultural fields and water resources in a semi arid region must have been a priority to the local community and central authority in antiquity. Finally, the tower was potentially positioned to watch the route between Udhruh and Basta (Graf, 1997a: VI 7), and it could have been used for a signalling system within a series of watch towers.

#### 4- Rujm al-Jerba (Site no. 030):

Location: hilltop about 5 km north Udhruh and approximately 300m south of the ancient settlement at Khirbet al-Jerba.

Architectural Character: Although the site is very close to Khirbet al-Jerba which was previously mentioned and described by earlier scholars (see Glueck, 1935: 77), very little information is available from previous studies regarding the architectural elements of the structure at the site. Killick (1983: 127) wrote: “three hundred metres to the south of the main site [Khirbet al-Jerba] are the foundations of a tower, with ashlar masonry and a few fragments of surface Nabataean pottery.” The current author’s investigations revealed that the structure measures 14.8×11.2m and is built of limestone blocks laid down with clay and small stones as a filling (Fig. 6.4). The walls seem very thick. The north wall’s thickness, for example, is 0.75m. The structure appears to have been internally divided into units, but the current state of the site does not help to recover the plan of the structure.

Function and Date: The structure was located on the south edge of the hill which accommodates Khirbet al-Jerba, the highest part of the hill with a wide view in all directions. It is also worth mentioning that a clear view is possible from Khirbet al-Jerba in all directions but for the south. Therefore it is possible that this structure was constructed to compensate for this. However, it is the security of the intensive

settlement at Khirbet al-Jerba, the spring and the agricultural fields below the Khirbet which seem to have necessitated the construction of this tower.

Al-Jerba is well attested in the Late Byzantine and Early Islamic period as, along with Udhruh, it submitted to Prophet Muhammad and paid the poll tax around AD 630 (Schick, 1994: 149; Musil, 1907: 306). This fact indicates that the site was known and flourishing at that time, and it is believed that agriculture was a strong economic factor in the life of the site's population. Archaeologically, there are traces of many agricultural fields in Wadi al-Jerba, particularly to the east of the Khirbet. Killick (1986: 440) believes that al-Jerba's tower fits in a series of towers located on hills along the path of the Roman road to Udhruh. Although Killick's suggestion seems reasonable on the ground since more watch towers or security structures were found to the north and south of this tower (Killick, 1983: 127), al-Jerba's tower appears to fit appropriately within a local series of towers to the east of Udhruh and al-Jerba (below). The concern of these towers was most likely the security of the fields and settlement sites at Udhruh and al-Jerba.

The ceramic evidence from the site suggests a controversial date. Killick (1983: 127) found some Nabataean pottery sherds whereas the pottery sherds collected by the author were Edomite. This evidence seems in contrast with the historical and archaeological evidence which shows that Khirbet al-Jerba was thriving in the Late Byzantine/Early Islamic period. However, the presence of a few Edomite and Nabataean pottery sherds at the site does not mean that the tower was constructed during one of the two periods. Traces of settlement of both periods at al-Jerba are indeed expected; the region of Udhruh is a geographical and historical part of Edom and Nabataea. Architecturally, the layout of the structure and the materials used to construct the tower correspond to the architectural elements of Late Byzantine/Early Islamic structures. In brief, the tower seems to have been built when the town of al-Jerba was flourishing during the 6th and 7th century A.D.

#### 5- Rujm al-Mattwi (Site no. 032):

Location: hilltop about three kilometres to the east of Khirbet al-Jerba, and where structure was built on the west edge of the hilltop.



**Architectural character:** The structure is roughly square measuring 15.9×15.4m, and was constructed of limestone blocks. Although the site is not well preserved, some walls can still be seen on the surface but do not stand to any considerable height. The walls were laid down with clay and pebbles.

**Function and Date:** It is the strategic location of the structure which suggests that it was created as a watch tower. The site faces Khirbet al-Jerba to the west and commands a wide view over the surrounding area, especially to the east where a clear view from the presumed tower is possible for approximately 10 km. Thus, it is highly likely the tower was used as an advanced watch point to protect the settlement at Khirbet al-Jerba and the agricultural fields in Wadi al-Jerba to the west of the site. This suggestion seems very probable in the light of the presence of archaeological finds, including field walls and some structures, in the Wadi al-Jerba between the Khirbet and the tower.

Like the case with most of the other sites, the ceramic evidence provides dating evidence in the absence of excavations. Moreover, the state of the structure at Rujm al-Mattwi is not helpful in suggesting a date according to the architectural character. However, to judge from the few pottery sherds found at the site, it seems it was in use during the Nabataean and Byzantine periods. The presence of both periods is not strange as the whole region was thriving under the Nabataeans and Byzantines. The lack of other periods, particularly the Roman, does not mean that the site was never occupied during that period. The Roman period is well represented at Udhruh by the legionary fortress. Finally, it is possible that this tower was originally a Nabataean structure reused in later times when the region had intensive settlement and agricultural activities in the Byzantine period.

#### 6- Rujm al-Minbijis (Site no.038):

**Location:** The site was located on a relatively flat hilltop a few kilometres to the east of Udhruh (Fig. 6.5). The site overlooks Wadi al-Braikeh to the southeast and Wadi Udhruh to the west. A structure was constructed almost in the centre of the hill and on the west edge.

**Architectural Character:** The structure is roughly square, measuring 10×9m, and was built of limestone blocks. The structure seems to have been in a good state, but has been recently disturbed by tomb robbers. However, the west and north walls are still visible, and were laid on with clay. No internal divisions can be recognised within the external walls.

**Function and Date:** From the point where the structure was located, a very clear and wide view is easily obtainable in all directions, particularly to the west and east. To the west is the town of Udhruh, the spring and the agricultural fields in the Wadi Udhruh. To the east and southeast is what seems to have been a natural water basin known currently as al-Braikeh. The word al-Braikeh means the pool or the little pool. Therefore, the local name appears to reflect the ancient nature of the area. The ground water in the same area is still being tapped by modern wells, to the west of which an ancient well was found.

Archaeological evidence seen by the author in addition to reports by local people indicate that they had found faunal remains, particularly stems of trees, near al-Braikeh confirms that agricultural fields extended further east in the Wadi Udhruh in antiquity. A watch tower at that point would have played a role in the security of the settlements at Udhruh and al-Jerba, if a signalling system was initiated between Rujm al-Jerba, Rujm al-Mattwi and this tower. The security of whatever crops or trees grown in the Wadi Udhruh was also considered by whoever founded the site. It is also very possible that this tower had something to do with the protection and observation of the water resources in al-Braikeh area.

According to the ceramic evidence, the Byzantine period is the only period represented at the site. Therefore excavations are required to confirm or contradict the evidence from the pottery sherds. However, a sort of homogeneity can be observed between the general architectural elements of the structure at this site and the architectural character of the structures at Rujm al-Mattwi, Rujm al-Jerba and Ruj Ghrab (below). If this architectural similarity is rightly observed, it could be possible that these towers were constructed, or at least reused, in more than one period. In the light of the archaeological evidence from that part of the study area (Udhruh and al-Jerba), and according to historical records, it can be logically assumed that these



towers were in use during the Byzantine/Early Islamic period; the period during which the region was economically and politically well known.

#### 7- Rujm Ghrab (Site no. 061):

**Location:** The site was located on a relatively flat and very low hill approximately 4 km to the south of Udhruh. A structure was built on the north edge of the hill.

**Architectural Character:** As has been mentioned above, a structure was constructed at this site. The structure and other archaeological remains occupy a considerable area measuring 44m NS and 38m EW (Fig. 6.6). Taking accurate measurements for the structure was very difficult due to the state of the site which has been recently disturbed by robbers, and the fact that the structure's walls are covered with debris and collapsed stones. However, the structure, which is most likely square (10×10m?) is built of hewn limestone blocks and cobbles. Clay and small stones seem to have been used to lay down the walls, and internal divisions might have existed within the structure. Finally, the remains of the structure are still visible from a distance and stand for more than 1m above the ground.

**Function and Date:** Although the site is discussed under the watch towers section, it is quite difficult to decide its function. Firstly, the site does not possess a significant strategic location that could have been used within a regional signalling system. Secondly, the site does not directly overlook or watch a natural corridor or an ancient road. Thirdly, the site does not guard a water resource such as a spring or a well, and is not located near a settlement site or a cluster of settlements. It is however interesting enough to know that Rujm Ghrab was located about 100m west of the traces of Khatt Shabib (Chapter 7).

The ceramic evidence and the architectural elements of the structure suggest that the site was in use during the Byzantine period. If this evidence is rightly read, some suggestions could be made regarding the function of the site. The region of Udhruh flourished during the Byzantine period, particularly the area between Shaubak and Ma'an; namely al-Jerba, Udhruh, Wadi al-Fiqai and Jebel al-Tahuna. Rujm Ghrab was located between the last three sites; Udhruh north, Wadi al-Fiqai east and Jebel

al-Tahuna south. The Byzantine/Early Islamic period is well represented at these sites. However, it is possible that the site was used as a watch and guard point or even a farmstead when agriculture was possible in that part of the study area. Unlike most of the Khatt Shabib, the stretch of the Khatt to the east of Rujm Ghrab is hardly traceable due to the clearance of its stones which might support the above suggestion. Moreover, it has long been assumed that a desert trade track passed through the area between Ma'an and Udhruh in the Byzantine period when Petra was no longer a major trade centre (Fiema, 1991). Therefore, this site was presumably and tentatively a checkpoint or watch tower on that trade route.

#### 8- Tell al-Safia (Site no. 066):

**Location:** Tell al-Safia is a very significant landmark about 3 km to the south of Udhruh. The hill stands in a relatively flat and arid area, and a structure was constructed on the hilltop.

**Architectural character:** The structure is square, measuring 6×6m, and was built of large limestone blocks. The latter seem to have been cut from bedrock on the west and south edge of the hilltop. The south and north sides of the structure can be easily seen whereas the other sides are still buried. Clay and pebbles were used to lay down the walls. The hilltop is easily accessible from the south side where a ditch seems to have been deliberately dug along the hillside to limit access.

**Function and Date:** The structure at Tell al-Safia was undoubtedly used as a watch tower. The hilltop commands a very strategic location with a wide and clear view in all directions. The security of what seems to have been a spring associated with a reservoir at the eastern base of the hill was most likely the direct concern of the tower on the hilltop. Although the spring no longer exists, there is a cluster of vegetation and shrubs on the surface of what looks like a square reservoir. Moreover, the older people in the area confirm the presence of a spring and reservoir at the site.

It is also very probable that the tower was used within a regional signalling system due to the considerable height of the hill; Udhruh north, Tell Qusaib and Jebel al-Tahuna south are visible from Tell al-Safia. Structures, probably towers, were



constructed on hilltops at Tell Qusaib and Jebel al-Tahuna. If a trade route between Ma'an and Udhruh ever existed, this tower should have contributed to the security of that road. To judge from the ceramic evidence, the site exhibits a long history of settlement and the following periods are present at the site: Nabataean, Roman, Late Byzantine/Early Islamic. Therefore, it cannot be firmly known in which period the tower was constructed unless an excavation is conducted. Nevertheless, the Late Byzantine and Early Islamic period is more appropriate as the archaeological evidence of this period is abundant in the area between Udhruh and Ma'an.

#### 9- Tell Qusaib (Site no. 197):

**Location:** Hilltop approximately 6 km to the south of Udhruh and almost in a line with Tell al-Safia. A structure was built on the hilltop, on the northwest edge, overlooking a spring and probably a reservoir on the northwest base of the hill.

**Architectural Character:** Unfortunately, most of the structure at the top of Tell Qusaib is still buried; therefore, there is little information about the architectural character of this structure. However, some information can be derived from the northwest corner which has been recently uncovered by robbers. The structure appears to have been rectangular and was constructed of hewn limestone cobbles and blocks.

**Function and Date:** In addition to the structure on the hilltop, other archaeological features were found at the site, particularly on the northwest and north base of that hill. There was a spring, probably associated with a reservoir, and terracing walls in the valley below the spring. It is also possible that the ground to the east of Tell Qusaib was cultivated and irrigated by the spring's water.

However, although the structure on the hilltop is still uncovered, the available evidence indicates that it is relatively small and was not occupied for settlement purposes. Moreover, it commands a strategic location with a wide view over the surrounding landscape for some distance. Thus, all of this might make the suggestion that the structure was a watch tower reasonable and acceptable. A watch tower or a security structure was necessary to guard and protect the spring and the suspected reservoir below the hill in a region where water resources are mainly restricted to

springs. The strategic location of Tell Qusaib in the pre-desert zone and the fact that it is naturally in a line with other hills in this zone suggest that it might have been integrated in a regional security system sometime in antiquity to protect the major settlement sites. Finally, an untraceable desert track passing the area to the north of Tell Qusaib seems to head westward off to the alleged Ma'an-Udhruh route. The users of this track could have used the spring at Tell Qusaib which consequently had to be guarded and protected.

The date of the structure at Tell Qusaib remains subject to the imprecise evidence, limited to the pottery sherds unless an excavation is conducted there. The sherds which were picked up from the site show a long history of occupation. The Edomite, Nabataean (1st and 2<sup>nd</sup> century AD), Roman, Late Byzantine/Early Islamic and Ottoman periods are present at Tell Qusaib. Therefore, it cannot be clearly concluded to which period that structure belongs. However, it is very possible that the site was occupied for security or defensive purposes during the Nabataean, Roman and Late Byzantine/Early Islamic periods. The structure might have been founded by the Nabataeans and reused in the following periods, particularly the Late Byzantine/Early Islamic period during which this zone of the study area was flourishing significantly.

#### 10- Jebel al-Tahuna (Site no. 216):

**Location:** Hilltop about 12 km to the south of Udhruh. The archaeological features at Jebel al-Tahuna are many and the site itself is very significant. However, the concern of this part of the study is not the settlement or the water supply system at the site but the structure on the top of Jebel al-Tahuna. The site was reported by Killick (1986: 438-441) during a fieldwork in the region. However, nothing was mentioned about a structure on the hilltop.

**Architectural Character:** Unfortunately, the structure on Jebel al-Tahuna has been recently and severely disturbed by robbers; mostly destroyed. Therefore, important architectural elements including the plan cannot be recognised. However, the structure seems to have been rectangular, measuring 8×5m, and was constructed of hewn Nari and limestone cobbles and boulders.



**Function and Date:** It is quite reasonable that this structure was merely a watch tower in the light of the presence of a village on the east base of Jebel al-Tahuna. A very significant and large enclosure surrounds the archaeological remains including the village to the east of Jebel al-Tahuna. Aerial photographs (e.g. Kennedy and Bewley, 2004) and the data collected by the author from the site itself confirm the presence of this village which is still buried. The archaeological remains within the enclosure include two reservoirs and many agricultural fields in addition to the settlement structures. A dam was also seen by Killick (1986: 438) on the southwest end of the hill. In fact, the archaeological evidence clearly shows that Jebel al-Tahuna was a flourishing and important site sometime in antiquity.

Accordingly, the security of this site was taken into consideration not only by constructing a huge enclosure around the site, but also by locating a watch tower at the hilltop which commands a very wide view in all directions. A suspected enemy or threat could have been easily reported to the inhabitants of the village, or signals would have been sent to a military base in the region. The tower should have also been used to watch the qanat system which was supplying the site with water from the area to the west of Jebel al-Tahuna, and probably to watch the spring of al-Hssieh southwest of the site.

No excavations have been conducted at the site. Therefore we should still refer to the ceramic evidence to date this tower. However, it seems quite reasonable to suggest that the tower was constructed coincidentally with the village or sometime after that. To judge from the ceramic evidence, the settlements at Jebel al-Tahuna were founded during the Late Byzantine period and continued to flourish into the Early Islamic. The site was also in use during the Ottoman period. The site was previously dated to the Byzantine period by Killick (1986: 438). The archaeological evidence from the pre-desert zone or the area between Udhruh and Ma'an strongly supports this date; the area had a period of prosperity by the Late Byzantine/Early Islamic period.

#### 11- Tower at site no. 021:

**Location:** Several kilometres to the northwest of Udhruh. Three archaeological features were found at the site; one of them, a structure, is the concern of this

discussion. The whole site occupies a very low and a roughly flat hill encircled by high hills.

**Architectural Character:** The structure looks like a high mound due to the collapse of stones and the accumulation of debris. Therefore, little information can be derived regarding the architecture of the structure. The author was not able to take accurate measurements or to produce a sketchy plan. However, rectilinear walls built of hewn limestone blocks can just be seen beneath the debris on four sides, and this would suggest that a rectangular structure stood at the site. The height of the mound, which is about 2m above the ground, and the amount of stones and debris around and above the structure indicate that it was a high structure, possibly a tower.

**Function and Date:** The tower at Site no. 021 appears to have been mainly occupied for the security of the site itself and the nearby sites; namely Khirbet al-Trabsieh. At the same site, and about 40m to the west of the tower, there is a large (3200 square metre) flat area of exposed bedrock which was most likely used as a threshing floor. The area around and near the site is indeed agricultural and was evidently cultivated; many terrace walls are still clearly visible on the hillsides. The area of the threshing floor is enough to receive tens of tons of crops during the harvesting seasons.

The inhabitants of Khirbet al-Trabsieh (Site no. 025); less than 700m westward, must have used and looked after the threshing floor, and probably built the tower on the eastern edge of the hill which accommodates the threshing floor. The latter and Khirbet al-Trabsieh are easily accessible and can be threatened from the east via Wadi Swaillmat. Thus, the tower was constructed to protect the threshing floor and Khirbet al-Trabsieh up on the hills. Moreover, two springs (now dry) are said to have flowed in Wadi Swaillmat to the east of the site and the security of these springs must have also been considered by that tower.

Judging from the ceramic evidence, the site appears to have been in use in different periods. Edomite, Nabataean (1<sup>st</sup> century B.C.? 1<sup>st</sup> and 2<sup>nd</sup> century AD), and Byzantine pottery sherds were collected from the site. It is worth mentioning that this piece of evidence corresponds to that from Khirbet al-Trabsieh. Therefore, it would be safe to presume that this tower or structure was built by the inhabitants of Khirbet al-



Trabsieh to protect their settlements and guard the agricultural fields and the threshing floor. In fact, Khirbet al-Trabsieh and this site seem to have been founded during the Nabataean period, as shown by the ceramic evidence, and the general archaeological data which demonstrates the importance of this area in the Nabataean period.

#### 12- Site no. 108;

**Location:** Hilltop about 10 km to the southwest of Udhruh, and about 300m to the east of the modern road between Basta and Udhruh.

**Architectural Character:** The site is not well preserved. However, the walls of a rectangular structure are still fairly traceable. It measures 7×5m and was constructed of flint stone. No internal divisions were recognised.

**Function and Date:** The hilltop where the structure was located commands a strategic point with a clear and wide view in all directions. The strategic location of the site suggests that it was used as a watch point in order to protect and guard the many settlement sites and agricultural fields to the east, northeast, and southeast of the site. Moreover, an observation point at that site should have been necessary for the security of the road system as major north-south and east-west routes pass through that part of the region. The importance of the site can be seen through the continuous use of the site throughout most of the first millennium AD. Nabataean, Roman, Late Roman and Byzantine pottery sherds were picked up from the site.

#### 13- Rujm 'Abed (Site no. 063):

**Location:** Hillside a few hundred metres to the southeast of Rashid (previously al-Qa'a).

**Architectural Character:** The main feature at the site is a rectangular structure built of flint stones, cobbles and boulders, which looks like a low mound from a distance. The external wall, especially on the south side and at the southeast corner, can be clearly seen. Internal divisions seem to have existed within the structure. Many stone walls

encircling rectilinear areas can be seen around the structure; particularly to the east and southeast of it. These areas seem to have been external courtyards.

**Function and Date:** The site was located on a strategic point with a wide and clear view, particularly to the east and northeast over the desert. Therefore the site could have been used for security purposes. The available evidence indicates that the area to the east and northeast of the site was used for agricultural purposes; hundreds of stone piles can be seen in the area. The latter are said to have been used to keep the run-off water in the soil for agricultural purposes (Oleson, 1995). Moreover, the site might have also been located on the path of an ancient route between Udhruh and Basta; traces of this route can be seen in Wadi al-Beir to the southwest.

It was suggested, elsewhere in this study, that this route passes the village of al-Qa'a on the way to Basta. However, a desert track either off the Ma'an –Udhruh route or from Udhruh itself probably passed Rujm 'Abed. The latter could have also been a road station on one of these routes. It is probably worthwhile mentioning that a modern road heads eastward via Rujm 'Abd to intersect the Ma'an-Udhruh modern road. Finally, there is a slight probability that the site was merely a farmstead in an agricultural locality. Further investigation, excavations in particular, would reveal more information regarding the function and date of this site. However, the ceramic evidence indicates that it was in use during the Nabataean and Early Roman periods.

#### 14- Rujm al-Khatebieh (Site no. 134):

**Location:** Hilltop about 1 km northwest the well of Abu Danna.

**Architectural Character:** A square structure measuring 5×5m was built of hewn limestone (100% flint) blocks at the hilltop; The stones are very large and up to 1.8m long (Fig. 6.7). Although the structure looks like a mound from a distance due to the accumulation of debris and collapsed stones, it is still fairly well-preserved. The four side walls still stand up to 1.5m high. No internal divisions can be seen within these walls. A buttress wall, built of cobbles, encircles the structure to support the walls. The thickness of this wall is approximately 1.2m.



**Function and Date:** The site commands a strategic location with a wide and clear view over the surrounding landscape. As a matter of fact, there are many reasons to suggest that this structure was used as a watch tower. First of all, in relation to other archaeological sites, the tower was located in a key position. It overlooks ancient settlement sites, water resources, road system sites and other security structures. Just a few hundred metres northwest of the site, an ancient road which heads northeast-southwest is still fairly traceable. Another route, which heads westward off the probable Udhruh-Basta road via the village of Abu Danna and intersects the abovementioned road, is still also traceable in the valley southward and westward below the Rujm. Moreover, a clear view is indeed possible from the site over the path of the Udhruh-Basta route up to Rujm al-Bitar northward.

In addition to watching the road system in the vicinity of the site, the tower seems to have been involved in the security of the settlement sites in the area, particularly to the west, south and southwest and northwest of the site. A large settlement site known as Khirbet Umm al-Jarad was located about 1 km northwest and another one known as Khirbet Tell'et 'Eli, was located on a hilltop southwest and opposite Rujm al-Khatebieh. To the west of the site, there are four settlement sites near the spring of al-Maen. Moreover, the well of Abu Danna, the fort at Abu Danna and Khirbet Abu Danna were all located east and southeast of the site. Finally, if the signalling system had ever been integrated, this site would have been a key location as signals can be easily sent to other watch towers such as Rujm al-Bitar, Rujm al-Mshubash, Rujm 'Abd and the forts at Abu Danna and Umm Hilal.

To judge from the ceramic evidence, a few Nabataean sherds were picked up from the site. However, this does not mean that the site was definitely founded during that period. In contrast, the archaeological evidence from the sites which were found in the vicinity of this tower strongly suggests that the tower was built sometime during the Nabataean period when these sites were flourishing and in use. This also seems very reasonable if the short distance between Petra, and this area are taken into consideration.

15- Rujm Ras al-Mshubash (Site no. 159): this site was discussed elsewhere in this study (Pp 110).

# 16- Rujm Abu Halaqa (Site no. 222):

**Location:** Hilltop a few hundred metres northwest Basta, a structure was built on the highest point of that hill.

**Architectural Character:** The structure is square measuring 6.5×6.5m, and was built of hewn limestone (lime and flint) blocks. The structure is fairly well preserved. It still stands for up to 1.5m above the ground. No internal divisions can be seen within the external walls of the structure. The walls are quite thick (1m) as each course was built of two rows of stones filled in with clay and small stones. The amount of debris and stones around the structure indicates that it stood for a considerable height before it collapsed. A courtyard, a stone circle to be precise, was built outside the east side of the structure.

**Function and Date:** The structure seems to have been deliberately located on a hilltop where a clear and wide view is possible in all directions. Thus, a watch tower is a very likely function for this site. This site, Rujm 'Abd and two other sites (below) were located on the highest hills of the eastern sides of Jebal al-Shera overlooking the roughly flat terrain in the pre-desert zone between Ma'an and Udhruh. However, the direct concern of a tower at this point was obviously the ancient settlement at Khirbet Basta, the spring and agricultural fields in Wadi Basta. Apart from the Neolithic village at Basta, there are no traces of ancient settlements due to the fact that a modern village (the Khirbet) was built on an ancient settlement site (Glueck, 1935: 74).

The available evidence, mainly the presence of the spring, the aqueducts and reservoir in Wadi Basta show that Basta was a flourishing site in antiquity, and most likely a nexus for ancient roads. The security of such an important area probably necessitated the construction of this tower which kept an eye on the desert which is traditionally seen as a source of threat. The location of the site would have also allowed watching the roads which pass the area to the east, north and west of it such as the Udhruh-Basta route and the Maqtum Yousef road. Fairly well-preserved traces of both can still be seen to the west and north of the tower. The latter route seems to have played a role in the long-distance trade between Arabia and the Mediterranean countries in



antiquity. More important is the fact that some earlier explorers mentioned the presence of an aqueduct between Ma'an and the spring of Basta (reported in Parker, 1986: 101, see also Musil, 1907: 272). If this aqueduct had ever existed, its security would have been guaranteed by this tower.

As in the case of most of the suspected sites, a precise date remains open to question unless excavation is conducted at the site. The ceramic evidence is still however valuable regarding this issue. Some Nabataean and Roman pottery sherds were found scattered around the structure. Generally speaking, the Nabataean period is dominant in the study area and many sites seem to have been founded in that period, and this is very reasonable if taken into account the fact that a considerable part of the study area lies within the hinterlands of Petra. Taking into account the archaeological evidence from Basta itself and other sites, it seems reasonable to assume that Rujm Abu Halaqa was constructed in the Nabataean period and remained in use in the later period despite the lack of the ceramic evidence for other periods such as the Byzantine.

#### 17- Rujm Muhaidhrat (Site no. 177):

**Location:** The site was located on the edge of a hilly area overlooking Wadi Muhaidhrat approximately 1.5 km northwest of the spring at Basta.

**Architectural Character:** A significant structure was constructed at the site. It consists of two parts; a base and a tower. The former is square measuring 18×18m whereas the latter is rectangular measuring 6.3×5.3m. Both were built of hewn limestone blocks (Fig. 6.8). The base was constructed on exposed bedrock on the edge of a hilly area. The tower was built above the base and within its wall, and is still fairly well-preserved. A huge amount of collapsed stones is scattered around the structure which might be an indication that the tower was once very high. The walls of the tower are 1m thick as they were built of two rows of stones laid down with mortar. It is very possible that a curtain wall was built on the base's wall to encircle the tower.

**Function and Date:** The information from the architectural description above and the location of the site strongly indicates that the structure was a watch tower. But the question is was a security structure at the site necessary? According to the

archaeological evidence collected from the vicinity of the site, the area seems to have been intensively occupied in ancient times. Moreover, natural resources including springs and agricultural fields are very common. To the southwest of the tower, there is a modern (traditional) and ancient settlement site known as Khirbet Muhaidhrat. The spring of Muhaidhrat and the agricultural fields appear to have attracted the settlement since the spring was intended to irrigate the fields below the Khirbet. A reservoir was constructed there. Moreover, three small farmsteads and threshing floors were found west, southwest and east of the tower.

In addition to the security of the settlement sites and the heavily cultivated fields near the tower, the protection of the road system passing through the area should have been taken into consideration. Two ancient routes pass the area to the east of the site and head to Basta; the first is the Zharah road and the second is Kafr Ass-ham road. The latter was probably a stretch of the *via nova Traiana*, the Roman highway which was used for military and trade purposes. The tower was also located on a point to overlook Wadi Muhaidhrat which naturally gives access to Basta from the west.

Judging from the ceramic evidence, the tower was in use during the Late Roman period. However, it could have been constructed a long time before that and was rebuilt and reused in the Roman period as most of the abovementioned site displays pre-Roman dating evidence. On the other hand, the site might have been constructed during that particular period (Late Roman) as there is enough evidence from the area indicating the continuity of settlement and landuse in that area in the Late Roman and Byzantine periods (Graf, 1995b).

#### 18- Site no. 229:

**Location:** The site was located on a hilltop on the left hand side of Wadi Basta about 2 km to the east of Basta.

**Architectural Character:** The structure is badly disturbed. Therefore, very little information is available about its architectural elements. However, close investigation revealed that a rectangular structure measuring approximately 24 square metres and built of limestone blocks was built at the site.



**Function and Date:** The topographic location and the architectural features including the size of the structure indicate it was a watch tower. A tower at this point, with a clear view eastward over the path of Wadi Basta, would have easily kept an eye on the potential aqueduct between Ma'an and Basta via the valley of Basta. Moreover, agriculture seems to have extended further east. Tens of stone heaps reflecting ground clearance for agricultural reasons can be seen to the east of Basta. A signalling system would also have been possible as another Rujm (tower, site no. 236) is clearly visible to the southeast of the site. The ceramic evidence shows that the tower was in use during the Early Roman period. However, the site could have been part of a Nabataean watch tower system which was partially reused in the Roman period.

#### 19- The Rujm at site no. 236:

**Location:** Hilltop about 1.5 km south east Basta to the south of Wadi Basta and northeast of Wadi Ayl.

**Architectural Character:** A square structure measuring approximately 10×10m was probably stood for a considerable height at this site. However, little information can be derived from the current situation of the structure which is destroyed and covered with stones. A mound still stands up to 2m above the ground which might indicate that the structure was originally quite high. The structure was constructed of multi-sized limestones (flint). The walls seem to have been very thick as they were built of two rows of stones. The plan of the structure cannot be traced, but rectilinear walls can be seen in the southwest and southeast corners of the structure. It is also possible that its external walls were supported by a buttress wall.

**Function and Date:** The site commands a strategic location with a wide and clear view over the landscape. The structure was deliberately constructed on the eastern edge of the hilltop where a clear view is possible in all directions, particularly eastward. The location and the architectural elements which resemble the elements of most of the watch towers, suggests that the structure at this site was used for the same purpose. The construction of such a tower at that particular site was probably necessary to protect and guard the agricultural fields in Wadi Basta and Wadi Ayl respectively to the north and south of the site.

Moreover, agriculture seems to have been intensive in the area southeast and east of the tower as indicated by hundreds of the stone heaps and some field walls in addition to a considerable number of small structures which could have been used for agricultural purposes. Taking into account the importance of Basta and Ayl as water and road stations and settlement sites, the site would have probably been part of an alarm system against any possible threat from the desert eastward. The ceramic evidence shows that the site was in use during the Roman period, but as usual, this does not necessarily mean that it was founded in that period. Other periods could have been present at the site but we lack the evidence.

## 20- The Rujm at Site no. 238:

**Location:** Hilltop about 500m to the east of the modern village at Ayl. The hill is on the right hand side of Wadi Ayl and about 200m to the north of the modern road between Ayl and Ma'an.

**Architectural Character:** A square structure measuring 6×6m was built of multi-sized limestone blocks. It is now collapsed and derelict. However, some of its walls can be seen in the north and east sides of the structure. The walls seem to have been thick as they were constructed of two rows. A stone wall forms a rectangular area to the east of the structure.

**Function and Date:** Some facts on the ground make the assumption that this was a watch tower reasonable. Again, agriculture seems the main motivation for constructing this watch tower since there is quite enough evidence that the area to the east and south of the site was heavily cultivated in ancient times. The evidence comes from the field walls and the hundreds of stone piles ('Amr and al-Momani, 2001: 276), the construction of which was probably a technique to keep the run-off water on the ground for seasonal cultivation. If the plains and hillsides were cultivated as indicated by the archaeological evidence, a considerable amount of crops must have been produced. The security of these fields must have been guaranteed by the local community or the central authority through a series of watch towers. Moreover, a recent study ('Amr and al-Momani, 2001: 275) revealed that an ancient and paved



road heads eastward via Ayl passing the site about 200m to the south. The path of this road could be easily watched for several kilometres to the east from this tower.

The ceramic evidence from the site is important although only two periods were recognised. Nabataean and Late Roman pottery sherds were found at the site. In fact, it is not strange to find Nabataean sherds at this site because it was the most significant period in the history of the region. It is rather the evidence for the Late Roman period which deserves further explanation. It has long been suggested that Ayl had a Roman military base, probably a *castellum* (Brünnnow and Domaszewski, 1904: 69; Parker, 1986: 99). Parker on the basis of the ceramic evidence and the architectural features of the tower at the site, prefers a Late Roman date for the *castellum*. If this piece of evidence was rightly suggested, it seems reasonable to assume that this tower was in use during that period to alert the *castellum* which was according to Parker in charge of the security of the spring and the portion of the *via nova Traiana* passing the area below the *castellum*.

#### 21- The towers at Site no. 260 (south of Khirbet Ayl):

**Location:** A very high hilltop a few hundred metres to the south of the spring and Khirbet Ayl.

**Architectural character:** The site was cleared for the construction of two mobile phone signalling towers on the same hill where the site was located. The information about the architectural elements comes mostly from the study 'Amr ('Amr *et al*, 1998: 537). According to 'Amr "two square structures (watch towers) at the summit of the mountain built of medium and large stone blocks, with one and sometimes two courses visible above ground. Abundant sherds and some flint scatters were noted in the area. This site is to the south of Khirbet Ayl, on a high mountain top and slope." Unfortunately, the remains of only one tower (6×6m) were found when the current author visited the site.

**Function and Date:** It is clear from the significant topographical location of the site that the structures were used as watch towers. 'Amr *et al* (1998: 537) assert this saying: "the area is strategically located with a superb view all the way to Ma'an and

beyond and there is (relatively) abundant water in the area". In the light of the archaeological evidence in that particular area, east, west, south and north of the towers, there are many important archaeological finds which seem to have necessitated the foundation of these towers.

First of all, to the north and just below the towers there are the spring and Khirbet Ayl. Second, it has been suggested that the stretch of the *via nova Traiana* between Sadaqa and Petra passed through the area below Khirbet Ayl (Graf, 1997a: VI 7-11). Another route, probably a branch of the Roman road, was discovered by the author to the west of the towers. A third one was seen and recorded by 'Amr *et al* (2001: 275-6) near the eastern edge of the modern village of Ayl. Third, many settlement sites in addition to a complex of threshing floors were recorded over the hilly area a few hundred metres to the west of the site. Thus, the security of all of these sites was considered when these towers were constructed since the site commands a significant location. If a threat was suspected or signals received from other towers, the garrison at the *castellum* should have taken serious actions. Parker (1986: 99) who sees Ayl as part of the frontier zone in southern Jordan suggests that the tower at Rujm Sadaqa was constructed to compensate for the weakness of visibility to the west, south and north from Khirbet Ayl, the assumed location for a Roman *castellum*. In contrast, these towers were situated on a typical location if the signalling system had ever existed between the military bases of Udhruh, Sadaqa, and Ayl. However, Parker seems to have been unaware of this site when he conducted his study.

## 22- Site no. 243:

**Location:** The site was located on the top of a low hill on the edge of a valley about 1.5 km northwest Jebel al-Jithih. A dry spring lies about 100m northwest of the site.

**Architectural Character:** A rectangular structure measuring 10×6m was constructed of multi-sized limestone blocks at the site. It is still fairly well-preserved although it has been recently disturbed. However, the plan of the structure cannot be recognised. The wall can still be seen on the north and south sides, but, it does not retain a considerable height.



**Function and Date:** The lack of internal divisions indicates the structure was not used for settlement purposes. Moreover it was located near a water source. All this strongly suggests that the structure was used as a watch tower to protect and guard the spring. Judging from the pottery sherds collected from the site, it seems to have been in use during the Nabataean and Roman periods. However, the structure might have been initially constructed by the Nabataeans and continued to be used in later periods.

#### **Mounds on hilltops (Fig. 6.9)**

One of the significant archaeological finds in the study area was the phenomenon of the small mounds which were usually located on hilltops or high places. They are remarkable due to the considerable number of the sites which exhibit this type of find. Geographically, these features are usually noticed in the pre-desert zone, particularly in the area around Jebel al-Jithih, and are rarely visible in the heavily settled and agricultural areas. More than 20 sites of this type were recorded in the course of the fieldwork in the study area.

In addition to the fact that they share roughly the same topographical location, their physical appearance or architectural elements are also quite similar. The following points might clearly explain this issue:

- They usually look like a low mound of stones. The latter are unhewn, multi-sized and scattered on the surface
- In some cases the mound is undefined and has an irregular structure. Walls were rarely seen.
- Many of the stones at these mounds were marked with special symbols, letters and camel brands. This is the most common characteristic among these mounds.

#### **The Function and Date**

In the light of the available evidence, it seems very difficult or even impossible to set up a date for these mounds or structures. They lack ceramic evidence and are not architecturally well defined to suggest a date according to the architectural characteristics. Therefore, they cannot be dated to certain historical periods. The

function of these features is also quite difficult to understand. However, some assumptions can be suggested here. The architectural character of these sites do not indicate that they were constructed for defensive or security purposes. Moreover, they were not situated near or to overlook a settlement site, a route or a water resource, and they are found in remote areas.

Apart from a few examples, they do not reflect the activities of a permanent society. Therefore, they seem to have been created by nomads society if we take into account the geographical distribution of these mounds and the camel brands and symbols which mark the stones. These mounds might have been constructed when a nomadic camp was temporarily or seasonally in the vicinity of the mound. The latter could have been used as a landmark to identify the territory of that camp or to use it as a guiding point if the nomads returned to the same area in the next year. It is interesting to know that on two occasions in the course of the fieldwork, the author saw two Bedouin camps near two of these mounds. The function of these mounds remains open to question and awaits further investigation.

#### **Major Military Structures (Fig. 6.10)**

The following discussion will consider the major military structures in the region of Udhruh. Forts and *castella* seem to have been founded in the study area throughout the main historical periods. Some of these sites were visited and documented as early as the late 1890s (Brünnnow and Domaszewski, 1904).

#### **The fortress of Udhruh (Site no. 050)**

**Location:** Udhruh lies about 15 km east of Petra and approximately 25 km northwest of Ma'an. The ruins of the fortress can be seen on the edge of the modern road between Udhruh and Ma'an. Topographically, the site was located on a very gentle slope at the top of Wadi Udhruh. The site is almost encircled by a series of hills: Tell Jraideh lies northeast, Tell Udhruh (Dubais) east, Tell Abara (Abu Ar'a) southwest and there are two hills to the south and southeast (Fig. 6.11).



Architectural Character: The fortress of Udhruh is always referred to as one of the biggest Roman military outposts in Jordan (Kennedy, 2000: 168). Valuable data regarding the plan and the architecture of the fortress were revealed by Brünnow and Domaszewski in their study *Provincia Arabia* (1904: 433-463). The site was also mentioned and described by other explorers (see Doughty, 1923: 35-37; Glueck, 1935: 76-77). More data were revealed and updated by Alistair Killick who conducted excavations at the site in the 1980s (1983: 231-243).

The general outline of the fortress is still fairly well preserved, particularly the perimeter wall, the corner towers and the interval towers and these features are clearly shown in the plan of the fortress (Fig. 6.12). The plan also shows that the fortress has a trapezoidal shape due to the difference in the length of the curtain wall in each side with a bend in the east side near the northeast corner. The north and south sides are the longest, 246m and 248m respectively, whereas the west and east sides are 177m and 207m in length (Killick, 1983:231-234; Kennedy and Riley, 1990: 131; Gregory, 1995: 384; Kennedy, 2000: 168). The enclosure wall is fairly well preserved on the west and south sides and is 3m thick and still stands to about 6m in the west side after clearance. However, it is significantly disturbed on the east side due to the construction of the modern (traditional) village. The masonry of the curtain wall consists of two faces on each side with a rubble core of very large well-drafted limestone blocks quarried from a huge quarry about 1.5 km northwest of the site (Site no. 028) (Killick, 1983: 234; Gregory, 1995: 384).

Interval and corner projecting towers were constructed on the curtain wall. Twenty U-shaped interval towers were placed along the side walls along with four corner towers. The number of towers varies from one side to another, with four towers on the north and south sides whereas six towers were located on the west and east sides (Killick, 1983: 231-234; Gregory, 1995: 386). The interval towers 'project 6-7m at right-angles to the curtain walls before terminating in a semi-circle...the total projection is c.11m for the interval towers...' (Gregory, 1995: 386) (Fig. 6.13). The corner towers are extremely larger and 'project 13-15m with straight sides finishing in a semicircle of c.22m diameter' (Kennedy, 2000: 168). The best preserved corner tower is the southwest corner which was excavated by Killick (1983: 239). The excavations revealed that four rooms originally occupied the ground floor of that tower (Kennedy,

2000: 168; Gregory, 1995: 386). The remaining corner towers are not well preserved, especially the one at the northeast corner.

Four gates, one in the centre of each side, seem to have given access to the internal area of the fortress. Each gate seems to have consisted of a single arched entrance (3 m wide) and was flanked by two interval towers, closer together at the point where the gateway was constructed. The excavations at the gate in the north side uncovered 'sockets for a double-leaved door and traces of wheel ruts in the threshold'. This gateway was later blocked by a 3m high wall (Gregory, 1995: 387; Kennedy, 2000: 168).

Within the enclosure wall, traces of major buildings are almost unrecognisable as the site was significantly disturbed by later occupation. However, the traces of a building near the west side of the fortress were tentatively identified as part of the *principia* or headquarters (Killick, 1983: 236; Parker, 1986: 95; Gregory, 1995: 387). A few column drums and capitals (Fig. 6.14) were also seen a few metres from the presumed *principia*. Similar fallen capitals were documented outside the *principia* at Palmyra in Syria (Gawlikowski, 1984: plan VI). A cistern (recently restored) was also found near the Ottoman fort. The surface of the remaining area within the curtain wall is covered with debris and stones.

**Discussion (date, function, legion and similarity with other fortresses).**

Udhruh is attested in historical sources as early as the second century AD, but none of these references refers to Udhruh as a military site. Ptolemy, writing in the 2nd c.AD, mentioned it as a town in Arabia Petraea (Killick, 1983: 110; Gregory, 1995: 383). The site is more often attested in Byzantine and Early Islamic sources and documents. The Byzantine tax edict known as the Beersheba Edict lists Udhruh among the towns of Palestina Tertia as does Stephan of Byzantium (Killick, 1983: 110; Parker, 1986: 95; Mayerson, 1986: 141-148). Udhruh is also suspected to be the Augustopolis mentioned by George of Cyprus and Hierocles (reported by Killick, 1983: 110; Parker, 1986: 95). The data which has been recently revealed from the Petra Papyri support earlier suggestions linking Udhruh with Augustopolis (Graf, 2001: 229). Two bishops from Augustopolis are mentioned attending two church councils in the 5<sup>th</sup> and



6<sup>th</sup> centuries AD (Killick, 1983: 110-111; Parker, 1986: 95; Koenen, 1996: 178; Fiema, 2002a: 210). Udhruh was also often mentioned in the Early Islamic sources as the inhabitants of the town agreed to pay the poll tax to Prophet Muhammad in A.D 630 (Killick, 1983: 112; Fiema, 2002a: 210).

It is quite clear that there is a significant contrast between the historical record and the archaeological evidence from Udhruh. The latter undoubtedly indicates a Roman fortress was constructed at the site whereas the historical sources refer to Udhruh as a town. This contrast is indeed confirmed by the fact that Udhruh is not listed on the *Notitia Dignitatum* which names the Roman military units and their locations in the Roman provinces including Palestina Tertia and Arabia (see Seeck, 1962: 72-74 and 80-82 for the units in the ND; Bowersock, 1976: 226-227; Killick, 1983: 110; Gregory, 1995: 383; Kennedy, 2000: 49). The document is roughly dated to the beginning of the 5th century A.D (Genequand, 2003: 25). Killick (1983: 110) suggests that 'the site may be one of the un-located names in the *Dux Palaestinae* listings, or perhaps the site was temporarily abandoned'. However, in the light of the forthcoming hypotheses concerning the date of the fortress of Udhruh, its absence from the *Notitia Dignitatum* is very problematic (Seeck, 1962: 72-74).

Although no building inscription was found at Udhruh, many scholars seem in favour to a Late Roman date (Parker, 1986, 1988, 1995; Kennedy, 2000: 168-170; Kennedy and Riley, 1990; Gregory, 1995) whereas the excavator suggested a second century date in his preliminary reports (Killick, 1983: 125). The first group of scholars based their argument on typological and architectural aspects. In a recent study, Parker (1995: 251-260) categorised the Roman and Byzantine forts and fortresses in Jordan into six groups according to their typology. Udhruh falls in 'the fortresses with U-shaped and semi-circular external towers'. This type of fortress in particular seems not to have been known before the end of the 3<sup>rd</sup> century AD (Parker, 1986: 97-98; 1989: 358). The forts of the early Roman Empire were normally rectangular with round corners in plan and lack the projecting towers. This type of (playing-card) fort is well attested in European frontiers (Johnson, 1983: 31-35; Parker, 1986: 98; 1995: 258).

This argument seems more solid when the similarity between the fortress of Udhruh and the fortress of Lejjun is considered. Apart from the general plan of each fortress, rectangular at Lejjun whereas trapezoidal at Udhruh (Fig. 6.15), both structures resemble each other almost in all the architectural features including the interval and corner towers and the gates (de Vries, 1987: 311-351; Parker, 1986: 98; 1995: 258; 1999: 157; Kennedy, 1992: 480). Fortunately, the fortress of Lejjun has now been fully excavated (Parker, 1987a). Therefore; the excavator firmly refers to Lejjun as a Diocletianic or 4<sup>th</sup> century fortress according to stratified archaeological evidence (Parker, 2002: 79). He also believes that the fortress at Udhruh was erected at the same time due to the identical similarity between the two sites (Parker, 2002:79).

Unfortunately, the final results of Killick's excavations at Udhruh still await publication. However, his initial thoughts regarding the fortress's date prefer the 2nd century, probably shortly after the annexation of Nabataea in AD 106 (Killick, 1983: 125). In fact, this suggestion cannot be totally dismissed in the light of general glimpses from archaeological evidence and written documents. Killick (1983: 125) claims that he found 1st and 2<sup>nd</sup> century materials in association with the enclosure wall, the *principia* and a corner tower. Moreover, the layout method of the interval towers indicates that they may not be contemporary with the perimeter wall as they are not bonded into the wall; all the towers touch the circuit wall (Parker, 1986: 98). Finally, two letters were sent in AD 107 and 108 from Arabia by a soldier serving in an unnamed legion to his father at Karanis in Egypt, in which he mentioned that troops were cutting building stones all the day (P. Mich. Inv. 5903; Kennedy, 1980: 289-292). Some scholars (i.e. Bennett, 1997: 176) assume that the building stones cut by the troops were probably used to build the fortress at Udhruh.

However, Bowersock (1976: 226-227) believes that a 6<sup>th</sup> century fortress at Udhruh 'may well be correct'. He based his argument on information from the Muslim historian Hamza al-Isfahani who states that Udhruh was founded by Jabala ibn Harith. Bowersock (1976: 226) accepts a 6th century date for 'Udhruh forms the southern terminus of the Jurf Eddarawish road protected by apparently late forts; and the site itself, with its camp, is conspicuous by its absence from both the *Notitia Dignitatum* and the Peutinger Table'. Parker (1986: 97) states that the presence of a 6th century pottery at the site might support Bowersock's interpretation. In contrast, the Beer



Sheba edict (Mayerson, 1986: 148) refers to Udhruh as a town as do Early Islamic sources (Killick, 1983: 111).

Judging from the ceramic evidence collected from the area near the legionary fortress and the study area in general, the region appears to have continued to flourish up to the 7<sup>th</sup> century. Moreover, some sites exclusively display Late Roman pottery sherds. These sites range from a single small structure to a complex and large settlement site probably reflecting the function of each site. Economically, the region seems also to have been rich where agriculture was probably the core of the region's economy. Some scholars, particularly Thomas Parker, believe that the Tetrarchic or Diocletianic military reforms touched that part of the Roman Empire as some forts and fortresses seem to have been constructed in that period (Parker, 2002: 79; Lewin, 2002: 94). Many military sites in southern Jordan are believed to have been reconstructed or reused in the Late Roman period (Fiema, 1991: 131).

The garrison of the fortress at Udhruh is not firmly determined because of the lack of any epigraphic or written sources. However, some suggestions have been made concerning the garrison unit at Udhruh. Parker (1986: 98), on the basis of the area within the circuit wall, suggests that this area 'could have accommodated the largest auxiliary units of the Principate, military *alae* or cohorts of ca. 1000 men'. Kennedy and Riley (1990: 133) assume that the garrison of Udhruh might have consisted of 1000 to 1500 troops, and this number does not fit any one auxiliary unit or an entire legion in the 2nd century AD. It would, rather, accord with the size of a Late Roman legion and this seems to support the presumed date of the fortress discussed above. One legion, namely *VI Ferrata* was suggested by Speidel (1979: 171-172) to have been shifted to Udhruh from its base at Jezreel plain in northern Palestine during the 4th century AD (Gregory, 1995: 384). The absence of this legion from the *Notitia Dignitatum* might indicate that it was destroyed or disbanded sometime in the same century, and it was no longer a military site (Parker, 1986: 98; Kennedy, 2000: 169).

Although the establishment of a precise date of construction for the fortress at Udhruh would be helpful in explaining the function of this military site, some hypotheses regarding this issue are still valid and worthy of review. Many scholars (i.e. Parker, 1986; Kennedy and Riley, 1990; Gregory, 1995; Kennedy, 2000) cite the location as

an important factor. Therefore, it should have contributed to the security of the region in the Roman period. Economic and strategic and security factors seem to have motivated the founders to construct a legionary fortress at Udhruh. First of all, it lies in the hinterland of Petra (ca 12 km east) and Udhruh seems to have been connected with Petra by direct route, the traces of which were seen by the author. For some scholars, Udhruh was located on the *via nova Traiana*, however, this claim was challenged by Graf (1992a: 256).

Parker (2002: 80) noted that “in Jordan, the majority of the military units were located either in the desert or close to the desert fringe either on or just east of the *via nova Traiana*”. The nomadic groups were a source of threat for the settled areas in the 4th century according to Parker (2002: 80). Therefore, Udhruh may be one of the sites where troops were deployed to watch and control nomadic groups. Even though, the nature of the relationship between the nomadic and settled people is still debatable (Kennedy, 1992: 484-486). He also rightly argues that military units may have played a role in ‘securing the agricultural hinterlands and get supply from the crops or fruits grown in those areas’ (Parker, 2002: 79; 1989: 361). This seems to have been the case at Udhruh which experienced a long history of agriculture, notably in the valley below its spring and in the area southeast and on the hills southwest and northwest.

More important was probably the security of the settlement sites (Fiema, 2002b: 132; 1995: 263-264). Many clusters of settlement sites were identified in the study area, usually four to five sites in the vicinity of a major water source. The sites range from a small farmstead to a huge settlement site or khirbet. The security of these sites seems to have been guaranteed by small security structures, either towers or small forts. Small military units detached from the legion at Udhruh could have been stationed at these sites to control and watch the settlements, as well as the water resources and the agricultural fields (Parker, 2002: 79). Any potential threat seems to have been treated immediately by the unit nearby the targeted site or area or could have been reported to the legionary base at Udhruh since the location of most of the towers and forts in the study area does facilitate using a signalling system (Fig. 6.16).

Apart from the strategic and important location of Udhruh, the availability of the construction materials seems to have also attracted the builders of the fortress. A huge



exposed limestone bedrock lies about 1 km northwest of the site. Many large cut blocks are still *in situ* at the site (Fig. 6.17). However, the quarrying was concentrated at the highest point of the quarry. At least five rectangular quarrying areas were found there (Fig. 6.18). The bedrock seems to have been quarried at a single time on the basis of the similarity in the quarrying methods and the shape of the quarried areas. Most of the large blocks in the perimeter wall of the fortress at Udhruh were quarried from that quarry. If the fortress was to be constructed somewhere else in the vicinity of Petra, there is no site comparable with the same features as available at Udhruh.

### **Khirbet Sadaqa**

**Location:** Sadaqa lies on about 7 km southwest Ayl and 23 km to the west of Ma'an. The site was located on a relatively flat ground encircled by hills from west, south and east. It is easily accessible from the north and northeast. The spring at Sadaqa is about 200m to the north of the ruins. The site is now encircled by modern houses in almost all directions.

**Architectural Character:** The reader should not confuse with Rujm Sadaqa which has already been discussed in this chapter. Khirbet Sadaqa is the settlement site to the west of Rujm Sadaqa (Fig. 6.19). No systematic excavations have been conducted at Khirbet Sadaqa. Therefore, most of the information regarding the architectural elements at the site is derived from the accounts of earlier explorers (Burckhardt, 1822: 435; Glueck, 1935: 71/2). Even though, these sources lack the detailed descriptions since their attention seems to have been given to Rujm Sadaqa on the hilltop to the east of the site. Useful information is now available from recent investigations (see Graf, 1995; Gregory, 1995; Kennedy, 2000; Fiema, 2002b).

The ruins at Sadaqa cover an area of approximately 250×150m. Ground investigations and aerial photography clearly show that a rectangular enclosure wall encircled the town. The wall is reasonably traceable on the west and south sides (Kennedy, 2000: 176-177). Fiema (2002a: 211) asserts that "Sadaqa has extensive ruins, including a large trapezoidal fortification with corner and interval towers and a complex internal plan..." three interval towers were seen by the author along the west side of the wall. The perimeter wall was constructed of limestone blocks, and the stonework is quite

modest compared with the fortress of Udhruh. Excavations are definitely required to uncover the architectural elements of the site.

Discussion: Although the archaeological evidence at Sadaqa is not as well preserved as at Udhruh, Sadaqa is repeatedly attested in epigraphic and written sources. It was mentioned as *Zanaatha* by Ptolemy, *Zadagatta* in the Peutinger Table and *Zadakatha* in the Beer Sheba edict (Fiema, 2002a: 211; Mayerson, 1986: 144). However, none of these sources indicates the military importance of the site. The fact that a military structure should have existed at Sadaqa is confirmed by written and epigraphic evidence. The *Notitia Dignitatum* lists *Zodocatha* under the *dux* of Palestina Tertia and was garrisoned by the *Equites promoti indigenae* (the advanced native cavalry) while two graffiti from Wadi Haggag in Sinai indicate the presence of a military unit at Kastron Zadacathon (Seeck, 1962: 73; Kennedy, 2000: 176-177; Fiema, 2002a: 211).

It is quite obvious from the historical sources mentioned above that Sadaqa had a long history of settlement. Pottery sherds ranging from the Edomite throughout the Nabataean/Roman (1st-3rd c.AD), Byzantine (5th c.AD onward) and Late Islamic periods were found at the site by the author and earlier archaeological projects (Parker, 1976: 24). However, it is not clear if the site had a garrison shortly after the Roman annexation of Nabataea in AD 106. In the light of the archaeological and historical evidence, a Nabataean military unit may have been located somewhere near the site, probably in the tower of Rujm Sadaqa (Glueck, 1935: 72; Parker, 1986: 100). A second-century military structure at Sadaqa might have existed since the important station of *Zadaggata* on the *via nova Traiana* in the Peutinger Table has been now firmly identified with Sadaqa (Graf, 1997a: VI 14). A Roman garrison would have controlled the traffic on the Roman highway down to Humeima and guaranteed the water supply from the adjacent spring.

The military presence at Sadaqa in later periods is no longer questionable. *Equites promoti indigenae*, according to the early fifth century military document '*Notitia Dignitatum*', was based at Sadaqa (Fiema, 1995: 263 and 266; Parker, 1989: 360). Although it is still not clear if the supposed fort at Sadaqa belongs to that period, the typology of the fort with interval towers supports a Late Roman date. However,



according to Fiema (2002b: 134), the site remained garrisoned towards the end of the 6th century AD whereas Graf (1997a: VI14) asserts that the archaeological remains including the curtain wall and interval towers belong to “*Castra Zodacatha* mentioned in Byzantine Christian graffiti discovered in South Sinai.” The sixth –century garrison of Sadaqa seems to have lived side by side with the residents of the town (Fiema, 2002b: 134).

The existence of a garrison at Sadaqa up to the sixth century is also indisputable in the light of the archaeological evidence collected from the vicinity of the site. In the area between al-Fardhakh and Sadaqa, five settlement sites were recorded by the author, one of them was probably a village and revealed either Late Roman or Byzantine pottery sherds (sometimes both). Moreover, the same area seems to have been heavily cultivated as indicated by terracing and field walls (Fig. 6.20). The information derived from the Petra Papyri shows that Sadaqa was one of the major agricultural areas in the hinterlands of Petra (Kaimio and Koenen, 1997: 462; Koenen, 1996: 183-86). The economic importance of Sadaqa is also attested in the Beersheba edict which lists the tax-paying towns in Palestina Tertia (Mayerson, 1986: 144). Finally, it is quite possible that the portion of the *via nova Traiana* between Petra and Ayla was still in use. Thus, Sadaqa with its location on this highway would have gained some profit from interregional trade.

#### **Khirbet Ayl (Site no. 192)**

**Location:** About 20 km southwest of Udhruh and 8 km north of Sadaqa is Khirbet Ayl. The site is located on a slope of a hill overlooking the wadi and spring of Ayl to the east.

**Architectural character:** Unfortunately, the ancient site is no longer traceable due to the construction of a modern village (Khirbet) in the last century. However, a fairly well preserved tower still stands in the southeast corner of the site (Fig. 6.21). Traces of the ancient ruins were seen and described by earlier explorers (see Brünnow and Domaszewski, 1904; Glueck, 1935). Kennedy (2000: 170-171) reported that earlier visitors recorded a rectangular structure measuring 60×69m approximately (Fig. 6.22) in addition to the tower mentioned above. The German scholars, Brünnow and

Domaszewski (1904: 467), produced a plan of that tower. The tower is rectangular (8×6m), constructed of dressed limestone blocks, and is projects out from the perimeter wall (Parker, 1986: 99; Gregory, 1995: 390). The latter can be seen running for about 15m to the west of the tower. This tower has long been identified as a corner tower of a fort or *castellum* (Parker, 1986: 99).

Discussion: Judging from the ceramic evidence, the site was occupied from the Iron Age up to the Ottoman period (Parker, 1976: 24). However, it might have also seen periods of abandonment. During the Roman period, a fort seems to have been implausibly constructed at the site (Graf, 1997a: VI 9). Parker (1986: 99) bases his evidence on the architectural features of the surviving tower, dates the fort to the beginning of the 4th century AD. Although excavation have not been conducted to confirm the date, the assumption that a Roman fort existed at Ayl seems reasonable. Epigraphic and archaeological evidence support this hypothesis. First of all, a Latin text painted on a milestone, found in field wall below Khirbet Ayl (Glueck, 1935: 75), has been recently rediscovered where the text is roughly dated to the late 230s (Graf, 1995a: 418). Moreover, recent archaeological projects favour locating Ayl on the *via nova Traiana* (Graf, 1997a: VI 7-12). Traces of the Roman highway were reported to the south of the Khirbet below the tower (‘Amr and al-Momani, 2001:275).

Parker (1986: 99) states: “the function of the garrison at Ail (Ayl) was threefold: to guard this portion of the *via nova Traiana*, to protect the spring in the wadi, and keep watch over the desert to the east.” Fiema (2002a: 229) presumes that Ayl among other places, was garrisoned during the 4th century, but probably was abandoned in the 6th century (Fiema, 2002b: 133). The *Notitia Dignitatum* makes no mention of a military unit at Ayl.

#### **Khirbet al-Temeiah (Jebel al-Tahkeem, Site no. 047)**

Location: Khirbet al-Temeiah is located on a significant hilltop approximately 2 km northeast of Udhruh and about 3 km south of Khirbet al-Jerba.

Architectural character: Two rectangular structures were identified on the hilltop. The first structure extends on a north-south axis whereas the second structure extends in



an east-west axis. Therefore, they form an L-shaped complex building (Fig. 6.23). The first structure measures 16×10m, according to Glueck (1935: 77) whereas Killick's dimensions for the same structure are 13.5×10.5m (1983: 127). Both structures were built of quarried multi-sized limestone blocks. The external walls have two faces with a rubble and stone core. Therefore they have a significant thickness of approximately 1.2m. The most recognisable architectural elements at the site are the external walls which still stand up to 1.5m on most of the sides. However, internal walls were also seen within the structures. Both structures seem to have been accessed from the southeast edge of the hill.

Discussion: Little attention was given to the archaeological site at Khirbet al-Temeiah in recent scholarly studies. It was not, for instance, included in the *Limes Arabicus* Project in the 1970s (Parker, 1976: 19-31). However, the site was noticed and mentioned by earlier explorers (Glueck, 1935: 77). No excavations have been conducted and no epigraphic evidence is from the site. Therefore, the date of construction requires further investigations. To judge from the ceramic evidence, Glueck (1935: 770) found an extensive quantity of Nabataean pottery sherds whereas Killick (1983: 127) reported Late Byzantine/Early Islamic sherds from the site. The ceramic evidence collected by the author shows that the site was in use during the following periods: Nabataean (1st c.AD), Roman (3rd c.AD?), Late Byzantine/Early Islamic and Ottoman.

The strategic location of the site and its fortifications (the walls are 1.2m thick) with a wide and clear view over the surrounding landscape, leaves no doubt that it was founded for military and security purposes. The abundant Nabataean pottery sherds at the site might suggest, as Glueck (1935: 77) stated, that the structure was Nabataean in origin. Moreover, the stonework of the structures does resemble masonry in many archaeological sites in the study area, and is totally different from the stonework of Udhruh fortress. However, the site was perhaps reused during the Roman period as a military outpost and by a unit detached from the legion at Udhruh.

If the site was utilized by the Romans it would compensate for the lack of vision northwards from the fortress of Udhruh and control and watch the presumed road which was running north-south via Udhruh (1987a: 175). A group of milestones can

still be seen at the west foot of the hill on which the site is situated. The location of the site is very appropriate for a signalling system with the tower south of Khirbet al-Jerba, Tell Udhruh and the towers at Sites nos. 032 and no. 038. In later periods, particularly the Late Byzantine/Early Islamic, the site continued to be used probably for security purposes. However, the protection of agricultural fields in the Wadi Udhruh and Wadi al-Jerba was probably the main concern of the military unit at Khirbet al-Temeiah at that time (Fiema, 1995: 267). Finally, the existence of Ottoman pottery sherds at the site suggests that it was also reused for security purposes.

#### **Tell Abara (Abu Ar'a)**

**Location:** Tell Abara lies on about 2 km southwest Udhruh. Tell Abara is a significant and prominent hill in the area around Udhruh.

**Architectural character:** The main feature at the site is a regular enclosure measuring 150×120m running around the top of the hill 'with openings' in the east and west side (Killick, 1986: 436-438; Kennedy, 2000: 170). Two-thirds, at least, of the enclosure occupies the west slope of the hill and the west side wall is very close to the base of the hill. The east side was located almost on the edge of the hill (Fig. 6.24). The enclosure was constructed of unhewn multi-sized limestone cobbles and boulders.

**Discussion:** The site was first noticed by Alistair Killick in 1980s when he was conducting fieldwork in the vicinity of Udhruh (Killick, 1986: 436-438). His initial thoughts about the site show that it 'could be a construction camp for Udhruh or even an army marching camp or practice camp' (Killick, 1986: 436). Following Killick's view, many scholars refer to the enclosure at Tell Abara as a possible Roman temporary military camp; a very rare structure in the Middle East (i.e. Kennedy and Riley, 1990: 107-108; Kennedy, 2000: 170; Parker, 1995: 258). A similarity in the architectural features of the structure at Tell Abara and the Roman temporary camps near Masada has also been noted (Kennedy and Riley, 1990: 107-108; Killick, 1986: 483). It is worth mentioning that a new possible temporary camp which lies northwest of al Jafr oasis has recently been published (Kennedy and Bewley, 2004: 175-176).



Although many scholars refer to the enclosure at Tell Abara as a possible temporary Roman camp on the basis of its location near the legionary fortress at Udhruh and its shape which resembles well known Roman temporary camps, there are some reservations about this identification. First of all, the stonework of the enclosure does not reflect any defensive measurements. Secondly, the enclosure encircles very steep ground on the hillsides. This ground does not seem appropriate for a military camp at all; it would be difficult to set up tents. Moreover, no internal divisions were noticed within the enclosure and there are no traces of a tented camp. Most of the alleged temporary camps in the Middle East seem to have been located on relatively flat ground (Kennedy and Riley, 1990: 95-110). Third, the ground at the western foot of the hill is more suitable for a camp; it is flat and well protected by the hill itself and a watch tower on the hilltop could easily keep an eye on the surrounding area and alert the camp. Fourth, there might have been a relationship between this enclosure and the qanat system to the east of Tell Abara. Fifth, it can be tentatively presumed that the enclosure is a prehistoric structure on the basis of the abundant presence of flint blades to the east of the hill.

#### **The Fort of Abu Danna (Site no. 219)**

**Location:** About 10 km southwest of Udhruh lies the fort of Abu Danna and approximately 300m to the east of the well of Abu Danna. The site was located on a relatively flat ground between two high hills. The site was considerably disturbed by a modern cemetery.

**Architectural character:** A rectangular structure built of hewn limestone blocks 'well drafted ashlar' was located at the site. The external wall on the south and west sides is still traceable whereas it is significantly disturbed on the north and east sides. It is c.75cm wide as it is constructed of two faces filled in with a rubble core. The interior of the structure seems to have been divided into regular units by internal walls running west-east between the west and east sides. Some internal units are still traceable (Fig. 6.25).

**Discussion:** The site was first noticed and identified as a fort by Alistair Killick in the 1980s (1986: 438, 1987: 30). Graf (1997b: 279) refers to the structure as a *castellum*.

Both scholars seem to have based their identification on the archaeological evidence which shows that the site was located on an ancient route between Udhruh and Basta. Traces of this route were found by the author in Wadi al-Beir about 600m north of the fort and a fairly well-preserved short segment a few hundred metres to the east of the site (Fig. 6.26). Moreover, the site is passed by another route which heads east-west and intersects the Udhruh-Basta route at a junction southeast of the fort. This route appears to have come from Ma'an and probably beyond (see Chapter 5) and approached Petra westward via the village of Abu Danna.

The fort of Abu Danna seems to have played a security and military role. First of all, the site was located on a road network connecting vital sites in the hinterlands of Petra. Therefore, it would control and watch the traffic on these routes. Secondly, it is quite possible that the fort was also constructed to protect the settlement at Khirbet Abu Danna which is naturally protected by high hills but from the east. Unfortunately, the archaeological evidence is not informative enough to estimate the size of the settlement at Khirbet Abu Danna since the construction of the traditional village has severely disturbed the ancient site. However, other archaeological deposits including hundreds of pottery sherds and complete objects reported by the local inhabitants indicate that a small village existed there. Moreover, the stones used to construct the traditional houses seem to have been taken from the ancient site. Finally, it is reasonable to presume that the protection of the well below the fort was considered and a fee was probably collected from caravans to use it.

#### **Malghan (Site no. 006)**

**Location:** The site lies about 7 km northwest of Udhruh and approximately 200m to the east of Ayn Malghan (spring). Khirbet Malghan is about 400m northwest of the site on the opposite hill. Finally, the site was located on a gentle slope.

**Architectural character:** A rectangular structure measuring 30×45m was constructed at the site. Large hewn limestone blocks were used to build the structure. The external or enclosure wall is fairly well preserved. The interior plan cannot be traced due to the extensive amount of stones and debris that have accumulated within the structure. However, some internal walls can be seen in the south part of the structure. Internal



divisions seem to have been built against the external wall in all sides. The building appears to have stood to a considerable height as a huge amount of collapsed stones can be seen around the external wall, particularly along the west and north sides. The building was probably accessed from the southeast corner.

Discussion: Judging from the stonework and the location of the structure, it can be assumed that it was used for security and military purposes, probably as a fort. A fort appears to have been necessary for protecting the extensive settlement site at Khirbet Malghan and guarding the spring and reservoir in the gulley below the site. Moreover, the land above and below the reservoir was evidently heavily cultivated in antiquity as indicated by terracing walls and traces of water channels running on either edge of the gulley further below the reservoir. Agriculture should have played a significant role in the economy of Khirbet Malghan. Many large threshing floors were identified to the west of the Khirbet.

Khirbet Malghan was also located on an important road network connecting the site with Petra, Udhruh and other sites in the region. It is passed by a significant road which heads northeast (probably from al-Jerba and beyond) to south and southeast (to Udhruh). Secondary roads heading westward were connected to this route; some of them might head westward to Petra via other secondary roads. According to this evidence, it is possible that the site contributed and benefited from regional exchange or even from the long-distance trade.

No excavation has been conducted at the site. Therefore, the date of the alleged fort cannot be confirmed. However, the ceramic evidence is reliable and valid in identifying the main periods in the site's history. The available evidence shows that the following periods are present at the site: Edomite (Iron Age), Nabataean/Roman (1<sup>st</sup>-2<sup>nd</sup> century AD), and Late Roman/Byzantine (4<sup>th</sup> century AD onward). However, the structure in its current situation may not have been constructed in one period. It was re-used and probably modified to suit the function during each period as the utility of the site could have changed through time. The continuation of settlement at Khirbet Malghan might have required permanent protection by the military authorities in the region. The site was probably garrisoned during the Nabataean period and most likely during the Roman and Byzantine periods. A small unit was perhaps detached

from the legion at Udhruh to secure the spring, the agricultural fields near Khirbet Malghan and to control the traffic passing the site via the Malghan road (Site no. 004). The structure was possibly utilised as a farmstead in the Late Byzantine period.

#### **Mahajat (Site no. 013)**

**Location:** The site was located about 10 km northwest of Udhruh and approximately 2km northeast of Khirbet Du'a'ij (Site no. 012). Topographically, it was situated on a gentle slope of a hilly area.

**Architectural character:** A rectangular structure measuring 32×20m was constructed at the site. It was built of large quarried flintstone blocks. The enclosure wall is still traceable and stands for the height of one course above the ground. The interior plan is not clear enough to be drawn. However, there are some internal divisions defined by internal walls built against the external wall. The long axis of the structure (32m) extends northwest-southeast. A large stone mound and a stone wall were respectively seen to the northwest and north of the ruins.

**Discussion:** The structure was designated as a security site on the basis of its location and architecture, even though the site could have also been utilized for settlement or as a farmstead sometime in antiquity. Killick (1987a: 176) rightly noticed the difficulty of distinguishing between a fortified farmstead and a military structure in the study area. However, there are sensible reasons to assume that the site was used for security purposes. It commands a strategic location with a clear view over Wadi Mahajat. The latter naturally gives access all the way down to Udhruh and up to Khirbet Du'a'ij. A spring and well reported by local people lie respectively north and southeast of the site, the protection of both should have been considered by Khirbet Mahajat. Finally, the area around the site including the valley seems to have been heavily cultivated. Many terrace walls are still fairly well preserved on the slopes of hills (Fig. 6.27).

To judge from the ceramic evidence, the site remained in use as late as the Ottoman period, but short and long periods of abandonment should be expected. The following periods were represented by pottery sherds collected from the site: Edomite (Iron



Age), Nabataean (1<sup>st</sup> century B.C.-2<sup>nd</sup> century AD), Roman, Late Byzantine (?), and Ottoman. Thus, the site probably continued to be used from the first century until the fifth or even the sixth centuries AD. During that period, a garrison might have been based at the site.

#### Umm Hilal (Site no. 144)

Location: About 10 km southeast of Petra and approximately 3.5 km west of Beir Abu Danna. The site was located on a high hilltop.

Architectural character: The author believes the site is the same one mentioned and described by Sir Aurel Stein in the course of fieldwork conducted in the 1930s in southern Jordan (Gregory and Kennedy, 1985: 337-340). Stein wrote: *“A hill rising some 250 feet [76m] above it to the east bears on its top the decayed remains of a small castellum. It forms a correctly orientated rectangle measuring 74 by 68 feet [22.55×20.73m]. The enclosing walls of 2.5 feet [76cm] have suffered much from closely approaching cultivation which has almost completely obliterated the north-west corner. In the interior the walls facing quarters on four sides are just recognisable, giving a uniform width to the rooms. The walls dividing the rooms can be traced only on the east side where also the entrance appears to have lain. The name of the hill was given to me as Umm Mekhlan, but the name of the ruin was heard by surveyor Iltifat Husain as Umm Hilal”* (Gregory and Kennedy, 1985: 337). The structure was built of hewn flintstone blocks.

Discussion: The structure was perfectly located on a very significant hilltop with a wide and clear view in all directions. Both the plan (Fig. 6.28) and the strategic location of the structure suggest it was used for military and security functions. A road network connecting vital sites in the area was identified in the vicinity of the site. A few hundred metres to the west, traces of two routes were found (the Zharah and the Kafr Ass-ham road), the latter could have been part of the *via nova Traiana* between Petra and Sadaqa and both seem to have originally commenced from Petra and approached southeast to Basta, Ayl, Sadaqa and beyond. The site would have also watched the Umm Hilal road down to Abu Danna.

A *castellum* on that hill would have also secured many settlement sites, water resources and fields east, southeast and northeast of the position. A group of settlement sites or farmsteads were located around the spring of al-Maen, southeast of the alleged fort at Umm Hilal. A large and important settlement site known as Khirbet Umm al-Jarad lies about 1.5 km to the northeast of the site. The spring of al-Maen, judging from its existence and abundant water, seems to have been the main water supply for the abovementioned sites. Therefore, its protection was probably considered by Umm Hilal fort. Finally, most of the slopes to the west and east of the site exhibit tangible evidence that they were heavily cultivated in antiquity. Many terrace walls and boundary walls were identified in that area.

Stein (Gregory and Kennedy, 1985: 337-341) refers to the site as a small *castellum*, giving the impression that the structure was constructed to receive a Roman military unit. In fact, Stein's plan shows a remarkable similarity with other Roman military sites in Jordan. However, the ceramic evidence collected from the site reveals that it was in use during the Late Nabataean and Early Roman periods (1<sup>st</sup>-2<sup>nd</sup> century AD) and probably in the Late Roman. It has been recently argued that the Nabataean pottery were continued to be produced even after the Roman annexation of Nabataea in 106 ('Amr, 2004: 237-45). Thus, it can be assumed that the small *castellum* at Umm Hilal was founded in the Roman period and the existence of Nabataean pottery sherds could be due to the continuous production of Nabataean pottery ware in Petra.

#### **Khirbet al-Hajareen (Site no. 264)**

**Location:** Approximately 3.5 km northwest of Khirbet Ayl and about 2 km north of al-Fardhakh. The site was located on a gentle slope (relatively flat ground) in a hilly and very high area to the southeast of Jebel Mabarak (1727m).

**Architectural character:** A rectangular structure which measures 32×24m was built at the site. It was constructed of large hewn limestone blocks. The structure is fairly well preserved and its walls still stand up to 1.75m, particularly with the perimeter wall. The latter has two faces, about 1.2m in thickness, filled with a rubble and stone core. The plan (Fig. 6.29) shows regular internal divisions. The latter were distributed around a large courtyard in the centre of the structure. Four major internal units were



recognised; two along the east side, two along the west side and one on the north side. The entrance was located in the centre of the south side.

Discussion: The structure is very significant in terms of its location, architecture and plan which does not resemble any other site from the study area. It was located at a strategic site with a clear and wide view over the surrounding landscape. It particularly overlooks the Wadi al-Fardhakh to the south and another valley in the south and the hilly area down to Ayl to the east. The site was also connected by a secondary road with a major route which seems to have come from Ayl in the northeast and approached south to al-Fardhakh, Sadaqa and probably beyond. The masonry of the building is very remarkable; most of the blocks are very large and seem to have been consciously quarried to meet a defensive function. The relatively large dimensions of the internal divisions would also reflect a specific use. Most of the internal divisions of the structures recorded in the study area are relatively small, being either square or rectangular.

Two possible functions for this structure can be suggested on the basis of the abovementioned information. Firstly, according to the strategic location and stonework of the building, it might have played a role in protecting and securing the settlement sites, their fields, water resources and the road network in the vicinity of the site. Four settlement sites were recorded to the east of the site and a complex of threshing floors was located on exposed bedrock approximately 600m southeast. The threshing floors cover a large area which might reflect the intensity of agriculture. If they were in use in antiquity, they might have been protected by the alleged fort. To the south and below the site is the village of al-Fardhakh where two springs and reservoirs in addition to a large settlement site were located (Glueck, 1935: 76; Graf, 1997a: VI 11). The road, to which the structure was connected, perhaps connected Sadaqa, al-Fardhakh, Ayl and Basta with Petra and Udhruh and beyond. The fort was located on a point where a clear view over this road was indeed possible for a distance. Second, the site might have been a *caravanserai* on the basis of its precise location on what appears to have been a major regional route.

Unfortunately, no epigraphic or stratified evidence was obtained from the site. Moreover, the ceramic evidence is scanty for only a few pottery sherds were collected

from it. However, judging from the ceramic evidence from the nearby settlement sites, the following periods are well represented in the area: Nabataean, Roman and Byzantine. The absence of Nabataean and Roman pottery sherds from the site does not mean that it was not in use or did not exist in these periods. The archaeological evidence from major sites such as Sadaqa, Ayl and Udhruh clearly shows a strong presence for both periods. If the road which passed the site was part of the *via nova Traiana* or a branch of it, as suggested elsewhere in this study (Chapter 5), the presumed fort should have been in use in the 3rd, 4th and probably the 6th centuries AD.

#### **Al-Unaiq (Site no. 274)**

**Location:** The site was located on a hilltop above the spring and reservoir of al-Unaiq in the south end of the modern village of al-Fardhakh.

**Architectural character:** A square structure measuring 21.5×21.5m was constructed at the site, and was built of multi-sized limestone blocks. The enclosure wall is fairly well preserved and still stands and has a considerable thickness (1m) as it consists of two faces with a rubble core. Five metres in from the south side wall and parallel to it, an internal wall was built. Another internal wall divides the area between the south side wall and the wall parallel to it into two parts. No internal walls or divisions were seen in the area between the north side wall and the interior wall which runs parallel to the south side wall. The ground at this part appears to have been paved. A stone wall was built outside the structure and parallel to the east side wall, probably to outline a courtyard. Finally, it is worth mentioning that a small fort (20×12m) was reported on the hills southwest of Ayn al-Unaiq (Graf, 1997a: VI11). However, although the dimensions are clearly not the same, the author believes that the reported site is identical with the site under discussion.

**Discussion:** The structure was positioned on a hilltop with a clear view of the spring and reservoir northeast and Khirbet al-Fardhakh to the north of it. The strategic location of the site suggests that a fort was constructed for security and military purposes. A fort on that hilltop would have participated in protecting the reservoir and spring and Khirbet al-Fardhakh which seems to have been a considerable settlement



site. Although the ancient reservoir is no longer traceable, a large reservoir must have existed on the basis of the abundant water being discharged from the spring into the modern reservoir. At present, small gardens grow in the area to the east of the reservoir. The same situation, with probably more and extensive agricultural activity, might have existed in antiquity. It seems also quite reasonable to suggest that the reservoir was a feeding station for caravans and local traffic in the light of the existence of a road network to the north and west of the site. If the structure above the reservoir was indeed a fort, the central authority (in Petra) may have considered organising the use of the reservoir and charges might have been applied. Finally, the site is typically convenient for initiating a signalling system with Rujm Sadaqa to the south and Khirbet al-Hajareen to the north.

No excavation has been conducted at the site to reveal a precise or stratified date. However, substantial amounts of pottery sherds are scattered around the site, particularly outside and to the east of the structure. The ceramic evidence reveals that it was continuously occupied from the first century AD up to the sixth century. The continuous use of the structure does not mean that it was used for the same purpose throughout its long period of use the site had. However, it is realistic to claim that the site was Nabataean in origin and reused in later periods, particularly the Roman and Byzantine periods. The archaeological evidence of the abovementioned eras is very tangible and strong from the surrounding area. Most of the sites recorded in the vicinity of the site exhibit Nabataean, Roman and Byzantine sherds. A Roman and Byzantine fort at al-Unaiq is therefore quite reasonable if the archaeological evidence is regarded. About 3 km south is the site of Sadaqa which was repeatedly attested in Roman and Byzantine sources, and where a military unit was located probably up to the 6th c.AD (Fiema, 2002a: 211). Moreover, it is claimed that al-Fardhakh was 'the Byzantine centre known as Pentakomia in the metropolis of Petra in Palestina Tertia' (Graf, 1997a: VI11).

### The Fortifications in the study area and the Roman Frontier and the *Limes Arabicus*

A scholarly debate has emerged in the last thirty years over the function of the military outposts and the relationship between the Romans and the nomadic tribes or Saracens in Arabia. Most of it is a response to Thomas Parker's hypotheses and conclusions concerning this theme (see Parker 1980; 1986; 1987a & b; Banning, 1986; 1987). Parker's hypotheses briefly assert that the relationship between Romans and Saracens was generally hostile and the fortifications were built to monitor and control the nomadic tribes along the frontier zone (the *Limes Arabicus*) (Parker, 1986: 6-10; 1987: 48; Fiema, 2002b: 132). Parker based his argument mainly on the results of his research in the region since the 1970s and on epigraphic and ethnographic evidence. The majority of the military units listed in the *Notitia Dignitatum* were located in forts and outposts along the desert fringe in Arabia whereas none were stationed in urban cities and towns (Fig. 6.30) (Parker, 1987b: 44-45; 1992: 470-471; 2002b: 80; Kennedy and Riley, 1990: 37). Epigraphically, thousands of inscriptions and graffiti written by nomadic people were recorded in the desert of north Jordan and south Syria, some of these mention raids and wars against the Romans (Parker, 1992b: 469). Parker also considers the influence of the nomadic people on urban centres whenever they are not subject to a central authority. They were, for example, very hostile and routinely launched raids on towns in Syria and Palestine in the 20<sup>th</sup> century when the Ottoman authorities were unable to protect them (1992: 469).

Parker's hypotheses were directly challenged. Isaac's point of view (1990) concerning the frontiers and the Roman military policy is clearly explained in Chapter 9 of his book *The Limits of Empire* (1990: 372-426), where he briefly denies that 'Roman frontiers were determined by choice and by a conscious decision to halt indefinitely all further advance' (1990: 387). Isaac also claims that it was not a matter to the Romans where the boundary ran (1990: 401). Moreover, he suggests that the term *limes* is mistakenly used in recent studies to mean a frontier zone or a zone of fortifications since the term was used to indicate 'a demarcated land border of the empire' in the first three centuries AD and 'to designate a frontier district under the command of a dux. It denotes an administrative concept, again unconnected with the military structures which may have existed in the area' from the 4<sup>th</sup> century AD onward (1990: 408-409; 1998: 345-387). Isaac claims that the external threat was rare



and ineffective whereas the security and control of provincial population was a priority to the Roman army. Finally, he asserts that 'not a single literary source mentions major difficulties caused by nomadic tribes before the Byzantine period' (Isaac, 1998: 124).

Banning (1986) and Mayerson (1989) presented alternative explanation regarding the nature of the relationship between the nomads and the Romans and the function of the frontiers. The former based his conclusions on a fieldwork study conducted in Wadi al-Hasa (southern Jordan). Presenting an alternative model for this relationship he suggested that 'there was no ethnic dichotomy at all, implying that all of the Roman-Byzantine sites within the study area belonged to a fairly homogeneous society with an agricultural base' (Banning, 1986: 44). Mayerson rightly reminds us that the literary evidence, which mainly comes from the accounts of Roman historians, represents one view or 'the Roman side of the picture'. He also suggests that the relationship between the two parties had two aspects; raiding and trading (Mayerson, 1989: 72-73). In addition to the well attested attacks launched by the nomadic tribes on the Roman provinces in Syria, Palestine and Egypt, there is also solid evidence indicating that the Saracens were involved in profitable activities such as selling animals, passing messages, guiding, and providing transport for travellers and pilgrimages in these areas (Mayerson, 1989: 73). However, this was not always the case as nomadic peoples can be hostile particularly in the absence of a central power (Mayerson, 1963: 162).

In his reply to Parker's view, Mayerson (1989: 75) wrote: "the major objection to that point of view is that we do not possess a recorded instance of a military unit "controlling" a nomadic raid; nor do we have a citation of Romans denying invaders food, water, and fresh mounts, nor of a mobile strike force taking pre-emptive action to intercept and destroy raiders". He concludes: "but it is quite clear that the Romans never were able, or committed, to control the movement of Arab tribes. At best, they could only react to situations, both small and large, as they arose" (Mayerson, 1989: 77).

From the 4<sup>th</sup> century onwards the long-ambiguous relationship between the Romans and the native people in the East, particularly those on the fringe of the frontiers in

Syria, Arabia and Palestine (meaning Tertia here), became increasingly lucid to the student and historian of this period. It is also becoming evident that the Saracens played a significant role in the conflict between Rome and Persia, and in the provincial administrative and military arrangements of the whole region. For this Isaac (1990: 235) states: "*from the fourth century onwards every author who discusses the eastern wars or every source of a local nature whether or not aware of the eventual success of the Islamic conquest-refers to the Saracens as a factor of importance*". And apart from the scholarly debate over the exact meaning of the term "Saracens", many scholars appear to accept the term to mean nomadic tribes (Graf, 1997a: IX 14; Mayerson, 1991: 291). Abundant attestations of the Saracens in 4<sup>th</sup> century sources can be found in the accounts of Ammianus Marcellinus as he dealt with them as allies and enemies (Graf, 1997a: X355; Parker, 1986: 5). The Saracens also served in the Roman army as troops; three cavalry units bearing the name of *Saracens* are listed in the *Notitia Dignitatum* (Seeck, 1962: 72-74; Mayerson, 1989: 76).

The nature of this relationship was indisputably based on alliances between the two parties, the Byzantine authority and the Arab tribal chiefs. From historical events, literary sources and epigraphic evidence, the relationship seems to have gone beyond the traditional sequences between two allies to the extent that Mavia, queen of the Saracens, fought on behalf of the Romans in 378 against the Goths (Shahid, 1984: 175). Of course, the basic duties of the desert people as allies included the protection of the frontiers and its roads from any incursions by other nomadic people. Moreover they played a role in fighting the rivals of Byzantium, the Persians, or at least containing the attacks of Persia's allies (Isaac, 1990: 240, 273). However, such relations must not be seen as an invention of the 4<sup>th</sup> century emperors since alliances or a sort of cooperation between Rome and the nomadic tribes is attested in the previous centuries, particularly the 3<sup>rd</sup> century. A third century inscription from Rawwafa, for example, commemorates a temple erected by Thamudic tribes to a Roman emperor, and the well-attested participation of the Tanukhids in the Roman war against Palmyra leaves no doubt that the roots of this relationship was deeper than the 4<sup>th</sup> century (Graf, 1997a: IX 16-17; Isaac, 1990: 238-239; Bowersock, 1983: 133-134).



The case of fourth century alliances is much more apparent for in this period we are able to present names, events and written material to reflect the situation. Of the main clients of Byzantium in the time period, the Tanukhids come first in the list. Irfan Shahid's *"Byzantium and the Arabs in the Fourth Century"* (1984) is fundamental in this matter. According to him (1984: 368-72) the Tanukhids were united groups of tribes in the service of Byzantium in Syria, opposite to the Persian frontier and its allies, the Lakhmids. Three kings of this confederation of tribes are attested in Arab sources, and this might indicate the short period of dominance the Tanukhids practised over other tribes, probably due to the appearance of a new and strong rival. The latter explanation is a reasonable consideration since the end of the 4<sup>th</sup> century witnessed the strong presence of the Salihids in Syria (southern Syria and northern Jordan) and the Mesopotamian desert. They also served as clients of Byzantium in the region (Isaac, 1990: 240; Fiema, 1991: 142).

A well-known inscription of 328 has long been the subject of scholarly discussion (Bowersock, 1983; Shahid, 1984). It was found at Namara, north-east of Jebel Druze (Isaac, 1990: 239). The significance of this inscription lies in its date, location and text. This funerary inscription mentions a certain Imru'l-qais and describes him as the 'king of all the Arabs'. Although the inscription dates to the period when both the Romans and the Saracens officially recognised each other, it does not explicitly inform whether Imru'l-qais was ally to Byzantium or not. However, many scholars accept the presence of such relationship between Imru'l-qais and Byzantium since the burial of this king was in a region in the province of Arabia under the Byzantine control, and near a Roman fort at Namara (Bowersock, 1983: 140; Shahid, 1984: 31-53).

The course of the 5<sup>th</sup> century was probably one of the rare times in which the eastern frontiers were not entirely exhausted by aggressive attacks. The relative stability was mainly due to the long period of peace between Byzantium and Persia (Watson, 2001: 465). This peace might have guaranteed a sort of prosperity in Mesopotamia and north-east Syria. The south-eastern fronts of the empire in Arabia and Palestine (Tertia) during that period as in the previous centuries remained outside the theatre of the conflict between the two powers. Making alliances with the main nomadic tribes along the fronts of these provinces continued to be Byzantium's favoured policy in

the region. The Salhids were the main federate of Byzantium in the 5<sup>th</sup> century. This tribe was controlling a wide territory in Syria, Mesopotamia, and northern Transjordan (Fisher, 2004: 51; Isaac, 1990: 240; Watson, 2001: 465).

With respect to the frontier of the 5<sup>th</sup> century, literary and archaeological evidence indicate a sort of weakness and decline since general and intensive military build up have not been attested in the time period except in some areas, and well-attested penetrations of important regions by ambitious tribal chieftains were recorded by contemporary sources (Parker, 1986: 146; 149; 1987: 816-19). A certain Amorkesos for example (probably Imru'l-qais but not the one mentioned in the Namara inscription) penetrated the frontiers of Palestina Salutaris (Tertia) around AD 470. He subsequently controlled the island of Iotabe on the Red Sea by force, and ejected the Byzantine customs officials (Mayerson, 1992: 1). This invader was not expelled from the island as one would expect, on the contrary, he was recognised by the emperor Leo in AD 473 and became a phylarch of Arabia Petraea (Fisher, 2004: 52; Isaac, 1990: 247; Fiema, 2002a: 213). Having taken charge of the area around Petra, Amorkesos might have seized the region of Udhruh as well. However, by the end of the century, in AD 498 Byzantine authority resumed control over the island after expelling the Arabs from there (Isaac, 1990: 248; Watson, 2001: 490).

The 6<sup>th</sup> century situation was totally different from that of the 5<sup>th</sup> century. The long-lived peace with Persia was over, particularly under Justinian who reigned from 527 until 565. During that time Justinian conducted three major wars with Persia, the last of which ended with a peace treaty in 562 (Watson, 2001: 465; Kennedy and Riley, 1990: 34). The ambitions of Justinian led him to attempt the recovery of the western provinces. Therefore, the army in the 6<sup>th</sup> century was fighting on the eastern and western fronts (Parker, 1986: 153). The role the nomadic tribes or Byzantine federates played on the eastern frontier was probably more vital than ever. On some occasions Roman troops were either led by Arab federates or joined them to attack a common enemy (Parker, 1986: 151; Isaac, 1990: 243). Two large tribes, the Kindites and Ghassanids, were respectively in the service of Byzantium during the course of the 6<sup>th</sup> century and after. The former were probably settled in Palestina Tertia whereas the latter were evidently settled in the province of Arabia (Shahid, 1995: 19).



The frontiers of Arabia and Palestina Tertia during the period under study seem to have experienced a sort of abandonment or at least a decline in importance, particularly in the 6<sup>th</sup> century (Watson, 2001: 490). This fact has emerged from the systematic fieldwork on either individual sites, or regional areas. Parker's work (1986; 1987) can be consulted on this matter. Major military sites in central Jordan, then part of Arabia, were abandoned by the beginning of the 6<sup>th</sup> century (Parker, 1987b: 820). Moreover, not one military building inscription has been recovered from the region. Nevertheless, an inscription of 529 from el-Hallabat records the restoration of the *castellum* there (Parker, 1987a: 821). The situation is not much better further south including the study area. Most of the structures which previously had military importance were either abandoned, or became civilian settlements, as at Udhruh and Ail, the key military sites in the study area (Watson, 2001: 490; Parker, 1986: 153). By the second half of the sixth century, especially under the successors of Justinian, the relationship between Byzantium and her allies, the Ghassanids, witnessed difficult times and led to the decline of the frontiers under the attacks of Persia's allies, or other nomadic tribes. Moreover, large areas in Arabia, Palestine, Syria and Phoenicia were penetrated by Byzantium's allies when the confidence, subsidies, and alliance were over (Parker, 1986: 153; Watson, 2001: 490).

To judge from the evidence from the region of Udhruh, neither Parker's model nor Isaac's conveniently explains the presence of military outposts, including the fortress at Udhruh, on the fringe of the desert and the relationship between the Romans and local people. In the study area, the distribution of military structures does not follow the same patterns, they were located throughout the landscape, on the edge of the desert and on the hilly areas. Local resources including springs and agricultural fields as well as the road network seem to have been the main concern of the security system since most of the military sites were closely located near such resources. This system was active whenever a central power was in charge. The presence of this system does not mean that there was a major threat, security measures can be set up at anytime and it is a common sense especially when a region is under a state control. In terms of date, talking about a certain security model during a certain period seems risky as many of the military outposts show evidence of site continuity from the Edomite period throughout the Islamic period. However, this system was actively in use during the Nabataean period on the basis of the collective archaeological evidence



from the region. Many of the Nabataean military sites continued to be used by Romans after AD 106 and new security structures were constructed (e.g. the fortress of Udhruh). The presence of the Romans as ethnic group was most likely restricted to military sites and very minimal in the Byzantine period when local chieftains became responsible for the security of the region. The Romans may have deployed and located military units after the annexation to control a potential resistance by the Nabataeans, but the protection and control of local resources seems to be their concern in later periods. Nomadic groups, although their presence cannot be denied particularly in a marginal area such Udhruh, do not seem to have caused a serious disturbance to the settled areas, at least in the study area. This conclusion based on the fact that the societies in southern Jordan in general and the area around Petra in particular were most likely semi-nomadic or originally nomadic groups settled in the region. The Nabataeans, for example, were nomadic groups settled in southern Jordan and established a state for many centuries. The people in southern Jordan, in our time, although settled and live in permanent houses and practise agriculture, still breed cattle and move in the desert to look after their livestock. The same lifestyle may have existed throughout the region's history taking into account the nature of the landscape which facilitates such lifestyle. Moreover, neither the epigraphic evidence nor the historical record indicates that the region did not accommodate significant and influential tribes, at least in the first three centuries, such as the Ghassanids or the Lakhmids. Therefore, the claim that nomadic groups were a major threat to the Roman frontiers all over the empire is not logical and lacks solid evidence. However, Parker's model may well work in other parts of the empire where the historical record and archaeological evidence indicate the influence of nomadic people on the frontiers. The suggestion that Roman military units were located along the frontiers to control local societies does not either work in the region of Udhruh and probably in southern Jordan due to the fact that large-scale settlements or cities are rare in the region and the geography of the region and lifestyle of the people would not even make such policy successful. The *Notitia Dignitatum* clearly shows that indigenous military units were in charge in the region as they could better deal with their locals and probably sort out any problem without using the force. This policy was commonly practised from the 5<sup>th</sup> century onwards according to the available evidence.



## Conclusion

Two types of military and security structures were distinguished in the study area, watch towers and forts. The size and location of the structure determine to some extent the type of structure. In terms of size, watch towers are usually medium or small whereas major military sites (forts) are either large or very large. With regard to watch towers, since they were mostly located on hilltops, the available space on that hilltop seems to affect the size of the structure. Moreover, the size of a watch tower should have also been dependant on the number of troops to occupy the structure. Forts or fortresses are much larger and were built to accommodate a large number of troops. Besides the strategic location, other factors such as the water and food supply and communication would have been considered before the construction of a fort. In many cases, forts were established to protect local communities and settlements and to interfere whenever there was a threat. In contrast, watch towers were constructed to offer information and send early alerts. However, some watch towers in the study area were big enough to accommodate a small military unit.

The fact that many of what have been identified as military and security sites lay on the edge of the desert or at least overlooking the desert does not necessarily mean that these structure were built to form a defensive line against the nomadic people or to deny them access. It would be more reasonable to talk about a security zone against the desert people if these structures were found to have been constructed in one period. Moreover, although the sites may fit in a regional security system, the concern of security and military sites in the study area is most likely internal rather external. Many of these structures were located near water resources, agricultural areas, on or near road networks and clusters of settlement sites. It should also be taken into account the possibility that the function of these structures changed upon time. Udhruh for instance, although it was the second largest Roman fortress in Jordan (Kennedy, 2000: 168), there is no reference to it as a military site in written documents such as the *Notitia Dignitatum*, rather it is attested as a town.

The security and military system in the study area on the basis of the archaeological evidence from the whole region, seems to have been actively in use during two periods, the Nabataean and the Roman (Chapter 6). The modern state of Jordan as

well as considerable parts of the neighbouring countries formed the body of the Nabataean kingdom which had a long period of prosperity particularly by the end of the 1<sup>st</sup> century B.C. and the beginning of the 1st century AD. During that period, military and security structures appear to have been constructed throughout the state to protect settlements, natural resources and the trade routes which approached Petra from the south (Arabia) and continued further north and west. The region considered in this study not only lies in the hinterland of Petra, but flourished in that period and might have supplied Petra with food due to its very agricultural nature. In addition, trade routes such as the Kings' Highway were built in the area (Chapter 5). Therefore, one would expect the presence of a security system in that period represented on the ground by watch towers and forts along the road network, agricultural areas and settlement clusters.

In the study area, the evidence regarding the date of most of the structures is provisional and derived from the surface ceramic evidence which needs to be confirmed by excavation. Many of the Nabataean security sites, particularly watch towers, seem to have been reused in this period. However, new military structures were undoubtedly founded at this time. The fortress at Udhruh and *castella* at Ayl and Sadaqa respectively seem to date to the Roman period judging from the architectural elements at these sites. The fortress of Udhruh is identical in plan to the Late Roman fortress excavated at Lejjun. Ayl is believed to be located on the *via nova Traiana* and the remains of what seems to have been a *castellum* with corner towers is still fairly well preserved. A milestone dates roughly to the late 230s was found in the valley below the site. Unlike Udhruh, Roman military units are attested at Sadaqa as late as the 6th century from the *Notitia Dignitatum* and epigraphic evidence. Small security structures were probably built in the 5th and 6th century AD, particularly in the area around Udhruh. At Udhruh the site and its neighbour al-Jerba were flourishing towns in the Byzantine/Early Islamic period, in the vicinity of both wide areas were cultivated. The presence of Udhruh the Justinianic tax list from Beersheba clearly indicates prosperity and consequently the existence of a force somewhere in the region to protect the settlements and fields and to guarantee the payment of the tax.

Judging from the archaeological, written and epigraphic evidence, the military and security arrangements in the study area are ambiguous in the two centuries after the



annexation. This situation is due to first a lack of evidence since no excavations were conducted. Second, many of the Nabataean military sites were probably reused by Romans and in this case the architecture is not helpful in distinguishing the date. Third, the ceramic sherds collected from the sites are broadly identified as Nabataean although it might date to the Roman period, simply because the traditional or local ware survived and remained in use before new styles see the light ( see discussion in Chapter 3, Pp 48-50). On the other hand, the picture is not complete but clearer from the 4<sup>th</sup> century onwards. The evidence is based on distinguishable pottery sherds, the architecture and a frequent attestation of certain sites in some documents. By the late 6th and Early 7th century, many structures might have been abandoned and the security of the region was probably totally in the hand of the local people or more precisely tribal societies. Both parties, the Byzantine authority represented by the emperor and the local tribes, led by chieftains recognised, the presence of each other. In some cases, a tribal chieftain like Abu Karb (Kaimio and Koenen, 1997: 462) disturbed the security of the region in the 6<sup>th</sup> century. However, whether the local tribes were responsible for the security of the region or small military units, it is very clear that neither of them was able to stop the Muslim army which reached Mu'tah (Kerak) without any resistance. In brief, by the 7th century there was no considerable military force in the region of Udhruh or even to the south of Wadi al-Hasa.

## **Chapter Seven**

### **The settlement pattern**

#### **Introduction**

This chapter will consider settlement patterns in the study area. There will be a chronological discussion for the patterns in the study area on the basis of the ceramic evidence collected from the sites. Some of the ceramic sites have already been discussed in this study under other topics such as the water supply systems and the military and security structures, even though, they will be displayed on the maps and reconsidered whenever is necessary. This chapter will mainly rely on maps to show the contrast in settlement patterns throughout the archaeological periods attested in the study area.

#### **Chronological Survey**

##### **Prehistoric Periods**

Generally speaking, prehistoric sites have long been identified, closely investigated and sometimes excavated in southern Jordan (Olszewski, 2001: 31-65; Rollefson, 2001: 67-105; Bourke, 2001: 107-162; Jobling, 1984: 191-201). Important sites were also found in the vicinity of Petra, as at al-Bayda (Kirkbride, 1968: 263-74). New prehistoric sites have been recently located and investigated in areas adjacent to the study area, namely in al-Jafr basin to the east of Udhruh and Ma'an (Rollefson, 2001).

In the study area, a Neolithic village (Fig. 7.1) was uncovered and excavated at Basta in the late 1980s by a German archaeological team (Nissen *et al*, 1987: 76-119). New sites showing evidence of human activities in prehistoric times were documented by Khairieh 'Amr in the course of a survey conducted in association with the construction of a water pipelines network, particularly in the area around Jebel al-Jithih ('Amr and al-Momani, 2001: 278). Nine sites out of 15 recorded in that area show evidence (flint tools) of prehistoric human activities, preliminarily dated to the



Palaeolithic period ('Amr and al-Momani, 2001: 278-281). The majority of these sites were seen and sometimes re-recorded by the author for the purposes of the study.

However, more evidence was recovered by the current study from new sites in the region of Udhruh. These sites are shown on Figure 7.2. At Site no. 037 (Tulail al-Ruz) northeast Udhruh, upper Palaeolithic pottery sherds and many quern stones (basin shape) were found (Fig. 7.3). The quern stones might reflect the existence of an agricultural society at that time. Flint tools, mainly scrappers, were found on the east lower slopes of Tell Abara near the qanat system (Site no. 054). Further south and west Jebel al-Tahuna, a few flint tools including one arrow head were found at Ayn Mafrij (Site no. 294). At Khirbet Whaidieh (Site no. 289), simple structures located on the hilltop and adjacent slopes besides a few Chalcolithic pottery sherds and flint tools clearly indicate that the site was occupied in prehistoric times.

#### **Iron Age 1200-539 B.C. (Edomite Period, Iron II)**

It seems worthwhile to have a brief historical and archaeological survey for the period under discussion ahead of analysing the data from the study area. The survey will only consider the evidence concerning the Iron Age of Edom or the Edomite kingdom. The interest in the history and archaeology of Biblical Edom started as early as the 19th c. AD (MacDonald, 1992a: 295; Bartlett, 1989: 15-32). Edom is attested in Egyptian written sources and in Biblical texts, particularly more in the latter due to the geographical proximity to Palestine (Bartlett, 1992: 287-290). Even though, the evidence from the abovementioned sources is usually seen as uncertain and is not enough to trace the development of Edom as a state (Bartlett, 1992: 288-291; Weippert, 1982: 153-157; Bartlett, 1989: 103). There seems common agreement among scholars that by the end of the 9<sup>th</sup> century B.C. Edom might have become a political state (Bartlett, 1989: 115-128; 1992: 290-291). Like other states in the Near East, Edom appears to have been subject to a political and probably military influence from the Mesopotamian powers of Assyria and Babylonia until its decline presumably by the beginning of the Persian period (539-332 B.C.) (Bartlett, 1989: 128-174; 1992: 291-293).

Archaeologically, Edom has long been bound to the area between Wadi al-Hasa in the north, Wadi Araba in the west, Wadi Hisma in the south and the desert in the east (Fig. 7.4) (MacDonald, 1992a: 295). However, it has been recently argued that Edom should have included the Negev Central Highlands and southern portion on the basis of Biblical and archaeological evidence (MacDonald, 1992a: 295; <http://nabataea.net/eborder.html>). Southern Jordan has received considerable scholarly attention as the homeland of the Edomites. However, most of the archaeological work, particularly excavation, has been directed to major sites such as Buseira near Tafilah, Tawilan and Umm al-Biyara near and at Petra and Tell al-Kheleifeh near Aqaba (Herr and Najjar, 2001: 334; Bienkowski, 1990: 91-109; Bennett, 1970: 371-374; 1971: v-vii; 1977: 1-10; 1984: 1-23). Bennett (1984: 19) suggested that these centres might have been capitals for the Edomite kingdom in different periods.

Figure 7.5 shows the sites where the archaeological evidence, particularly the ceramic evidence, indicates that there was occupation during the Edomite period or Iron II as many scholars refer to it. Many of these sites seem to have remained in use for several centuries, particularly during the first millennium AD. Interestingly, some of the sites, such as Udhruh (Site no. 050), Sadaqa (Site no. 282), Khirbet al-Jerba (Site no. 029), and Khirbet Malghan (Site no. 007), were clearly major settlement sites in later periods. Edomite pottery sherds were also found at sites which had security and military importance such as Rujm Sadaqa (Site no. 286), Tell Udhruh (Site no. 047) and at Udhruh itself where a Roman fortress was constructed. At Tell Udhruh for instance, besides the surface ceramic evidence, Iron Age (II) buildings were uncovered during the excavations there (Killick, 1987b: 24-25).

Despite the fact that Edomite pottery sherds were collected from about twenty sites, no single structure at these sites can be firmly identified as Edomite due to the fact the ceramic evidence from these sites dates to later periods as well. Therefore, without excavation it seems quite difficult to determine which structure belongs to the earlier periods and which belongs to the later periods. However, many of these sites consist of complex structures or adjacent buildings which were part of larger settlements. Thus, it can be arguably assumed that one or more structure was constructed in the Iron II period at these sites. At al-Jerba for instance, Iron II pottery sherds were collected not only from the Khirbet but from the watch tower on the edge of the hill



south of the site and this might indicate the presence of a settlement which required certain security measures. Moreover, the archaeological evidence at some sites shows that the large settlement site developed or expanded from a single structure on one part of the side.

At Khirbet Tell'et 'Eli for example, a three-internal division structure, probably a fort, appears to have been the first structure at the site. The site expanded eastward on the hilltop; traces of rectilinear walls and abundant stones can be seen to the east of the structure. The architectural material and layout methods also help to distinguish between the structures. The stones of the main structure are quite large and seem to have been quarried from one area. The site seems to have extended eastwards in later periods as indicated by the walls which are still traceable on the surface. The orientation and stonework of those walls are not the same as these of the main structure and there is no harmony between the two features. There are also some features, particularly small enclosures built of the site's stones, which reflect the use of the site in modern times.

In brief, Iron Age (Iron II) settlement in the study area was attested at the sites which in later periods became major settlements. Natural resources, particularly perennial springs, should have motivated the Edomites to establish their settlements where they were. The majority of Iron II sites were either directly located above or near a spring or in the vicinity of a water resource (Fig. 7.5). The general impression about these settlement sites indicates that agriculture was a major economic factor for their inhabitants. However, the available evidence may not reflect the whole picture; the sites which lack ceramic evidence of this period were not necessarily unoccupied during the Iron II period. It should be taken into consideration the fact that part of the population in Edom might have been pastoralists or lived in caves (Hart, 1986: 54). Tens of caves were documented in the study area; many of them show evidence of utilisation in different periods.

#### **The Persian Period (539-332 B.C.)**

The Persian period in Jordan in general and in southern Jordan including the study area in particular is probably one of the least epigraphically and archaeologically

documented periods. This period is commonly accepted to span between 539 B.C. and 332 B.C., from the fall of Babylon to Cyrus II, king of Persia, to the arrival of Alexander the Great to Phoenicia (Bienkowski, 2001: 347). It has been long believed that there was a gap in human settlement during the Persian period. Because of the lack of written sources and scanty of material culture, this hypothesis was suggested by Nelson Glueck in the 1930s and has been widely accepted subsequently (Glueck, 1935: 139; Sauer, 1986: 3; Bartlett, 1989: 165).

However, the hypothesis has been rejected in the light of the archaeological evidence revealed by excavations and surveys conducted in different areas of the country, particularly the work of C Bennett in southern Jordan (Bartlett, 1989: 165; Bienkowski, 2001: 349-352). In Edom, the evidence comes from Buseira, Tawilan, and Tell al-Kheleifeh. At Tawilan for instance, the excavations revealed a cuneiform tablet which concerns a contract regarding the sale of a livestock. It was prepared in the city of Harran in the accession year of one of the Achaemenid kings mentioned by name, Darius (Dalley, 1984: 19). However, the text does not specify which Darius, it could be Darius I (521-486 B.C.), Darius II (423-405 B.C.) or even Darius III (335-331 B.C.) (Dalley, 1984: 19; Bartlett, 1989: 166). At any rate, what interests us is the fact that Tawilan was occupied during the Persian period. At Tell al-Kheleifeh, human activity, including involvement in the long-distance trade, seems to have continued throughout most of the Persian period (Graf, 1990: 137; Pratico, 1985: 1-32).

Despite the thinly emerging archaeological evidence, the picture is still far from complete. Nothing is known about any administrative or provincial arrangements in southern Jordan (Edom) including the study area in the Persian period (Bienkowski, 2001: 348). However, David Graf (1990: 173-189) in his reconstruction of the imperial road system during the Persian period, suggests that a route connected Damascus with Aqaba at this time. This route, according to Graf (1990: 183; 1993: 156-160) started from Damascus and headed southward to Aqaba via Busra, 'Amman, Hisban, al-Karak, Buseira, Tawilan, al-Fardhakh, and Tell al-Kheleifeh. Bienkowski (2001: 348) responds to this claim by saying: "...but much of the evidence is tenuous: there are no specifically Persian-period finds from al-Karak or Fardakh [al-Fardhakh] (which is included only because the name seems to be of Persian derivation), and



there is no evidence for an actual road, although at this period even a royal road would have been a dirt track that is hard to detect archaeologically”.

In the study area, the Persian period was insubstantially attested at only two sites; Tell Udhruh (Site no. 047) and Site no. 138 at Abu Danna (Fig. 7.6). Although the evidence is scanty and questionable as it comes from a surface survey (Bienkowski, 2001: 351), the evidence cannot be excluded in the light of the archaeological evidence from either of the sites or from adjacent sites. At Tell Udhruh, an Iron II stratified settlement has long been uncovered (Killick, 1987b: 32) whereas Edomite pottery sherds were collected from Khirbet Abu Danna (Site no. 218) to the south of Site no. 138. The attestation of Iron II or Edomite settlement at Tell Udhruh and at sites near site no. 138 tentatively indicates continuity in settlement from Iron II to the Persian period. At a site such as Udhruh with its perennial spring, one should not exclude the continuity of human activity if one takes into consideration that archaeological materials which predate the Persian period were found there. Nevertheless, the lack of evidence from the study area in general would indicate that either the area was abandoned or a different lifestyle was practiced because of environmental or political changes; otherwise, there is no firm explanation for the significant drop in the number of sites which were occupied during the Edomite and Persian period (Fig. 7.7).

### **The Nabataean Period**

Since the historical and political issues concerning the Nabataean period were discussed in Chapter Two of this study and to avoid repetition, merely a brief review of this period, particularly regarding the settlement, seems worthwhile. It is now commonly agreed that by the first century B.C. at least, Nabataeans had permanent settlements in Edom and throughout most of modern Jordan (Fiema, 1991: 65-66; MacDonald, 1992a: 297; Parr, 1978: 204). Continuity of human settlement from the Edomite down to the Nabataean period in southern Jordan is very questionable and uncertain due to the lack of archaeological evidence (Hart, 1986: 57; Schmid, 2001: 367; Smith, 1990: 123-130). It has been suggested that after the Babylonians lost the region to the Persians, Edom passed into the hands of Arab tribes named as Nebaioth

and Qedarites in Biblical texts (Bartlett, 1989: 168-169), even though, this hypothesis seems speculative and requires further investigation (Bartlett, 1989: 168).

However, the Nabataean presence as a cultural, political realm and society is now beyond any doubt, not only in modern Jordan but in adjacent regions (Graf, 1992b: 450-66; Graf and MacAdam, 1989: 177-196). The archaeological evidence from southern Jordan in particular shows an abundance and the dominance of material culture which belong to this period. Apart from those which were found at Petra, tens of surveys and excavations have documented hundreds of structures including settlement sites, temples, water supply systems and other material culture in the region (MacDonald, 1992a: 297; Tholbecq, 1998: 241-254; Graf, 1992a: 254-56; Glueck, 1935). Many archaeological surveys, conducted in different areas in southern Jordan, in considering the settlement patterns conclude that the Nabataean period was dominant and significant in terms of its material culture (Hart, 1986: 58; Graf, 1979: 126; Hart and Falkner, 1985: 256, 258, and 268; MacDonald, 1992b: 75; Parker, 1992a: 322).

In the study area, the situation seems to be largely matching the conclusions drawn by previous studies. The Nabataean period is absolutely dominant and well represented. Nabataean sherds were collected from more than a 110 sites out of about a 160 (Fig. 7.8). The majority of the ceramics date from the first century AD onward. However, some sherds were dated to the first century B.C. Thus, the size and number of sites occupied during the Nabataean period in the study area is significant, specially when compared with previous settlements, and after the tangible gap in human settlement through the Persian and Hellenistic periods. However, this situation is not restricted to the study area. The same pattern is well attested within the borders of Nabataea. Many scholars credit king Aretas IV (9 B.C.-AD 40) with this flourish and prosperity (Graf, 1992a: 254; Schmid, 2001: 374-382; Bowersock, 1983: 59; Negev, 1977: 567). The Nabataean involvement in the long-distance trade as well as their creativity and innovation in agriculture and water supply systems seem to have been the main factors that led to such prosperity (Fiema, 1991: 64-79; Gogte, 1999: 299-304).

The involvement in long-distance trade appears to have affected the Nabataean settlement pattern in some areas since important towns and centres were located along the major trade routes (Graf, 1992a: 254). However, the picture is not the same in the



study area despite the fact that many sites were located on ancient routes which were presumably used for that purpose (see Chapter 5). The majority of these routes were constructed to ease communications between rural sites and urban and administrative sites such as Petra and lead to major water supply systems. The sites which have archaeological remains dating to the Nabataean period range from small and simple structures to a complex and multi-structure sites.

In terms of function, the sites fall into four categories: settlement sites, industrial sites (quarry or kilns), water supply system sites (discussed in Chapter 4) and military and security sites (discussed in Chapter 6). The major settlement sites at the level of village or a small town were located near perennial springs and these sites remained the major human settlement centres in the region until now. The vicinity of the major settlement sites is usually dotted with smaller size sites including farmsteads and hamlets. The presence of a spring would usually mean an increasing number of structures located in its vicinity (Fig. 7.9). Rock-cut cisterns were made to provide individual structures with water in the light of the unavailability of a permanent water source. It has been also noted that the distribution of sites during the Nabataean period can be linked to the suitability of the nearby land for agriculture. Not only are the surrounding fields of every site indeed fertile, there is physical evidence to support this interpretation. Terrace walls, field walls, clearance mounds and most likely boundary walls were observed near almost every site of this period. Threshing floors were also found in association with many settlement sites (small or large) which reflects the centrality of agriculture to the Nabataean economy (Fig. 7.10).

Although most of the evidence concerning permanent Nabataean settlement was collected from almost one topographic zone (on the hills and hillsides of al-Shera Mountains), there is a concrete archaeological evidence to claim that human activities extended eastward towards the desert. However, settlement in this zone is clearly restricted to the sites where water was available. Some of these sites seem to fall within the fourth category (military and security sites, see Chapter 6) to protect and guard the water source itself which must have been of great value in that area. Again, agriculture appears to have been the main interest here. Small and simple agricultural structures were found in the area to the east of the modern villages of Rashid (al-Qa'), Abu Danna, Basta, Ayl, al-Fardhakh and Sadaqa. Moreover, hundreds of stone heaps

mark that area, particularly the hillsides east and southeast Ayl and Basta, and were probably due to the process of preparing the land for cultivation. The evidence is also well attested in a drier area southeast of Udhruh in the Wadi al-Fiqai where a settlement site and two reservoirs, water channels and an aqueduct besides tens of field walls reflect agricultural activity. Some scholars refer to this evidence to support their claim that there was a shift, or expansion, in human settlement towards the desert in the Byzantine period (see Fiema, 2002a: 231-2). However, despite the fact that this hypothesis is true in the light of the archaeological evidence from the same area, it seems unreasonable to exclude the establishment of any Nabataean settlement in the same area.

As mentioned above, the sites which were occupied during the issue period range from small to large settlement sites. Excluding the sites that belong to the water supply systems and the military and security arrangements, the remaining sites (where a single structure or a complex of structures are the main feature/s at the site) would fall into the following categories: village or hamlet, farmstead or farmhouse, and a simple farming structure. However, it was noticed at many sites that there were some modifications and additions in later periods. The size and components of every site were taken into consideration to decide to which category each site should belong. The table below shows the sites dating to the Nabataean period and the probable function of each one.

Site No/Name of site or area	Probable Function
003/al-Zhaqiat	Farmhouse
004/Malghan road	Road
006/Malghan	Fort
007/Khirbet Malghan	Small village
008/Khirbet Maghair Zaid	Farmstead
010/Khirbet Qumaid	Farmsteads
012/Khirbet Du'a ij	Farmstead/road station
013/Khirbet Mahajat	Fort
017/Khirbet Qrah	Farmsteads



021/Swailmat	Tower and threshing floor
023/Khirbet Al-Nmaileh	Fortified farmstead
024/Khirbet al-Akhshan	Farmsteads
025/Khirbet al-Trabsieh	Farmhouses
027/Wadi al-Harab	Farmstead
029/Khirbet al-Jerba	Small village
032/Rujm al-Mattwi	Tower
034/al-Jerba	Caravanserai
036/Wadi al-Jerba	Unknown
041/al-Fiqai	Field walls
042/al-Fiqai	Reservoir
044/Khirbet al-Fiqai	Farmhouse
045/Jebel al-Tahkeem	Fort
047/Tell Udhruh	Tower
048/Birket Udhruh	Reservoir
050/Udhruh	Town/village/caravan station
053/unknown	Industrial/kiln
055/Tell Abara (Abu al-Ra'a)	Enclosure
056/Khirbet Rbai'	Farmstead
058/Abdat	Farmstead
059/Door Ibn Raja	Farmstead
063/Rujm Abd	Tower/road station
065/unknown	Small farming structure
066/Tell al-Safia	Tower and reservoir?
069/Abdat	Farmstead
071/Abdat	Structure inside a cave
072/Abdat	Farmstead
074/Abu Tiran	Farmstead
075/Abu Tiran	Farmstead
083/Abu Tiran	Farmstead

086/Abu Tiran	Farmstead
088/al-Juri	Farmhouse
089/Abu Suda	Farmhouse
090/Abu Suda	Farmstead
094/Umm al-Awsaj	Cave
095/Umm al-Awsaj	Rock-cut cistern
096/Umm al-Awsaj	Cave
098/Tell'et Eisa	Farmstead
099/Tell'et Eisa	Rock-cut cistern
102/Rujm al-Bitar	Tower
106/Khirbet al-Hazahzeh	Small village
108/Umm al-Futtus	Tower
111/Umm al-Futtus	Farmstead
114/Umm al-Futtus	Cistern
115/Umm al-Futtus	Farmstead
116/Umm al-Futtus	Farmstead
118/umm al-Futtus	Farmstead
121/Umm al-Futtus	Farmstead
122/al-Hatteh	Road station/caravanserai
126/Umm al-Jarad	Farmstead
133/Khirbet Umm al-Jarad	Fortified hamlet
135/Abu Danna	Farmstead
138/al-Khatebieh	Farmstead
139/Abu Danna	Industrial
140/Umm Hilal	Farmstead
143/Umm 'Arier 1	Farmstead
144//Umm Hilal	Fort
146/Khirbet al-Maen	Farmstead
147/Khirbet Tell'et Eli	Fort/Hamlet
152/Tellet Eli	Ritual place/farmstead
155/ Ras al-Mshubash	Cave/shelter
156/ Ras al-Mshubash	Cistern?



159/Ras al-Mshubash	Tower
160/Zharah	Farmstead
163/Zharah	Farmstead
166/Zharah	Farmstead
168/al-Dinarieh	Farmhouse
175/al-Bitahi	Farmstead
176/Wadi Muhaidhrat	Farmstead
178/Wadi Muhaidhrat	Farmstead
184/Ayn Muhaidhrat	Hamlet
185/Khirbet Muhaidhrat	Farmstead/fort?
192/Khirbet Ayl	Village/fort
197/Tell Qusaib	Tower/settlement site
198/ Rujm 'Abd al-Sagher	Tower
200/al-Madhba'a	Inscription
202/Khirbet al-Ajami	Caravanserai/fort
209/Maqtum Yousef	Enclosure
210/Door Khadhra	Structure/inscription
213/Maqtum Yousef	Cave
215/Wadi al-Dafianieh	Tower
217/unknown	Simple structures
218/Khirbet Abu Danna	Small village
219/Abu Danna	Fort? Farmstead
222/Rujm Abu Halaqeh	Tower
223/Khirbet Abu Qumrah	Farmhouse.
230/Wadi Basta	Farming structure
233/Khirbet al-Hasieh	Farmstead
238/Ayl	Tower?
239/Ayl	Stone circle
241/al-Jithih	Structure
242/al-Jithih	Farming structure
243/al-Jithih	Tower
245/al-Jithih	Stone circle

247/al-Jithih	Farming structure
249/al-Jithih	Stone circle
258/Ayl	Farmstead
259/Ayl	
270/Khirbet Sabbah	Small village
272/al-Fardhakh	Farmstead
274/al-Unaiq	Fort?
280/Sadaqa	Farmstead
282/Khirbet Sadaqa	Village
284/Ahmed Kashef	Tower/farming structure
285/Ayn al-Dirbasi	Unknown
287/Sadaqa	Farmstead
288/Khirbet Laikeh	Tower/farming structure
289/Khirbet Whaideh	Settlement site

### The Roman Period

The beginning and end of the Roman period in Jordan are debatable, and most of the suggested dates were based on historical events. For many scholars the Roman period in Jordan started in 63 B.C. when Syria became a Roman province, and soon after that north-western Jordan (the Decapolis) was joined to that province (Freeman, 2001: 427; Kennedy, 2004: 36). However, the rest of the country will have remained under the Nabataean control, as part of their kingdom, until AD 106 when Trajan's troops subdued Petra and what was a Nabataean realm became the Roman province of Arabia (Freeman, 2001: 427; Kennedy, 2004: 38; Fiema, 1991: 87). Thus, it can be said that the Roman presence (militarily and politically) in Jordan virtually started in AD 106. The end of the period is more problematic due to the dispute over the beginning of the succeeding period (Byzantine). The dates vary from one school to another, some scholars refer to the year AD 324 as the end of the Roman period and the start of the Byzantine period whereas others refer to the fifth or sixth centuries (Freeman, 2001: 427; Parker, 1986: 11). However, some scholars (i.e. Kennedy, 2004: 36-43) treat the whole period, up to the seventh century, as one period with only two subdivisions; Early Roman and Late Roman.



Before proceeding to the data from the study area, the question of continuity and the nature of the Roman influence on the region after 106 AD should be addressed. The continuity from the Nabataean to the Roman period is well attested in many parts of what previously was the Nabataean kingdom. Material culture post-dating the first and second centuries AD is repeatedly reported from modern Jordan (Parker, 1992a: 321-325; 1997: 189-193; MacDonald, 1992b: 73-6; Hart, 1986: 51-8; Graf, 1979: 121-127). Culturally, the Roman influence seems to be minimal or largely unnoticed. Freeman (2001: 428) concludes: "in one respect, then, to talk of a specific archaeological period that is characteristically or purely Roman is misleading, if not erroneous". In a recent paper, 'Amr (2004: 237-245) asserts that the "the evidence from the Petra region indicates a continuity of a [Nabataean] tradition of pottery making well into the [Late Byzantine] period" (2004: 240), and this is also the view of Parr (1978: 203). Therefore, it is very difficult, particularly in southern Jordan, to clearly draw a line between the Nabataean and Roman ware. The more attested Roman impact is the military and security arrangements through the construction of forts and outposts.

Does the evidence from the study area reflect the general picture attested elsewhere in the country? Figure 9.11 shows the distribution of sites which seem to have been occupied during the Roman period on the bases of the ceramic evidence. A glance at this map and Figure 9.8 easily demonstrates the continuity in settlement from the Nabataean to the Roman periods. However, the number of sites occupied during the latter period is slightly less than those which date to the Nabataean period. The ceramic evidence from the sites falls into two groups: Roman and Late Roman.

If the ceramic evidence is a true indicator, agriculture was still the main economic factor in the life of the society in the study area. The majority of the sites which were previously designated as farmsteads or farmhouses were still occupied during this period, and the same can be said about the large settlement sites which were designated as villages or small villages. However, this is not applicable to all the sites since there seems to have been a significant change in the function of certain sites after the Roman annexation. This shift in site functions clearly attested at three sites in the study area. The archaeological evidence from Udhruh, Ayl and Sadaqa, indicates that they were major settlement sites in pre-Roman periods (Killick, 1982: 415; 'Amr

*et al*, 1998:538-9; Gregory, 1995: 383-389, 390-391; 395-397). Roman military structures have long been suspected and investigated at these sites (see the discussion in Chapter 6). At Udhruh, a legionary fortress was constructed during the Roman period whereas a *castellum* or a fort was suspected at Ayl and Sadaqa. The strategic locations of the three sites seem to have motivated the construction of outposts. First, persistent springs are available at the three locations. Second, they command strategic points in the international and regional road network, particularly at Ayl and Sadaqa which seems to be stations on the *via nova Traiana*. Finally, the vicinities of these sites appear to have been agriculturally rich and offered food for the troops and for potential markets in the area. However, the available evidence from the abovementioned sites is not enough to distinguish between military and civilian occupation.

Judging from the ceramic evidence, new sites were founded during the Roman period in the study area. The function of each site varies, but the majority of them seem to fall within the military and security category, mainly watch towers or tower-like structures. Nevertheless, settlement sites were being established during this period. Roman pottery sherds not associated with pre-Roman ceramic evidence were collected from four sites (Sites nos. 145, 170, 257 and 276). The first two sites are relatively small and appear to have been farmsteads (Fig. 7.11) whereas the last two are much bigger, especially Site no. 276 which is most likely a hamlet or small village in the vicinity of Sadaqa. A complex structure and three more isolated structures were found at the site, which is by-passed by an ancient road (Site no. 278). Thus, it can be argued that the region continued to flourish and the Roman presence was not an obstacle.

As mentioned above, two types of pottery sherds were designated Roman. The first is broadly dated to the Roman period while the second type is more specifically dated to the Late Roman period. Pottery sherds that belong to the latter period were collected from 32 sites in the study area (Fig. 7.12). Many of these sites were already occupied at least from the first century AD, particularly those which had major settlement centres. However, the drop in the number of the settled sites in the Late Roman period compared with the number of sites which were occupied during the Roman period in general does not necessarily mean that the region was gradually abandoned. It should



be remembered that the current evidence is based on a surface survey rather than on the result of excavations. Despite the economic and security problems the empire had seen in the third century AD, the region seems to have been still important for the empire judging from archaeological evidence which suggests that Roman military outposts, such as the fortress of Udhruh, al-Hammam and al-Mutrab east Ma'an, were constructed in the Late Roman period (Parker, 1986: 94-102; 2000b: 373-374; 2000a: 121-138). With regard to the function of the sites which appear to have been settled during the Roman period, the majority retained the same function they had in the pre-Roman period. However, as mentioned above, the nature of settlement changed at certain sites due probably to the new arrangements the Romans introduced to the province of Arabia in general. The following table shows the potential functions of the sites occupied during the Roman period.

Site No/Name of site or area	Probable Function
002/unknown	Threshing floor
003/al-Zhaqiat	Farmhouse
004/Malghan	Road
006/Malghan	Fort
007/Khirbet Malghan	Small village
008/Khirbet Mghair Zaid	Farmstead
010/Khirbet Qumaid	Farmsteads
012/Khirbet Du'a'ij	Farmstead/road station
013/Khirbet Mahajat	Fort
017/Khirbet Qrah	Farmsteads
022/Ayn Al-Nmaileh	Caves and spring
023/Khirbet Al-Nmaileh	Fortified farmstead
024/Khirbet al-Akhshan	Farmsteads
025/Khirbet al-Trabsieh	Farmhouses
026/al-Burnos	Tower
027/Wadi al-Harab	Farmstead
029/Khirbet al-Jerba	Small village
034/al-Jerba	Caravanserai
036/Wadi al-Jerba	Unknown
037/Tulail al-Ruz	Watch point?

044/Khirbet al-Fiqai	Farmhouse/kilns?
045/Jebel al-Tahkeem	Fort
046/Tell Jraideh	Farmstead/caves
047/Tell Udhruh (Dubais)	Tower
048/Birket Udhruh	Reservoir
050/Udhruh	Fortress/town?
052/Udhruh	Watermill
053/Dhwawi Udhruh	Industrial/kiln?
055/Tell Abara (Abu a-Ra'a)	Enclosure
056/Khirbet Rbai'	Farmstead
059/Door Ibn Raja	Farmstead
060/Door Abu Zahaiqah	Farmstead
063/Rujm 'Abd	Tower/road station
066/Tell Al-Safia	Tower and reservoir?
069/Abdat	Farmstead
071/Abdat	Structure inside a cave
072/Abdat	Farmstead
075/Abu Tiran	Farmstead
083/Abu Tiran	Farmstead
086/Abu Tiran	Farmstead
088/al-Juri	Farmhouse
089/Abu Suda	Farmhouse
090/Abu Suda	Farmstead
094/Umm al-Awsaj	Cave
095/ Umm al-Awsaj	Rock-cut cistern
096/ Umm al-Awsaj	Cave
098/ Tell'et Eisa	Farmstead
099/ Tell'et Eisa	Rock-cut cistern
100/ Tell'et Eisa	Two caves
102/ Rujm al-Bitar	Tower
106/ Khirbet al-Hazahzeh	Small village
107/Umm al-Futtus	Checkpoint



108/ Umm al-Futtus	Tower
111/ Umm al-Futtus	Farmstead
115/ Umm al-Futtus	Farmstead
116/ Umm al-Futtus	Farmstead
118/ Umm al-Futtus	Farmstead
121/ Umm al-Futtus	Farmstead
122/al-Hatteh	Road station/caravanserai
126/Umm al-Jarad	Farmstead
132/Umm al-Jarad	Tower?
133/Khirbet Umm al-Jarad	Fortified hamlet
138/al-Khatebieh	Farmstead
140/Umm Hilal	Farmstead
144/ Umm Hilal	Fort
145/ Umm Hilal	Farmstead/road station
146/Khirbet al-Maen	Farmstead
152/ Tell'et Eli	Ritual place/farmstead
154/Zharah road	Road
155/ Tell'et Eli	Cave/shelter
156/ Tell'et Eli	Cistern?
159/ Rujm al-Mshubash	Tower
160/Zharah	Farmstead
163/Zharah	Farmstead
166/Zharah	Farmstead
168/al-Dinarieh	Farmhouse
170/ al-Dinarieh	Farmstead
176/Wadi Muhaidhrat	Farmstead
177/ Rujm Muhaidhrat	Tower
184/Ayn Muhaidhrat	Hamlet
185/Khirbet Muhaidhrat	Farmstead/fort?
192/Khirbet Ayl	Fort/village
197/Tell Qusaib	Tower
198/Rujm 'Abd al-Sagher	Tower?

202/ Khirbet Al-'Ajami	Fort/caravanserai
218/Khirbet Abu Danna	Small village
219/Abu Danna	Fort?
222/ Rujm Abu Halaqeh	Tower
223/Khirbet Abu Qumrah	Tower
229/Wadi Basta	Tower? structure
230/Wadi Basta	Farming structure
233/Khirbet al-Hasieh	Farmstead
236/Ayl	Tower
238/Ayl	Tower?
240/Ayl	Farmstead
243/al-Jithih	Tower
245/al-Jithih	Stone circle
246/al-Jithih	Mounds
247/al-Jithih	Farming structure
249/al-Jithih	Stone circle
254/al-Jithih	Mound and stone circle
257/Ayl	Farmhouse
258/Ayl	Farmstead
272/al-Fardhakh	Farmstead
274/al-Unaiq	Fort?
276/Khirbet al-Rwaiha	Hamlet
280/Sadaqa	Farmstead
281/Sadaqa	Farmstead
282/Khirbet Sadaqa	Castellum/village
285/Ayn al-Dirbasi	Unknown
288/Khirbet Laikeh	Tower/farming structure
289/Khirbet Whaideh	Tower? Farmstead?
290/Khirbet Wahadan	Farmstead



### The Byzantine period

The beginning of the Byzantine period in political and historical terminology is questionable like the end of the Roman period. However, many scholars refer to the fourth century, particularly the year AD 324 its start. In that year, Emperor Constantine moved the capital of the empire to Constantinople (modern Istanbul) or the Greek Byzantium (Watson, 2001: 461; Parker, 1999b: 135). The period in general is widely subdivided into two subdivisions: Early Byzantine and Late Byzantine (Parker, 1999b: 139). The end of this period in the East, particularly in the Levant, is well established and commonly dated to the year AD 636 when the Muslim army defeated a Byzantine force near the River Yarmuk in northwest Jordan (Watson, 2001: 461; Kennedy and Riley, 1990: 35).

Before the year AD 324, new administrative and military arrangements seem to have affected many regions in the eastern provinces including the study area (Lewin, 2002: 91-101; Münster, 1989: 555-71). The most significant change concerning the region of Udhruh occurred sometime by the end of the third century when the area from Wadi al-Hasa was detached from the province of Arabia and added to the newly established province known as *Palestina Tertia (Salutaris)* with its capital at Petra (Fiema, 2002a:192-195; Parker, 1999b: 137). Thus, from that time, the study area is no longer part of the province of Arabia until the Islamic period when a different administrative system seems to have been applied (Haldon, 1995: 379-423; see also Shahid, 1989: 208-243; 1987: 391-401).

Much fieldwork, regional surveys and excavation, has revealed that Jordan was intensively settled during the Byzantine period (Watson, 2001: 466; Piccirillo, 1985: 257; Parker, 1992a:321-24; Ji, 1998: 587-606; Fiema, 1992: 329). However, the density of settlement appears to decrease from north to south. The archaeological evidence was more tangible and dense in the northern parts of the country. Tens of towns, villages, farmsteads and ecclesiastical buildings, mainly churches, were documented there (Watson, 2001: 466-68; Kennedy and Bewley, 2004: 195). In southern Jordan, from Wadi al-Hasa to the Gulf of Aqaba, the Byzantine period is also well attested (MacDonald, 1992b: 75; Schick, 1994: 133-154; Fiema, 1991). Churches were found at Petra, Udhruh, and Humaima and suspected at Aqaba (Ayla),

and these sites seem to have been major urban centres in this period (Fiema, 2002a: 195-203; 209-213; Parker, 1999a: 373-76).

In the study area, the number of sites occupied during the Byzantine period is twice the number of sites settled during the Late Roman period but about half the number of sites occupied in the Nabataean and Early Roman periods. Judging from the ceramic evidence, 63 sites were occupied in this period, and as in the previous periods the sites range from small structures to large settlements and functions vary as well. Figure 9.13 illustrates the distribution of the Byzantine sites in the region of Udhruh, and clearly shows that they were concentrated in the vicinities of the major settlement sites which had permanent water resources. However, many of these sites were settled in previous periods. Finally, it is worth mentioning that two types of Byzantine ceramics were distinguished at these sites by the ceramist (Dr Khairieh 'Amr). The first type was broadly designated as Byzantine whereas the second type was more specifically designated as Late Byzantine.

From north to south, the following discussion will consider the major Byzantine settlement clusters. At the northern edge of the study area lies Khirbet Malghan. The size of the site and its location above a perennial spring and at a major route all confirm its importance in that period. The site seems to have been an agricultural village in the Byzantine period judging from its location in an agricultural area besides the presence of huge threshing floors at the site itself. The perennial spring in the gulley below the Khirbet must have influenced this prosperity. The road network should also have helped its inhabitants to exchange products with major settlement sites such as Petra and Udhruh. In the direct vicinity of the site, Byzantine pottery sherds were recovered from three sites (Sites no. 002, 006 and 010).

Further east, in what can be called the pre-desert zone lies Khirbet al-Jerba. It can be securely claimed that this was a town or at least a village in the Byzantine period on the basis of its size and the ceramic evidence found there. More importantly, al-Jerba is said to have paid the poll tax to the Prophet Muhammad, along with Udhruh, in about AD 630 according to Islamic sources (Schick, 1994: 149; Fiema, 2002b: 135). Therefore, al-Jerba must have been prosperous and important town in southern Jordan by the seventh century. This prosperity does not seem to have been gained overnight.



The site must have been grown throughout the fifth and sixth centuries. Various factors would facilitate al-Jerba flourishing. First, the site was located on a hilltop above a perennial spring. Secondly, the surrounding land, as today, was indeed suitable for growing many types of crops and fruits. Traces of ancient and modern field walls can be clearly seen in the Wadi al-Jerba north and northeast of the village. The site might have also derived some wealth from the Meccan trade with the Levant since there is a possibility that one of the trade routes passed the area (Fiema, 2002a: 231-234). Nevertheless, whether or not the site derived some benefits from this trade, agriculture seems to have been the core of its economy. Three sites to the east of al-Jerba appear to have been occupied in the Byzantine period (Sites no. 032, 036, 038 and probably 034).

Udhruh seems to have been a very important centre in southern Jordan in the Byzantine period. Although the site is dominated by the remains of the Roman fortress, written sources clearly reflect this importance as the site is attested in different sources. The most recent information is revealed in the papyri found at the Petra Church in the early 1990s (Peterman, 1994: 55-57; Koenen, 1996: 177-188). Besides its local name Udhruh, Augustopolis appears to have been the other name the town was known by, probably in the fifth and sixth centuries (Fiema, 2002a: 209). Economically, Udhruh should have been prosperous since it was listed on the Beersheba Edict paying the highest amount of tax among the towns of southern Jordan (Mayerson, 1986: 141-143; Watson, 2001: 469; Fiema, 2002a: 210). Ecclesiastically, the town was active judging from the participation of its bishops in church councils and meetings, respectively in AD 431 and 536 (Fiema, 2002a: 210). The Petra Papyri also mention the Church of the Saint and Glorious Martyr Theodoros in Augustopolis (Frösén, 2004: 142). Archaeologically, a church has long been found at Udhruh, about 30m northwest the fortress (Site no. 051). The fate of the fortress is not clear, but all the above indicates that Udhruh was a town in the Byzantine period.

Byzantine settlement sites were also found in the vicinity of Udhruh in all directions (Fig. 7.14). Important Byzantine settlements lay in the area between Udhruh and Ma'an. However, the archaeological evidence indicates that the area was occupied in earlier periods but heavily utilized in the Byzantine period, particularly the Late

Byzantine. A cluster of agricultural structures was found in the area of al-Fiqai. These include two reservoirs, water channels, huge agricultural fields and field walls as well as some small farming structures (Sites no. 043 and 044). This area should have contributed to the economy of Udhruh and provided food and products to the local market. The main settlement site in that area is Khirbet al-Fiqai (Site no. 044). However, Byzantine pottery sherds were not found here. The absence of ceramic evidence does not necessarily mean that the site was not in use during that period; it may have been missed at the site. Moreover, there is a structure just a few metres outside the northwest corner of Khirbet al-Fiqai probably built during this period. It was constructed of dressed stones very similar to the limestone blocks in the fortress at Udhruh. These stone were probably brought from the fortress when it lost its military importance. Finally, it cannot be assumed that Khirbet al-Fiqai was abandoned in economically a very important area.

In the same area, between Ma'an and Udhruh, a large settlement site (village, Site no. 216) emerged at the eastern foot of Jebel al-Tahuna in the Byzantine period (Killick, 1986: 438). Dwellings, reservoirs and agricultural fields were found within the enclosure. The dwellings were located at the foot of the hill whereas the fields covered the area between the east side of the enclosure and the dwellings. Judging from the ceramic evidence, the site was first founded in the Byzantine period, particularly the Late Byzantine. However, it is not attested in any Byzantine or Early Islamic sources. The size and components of the site indicate that the effort to establish the site was made by a group of people. The construction of the enclosure and the layout of the qanat system to the west of the site must have required a considerable human effort and financial support. The flourishing of Jebel al-Tahuna and other sites in the pre-desert zone must reflect stability and high security measures or the absence of any threat from the desert. However, this situation seems understandable in the light of the historical evidence which suggests that security of this area was in the hands of the local tribe chiefs or *foederati* in the Byzantine period (Fiema, 2002b: 132-133).

Further west, on the hills of what is now known as the villages of Ayl district, the situation is slightly different. The archaeological evidence indicates that the major settlement sites in our time, from Beir al-Bitar (north) to Sadaqa (south) were settled



during the Byzantine period. Unfortunately, the evidence is restricted to the ceramic record since the traditional villages at these sites (Bier al-Bitar, Beir Abu Danna, Basta, Ayl, al-Fardhakh and Sadaqa) seem to have overlapped and destroyed whatever Byzantine ruins existed there. Byzantine settlements were found in the countryside between these sites. However, the majority of the sites were previously occupied and some of them appear to have extended in this period. The density of human settlement in this area in this era is much less than the Nabataean and Roman periods. The information derived from the Petra church scrolls confirm that the hinterland of Petra, including this area, was heavily cultivated (Koenen, 1996: 183-185). The people, whose possessions the scrolls deal with, had lands and property in some parts of the study area, namely near Sadaqa (Kaimio and Koenen, 1997: 462). Sadaqa itself was agriculturally important and major Byzantine settlement and ecclesiastical site (Fiema, 2002a: 211-12). According to the scrolls, the Chapel of the Saint and Glorious Martyr Kyrikos was located in Zadakathon (modern Sadaqa) (Frösén, 2004: 142). Many of the sites which might have had a military presence in the Early Byzantine period appear to have not been garrisoned by the Late Byzantine period (Fiema, 2002b: 132-35; Parker, 2002: 80-81). The following table shows the sites which revealed archaeological materials date to the Byzantine period and the possible function for every site.

Site No/Name of site or area	Probable Function
002/unknown	Threshing floor
006/Malghan	Fort? Farmstead
007/Khirbet Malghan	Village
010/Khirbet Qmaid	Farmsteads
012/Khirbet Du'aïj	Farmstead
013/Khirbet Mahjat	Fort?
021/Swailmat	Tower and threshing floor

023/Khirbet al-Nmaileh	Farmstead
025/Khirbet al-Trabsieh	Farmsteads
027/Wadi al-Harab	Farmstead
029/Khirbet al-Jerba	Village
032/Rujm al-Mattwi	Tower
036/Wadi al-Jerba	Undetermined
038/Rujm al-Minbijis	Tower
041/Wadi al-Fiqai	Field walls
042/Birket al-Fiqai	Reservoir
043/Wadi al-Fiqai	Surface channel
045/Jebel al-Tahkeem	Fort? Farmstead
046/Tell Jraideh	Farmstead and caves
048/Birket Udhruh	Reservoir and field walls
050/Udhruh	Town
051/Udhruh	Church
056/Khirbet Rbai'	Farmstead and caves
058/Abdat	Farmstead
060/Dar Abu Zahaiqah	Farmstead
061/Rujm Ghrab	Tower
066/Tell Assafia	Tower and reservoir?
088/al-Juri	Farmstead



089/Abu Suda	Farmstead
090/Abu Suda	Farmstead
094/Umm al-Awsaj	Cave
106/Khirbet al-Hazahzeh	Small village
108/Umm al-Futtus	Tower
111/ Umm al-Futtus	Farmstead
116/ Umm al-Futtus	Farmstead
122/al-Hatteh	Farmstead
133/Khirbet Umm al-Jarad	Farmhouse
140/Umm ‘Arier 1	Farmstead
143/ Umm ‘Arier 2	Farmstead
146/Khirbet al-Maen	Hamlet
152/Tell’et ‘Eli	Undetermined
160/Zharah	Farmstead
163/Zharah	Farmstead
166/Zharah	Farmstead
192/Khirbet Ayl	Fort? Village
197/Tell Qusaib	Farmstead
202/Khirbet al-Ajami	Farmstead
216/Jebel al-Tahuna	Village
218/Khirbet Abu Danna	Village

223/Khirbet Abu Qumrah	Farmhouse
233/Khirbet al-Hsaieh	Farmstead
258/Ayl	Farmstead
260/Ayl	Tower
261/Banat al-Ashra	Farmstead
264/Khirbet al-Hajareen	Fort? Road station
270/Khirbet Sabbah	Village
272/al-Farhdakh	Farmstead
274/al-Unaiq	Fort? Farmstead
276/Khirbet al-Rwaiha	Village
282/Khirbet Sadaqa	Fort? Village
284/Ahmed Kashef	Undetermined
285/Ayn al-Dirbasi	Undetermined
287/Sadaqa	Farmstead

#### **Early Islamic Period (Umayyad and Abbasid, 7th to mid 9th century AD)**

As mentioned above, by the mid-seventh century (636) a new era commenced in the region of the Levant. Because the new period was not merely due to the success of a political movement supported by army, changes, particularly cultural shifts, seem to have been significant as a result of the adoption of Islam as a religion. A new provincial and administrative system known as Amsar or Jund was also introduced. Jordan, the modern country, fell within three Junds; Filastin [Palestine], al-Urdun [Jordan] and Dimashq [Damascus]. The majority of the new administrative centres continued to grow from that time to our time and became important urban centres. A



very good example is the city of Cairo which was founded in the Early Islamic period and known as al-Fustat at that time (Whitcomb, 2001: 503-506; 1994: 155-170; Scanlon, 1994: 171-179). However, ancient urban centres were not abandoned but continued to flourish such as Damascus which was the political capital of the Islamic state during the Umayyad period (Ball, 1994: 52-68).

The most significant Early Islamic archaeological sites are the desert palaces in north and northeast Jordan. Therefore, most of the archaeological research in the past decades has concentrated on these palaces (Whitcomb, 2001: 505-509; Ettinghausen and Grabar, 1987: 45-71; Creswell, 1989). In southern Jordan, the picture has recently improved due to the results of scholarly fieldwork, surveys and excavations (Schick, 1994: 134-142). Two important Early Islamic sites, Aqaba (Ayla) and Humaima (Auara), have been recently excavated in southern Jordan (Whitcomb, 1994: 155-170; Anver and Magness, 1998: 39-56). Petra, the most important city in southern Jordan for centuries, seems to have lost its significance in the Early Islamic period (Fiema, 2002a: 239). However, Early Islamic settlements are attested at sites in the direct vicinity of Petra, particularly at the town of Wadi Musa ('Amr *et al*, 1998: 516-529). Ma'an, southeast of Udhruh and the modern administrative centre of the region, is also well attested in Islamic sources (Schick, 1994: 148-149).

In the study area, the general view indicates a decline in the human settlement. Twenty sites were occupied during this period based on the ceramic evidence. Most of these sites were previously settled in the Late Byzantine period. However, the ceramic evidence from other Late Byzantine sites does not indicate any continuity. The settlement pattern in the study area during the period under discussion is more or less restricted to the area between Udhruh and Ma'an, particularly around Udhruh (Fig. 7.15), even though Early Islamic settlement is attested elsewhere in the study area. Ayl and Sadaqa, for instance, appear to have been occupied at that time, but no information is available about the nature of the settlement or even the fate of the alleged forts at both sites.

Udhruh gradually became a very important place in southern Jordan from the Late Roman period when a Roman fortress was built there. From that time onward its importance was clearly established. The town is listed the second on the Beersheba

Edict and about AD 630 paid the poll tax to the Prophet Muhammad along with its neighbour al-Jerba (Schick, 1994: 149). Udhruh and al-Jerba appear to have been flourishing agricultural towns in the Late Byzantine and continued to thrive in the Early Islamic period. By that time, the area seems to have had no garrison or security force, Muslim troops camped near Ma'an and marched to Mu'tah near Kerak to meet the Byzantine army without any resistance (Harding, 1967: 51; Cameron, 1993b: 188-9). The size of the settlement at three sites (al-Jerba, Udhruh and Jebel al-Tahuna) reflects a sort of stability and security in that region. It is just at this time that settlement in the pre-desert zone is more intensive and significant than that on the hilly areas or the mountains of al-Shera in all the historical periods. However, despite the fact that the entire region of Bilad al-Sham (Levant) was soon after AD 636 under the Muslim control, political, administrative and probably cultural changes did not appear immediately (Cameron, 1993b: 186-7; Haldon, 1995: 379). Written evidence shows that Christianity existed at Udhruh up to the tenth century AD. Fiema (2002a: 210-11) reported that "a Sinaite manuscript dated to A.H 288 (900/1) had been written by Thomas, an Egyptian monk, for the priest Musa ibn Hakim el-Adhruhi [from Udhruh]".

Some hypotheses can be suggested to explain the decline of human settlement in the region in general and the focus of settlement in the area around Udhruh in the seventh and eighth centuries AD. First of all, it has to be noted that the abovementioned conclusions concerning the settlement pattern in the region of Udhruh in the Early Islamic period are based on the ceramic evidence. The lack of ceramic evidence at some sites for this period does not mean certain abandonment or a settlement gap at all. In some cases surface evidence indicates the absence of one period whereas excavations proved otherwise (Parker, 1986: 12). Moreover, it seems quite difficult to draw a line between Late Byzantine and Early Islamic wares, a long time should have spanned before new traditions or pure Early Islamic ware saw the light. Thus, many of the sites which have Late Byzantine ceramics could have been occupied during the Early Islamic period, and in this case, the decline of human settlement would not be significant.

If the ceramic evidence, however, reflects the real situation in the Early Islamic period an alternative explanation is required. The decline of settlement in this period in the



countryside of Petra was probably due to the decline of Petra itself which gradually lost its importance as an administrative and trade centre. If this was the case, the products of the agricultural society in the hills east Petra would have lost an important market at Petra. This situation might have led to a shift in the nature of society, from agricultural to a pastoral or even semi-nomadic society. The latter might have existed in the area between Udhruh and Ma'an where the topography and landscape suits a semi-nomadic existence. The inhabitants of that zone could have had fields in the Wadis of al-Jerba, Udhruh and al-Fiqai and animal flocks. Islamic sources mention a certain chieftain or Sheikh from the tribe of Judham in the area around Ma'an converting to Islam. The same sources refer to him as the Roman governor of Ma'an (Schick, 1994: 148/9). This story might support the argument that a nomadic or semi-nomadic society existed at the region of Udhruh in the Late Byzantine and Early Islamic period. Finally, the decline of human settlement in the region in the same period might have been due to the cultural changes which Islam imposed. The majority of the inhabitants of the entire region of Bilad al-Sham accepted Islam and started to follow its teachings. During the Early Islamic conquests many of the conquered regions' inhabitants joined the Muslim army and consequently moved to new areas to take part in the Holy War. On the other hand, some migrated to the urban centres to learn the teachings of the new religion from the scholars who were based in the major cities (al-Mubarakpuri, 1995).

#### **The Middle Islamic Period (middle 9<sup>th</sup> to 15<sup>th</sup> century AD)**

The middle Islamic period witnessed many historical events and socio-political changes in the entire Middle East including Jordan, the least of which is that many political powers swapped control over Greater Syria or Bilad al-Sham (Walmsley, 2001: 515-559). The same period had also seen the Crusaders impose their military and political control and establish their provinces in the same area. The discussion here will consider southern Jordan including the study area under the following powers: Fatimid, Crusader and Ayyubid and Mamluk.

Jordan in general and southern Jordan in particular, appears to have lost some of its importance under the Abbasid dynasty who established their capital at Baghdad in the ninth century (Whitcomb, 2001: 506-507; Harding, 1967: 52). In the tenth century,

the region was subject to the Fatimid dynasty in Egypt. Geographically, according to the Arab geographer al-Muqadassi, the country was divided into three districts bounded by natural landmarks. The district of al-Urdun is north Wadi al-Zarqa, the district of al-Balqa' is between Wadi al-Zarqa and Wadi al-Mujib (Biblical Arnon) and the district of al-Sherah south of Wadi al-Mujib. The capital of the latter was Sughar (Zoar) south the Dead Sea. Ma'an and Udhruh are listed among the major settlements in the al-Sherah district (al-Muqadassi, 1994: 141). During the course of the eleventh and twelfth centuries and under the Crusaders, the importance of southern Jordan is archaeologically demonstrated by four significant castles constructed at al-Kerak (AD 1142), Shaubak (1115) and Petra (two castles, al-Wu'ayra (1115/6) and al-Habis (?). during that period. Wadi Musa was obviously the main settlement and administrative centre in al-Sherah. Its people are said to have unsuccessfully revolted twice against the Crusaders (Walmsley, 2001: 518-20; Harding, 1967: 52; Pringle, 2001: 667-684).

By the middle of the twelfth century, some Muslim leaders, particularly the dynasty of al-Zanki under the leadership of Sultan Mahmud and his son Nur al-Din and the Ayyubids under Salah Al-Din [Saladin], initiated military campaigns to end the Crusader control of (Greater Syria) and Jerusalem (Walmsley, 2001: 520). Nur al-Din raids in Syria appear to have been successful to some extent whereas Saladin campaigns failed to subject the military outposts in southern Jordan such as al-Kerak and Shaubak. However, he was victorious in AD 1187 when he defeated the Crusaders in the Battle of Hattin and resumed the Muslim control over Jerusalem and more importantly unified Egypt and Syria. The castles of Shaubak and al-Kerak soon came under the Ayyubid control in AD 1188 (Lane-Poole, 2002: 147-170; Walmsley, 2001: 520). The next dynasty to rule the region, until AD 1517, was the Mamluk. Jordan, under the new regime, was mainly governed from al-Kerak; one of the two administrative divisions or *mamlakah* [kingdom] during the Mamluk period. The kingdom of al-Kerak extended further south to include northern Hijaz, Wadi Araba, and the Sinai Peninsula (Walmsley, 2001: 521).

From the discussion above, we learn that major human settlements were concentrated in the vicinities of the administrative and military outposts (castles) throughout the middle Islamic period. The second type of settlements was focused along the



pilgrimage (Hajj) route between Damascus and Mecca. Many of the castles which were built either in this or in the subsequent period ensured the security of this route and the protection of pilgrims (Walmsley, 2001: 529-33; Petersen, 2001: 686; 1989: 99; Grant, 1937: 224). Despite the fact that this route was used only once a year, its role in attracting permanent settlements is clear, especially at the stations which became cities and administrative centres in later periods. The inhabitants of these stations could have gained some wealth from exchanging goods with the pilgrims and offering paid services for them such as accommodation, drink and food. A good example is the city of Ma'an which was often attested in the accounts of geographers and travellers as a station on the Hajj route (Burckhardt, 1822: 436/7; Petersen, 1989: 97-103; Schick, 1997: 75). Ma'an now is the major settlement and administrative centre in the area roughly from Jurf al-Darawish to Ras al-Neqb. Finally, a third type of human settlement was located near the holy sites (Walmsley, 2001: 521, 554/5).

In the study area, Figure 9.16 shows that pottery sherds dating to this period, mainly Ayyubid and Mamluk, were found at eleven sites only. Apart from Sadaqa, the remaining sites lie in the vicinity of Udhruh. Among these sites are Khirbet al-Jerba and al-Fiqai north and southeast of Udhruh respectively. al-Muqaddasi, a Muslim geographer of the 10<sup>th</sup> century, lists Udhruh among the major towns of the district of al-Sherat. The latter was one of the six regions of Bilad al-Sham according to al-Muqaddasi's division (1994: 141). He describes Udhruh: "*Adhruh is an outlying town on the borders of al-Hijaz and Syria. They keep here the mantle of the Messenger of God-God's peace and blessings be upon him-and a treaty from him written on parchment*" (al-Muqaddasi, 1994: 161). The presence of Ayyubid and Mamluk ceramics at Udhruh and the other sites would indicate the area continued to flourish despite the fact that Udhruh might have lost its importance to other centres, particularly the castle towns such as Shaubak and Wadi Musa, during the Crusader period (Walmsley, 2001: 518/19 ). Shaubak and Wadi Musa not only had strategic locations on the pilgrimage route and the routes to Palestine via Wadi Araba, but were economically significant due to the abundance of crops and fruits they produced (Walmsley, 2001: 20). During the Ayyubid-Mamluk period, the sugar trade flourished and probably reached its peak during this period. Sugar cane was being intensively grown in the Jordan Valley until the fourteenth century (Walmsley, 2001: 542/3).

However, the fact that the main economic and agricultural centres during the Ayyubid-Mamluk period were concentrated in the Jordan Valley does not mean that other regional agricultural areas were abandoned. The evidence from the study area suggests that Udhruh and its vicinity was still productive in that period taking into account that water resources and fertile soil were available at Udhruh, al-Jerba and Sadaqa. Ayyubid-Mamluk ceramics was even found at marginal sites such as Khirbet al-Fiqai where two reservoirs and fields are still fairly well preserved. Khirbet al-Fiqai was probably an industrial site in this period based on the existence of what might have been smelting ovens at the site. This type of industry is well attested at Mamluk sites (Walmsley, 2001: 543). Historical sites such as Udhruh and Sadaqa, at strategic locations, should have also achieved some prosperity during this period through trade or good exchange with regional centres such as Ayla which was a trade centre in the Crusader period (Walmsley, 2001: 542). Some of the products could have been sold to the garrisons in the castles at Shaubak and Wadi Musa. Moreover, a site such as Udhruh might have been a secondary or alternative station on the Hajj route since its path changed considerably due to the political situation in the middle Islamic period (Walmsley, 2001: 543/4) (Fig. 7.17). Food, water and accommodation should have been available at Udhruh. Finally, it is worth mentioning that Saladin during his campaigns against the Crusaders near Shaubak encamped at al-Jerba in AD 1182 (Walmsley, 2001: 520; Lane-Poole, 2002: 129).

From the discussion above, it can be noted that the political situation was unstable and security was relatively restricted to certain areas or towns (Walmsley, 2001: 554/5). This situation appears to have negatively affected the countryside which seems to have lost its importance to the main urban and administrative centres. Moreover, many of the sites which were occupied during the first half of the first millennium AD declined or were abandoned by the Early Islamic period. No attempt was made to reuse the water supply techniques which were brilliantly utilised in previous times such as the rock-cut cisterns. Finally, it can be rightly assumed that the society was more nomadic during that period and therefore the chances of finding material culture of the period is difficult and restricted to the sites which had major human activities and settlements (Saidel, 2000: 569-580).



### The Late Islamic Period (Ottoman)

By the first half of the 16<sup>th</sup> century, the entire region of Greater Syria and Egypt came under the Ottoman rule (Raymond, 2002: 18; Imber, 2002: 57-59). In 1516 Jordan was taken over following the defeat of the Mamluk governor of Aleppo (McQuitty, 2001: 563). For the rest four centuries (until 1918), the country remained under the Ottoman political and administrative systems. During this period, Jordan lay within the province (*wilayah*) of Damascus, and with regional administrative subdivisions well attested in historical sources (McQuitty, 2001: 563). Important information concerning many parts of Jordan, particularly the agricultural areas, can be found in the Ottoman taxation archive (*defter mfassel*) of the late 16<sup>th</sup> century (Hütteroth and Abdulfattah, 1977). The region of Udhruh is not listed in the documents, but the mention of well-known tribes such as Huwaytat from the region in the archive indicates that tax was also collected from the region of Udhruh at that time (Hütteroth and Abdulfattah, 1977: 173).

However, despite the very long period during which the country lived under the Ottomans, the material culture, for some scholars (e.g. McQuitty, 2001: 561), is limited and hardly recognisable. Apart from the attestation of many sites in sources dating to the same period, the archaeology of this period is mainly restricted to the forts located along the pilgrimage route, the most recognisable and visible Ottoman material culture in Jordan (McQuitty, 2001: 563 and 569; Petersen, 2001: 685-691). Furthermore, the period under discussion has received little attention in most scholarly studies concerning the archaeology of Jordan, and the available evidence has only come from the areas which were systematically and intensively surveyed. Therefore, the picture of settlement patterns during the Ottoman period is still far from complete (McQuitty, 2001: 568).

Nevertheless, historical sources reflect the presence of agricultural societies focused in villages where olives and fruit trees could be grown whereas seasonal settlements might have existed in the grain and summer-crop production areas (McQuitty, 2001: 568). Mixed farming is the common economic activity in the country throughout the period (McQuitty, 2001: 565). Nomadic society was also present and gradually got involved and affected the security of the country in the nineteenth century,

particularly that of the Hajj route. Gold was paid to tribal chiefs by the Ottoman sultans to guarantee the security of pilgrims (Doughty, 1989: 30). The accounts of European travellers indicate a strong presence of the nomadic tribes and the danger they imposed to the security of the whole region in the eighteenth and nineteenth centuries (Grant, 1937: 205-218)

Unlike the Ayyubid-Mamluk, the Ottoman period is relatively more obvious based on the ceramic evidence. Thirty sites revealed Ottoman pottery sherds; just a few sherds were found at some sites (Fig. 7.18). However, all the sites were occupied in preceding periods. Major settlement sites, probably villages, could have existed at al-Jerba, Udhruh and Sadaqa. Udhruh at this time appears to have retained its importance in the region since a fort was constructed there sometime in this period. It was located in the north-eastern part of the Roman fortress near the spring (Fig. 7.19). The construction of the fort must have been a security necessity to protect the spring and the settlement, and it was highly likely a station on the pilgrimage route (McQuitty, 2001: 569). A garrison at Udhruh would have also controlled communications with other centres such as Shaubak, Wadi Musa and al-Jerba. It could have also been in charge for collecting the tax from the farmers.

The area around Khirbet al-Fiqai, southeast of Udhruh, appears to have been agriculturally utilised in this period. If the area was rightly cultivated in that era, it would be reasonable to assume that the *qanat* system south of Udhruh was still in use. Jebel al-Tahuna was also occupied on the basis of ceramic evidence. However, further investigations are required, particularly excavation, to determine the nature of Ottoman presence at the site. According to Abdullah Dhyab (an inhabitant of Udhruh met in the field in October 2003), the Ottomans constructed a water supply system between Udhruh and Jebel al-Tahuna, part of which is the structure (watermill) southeast the fortress at Udhruh. The security of water resources in this area was taken into consideration. Ottoman pottery sherds were found at Tell Qusaib, south of Udhruh. A perennial spring used to flow at the western foot of the hill.

On the hills west and southwest of Udhruh, the available evidence does not indicate a certain settlement pattern. However, more sites are to be found near springs or wells. Some the sites were reoccupied after a long period of abandonment. The relatively



stable security situation might have encouraged the reoccupation process. Ottoman security and military points are still being mentioned in the tales of the local people, particularly the elders. Ancient security sites might have also been reused. A Turkish military road connecting Ma'an with Gharandal in Wadi Araba was reported by Glueck in the area below Rujm Sadaqa (1935: 72). A few Late Ottoman pottery sherds were found at the Rujm (Parker, 1986: 100). The existence of this road seems quite reasonable in the light of the available evidence. Ottoman ceramic evidence was found by the author at two sites (Khirbet Laikah and Whaideh) in the area between Ma'an and Sadaqa. Moreover, two springs, one below Khirbet Whaideh and another below Rujm Sadaqa besides the spring of Sadaqa, should have been supply points along the presumed road. A local inhabitant of Whaideh confirmed the existence of this road.

Finally, if the accounts of the local people concerning the nature of settlement pattern during the Late Ottoman period (18<sup>th</sup>, 19<sup>th</sup> and early 20<sup>th</sup> centuries) are considered, caves must be taken into account. Many of the local people in the study area, especially the elders, could tell in which cave they lived and where other families lived as well. Caves are particularly good shelters in the winter. In the big caves there was a space for animals as well. These types of caves can be easily distinguished by their built entrances and the smoke-blackened roofs (McQuitty, 2001: 573). Many of these caves were documented in the study area. A good example are the caves at Tell Jraideh, northeast of the fortress of Udhruh (Site no. 046). The nomadic society which must have existed in the region cannot be easily archaeologically traced. However, traces of tent camps and their hearths can be useful but are very often difficult to date (McQuitty, 2001: 575).

## Conclusion

The discussion above clearly reflects the long history of human settlement in the study area from prehistoric times throughout the 19<sup>th</sup> century AD. However, the intensity of settlement varies considerably all over these periods, the least recognisable of which are the prehistoric periods. The peak of human settlement in the region seems to have been reached in the first two centuries AD, particularly during the Nabataean period. The Roman annexation of the kingdom in AD 106 does not

seem to have significantly affected the intensity of settlement. However, the distribution of settlements gradually decreased towards the end of this period (Roman). During the Byzantine period (4<sup>th</sup>-7<sup>th</sup> century AD), the number of sites which revealed material culture (ceramic) of this period is greater than those which were settled in the Late Roman period. Thus, the region appears to have flourished during the Byzantine period but not as much as in the first two centuries AD. The fact that most of the Middle East came under the Islamic state by the 7<sup>th</sup> century AD, does not seem to have imposed any immediate and nor significant shift on the settlement patterns. In the study area, most of the sites which were occupied in the Late Byzantine period remained settled in the Early Islamic period. The scale of settlements in the Late Islamic periods, particularly the Ayyubid-Mamluk and Ottoman periods, is still fairly considerable but restricted to strategic, agricultural and major sites.



## **Chapter Eight**

### **Walls, Enclosures and Circles**

#### **Introduction**

This chapter will consider those archaeological sites and structures which have not yet been discussed or have only been briefly introduced so far. These include walls, enclosures and circles (one) documented in the region of Udhruh by this author. The discussion below will discuss walls first, their location, architecture, date and function. The enclosures will be discussed then and finally the circles or more particularly the circle west Udhruh will be presented. The discussion of the last two features will also highlight their locations, architectures, dates and functions.

#### **Walls**

##### **Khatt Shabib**

1-Khatt Shabib (Site no. 062) (Fig. 8.1a & b): Khatt Shabib is a very significant archaeological feature in the landscape of southern Jordan. It was first noticed and partially documented by Sir Alec Kirkbride (1948: 151). Kirkbride's investigations included observations from the air and tracking the wall from a point west of Ma'an to its end southward near a Roman settlement named Daouq (Kirkbride, 1948: 153). No serious archaeological studies have been conducted on the wall since then. However, the wall has been recently examined by fieldwork projects such as the Dana Archaeological Survey (Findlater, 2002: 142-143). This project tracked the wall from Kirkbride's area northward to Wadi al-Hasa where it stops or disappears, a total distance of about 100 km (Findlater, 2002: 142). Bewley and Kennedy (forthcoming) have recently investigated the Khatt using aerial photographs taken in 1953. The investigation revealed new data regarding the total length of the line (c. 150 km) as it extends further south and north beyond the points where it was previously thought to terminate. Unfortunately, due to the limited time the author had in the field, the wall was tracked on foot from only Khirbet Laikeh (Site no. 288) until Udhruh where it terminates before it reappears again outside the study area, northeast of al-Manshiah.

The wall was not tracked by Kirkbride in the area between Jebel al-Jithih and Udhruh (1948: 153).

**Location:** It has been clear that Khatt Shabib extends over a quite wide geographical area, from Wadi al-Hasa to Neqb Eshtar, within the borders of three administrative districts: Tafilah, Ma'an and Aqaba (Fig. 8.2). Topographically, the wall, at least in the study area, does not follow specific topographic features. It ascends and descends hills, crosses valleys and runs over relatively flat grounds. However, the general path of the wall shows that it lies on the edge of the desert (Kirkbride, 1948: 153; Findlater, 2002: 142).

**Architecture and layout:** The architecture and layout of Khatt Shabib is not consistent in general and in the study area in particular (Findlater, 2002: 142). The stonework of the wall varies considerably along its alignment according to the available stones and rocks in the area of each part of the wall. In the areas where rocks are rare or unavailable small stones and cobbles were used to construct the wall whereas large and semi-hewn stones were used in the areas where the bedrock are available (Fig. 8.3). A good example on the latter is the portion between Khirbet Laikeh and the Ayl-Whaideh road; stones were evidently quarried from bedrock along the wall. Most of the wall is a dry built and does not indicate a proper construction. It looks as if the stones were just put together to form a line or a feature in the landscape. Some parts are quite wide (up to 3m) and look like a paved road while others are very narrow and can be hardly seen from a distance (c. 50 cm wide). Short parts, particularly in valley beds were well constructed and consisted of two lines or faces filled in with rubble. Judging from the available evidence, the wall does not seem to have retained a considerable height.

Finally, as Figure 10.1a) shows, there are gaps in the Khatt, and this seems to be the case in other regions outside the study area. Bewley and Kennedy (forthcoming) suggest that this is due to the deliberate removal of the stones or the wall was not originally continuous. This explanation seems very applicable in the study area where considerable portions of the wall were removed because of modern agricultural activities. The creation of the modern farm of Abu Efas (Fig. 8.1a), for example, has caused the disappearance of the wall. Considerable part of the wall has recently



disappeared from the area south Jebel al-Jithih due to the construction of field walls.. This part was untouched when this author visited the area in 2003 and seems to have been removed a few days before the second investigation in June 2004.

Along its alignment, different archaeological features are associated the wall itself. Three types of these features were recognised along the wall: mounds, small enclosures and standing stones. Some of these features were previously seen by Kirkbride during his investigation (1948: 153/4). The mounds do not have the same lay out, some of them are merely simple mounds formed due to the location of stones at one point whereas some mounds seem to have been small rectilinear structures and these were particularly seen in the area between the Ayl-Whaideh road and Khirbet Laikeh (Fig. 8.1b). Some of the mounds were located on hilltops in the course of the wall such as at the hilltop northwest Jebel al-Jithih. The second feature is the enclosures which are less than the other features in numbers and seem to post-date the wall. The enclosures are simple in their construction and are almost walls built of stones probably taken from the wall. Upright stones appear to have been located at intervals along the wall. In some areas, the standing stone is completely different from the wall stones and was probably brought for a particular purpose. Some of these stones have certain marks or symbols, modern and ancient, and at least one has Nabataean letters (Fig. 8.4). In some cases, two upright stones were laid out about 2-3 m apart to form probably a passageway although the wall itself is not a real barrier (Kirkbride, 1948: 153) (Fig. 8.5).

#### **Date and Function**

Both the date and function of Khatt Shabib are uncertain. However, the discussion of the date requires the consideration of the local name of the wall. According to the information collected by the Minister of Foreign Affairs of Jordan at that time, upon a request from Kirkbride, a certain prince (Amir) known as Shabib el'Oqaili el Tubba'I governed major parts of Jordan including Ma'an in the 10<sup>th</sup> century AD on behalf of the Ikhshidid dynasty in Egypt (Kirkbride, 1948: 151-153; Bowersock, 1971: 239, note 141). Two other sites, Jebel Shabib in the south and Qasr Shabib near Zerka, were ascribed to a certain Shabib. The latter was dated to the medieval period based on its architectural character (Kirkbride, 1948: 151; Bowersock, 1971: 239, note 141).

The name does not imply at all that the wall was constructed during that period. People in Jordan tend to give historical names to archaeological sites just to indicate their antiquity. For instance they designate many archaeological sites as Roman just to indicate that they are ancient. Moreover, Bowersock (1971: 239; Parker, 1986: 89) could not find any reference to this wall in the medieval Arabic sources, and therefore he connects it with the Roman *limes*.

Unfortunately, no decisive evidence concerning the date of this wall can be presented in this study due to the lack of dateable materials associated with it. A brief examination of parts of the wall by the *Limes Arabicus* Project revealed no surface pottery whereas Kirkbride (1948: 153) dated some of the ruins found along the wall to the 2<sup>nd</sup> century AD according to the ceramic evidence. A few Nabataean and Roman pottery sherds at some parts of the wall were found as part of this survey, but obviously not enough to date securely the wall to that period. However, according to certain hints from the features associated with the site, it can be tentatively suggested that the wall was at least constructed by the 1<sup>st</sup> century AD. The first clue is from Khirbet Laikheh (Site no. 288) which was constructed just on the edge of the wall a few kilometres east of Rujm Sadaqa. The pottery sherds from the site date from the 1<sup>st</sup> century B.C. to the 3<sup>rd</sup> century AD and to the Ottoman period. If the ceramic evidence is a true indicator, the structure was deliberately constructed on the wall in the Nabataean period. Despite the relatively large size of the structure and the number of stones required to build it, the wall is fairly well preserved near the Khirbet and there is no significant clearance of the wall to suggest that its stones were used to construct the Khirbet in later periods. Thus, the wall and the Khirbet seem to have been founded at about the same period.

From the discussion above, it can be safely proposed that the wall was not constructed for defensive reasons. Neither the stonework nor the topographical location of considerable parts of the wall indicate a defensive function. This author favours the views of Kirkbride and Findlater who suggest that the wall was a boundary feature (1948: 154; 2001: 142; see also Parker, 1986: 89). Bewley and Kennedy (forthcoming) tentatively do not exclude the probability that “the wall was a demarcation between the desert and the area in which farming is possible”. Some scholars, particularly Bowersock and Killick, uncertainly propose a defensive



function to the wall on the basis that it lies along the line of the Roman frontiers for Bowersock (1971: 239) and on the basis that walls were used for defensive purposes elsewhere in the Roman Empire, as for example, the *Fossatum Africae* according to Killick (1986: 436). Again, the stonework and layout of Khatt Shabib by no means resemble that of *Fossatum Africae* (Cherry, 1998: 45-48; MacKendrick, 1980: 241-248) or Hadrian Wall in Northumberland, north England (Johnson, 1989: 9, Woodside and Crow, 1990: 36-40). Moreover, the structures which seem to have been watch towers located on hilltops passed by the wall do not appear to have been constructed as part of the wall to work in integration with it (Fig. 8.6). However, some of these structures were most likely in use when the wall was there (Findlater, 2002: 142). The wall in some areas ascends and descends a naturally defendable hill where traffic is even very impossible without the presence of the wall (Fig. 8.7).

Kirkbride (1948: 154) rightly noticed that the springs and the cultivated land lay to the west of the wall. Moreover, the wall lies in the 100mm isohyet area where rainfall average seems to support dry farming (Kirkbride, 1948: 154; Findlater, 2002: 142). Therefore, Kirkbride accepted the local tradition which states that the wall was constructed as a boundary 'between the land owned by cultivators and that at the disposal of their nomadic neighbours'. Another local tradition says the wall located as a demarcation between the areas which received snow and those which do not. However, this is not always correct since the wall was not attested at all to the east of agricultural areas such as Udhruh and al-Jerba. The absence of the wall in these areas can be either due to agricultural activities in later periods or due to the possibility that it did not exist there at all. However, the archaeological evidence from the study area indicates that the wall was used as a boundary line and probably to define agricultural areas. During the fieldwork, a significant feature in the landscape southeast of Ayl and Basta was noticed, particularly on the slopes near Khatt Shabib. Hundreds of small stone mounds can be seen in that area. The mounds seem to have been created as a result of a ground clearance for agricultural purposes (Fig. 8.8). The rainfall in that area seems enough to cultivating some crops such as wheat and barley.

2- Site no. 324: Unfortunately, this wall was not entirely traced due to the limited time that this author had in the field. Thus, Figure 8.9a does not show the true alignment of

the wall. A few GPS points were taken at irregular intervals along its path just to display the general position of this wall.

**Location:** This wall runs in a north-south direction parallel to Khatt Shabib from a point on the edge of the Dhra' Qusaib road a few hundred metres southwest the Tell al-Safia and terminates at a point just on the edge of the modern farmhouse near the farms of Abu 'Efas. Topographically, like Khatt Shabib it does not follow certain topography as it ascends and descends hill, and crosses valleys.

**Architecture and layout:** Judging from the short portions walked by the author and from the general alignment of the wall which can be seen from a distance, the wall was constructed of multi-sized unhewn stones. It does also seem to have had a considerable height and its width varies considerably (0.5-1.5 m).

**Function:** The purpose of this wall does not seem to be different from that of Khatt Shabib despite the fact that the latter runs for about 100 km. the wall was most likely a boundary line on a regional level.

**3-Site no. 327:** Unfortunately, the entire alignment of this wall was not traced, but GPS points were taken at irregular intervals along the wall (Fig. 8.10). The wall runs on a northeast-southwest axis from a point southeast of Basta and terminates east Ayl near the modern road to Ma'an. Unlike the previous wall, this one runs over a relatively flat ground and more importantly in an evidently agricultural area (Fig. 8.11). Clearance mounds and other short walls can be seen around the wall. Moreover, farming structures were found in that area. Therefore, the archaeological evidence indicates that this wall was used as a boundary line in an agricultural area. It might have also helped in some areas in decreasing the erosion of soil and holding the run-off water.

**4-Site no. 322:**

**Location:** This wall significantly runs from a point near the summit of Tell Abara (Abu Ar'a) southward and then turns westward until it terminates near a modern farm northeast the modern village of Rashid (previously al-Qa'). It descends the south slope of Tell Abara and crosses a valley southward and then runs over a hilly area.



**Architecture and layout:** The wall was constructed of multi-sized stones, hewn and unhewn. The majority of the stones are unhewn boulders and cobbles. Like the other walls, the main purpose of the builders was to forming a significant landmark in the landscape rather than creating a barrier wall. Some portions of the wall are shallow and wide (c.1.5m) (Fig. 8.12). The wall might have stood for a considerable height but collapsed in later periods. However, some portions, particularly on the relatively flat ground south of Tell Abara, were properly built of two faces filled in with rubble (Fig. 8.13). This was perhaps necessitated in order to prevent any damage in the wall as a result of rainwater.

**Date and Function:** Unfortunately, no dateable materials were found along the alignment of the wall and no other archaeological features were found in association with it. And as mentioned above there is no concrete evidence to assume that the wall had a defensive function. It appears to have been built to define a certain area or land which might have been owned by a group of people. The human effort required to construct this wall seems beyond the ability of individual landlords, and therefore, the local administrative authority might have presumably initiated such a project to prevent any clash between the local people over a piece of land. Such a wall might have helped in measuring the area of a particular agricultural land and consequently easily estimating the tax.

**5-Other walls:** Besides the aforementioned walls, tens of walls were seen during the field work in the study area, particularly on the hilly areas where many settlement sites were located. Unfortunately, many of those walls were seen but were not documented. Unlike the walls discussed above, these walls run vertically over the slopes of hilly areas (Fig. 8.14). In some cases, three parallel walls run vertically from uphill to downhill on the same slope. Some of these walls are easily recognisable due to their masonry whereas others can be noticed in certain times of the day, especially late afternoon because of the shadows. Most of these walls seem to have been constructed and probably reconstructed at the times when the nearby settlement sites were being occupied. Such walls appear to have performed a two-fold function: they, first of all, define a private land owned by a family or a person in the adjacent settlement site. It has been noticed in the field that the more settlement sites in the area the more the number of walls can be seen there. The land which is encircled by

two or more walls was, and sometimes is still, cultivated (Fig. 8.15). The second function of these walls was most likely to protect the crops or trees within them from the animals owned by other inhabitants in the area.

### Enclosures

Two enclosures were entirely traced and documented by a hand-held GPS system (Fig. 8.16). The first lies at Jebel al-Tahuna (Site no. 216) while the second lies east the modern village of Abu Danna (Site no. 218). However, other enclosures were seen in different parts of the study area but were not traced and properly documented due to the limited time the author had in the field. The enclosure was clearly constructed to encircle the small village, agricultural fields and reservoirs to the east of Jebel al-Tahuna. Judging from the ceramic evidence the settlement at Jebel al-Tahuna started in the Late Byzantine period and continued through the Early Islamic period. Therefore it is not unreasonable to assume that the enclosure was created at the same time or shortly after the creation of the settlement.

The enclosure to the east of Abu Danna requires further investigations. Most of its portions were built of semi-hewn and unhewn flint and limestone. The stones were properly laid down and its wall consists of two faces filled in with rubble and small stones. It significantly encircles a steep area on a hillside (Fig. 8.17) and does not have regular sides in terms of length. The distance between the vertical walls is wider near the hilltop but narrower at the base. The lower horizontal wall was constructed just on the edge of a valley; therefore, the stones are bigger and thicker to resist the water running in the valley in the winter. A small structure was built against the south wall of the enclosure on the hilltop. Apart from that structure, no other archaeological material was seen within the enclosure. Terrace walls or agricultural terraces were not observed on the slopes inside the enclosure but might have existed in antiquity. Fields can still however be seen on the hilltop within the enclosure. Besides the possible agricultural nature of the enclosure, it could have also been used to breed and keep domestic animals. No significant ancient settlement site was found near the enclosure. A cave associated with a small structure was found on a hill opposite to the enclosure and a traditional house and a cave were found in the valley below the enclosure. The



traditional house was probably built on ancient ruins and the area was generally agricultural.

Two more enclosures were seen and documented in the study area but were not totally traced. The first was found to the west of al-Jerba (Site no. 001) while the second was found to the west of al-Fardhakh (Site no. 271). The first was built of semi-hewn and unhewn flint stones and is still fairly well preserved in some parts (Fig. 8.18). It runs irregularly over a hilly area and encircles a huge area. The enclosure appears to have encircled privately owned agricultural land. Unlike the first enclosure, the second is more regular and surrounding an agricultural area on a hillside. Within the enclosure there is a spring associated with a structure (reservoir?) and a rectangular structure above the spring and against the northwest wall of the enclosure. The archaeological evidence indicates that a farm irrigated from the spring existed within the enclosure.

Finally, it is worth mentioning that other enclosures were constructed for other purposes. Some enclosures surround settlement sites either to protect them, although not significant in terms of strength, or as a sign of privacy. Such enclosures were recorded at Sites nos. 191 and 289. Interestingly, the archaeological evidence from both sites suggests the presence of prehistoric settlements. One enclosure found to the west of Jebel al-Tahuna (Site no. 231) appears to have encircled either a temporary military camp or a Bedouin camp.

### Stone Circle

Only one circle or circular enclosure was found in the study area. It was discovered through an aerial photograph taken in the early 1980s of the town of Udhruh (Fig. 8.19). The photograph, among others, was bought from the Royal Geographical Centre in Amman for the purpose of this study. The circle, according to the photograph, lies to the west of the fortress and to the south of the quarry at Udhruh. Unfortunately, photographs were not at the disposal of this author when he was conducting the fieldwork; therefore, no investigations of this feature were made on the ground. However, the circle is probably about 100m in diameter. Moreover, the land where the circle was located is now occupied by modern farms known as Mazr'at al-Twiesi. However, if close examinations were to be made to the north of the Wadi

Musa-Udhruh road, which almost cuts the circle into, traces of it should be found since there are no farms in that area.

Judging from the aerial photograph, the circle was clearly disturbed and some parts might have been cleared by agricultural fields even before the creation of Mazr'at al-Twiesi. A wall or a line appears in the photo and runs west-east through the southern part of the circle. It continues eastward until it terminates or disappears near the north access of the fortress at Udhruh. The line or wall is possibly the trace of the ancient road between Petra and Udhruh. No information is available about the stonework and the layout of the circle. A quick glance in the aerial photograph reveals a perfect circle, but there seem some kinks, particularly in the northwest portion. However, it is not clear if this was the original layout or merely due to the modern agricultural activities in the area.

This author did not find any reference to this circle in other field studies conducted in the region. However, two similar circles were documented and examined by Kennedy (1998b: 579) during a survey in the region of Ghrandal (Tafilah district) (Fig. 8.20). The circles were seen on aerial photographs and examined on the ground but no suggestions concerning the function and date were made. A few late antique pottery sherds were found in association with one of the circles (Kennedy, 1998: 579). In the light of the available evidence and since the circle was not investigated on the ground, it is not possible to present any serious hypothesis regarding the function and date of this circle.

## Conclusion

The discussion in this chapter considered archaeological features which have not been presented elsewhere in this study. The most significant one among them is clearly Khatt Shabib. This study presents for the first time a detailed investigation of the wall and other features in association with it in the area between Udhruh and Khirbet Laikeh. However, In terms of function, neither the physical appearance and layout of the wall nor the geographical and topographical location supports a defensive or military function. The evidence concerning the date of this wall cannot be considered decisive but judging from the pottery sherds collected along the wall and from sites in



the vicinity of the wall, the Nabataean and Roman period seems very possible. Khatt Shabib and the other walls were most likely constructed to be boundary walls related to a seasonal agricultural activity in a relatively dry area. The other elements, namely enclosures, clearly reflect agricultural society. Two enclosures may have defined a private farm or large animal-breeding farm. The one at Jebal al-Tahuna was most likely built to protect the settlement and fields at the site. The circle to the west of Udhruh as mentioned above was spotted on aerial photograph and has not been investigated on the ground, therefore, further research is required to understand and analysis this feature. However, similar circles were discovered elsewhere in Jordan.

## **Chapter Nine**

### **Conclusion**

This study was initiated to investigate the settlement pattern and the military organisation in the region of Udhruh, southern Jordan, during the Roman and Byzantine periods with particular interest in the region after the Roman annexation of the Nabataean kingdom in AD 106, and to examine the impact of the presence of a Roman legionary fortress at Udhruh. However, in order to have a better understanding of any changes, the scope of the study was extended to include periods before and after the main period of study, especially in the section of settlement patterns. In addition, the study has investigated the evidence of the major sites in the study area known from historical documents throughout most of the first millennium AD. Two seasons of fieldwork were conducted in the region of Udhruh to investigate the archaeological evidence which could help to answer the research questions.

This study has clearly shown that human activities in the study area date back to prehistoric times (to the Neolithic, for example). However, the intensity of settlement patterns fluctuated from prehistoric times down to the first century AD when the exploitation of the region reached a peak during the Nabataean period as indicated by the large number of sites occupied at that time. The impact of the Roman annexation on the distribution of human settlements seems to have been minimal and archaeologically unobservable. The majority of the sites which were occupied in the previous period continued in use after the annexation. However, the three centuries following the fall of the Nabataean kingdom witnessed a moderate decline in the number of sites occupied in the study area. During the Byzantine period (the 5<sup>th</sup> -7<sup>th</sup> centuries AD), the region seems to have flourished according to written and archaeological evidence. Archaeological evidence shows that many sites were settled during this period, but the significance of this period is not the number of sites which are far less than the Nabataean sites, but the volume of human activities which were focused at certain sites in the pre-desert zone such as at Udhruh, Khirbet al-Jerba and Jebel al-Tahuna.



The region saw a political shift as a result of the Islamic conquest, but this did not immediately influence the settlement patterns since the majority of the sites which have Byzantine ceramics appear to have continued in occupation during the Early Islamic period. After the 7<sup>th</sup> century the settlement pattern in the study area indicates a decline although the major settlement sites were still in use.

The study has also investigated the military and security arrangements in the study area. Besides the well known legionary fortress at Udhruh, many more security and military sites were recorded. These sites fall under two categories: 1- Relatively small structures located on strategic points, usually on hilltops with clear view over the surrounding landscape, these were identified as watch towers. 2- Large structures with strategic locations, identified as forts and fortresses. Considering the nature of the archaeological evidence in the vicinity of these sites, the security of the natural resources especially water appears to have been a priority when these structures particularly the watch towers were built. Throughout the long history of settlement in the region of Udhruh, agriculture seems to have formed a fundamental economic factor, and security measures were set up to protect the fields throughout the area from local nomadic groups or any outsiders. Some security structures were also built to watch and protect the road network. Finally, the security of settlement sites particularly the major sites was guaranteed by the construction of forts or watch towers in the direct vicinity of the site.

The military and security arrangements cannot be dated with certainty since the evidence presented in this thesis is based on pottery sherds collected from those sites. However, the archaeological evidence does collectively help to draw some conclusions. Many of the security and military sites, forts and watch towers, appear to have been built before AD 106, particularly during the Nabataean period. Following the creation of *Provincia Arabia* after AD 106, some of these sites were reoccupied and new structures were built. However, the absence of epigraphic and written evidence does not indicate that Roman troops were not located at these sites. The construction of a large fortress at Udhruh sometime in the Roman period clearly reflects the security measures implemented by the Romans and the importance of the region at that time. This study agrees with previous suggestions dating the fortress to the Late Roman period or the Tetrarchy on the basis of the similarity of plan between

Udhruh and other Tetrarchic fortresses. Small military units attested in Roman military documents such as the *Notitia Dignitatum* were located at some sites in the study area such as Sadaqa. During the Byzantine period, judging from the ceramic evidence, some military and security sites were abandoned. However, key security sites near the major Byzantine sites such as the towers around Udhruh and al-Jerba remained in use, and new structures were built particularly to the east of Udhruh. The construction of the latter was probably necessary due to the intensive exploitation of land for agricultural purposes in Wadi Udhruh and al-Jerba.

The discussion of the military and security arrangements in the study area led to the consideration of the position of these arrangements within a broader system known as *Limes Arabicus* or the Roman frontier in Arabia. The *Limes Arabicus* was initiated by Parker (1986) to understand the function of military structures located in marginal areas between the desert and the sown. Parker concluded that these outposts were built to control the nomadic tribes and prevent any damage they could cause to the settled areas. However, this hypothesis has long been challenged by many scholars (see the discussion in Chapter 2). The security sites in the region of Udhruh including the legionary fortress do not seem to fit in such system. The chronology of most of these sites remains uncertain. Second, the location of most of the security structures within agricultural areas or near water resources limit the search for alternative functions. Third, the interference of nomadic tribes on the frontiers was not attested before the 5<sup>th</sup> and 6<sup>th</sup> centuries AD. Finally, security structures appear to have been used for settlement purposes after they were abandoned. Udhruh for instance, although it had a large military structure, is only attested as a town in historical documents and is absent from the *Notitia Dignitatum*. Therefore, the function of a site might have changed over time.

This study has also shown that the attestation of Udhruh in written or epigraphic sources such as Beersheba Edict particularly during the Byzantine and Early Islamic periods appears to have been due to intensive agricultural activities in the region of Udhruh. The archaeological evidence collected from the area clearly shows that large areas were used for agriculture near the sites where the evidence of the two periods is archaeologically and historically solid. There are, for example, wide areas of fields surrounded by field walls and irrigated by large reservoirs documented by the author



between Udhruh and Ma'an. The fields in Wadi al-Fiqai, Wadi Udhruh and Wadi al-Jerba still preserve solid evidence which reflects the volume of agriculture practiced in the area. Thus, arable farming rather than pastoralism seems to have been a very significant economic factor in the region during the Byzantine and Early Islamic periods and this might explain why Udhruh was second on the Beersheba Edict.

This study has revealed various techniques initiated by the inhabitants of the region throughout its history to overcome the shortage of water in a dry zone and the lack of permanent water resources in some parts of the region. There were also techniques developed to distribute water and to irrigate agricultural fields. In addition to the exploitation of natural water resources such as springs, other techniques were used. Two significant methods of water supply were documented in the study area: qanat systems and rock-cut cisterns. The first technique was based on tapping ground water through underground tunnels to deliver the water near a settlement site, usually discharging it into a reservoir. This system has long been known in the Middle East, particularly in dry zones, and its presence in the study area reflects cultural contact. The second noteworthy method is rock-cut cisterns. This type of supply system was focused in relatively one area of the region of Udhruh where rocks can be cut and shaped and rainwater can be directed into these cisterns by earth channels using the local topography, usually upper slopes or hillsides. Water channels and aqueducts were also found in the study area. In many cases channels or aqueducts end at big reservoirs near a settlement site or agricultural fields, such these in Wadi al-Fiqai. Ancient reservoirs were also documented for the first time near well known and previously investigated sites such as Ayl and Basta.

Although the road system has been explored before in previous studies (Killick, 1986; Graf, 1992b), there is no detailed record or mapping of the roads in the study area. This study presents for the first time detailed investigations and mapping of the ancient roads in the region of Udhruh. One of these roads could be a segment of the Roman highway the *via nova Traiana*. Most of the roads retained the same layout, a clear path bordered with two stone walls. However, kerb stones and pavements were also observed in some of these roads. Many settlement sites in the region, particularly on the hills of Jebal al-Sherah, were linked by this road network. Long roads run on the hills in a north-south direction whereas short roads (east-west) connected the

settlement sites with the main routes. Some of these routes clearly linked the region with administrative and political centres such as Petra and probably Udhruh in later times. Finally, some of the roads in the study area appear to have been used for trade, particularly by caravans of the long-distance trade approaching Petra from Arabia (modern Yemen) via the Hijaz.

Apart from the above mentioned archaeological finds, this study revealed or introduced new archaeological features that have not been either investigated before or documented for the first time. Amongst these, walls are the more significant, the most significant of which is Khatt Shabib or Shabib's Wall. About 20 kilometres of this well known feature were tracked in the study area. Having done that, the wall between Jebel al-Jithih and Udhruh was investigated and mapped for the first time. Moreover, a detailed record of the archaeological features on and along this wall was obtained for the first time. This study has also provided new evidence regarding the function and date of this significant ruin. Other walls run relatively parallel to Khatt Shabib and to the west of it were also mapped and documented for the first time. These walls, including the Khatt Shabib, appear not to have had any defensive or security role and could have merely been boundary walls. Finally, this study presents for the first time also a detailed investigation and mapping of large enclosures in the region of Udhruh.

Throughout the long history of settlement in the region, agriculture was a vital economic factor. On the hills where most of the settlement sites were found, archaeological remains of terracing walls, field walls and clearance mounds are abundant and reflect a long history of landuse. These features are very clear near settlement sites. However, they can also be seen on slopes away from ancient sites. The presence of fields all over the hills regardless of the existence of water resources indicates that rainwater fed these fields. Cereals and trees may have been cultivated. This type of agriculture is still practised in the region. The farmers plough their fields (for wheat and barley) in late September and early October, the beginning of winter. Judging from the evidence from the settlement sites on the heights, landuse gradually increased from Iron Age II throughout the first half of the first millennium AD. However, landuse reached a peak during the Nabataean period on the basis of the collective evidence of that period. The situation in the pre-desert and desert zone of



the study area is different. The inhabitants of the highlands, particularly during the Nabataean period, appear to have utilised that area for farming. Stone or boundary walls such as Khatt Shabib, stone piles and small farming structures were documented in that zone, however, the nature of landscape, the rainfall and the archaeological evidence suggest that only seasonal crops can be cultivated there. Further east, between Udhruh and Ma'an, rainfall hardly reaches 100mm and the soil is generally infertile. However, there are a few clusters of agricultural fields. These fields were irrigated by reservoirs supplied with water from resources further west. The land use in this zone appears to have reached a peak during the Byzantine period on the basis of evidence from nearby settlement sites.

In brief, throughout most of the study period, the region of Udhruh was part of a greater geographical area which was controlled and administered by Petra from (or probably before) the Nabataean period until the 7<sup>th</sup> century AD. Udhruh appears to have been an important Nabataean settlement, but became politically and economically more significant from the Late Roman period (the end of 3<sup>rd</sup> century AD) when a legionary fortress may have been built there at that time. Towards the end of the Byzantine period, the concentration of settlements (according to the size of individual sites) shifted from the hills around Petra, mainly east of it, to the landscape of Udhruh and its vicinity such as al-Jerba. New large settlement sites such as Jebel al-Tahuna may have also been founded for the first time during the Late Byzantine period. However, according to archaeological evidence and information from the Petra Papyri, Udhruh until the 6<sup>th</sup> century AD continued to follow the authority of Petra. In the post-Byzantine periods (7<sup>th</sup> century onwards), Udhruh was politically a very significant town in southern Jordan and became the capital of al-Shera area.

#### **Future work**

Although this thesis has considered many aspects of the human activities in the region of Udhruh and contains detailed information concerning the archaeological materials in the area, there is still more work can be done in the study area. The fact that more investigations can be conducted in the region of Udhruh is due to the fact that the author had a short time to survey a large area and lacked technical support since he conducted the study on his own.

However, future work should include the following: 1- Excavation: many sites in the study area can be excavated, particularly the well preserved ones. Excavation shall reveal important data regarding the date and function of these sites. Sites like Jebel al-Tahuna and Khirbet al-Jerba will provide information about the Late Byzantine and Early Islamic transition. 2- Soundings can also be conducted at many sites in the region of Udhruh, especially the structures on the hilltops. 3- Geophysical survey would also be useful if conducted at a site like Udhruh to reveal any data regarding internal structures within the perimeter wall of the fortress. 4- Detailed and accurate plans of many well preserved structures recorded in the study area are needed since the plans the author made are often sketchy and of limited accuracy without additional work. 5-Surveying areas outside the study area but adjacent to it using aerial photographs will provide more archaeological finds particularly concerning the road system. Ancient roads outside the study area were seen in aerial photographs but the images were not at the disposal of the author when he was in the field. This will help to create more accurate maps showing the road system not only in the study area but in the hinterland of Petra. Finally, the ceramics collected from the study area will be borrowed from the Department of Antiquities of Jordan for further study to provide a quantification of ceramic sherds by period, proper description and drawings of the diagnostic sherds and looking for parallels from other sites in southern Jordan.



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