Ammonite Fortifications? A Comparative Study of Iron Age (1150 - 330 BCE) Circular Towers in Northern Jordan

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BA Thesis ~ Leiden University

Cover figure 0.1: City of Amman as depicted on flickr (https://www.flickr.com/photos/rawandaas/5384925041/in/photostream).

Cover figure 0.2: Rujm al-Malfuf North with background of eastern part of the city of Amman as depicted on Jordan-travel.com (https://jordan-travel.com/wp-content/uploads/2021/01/View-from-East.jpg).

Ammonite Fortifications?

A Comparative Study of Iron Age (1150 – 330 BCE) Circular Towers in Northern Jordan

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Chapter 1: Introduction

1.1 Introduction

This thesis will look into the Iron Age circular towers located surrounding modern-day Amman, the ancient site of Rabbath-Ammon, the capital of the ancient Ammonites in nowadays Northern Jordan. These gigantic circular towers (see Fig. 1.1) have been visited, surveyed, and some even excavated during the period from the late 19th century to the early 21st century (Kletter, 1991, p. 33-34; Tyson, 2014, p. 49-50). This thesis is a continuation of the preceding research, and the aim is to give the circular towers of the Ammonites a fresh update and provide new insights in order to unravel the main purpose of these circular towers, whose interpretations have varied widely over time.

This chapter first provides information on the geography and chronology of the Levant, where Jordan is located. Secondly, the historical background of the Ammonites will be discussed. Thirdly, the research conducted to date, its results, and interpretations will be discussed briefly. Fourthly, the objectives, relevance, and research questions of this thesis will be discussed. Lastly, it will conclude with the methodology and reading guide for this thesis.

Figure 1.1: Rujm al-Malfuf North is located in Amman, Jordan. An example of how the circular towers of the Ammonites look, photographed by M. Prins, and presented on livius.org. (https://www.livius.org/pictures/jordan/rujm-al-malfouf/rujm-al-malfouf-1/).

1.2 Geography and chronology of the Levant

The Levant is a geographical term for a large area of southwestern Asia situated in the Near East, which is a junction connecting the continents of Africa and Asia (Suriano, 2014, p. 9). The Levant (see Fig. 1.2) stretches out in the west from the coastline of the Mediterranean Sea to the deserts in the east and in the north from the Plain of ‘Amuq (Southern Turkey) to the Wâdi al-Arish (northern part of the Sinai Peninsula) in the south (Suriano, 2014, p. 9-10).

Figure 1.2: Map of the Levant as depicted in Macdonald (2013, p. 23, Figure 3).

This area can be broken down into two other geographical terms, namely the Northern Levant and the Southern Levant. The research area for this thesis is situated in Northern Jordan, which is part of the Southern Levant. The Southern Levant (see Fig. 1.3) stretches out in the north from the start of the Syro-African Rift (Southern Syria) to the Wâdi al-Arish in the south and has the same west-to-east limits as described above for the Levant (Suriano, 2014, p. 15). The Syro-African Rift starts from the north in Southern Syria and runs through the Beth Shean, the Sea of Galilea, which is also known as Kinneret, the Jordan River, the Dead Sea, and the Gulf of Aqaba in the south (Suriano, 2014, p. 15-17).

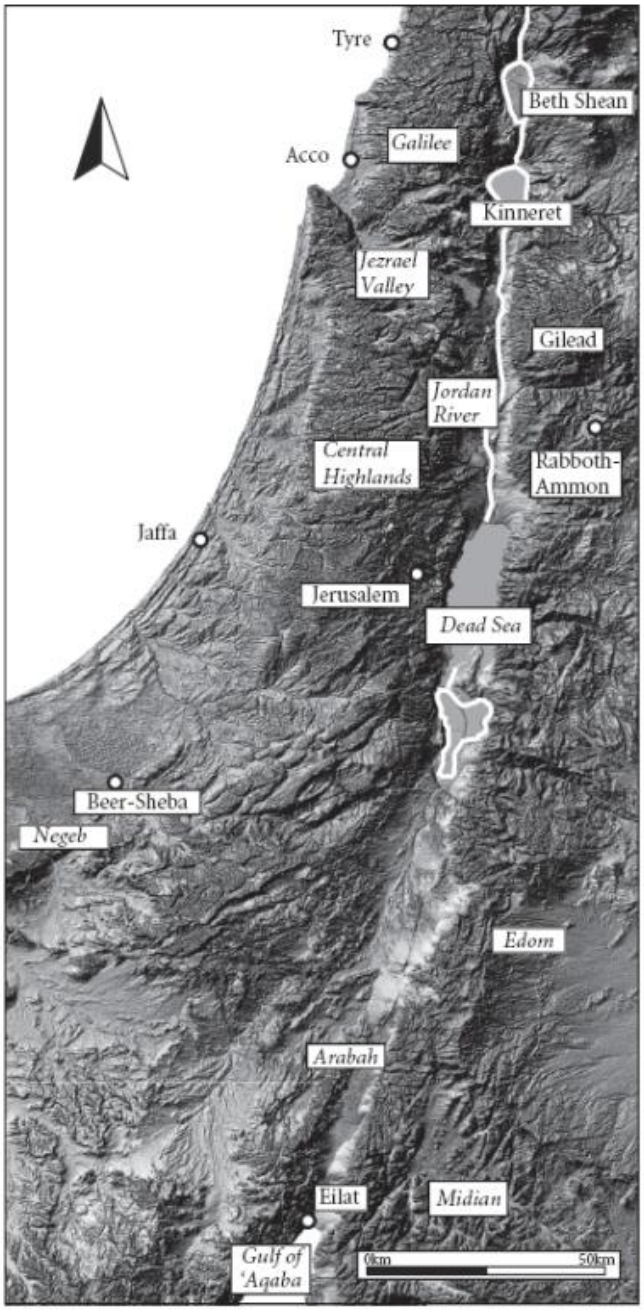

Figure 1.3: Map of the Southern Levant as depicted in Suriano (2014, p. 16, Figure 1.3).

The part of the Syro-African Rift that runs through the Jordan Valley, can also subdivide the Southern Levant into two areas, namely Cisjordan and Transjordan (Suriano, 2014, p. 15). The latter geographical term originated from a Latin translation of a Hebrew expression, which means in English 'beyond the Jordan River' and can be explained as if someone looks across the Jordan River towards the west (Routledge, 2018, p. 139). Whereas, Cisjordan would imply 'this side of the Jordan River'. The boundaries of Transjordan (see Fig. 1.4) are the Syro-Arabian Desert, the Syro-African Rift, and the mountainous terrain nearby the Red Sea (Suriano, 2014, p. 20). The research area is located in Transjordan because Amman is situated on the eastern side of the Jordan River.

In this thesis, various periods will be discussed from the Iron Age onwards; therefore, an overview of the chronology of the Levant is of great importance. This chronology is presented in Table 1.1, starting from the Iron Age I period because the Ammonites possibly arrived at the scene around the middle 2nd millennium BCE until the late 1st millennium BCE in the Southern Levant (Younker, 2014, p. 757-758).

Chronology of the Levant	
Archaeological period	*Date*
Iron I	1150/1100 – 1000/900 BCE
Iron II A	1000/900 – 925/800 BCE
Iron II B	925/800 – 730/700 BCE
Iron II C	730/700 – 608/586 BCE
Iron III / Persian	608/586 – 330 BCE
Hellenistic	330 – 63 BCE
Roman	63 BCE – 325 CE
Byzantine	325 – 636 CE
Umayyad	636 – 1099 CE
Crusaders	1099 – 1187 CE
Ayyubid	1174 – 1250 CE
Mamluk	1250 – 1516 CE

Table 1.1: Chronology of the Levant. The chronology presents the periods from the Iron Age I until the Mamluk (Dever, 2012, p. 83; Sharon, 2014, p. 63, Table 4.3; Walker, 2019, p. 776).

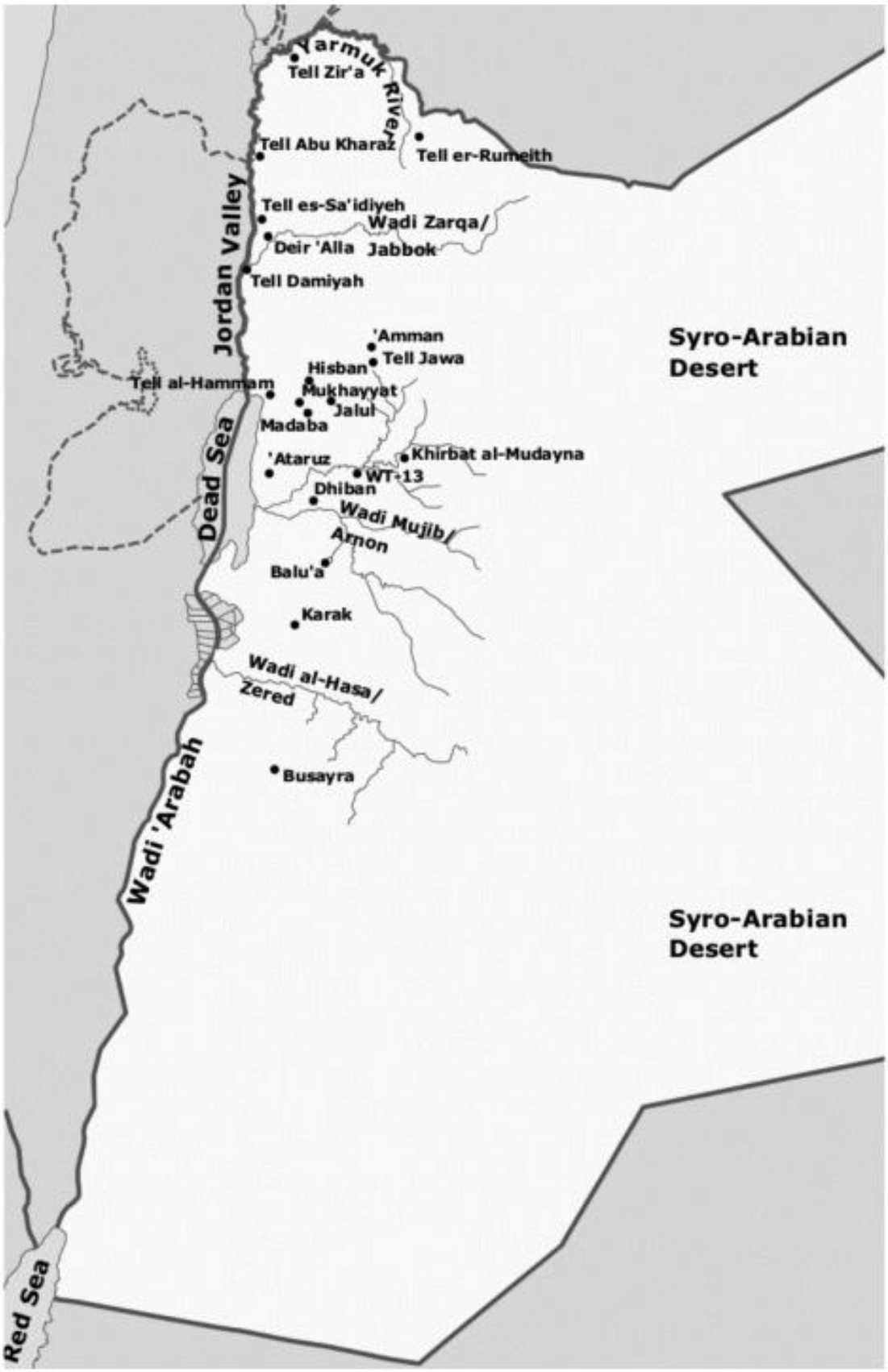

Figure 1.4: Map of Transjordan. Amman located between Wadi Zarqa and the Dead Sea. As depicted in Routledge (2018, p. 140, Figure 1).

1.3 Historical background of the Ammonites

The ancient Ammonites lived in modern-day Northern Jordan and made an appearance in the late 2nd Millennium BCE. Their capital bore the name Rabbath-Ammon, and their country was called Ammon (Younker, 2014, p. 757). There are multiple ways to refer to the Ammonites, like the one just mentioned, but also as 'the sons of Ammon', 'the children of Ammon', or just 'Ammon' (Tyson, 2014, p. 2). In this thesis, I will use the term 'Ammonites' to refer to the ancient people living in Transjordan around the city of Amman. The Ammonites are known from (extra)biblical sources and their numerous conflicts with neighbouring people, such as the biblical Israelites and the Moabites (Routledge, 2018, p. 143; Younker, 2014, p. 757). These conflicts were definitely not of any kind of friendly nature and possibly happened due to the close proximity (see Fig. 1.6) these groups of people lived to each other (Younker, 1999, p. 1).

1.3.1 Origin

Most of the sources that describe the history of the Ammonites date back primarily to the peak of their civilization (Tyson, 2014, p. 1). Unfortunately, no extra-biblical sources have been found that enlighten the ancestral origins of the Ammonites (Tyson, 2014, p. 1). The biblical records contain an origin story of the Ammonites that reads that the nephew of Abraham, Lot, begot with his youngest daughter a son named Ben Ammi or Ben-'ammi, who the Bible claims is the person the Ammonites descend from (The New Oxford Annotated Bible, 2010, Gen. 19: 1-38). After some linguistic research, it appeared that the name Ben-Ammi was found in Ugaritic archives, which date back to the 14th century BCE, and was regularly widely used as a personal name (Block, 1984, p. 197-212; Landes, 1961, p. 66-86; Younker, 2022, p. 600). The name really existed, however, it is very improbable that the Ammonites descended from the Lot, as reported in the Bible, but it cannot be ruled out that the ancestor of the Ammonites bore the name Ben Ammi or Ben-'ammi.

1.3.2 Geography

The current knowledge obtained from all the past surveys, excavations, and examinations has still not provided an accurate representation of the geographic reach of the Ammonites over time; in addition, there is also no clear-cut consensus

between scholars through the years (Tyson, 2014, p. 15-16). In the 1930s, Glueck argued that the Ammonites reach went up to Wadi az-Zarqa, a branch of the Jordan River, until at least the land where their architecture, the circular Ammonite towers, were located, because he was totally convinced these constructions were part of the Ammonite's defence system (MacDonald, 2000, p. 162). Glueck's view was generally agreed upon by scholars for decades, and German scholars surveyed in the 1960s the southern region beneath the modern capital of Jordan, the city of Amman, and concluded that the circular towers were "Grenzfestungen" (border forts) protecting the Ammonite border (Gese, 1958, p. 57; MacDonald, 2000, p. 162). After decades of research and the interpretation of the current archaeological evidence, scholars now seem to be more in favour of the idea that there was a core Ammonite region, which would over time have extended into surrounding remote areas as the current political position in which the Ammonites found themselves allowed it (MacDonald, 2000, p. 157-165; Tyson, 2014, p. 15-16). The residence of this core Ammonite region is located in the city of Amman (Younker, 2022, p. 601-604). Tyson critically highlights that we cannot draw the conclusion that the Ammonites controlled this core region during their whole existence (Tyson, 2014, p. 16). Hence, it is highly likely that their control over their territory moved fluidly over the course of time.

The biblical accounts describe the geographical range of the Ammonites as "the whole upper region of the Wadi Jabbok as well as the towns of the hill country" (The New Oxford Annotated Bible, 2010, Deut. 2: 37). Currently, the Wadi Jabbok is called the Wadi az-Zarqa or Zerqa River (Tyson, 2014, p. 15; Younker, 2022, p. 601). So it can be concluded that from a biblical perspective, the Ammonites territory was bordered by the Zerqa River and it stretched from the point where the Zerqa river split from the Jordan River, flowing in an arching manner towards Amman and ultimately flowing in a western direction towards the mountainous terrain (Younker, 2014, p. 758; Younker, 2022, p. 603). Tyson claims that the northern outer limit of the Ammonites is the biblical Jabbok and the southern limit lies somewhere above Madaba (Tyson, 2014, p. 15-16). Younker argued that the Zerqa River encircled (see Fig. 1.5) the Kingdom of Ammon and notes that if the Ammonites included the tributaries of the Zerqa river their territory would have increased tremendously (Younker, 2014, p. 758; Younker, 2022, p. 603-604).

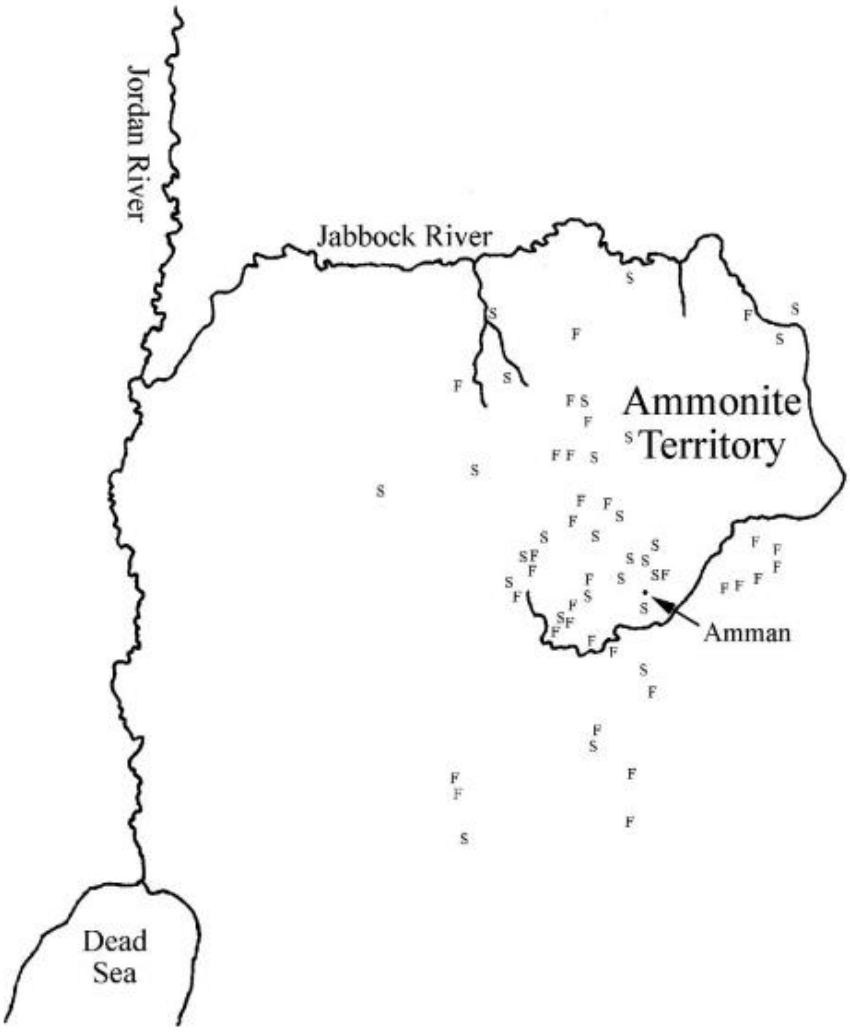

Figure 1.5: Drawn map of Ammonite Territory with displayed Iron Age II settlements. The Kingdom of Amman is located between the Jabbok River and the Dead Sea in Northern Jordan. As depicted in Younker (2022, p. 604, Figure 38.3).

1.3.3 Geographical environment

The results from dendrochronology, lake levels from the Dead Sea, paleopalynology, and botanical research indicate that the climate of the Southern Levant became drier from approximately 1000 BCE onwards, which is also somewhat comparable with the climate that prevails in the current era (Frumkin et al., 1991, p. 198; MacDonald, 2000, p. 33-34). The Ammonite territory has probably had an annual rainfall of at least 300 mm, which allows for dry farming (MacDonald, 2000, p. 31-32; Tyson, 2014, p. 16). Moreover, the soil of the southern, northern, and western regions around Amman is classified as Red Mediterranean soil, which is different in texture from the Yellow Mediterranean soil, which is dominant in the eastern region around Amman (Tyson, 2014, p. 16-17). The former soil contains a high concentration of

clay, allowing decent water absorption and having enough nutrients for growing crops, like grains, vegetables, and fruits (Lacella, 1986, p. 53). The latter soil is somewhat more calcareous, which does not allow decent water absorption, and it lacks nutrients, which makes growing crops harder in contrast to Red Mediterranean soil (Lacella, 1986, p. 53).

1.3.4 The Ammonites during the Iron Age

The shift from the Late Bronze Age to the Iron Age I in the Levant is characterized by the crumbling of the Canaanite city-states and the emergence of settlements of the Israelites, Ammonites, Moabites, and Edomites, which were tribal groups in Cis- and Transjordan during that time period (Younker, 2012, p. 367-370; Younker, 2022, p. 601). New surveys concluded a growth in sedentary lifestyle during the Iron Age I period in Transjordan because they noticed an increase in sites dating to the Iron Age I period in contrast to the previous Late Bronze Age (Tyson, 2014, p. 19). It became apparent that various sites in the mountainous regions of Jordan were fortified (Herr, 2014, p. 658).

The transition from the Iron Age I period to the Iron Age II period was archaeologically barely visible but can be characterized by the total disintegration of the Canaanite city-states and the unification of those tribal groups in Cis- and Transjordan into tribal kingdoms, or otherwise called monarchies (Herr, 2014, p. 658; Younker, 2012, p. 374-375; Younker, 2022, p. 601).

The next transition from Iron Age II A to II B in Transjordan for the Ammonites is characterized by an increase in trade and in social complexity, accompanied by the visibility of wealth and status found in the archaeological record, tombs (Tyson, 2014, p. 214). This rise in social complexity could possibly be explained by the threat of an attack from outsiders, like Israel and the Neo-Assyrian Empire, for example, but also by the agricultural lifestyle that arose and was currently needed (Tyson, 2014, p. 214-215). In this period, the monarchs of Transjordan had the wealth and capacity to convey their authority and leadership (Routledge, 2018, p. 153-154). Moreover, Ammon was obligated to pay tribute to the Kingdom of Judah in the late Iron Age II B period (Younker, 2014, p. 760).

Figure 1.6: Map of the Kingdoms of the Southern Levant during the late Iron Age II A period. As depicted on Wikimedia.org (https://commons.wikimedia.org/wiki/File:Kingdoms_of_the_Levant_Map_830.xcf).

The following transition from Iron Age II B to II C can be marked by the historical event of the capture of the Northern Kingdom of Israel by the Assyrians (Younker, 2012, p. 374-375). In this period, Ammon turned into a vassal of the Neo-Assyrian empire around 734-732 BCE to at least 630-620 BCE, paying tribute and contributing with military support while still being independent (Kletter, 1991, p. 42; Routledge, 2018, p. 142; Tyson, 2014, p. 217). During this period, Ammon was at its prime;

flourished most of all, and there seemed to be another increase in social complexity, status, power, wealth, and consumption of luxury goods by the elites, some of whom were described by Neo-Assyrian documents as kings (Tyson, 2014, p. 219). It appeared that the Ammonites paid the most tribute to the Neo-Assyrians, and some scholars even suggest that this can be a proxy for their wealth, prosperity, and economic stability (Younker, 2014, p. 765). The prosperity of the Kingdom of Ammon continued even into the Iron Age III / Persian period (Younker, 2014, p. 765-766). When the Neo-Assyrian empire was in decline, the Neo-Babylonian Empire arose, with Nebuchadnezzar ultimately invading the Levant and subjugating the Ammonites (Tyson, 2014, p. 231). The Ammonites did not disappear or go extinct, but they lost their independence to the Babylonians and eventually became a province of Persia (Tyson, 2014, p. 231-232).

1.4 Research

In 1838, Edward Robinson, a biblical scholar from the US, travelled to Palestine with the aim of locating and mapping biblical places in order to justify the use of the Bible in science (Davis, 2012, p. 54; Davis, 2014, p. 36). Robinson's pioneering surveys were the foundation for many to follow, who would walk in his footsteps and survey the Levant in the following centuries (Davis, 2012, p. 54). Levantine archaeology became increasingly popular in the 1850s, predominantly because of its biblical connotations, resulting in more and more scientific attention, however, unfortunately, some expeditions looked more like treasure hunts than real scientific investigations (Davis, 2012, p. 54).

After the First World War and the demise of the Ottoman Empire, a time period had arrived in which France and Britain controlled a very large territory of the Near East (Davis, 2012, p. 54-55; Davis, 2014, p. 37-38). Davis argues that colonial dominance led to the expansion of archaeological research in the Levant, and international scholars were able to examine areas that were previously inaccessible because they were controlled by the Ottoman Empire (Davis, 2012, p. 55; Davis, 2014, p. 37). This was possible due to new laws that were introduced by Britain in the 1920s, licensing easier archaeological research and the possibility "to expropriate land for excavation" by the government (Davis, 2014, p. 37-38).

Nelson Glueck, a Jewish American archaeologist with a love for biblical archaeology, conducted from 1932 until 1947 surveys across Transjordan mapping archaeological sites (Glueck, 1933, p. 1-2; Glueck, 1951, p. 2; Blank & Ginsberg, 1972, p. xx). From his point of view, there was a tremendous need in the beginning of the 20th century for archaeological surveys to be carried out in Transjordan in order to examine more thoroughly the Transjordanian civilizations and to try to understand their influence, rise, and downfall (Glueck, 1933, p. 2).

After the Second World War, there was a period of postcolonialism in which countries located in the Levant became independent in the 1960s, which had a tremendous need for building national identities using archaeology as a tool to fulfil these social and political needs (Davis, 2014, 39-40). The legitimization of the Jewish state by the Israelis with the help of archaeology is a perfect example (Davis, 2014, 39-40; Hallotte & Joffe, 2002, p. 84-90). In the past century, many discussions on the relationship between the Bible and archaeology have flared up intensely, with on the one hand the biblical maximalists claiming the biblical narratives as historically accurate and on the other the biblical minimalists who oppose this view. Some saw the possibility to meet in the middle and use archaeology as a tool for illustrative purposes and the Bible as a supplementary source for knowledge, while others used archaeology in a way to confirm the biblical narratives and argue that not everything in the Bible is historically accurate (Rast, 2012, p. 48-51). Biblical subjects do not currently have a major role in Levantine archaeology, in contrary to the previous periods (Davis, 2014, p. 41). Davis argues that archaeology was closely interconnected with nationalism, colonialism, identity, and politics during the past two centuries in the Levant (Davis, 2014, p. 35-43).

1.5 Research problem, goals and questions

In the 19th century, scholars noticed Ammonite architecture, which was circular of nature and was mainly located around Amman (Kletter, 1991, p. 33). These scattered circular towers across the Ammonite territory are, in my opinion, one of the most notable pieces of architecture created by the Ammonites. In the 20th century, scholars tried to map and examine the archaeological remains in the land of Ammon in Northern Jordan by conducting numerous archaeological surveys, where they came

across these circular towers and classified them mostly at first as Iron Age Ammonite border forts (Glueck, 1939, p. 166-167, 247; Kletter, 1991, p. 33-34; Tyson, 2014, p. 51). Strategic or agricultural positioning of the Ammonite towers due to their placements on hills for defensive purposes or close to arable fields was indicated regularly (Glueck, 1939, p. 155-247). After many decades of research, some scholars still classify the circular towers as border forts, while others classify them as fortified farmsteads or even just as settlements (Kletter, 1991, p. 39-41; Tyson, 2014, p. 50-52).

The opinions on the function or purpose of these circular towers vary widely, and this topic is still not fully understood to this day. Moreover, a catalogue of the Ammonite towers is still lacking, wherein they are presented, described, localized, and discussed. The aim of this thesis is to provide a contemporary assessment of the circular towers of the Ammonites, to examine their primary function, and to investigate the extent of their utilization across the Ammonite territory from 1150 to 330 BCE.

Main research question:

- What was the primary function of the circular towers in the land of Ammon in Northern Jordan during the Iron Age?

Sub-research questions:

- Is there architectural consistency among the circular towers?
- What is the chronological timeline of construction and abandonment for the circular towers?
- Were strategic defensive considerations influential in the positioning of the circular towers?
- How is the distribution of the circular towers across the land of Ammon characterized, and can discernible spatial patterns be identified?
- What insights can be derived from ceramics and other archaeological findings in and around the circular towers regarding their function and purpose?

1.6 Methodology

This thesis is a continuation of the preceding research conducted in Transjordan on the circular Ammonite towers. In order to examine these circular towers, the methodology used in this thesis will be based on academic literature, which consists of mainly surveys and excavation reports from the 19th to the 21st centuries.

The Ammonite towers will be distinguished from other structures in the literature using the following criteria:

1. Addressed as a tower
2. Circular architectural nature
3. Located in or nearby the Ammonite territory
4. Dated to the period of the Ammonites by architecture or ceramics
5. Identified as Ammonite by architecture or ceramics

In order to locate the Ammonite towers, the drawn maps with the locations of the Ammonite towers from the surveys and excavation will be consulted and compared with the current knowledge on their locations on the website megajordon.org, which is a geographic information system designed to manage and display the archaeological sites situated in Jordan. The coordinates of the Ammonite towers will be noted in Appendix 1. Furthermore, the locations of the Ammonite towers will be displayed in the upcoming chapters on distribution maps from Google Earth Pro and digital elevation models. If preserved, the Ammonite towers will be displayed from an aerial perspective from Google Earth Pro in the second chapter of this thesis.

The surveys and excavation reports that yielded Ammonite towers will be listed below:

- Surveys:
    - The Survey of Eastern Palestine (Conder, 1889)
    - Mackenzie Survey (Mackenzie, 1911)
    - McCown Survey (McCown, 1930)
    - Vaux Survey (Vaux, 1938)
    - Survey of Transjordan and Palestine (Glueck, 1939)
    - Pape Survey (Pape, 1952)

    - Surveys of German Scholars (Fohrer, 1961; Gese, 1958; Reventlow, 1963; Hentschke, 1960)
    - Hesban Survey (Ibach et al., 1987)
    - Archaeological Survey of Greater Amman (Abu Dayyah et al., 1991)
    - Wadi Shuʿayb Archaeological Survey Project 2016 (Ahrens, 2018)
- Excavations:
    - Excavation of Boraas (Boraas, 1971)
    - Excavations by Thompson (Thompson, 1973; Thompson, 1977)
    - Excavation of McGovern (McGovern, 1983)

The dataset will provide insights into the Ammonite towers gathered from academic literature, as well as findings within and around the circular towers. These Ammonite towers and associated findings will be dated according to the chronology outlined in Table 1.1. In the analysis, the data from the dataset will be compared over the different Iron Age periods, after which a discussion will follow in the following chapter on the generated information and analysis.

1.7 Reading guide

In Chapter 2, the dataset of this thesis will be presented. The Ammonite towers will be displayed in Table 2.1, and a distinction is made between which circular towers will be discussed thoroughly and which will be discussed briefly. Moreover, a distribution map and digital elevation model will be present.

In Chapter 3, the dataset will be analysed along with the presentation of various graphs and distribution maps.

In Chapter 4, the dataset and analysis will be discussed and placed in a broader context. The previous interpretations of the Ammonite towers will be discussed alongside the limitations of the dataset, and I will bring forward my own interpretation of the function and/or purpose of the Ammonite towers. At the end, I will provide recommendations for future research.

In Chapter 5, the thesis concludes by answering the research questions.

Chapter 2: Dataset

2.1 Introduction

In this chapter, the circular Ammonite towers will be extensively discussed, while their data will be analysed later on in the upcoming chapter. Firstly, in order to structure the data on the Ammonite towers, their information will be displayed in Table 2.1; see Appendices 1-3 for a more detailed and comprehensive overview. Furthermore, an identification number will be assigned to every Ammonite tower in this dataset.

Table 2.1 will provide the following information about the Ammonite towers:

- The identification number
- The name
- The period of construction
- The period of abandonment
- The diameter
- The number of towers
- The state of the art with regard to the preservation
- Strategic or agricultural considerations in the location of the circular tower
- The references

Secondly, the dataset will be discussed in detail with, if possible, pictures, drawings, aerial views from Google Earth Pro, and top plans (which are drawn maps of what is exposed from a top perspective). It appeared only three Ammonite towers were excavated out of the thirty-nine, and six Ammonite towers are possibly still preserved (see Table 2.1 and Appendix 1). There was great variety in the descriptions of all the Ammonite towers in the surveys and associated publications, whereas sometimes they were discussed in detail but mostly very briefly. The most notable Ammonite towers, which were extensively examined, will be discussed in detail in this chapter, whereas the other Ammonite towers will be briefly discussed in 2.8. Lastly, the location and distribution of the dataset will be presented on a map (see Fig. 2.11) and a digital elevation model (see Fig. 2.13), in which the identification numbers correspond with the numbers displayed on the distribution map and the points on the digital elevation model correspond with the points on the distribution map.

The Ammonite towers								
No.	**Name**	**Date (BCE) construction**	**Date (BCE) abandonment**	**Diameter (in M)**	**Number of towers**	**State of the art**	**Strategic or agricultural**	**Reference**
1.	Rujm al-Malfuf North	Iron Age III / Persian	Iron Age III / Persian	22	1	Preserved	Strategic	Boraas, 1971, p. 31-45; Conder, 1889, p. 193; Glueck, 1939, p. 167; Mackenzie, 1911, p. 22; McCown, 1930, p. 15; Pape, 1952, p. 40
2.	Rujm al-Malfuf South	Iron Age II C	Iron Age III / Persian	13	1	Destroyed	Strategic	Glueck, 1939, p. 167; Mackenzie, 1911, p. 19; Thompson, 1973, p. 47-50
3.	Khirbet al-Hajjar	Iron Age II B	Iron Age III / Persian	11.7	1	Destroyed	Strategic & agricultural	Thompson, 1977, p. 27-34
4.	Rujm al-Henu West	Iron Age II C	Iron Age III / Persian	12	1	Preserved	Strategic & agricultural	Vaux, 1938, p. 420-421; Glueck, 1939, p. 194-195; McGovern, 1983, p. 105-137
5.	Jumeian	Iron Age I	Iron Age III / Persian	12	5	Destroyed	None	Fohrer, 1961, p. 63-64; Ibach & LaBianca, 1987, p. 20
6.	Site F	Iron Age I	Iron Age III / Persian	*unk*	1	Destroyed	Strategic	Fohrer, 1961, p. 60-61
7.	Site C	Iron Age I	Iron Age III / Persian	8	1	Destroyed	Strategic	Fohrer, 1961, p. 59-60; Ibach & LaBianca, 1987, p. 28
8.	Qasr er-Rônaq	Iron Age I	Iron Age I	15	1	Destroyed	Strategic & agricultural	Conder, 1889, p. 152; Glueck, 1939, p. 155-156; Pape, 1952, p. 41
9.	Sweiwina	Iron Age II A	Iron Age II C	*unk*	1	Possibly destroyed	Strategic & agricultural	Abu Dayyah, 1991, p. 391; Conder, 1889, p. 251; Glueck, 1939, p. 168
10.	Rujm al-Qutnah South	Iron Age I	Iron Age II C	*unk*	2	Possibly destroyed	Agricultural	Abu Dayyah, 1991, p. 391; Glueck, 1939, p. 172-173
11.	Qasr Khelda South	Iron Age II A	Iron Age II C	10	1	Possibly preserved	Strategic	Abu Dayyah, 1991, p. 391; Glueck, 1939, p. 164-165
12.	Rujm al-Kharabsheh	Iron Age II A	Iron Age II C	*unk*	3	Destroyed	Strategic	Abu Dayyah, 1991, p. 391
13.	Qasr Khelda	Iron Age II A	Iron Age II C	*unk*	1	Destroyed	Strategic	Abu Dayyah, 1991, p. 392; Glueck, 1939, p. 164-165
14.	Khirbet al-Kursi	Iron Age I	Iron Age I	22	1	Barely preserved	Strategic & agricultural	Glueck, 1939, p. 162-163
15.	Rujm al-Jebeihah	Iron Age I	Iron Age I	15	1	Destroyed	Strategic	Glueck, 1939, p. 172
16.	Rujm ‘Ain al-Beida	Iron Age I	Iron Age I	10.25	1	Destroyed	Strategic	Glueck, 1939, p. 183-184
17.	Khirbet Morbat Bedran VIII	Iron Age I	Iron Age I	9	1	Destroyed	Strategic & Agricultural	Glueck, 1939, p. 186-190
18.	Khirbet Morbat Bedran X	Iron Age I	Iron Age I	9.8	1	Destroyed	Strategic & Agricultural	Glueck, 1939, p. 183-184
19.	Rujm al-Hawi	Iron Age I	Iron Age I	11.2	1	Destroyed	None	Glueck, 1939, p. 194
20.	Rujm al-Hawi	Iron Age I	Iron Age I	8.2	1	Destroyed	None	Glueck, 1939, p. 194
21.	Rujm al-Mûmani	Iron Age I	Iron Age I	15	1	Possible destroyed	None	Glueck, 1939, p. 195
22.	Site E	Iron Age I	Iron Age III / Persian	6.5-7	1	Destroyed	Possibly Strategic	Fohrer ,1961, p. 60
23.	Khirbet abu Ghurusch	Iron Age I	Iron Age III / Persian	*unk*	1	Destroyed	Possibly Strategic	Fohrer, 1961, p. 62-63
24.	Arkub umm Kutten	Iron Age I	Iron Age III / Persian	10	1	Destroyed	Possibly Strategic	Fohrer, 1961, p. 68
25.	Rujm Arkub	Iron Age I	Iron Age III / Persian	*unk*	1	Destroyed	Strategic	Fohrer, 1961, p. 67-68
26.	Rujm al-Hamman	Iron Age I	Iron Age III / Persian	7.1	1	Destroyed	None	Reventlow, 1963, p. 127-130
27.	Markaba	Iron Age I	Iron Age I	5	1	Destroyed	Strategic	Hentschke, 1960, p. 106-108
28.	Site no. 11	Iron Age I	Iron Age III / Persian	10.5	1	Destroyed	Strategic	Hentschke, 1960, p. 119-120
29.	Shajarat Bil’as	Iron Age I	Iron Age I	8	1	Destroyed	Strategic	Hentschke, 1960, p. 120-121
30.	Al Qasr	Iron Age I	Iron Age I	10	1	Possibly preserved	Possibly Strategic	Gese, 1958, p. 59-60
31.	Qasr et-Tabakeh	Iron Age I	Iron Age III / Persian	7	1	Destroyed	Possibly Strategic	Gese, 1958, p. 60-61
32.	Khirbet Jazzir	Iron Age I	Iron Age III / Persian	12	1	Possibly preserved	Strategic	Ahrens, 2018, p. 636

Table 2.1: The dataset of the Ammonite towers (made by author).

2.2 Rujm al-Malfuf North

The archaeological site Rujm al-Malfuf North can still be found to this day in the city of Amman due to its extraordinary preservation (see Fig. 2.1). In the course of the years this site has been surveyed and visited from the late 19th century onwards (see Fig. 2.2) and excavated by Boraas in 1969. Rujm al-Malfuf North's interior diameter is 15.6-15.8 m, the exterior diameter is 20.15 to approximately 22 m, the preserved height is at least 5.5 m, and the thickness of the plastered exterior wall is 2.3-2.5 m (Mackenzie, 1911, p. 27; Glueck, 1939, p. 165-167; Thompson, 2000, p. 482). The entrance of the Rujm al-Malfuf North is still not definitely pinpointed, however, Glueck argued that the opening in the wall on the eastern side of the circular tower could possibly be identified as an entrance (Mackenzie, 1911, p. 24; Glueck, 1939, p. 165).

Figure 2.1: Rujm al-Malfuf North. Photographed from a south-east perspective in the 21st century, and presented on universes.art (https://universes.art/en/art-destinations/jordan/amman/tours/11/ammonite-watchtower)

Figure 2 2: Rujm al-Malfuf North. Photographed by Mackenzie from a south-east perspective in the 20th century. As depicted in Mackenzie (1911, p. 22, Figure 9).

The top plan (see Fig. 2.3) does not display partition walls in the circular tower; however, from an aerial perspective from Google Earth Pro, it appears that the circular tower was divided into several rooms by partition walls (see Fig. 2.4). The height of the tower was possibly three stories high (Boraas, 1971, p. 38). Moreover, Conder mentions that the existence of archaeological remains adjacent to the Rujm al-Malfuf North may indicate the foundations of structures and walls (Conder, 1889, p. 193). Glueck agreed with Mackenzie's view on these structures and mentions that they could be regarded as the foundations of a rectangular building, which is approximately 27 m and 28 m in east-west and north-south directions, respectively (Mackenzie, 1911, p. 27; Glueck, 1939, p. 165). Boraas and Conder's interpretations argue that the archaeological remains of Rujm al-Malfuf North date back to the Roman period, because of the found terra sigillata (Conder, 1889, p. 193; Boraas,

1971, p. 37-43). However, Glueck's and Sauer's interpretations disagree with the former, and based on their own archaeological research, they claim independently of each other that Rujm al-Malfuf North date back to the Iron Age III / Persian period (Glueck, 1939, p. 165; Thompson, 2000, p. 483).

Thompson describes the idea that it is possible "that the Romans cleaned and rebuilt an original Iron Age tower" (Thompson, 2000, p. 482-483). This theory definitely makes sense, because the architectural style is consistent with other circular towers, and cultural formation processes could have affected the context, resulting in the absence of Iron Age ceramics during the 1969 campaign of Boraas. However, Polacky claimed to have found Iron Age ceramics dated to the Iron Age III / Persian period at Rujm al-Malfuf North after the excavation led by Boraas (Yassine, 1988, p. 11-31). It raises the question of whether Ammonite towers were reused repetitively or not in successive periods. The thin destruction layer, uninterrupted soil, and lack of weaponry in the circular tower imply, according to Boraas, that there was no sudden abrupt end, but a gradual decrease in the use of this tower before it was totally abandoned in the Iron Age III / Persian period (Boraas, 1971, p. 39).

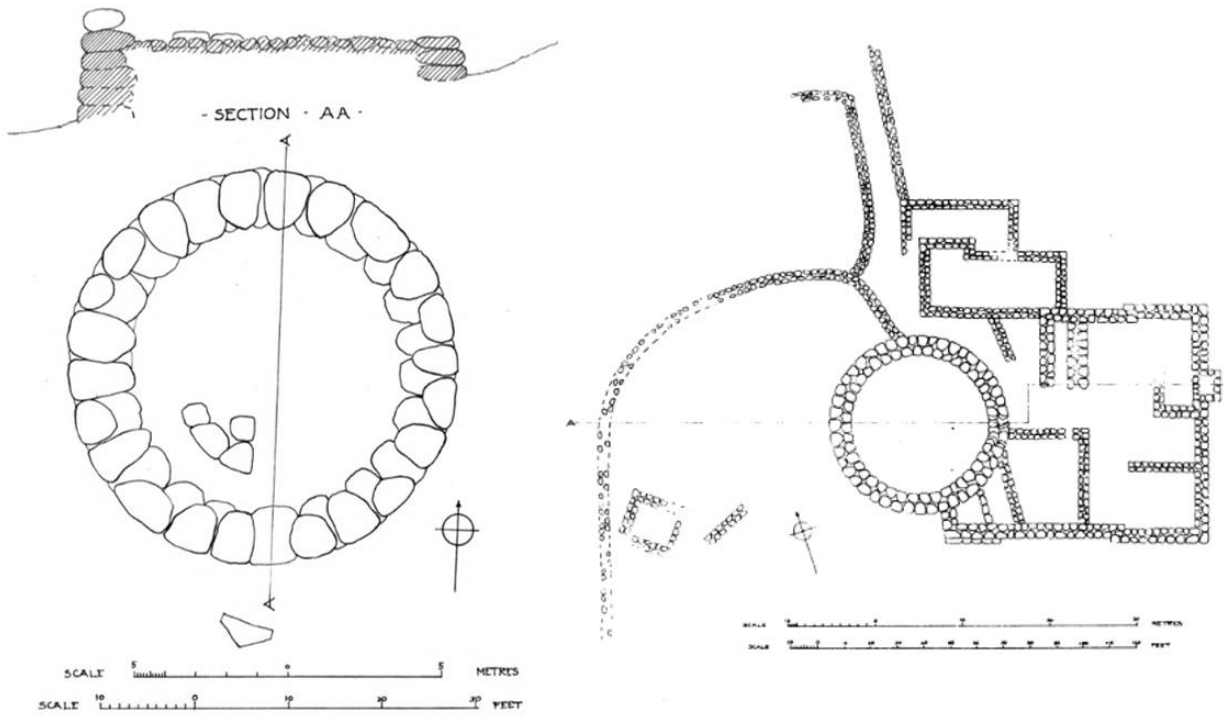

Figure 2.3: Top plan of Rujm al-Malfuf North. The fundaments of a building can be seen in the right drawing on the ride side of the circular tower. The plates as depicted in Mackenzie (1911, pl. 3-4).

It has been claimed that the Rujm al-Malfuf North was built for defensive purposes and was strategically located due to its tremendous visibility over highlands while being in visible range with other watchtowers or fortifications, such as the Rujm al-Malfuf South (Mackenzie, 1911, p. 22-25; Glueck, 1939, p. 166). The lack of sight in the southern direction from Rujm al-Malfuf North can possibly explain the construction of Rujm al-Malfuf South (Boraas 1971, p. 31).

Figure 2 4: Rujm al-Malfuf North. Photographed from an aerial view by Google Earth Pro. Adapted from Google Earth Pro (made by author).

2.3 Rujm al-Malfuf South

The archaeological site Rujm al-Malfuf South was excavated by Thompson in late 1972 to early 1973 after some financial aid from the Department of Antiquities of Jordan and practical and material assistance from the American Center for Oriental Research (Thompson, 1973, p. 47). Unfortunately, a concrete building was constructed partly above the Ammonite tower (see Fig. 2.5) by the Jordanian army around 1958, which increased the difficulty of the excavation and interpretation of the tower tremendously because parts of the tower were dislocated (Thompson, 1973, p. 49).

Rujm al-Malfuf South had a diameter of approximately 13 m and a preserved height varying between 2 and 5 m (Thompson, 1973, p. 50). Bedrock was used as its interior floor, which also bared ceramics dated to the Iron Age I period (Thompson, 1973, p. 50). In addition, ceramics were unearthed from the Iron Age II C to the Iron Age III / Persian period, the Byzantine period, and the Ayyubid-Mamluk period, indicating that the circular tower was, according to Thompson, revisited a couple of times during these latter two periods (Thompson, 1973, p. 50). It was concluded that the circular tower was constructed during the Iron Age II C period and was abandoned in the Iron Age III / Persian period (Thompson, 1973, p. 50).

The top plan (see Fig. 2.5) displays that the door opening was possibly located in the northeast part of the circular tower. Additionally, there is evidence for a potential stairway on the east side of the tower, however, the findings do not wholly confirm this hypothesis (Thompson, 1973, p. 50). Moreover, the outer wall of the Ammonite tower was also plastered just like Rujm al-Malfuf North, with an unmentioned material, and a wall was reconstructed during the Byzantine period inside the Ammonite tower against the steps of the entrance (Thompson, 1973, p. 48-50).

The circular tower was possibly located strategically because it is in close proximity to Rujm al-Malfuf North. Sadly, it is unclear if the tower still exists, because from Google Earth Pro, it is visible that buildings are nowadays standing adjacent to a rural parcel at the location of Rujm al-Malfuf South. It must be assumed that the tower was destroyed in the decades since 1973.

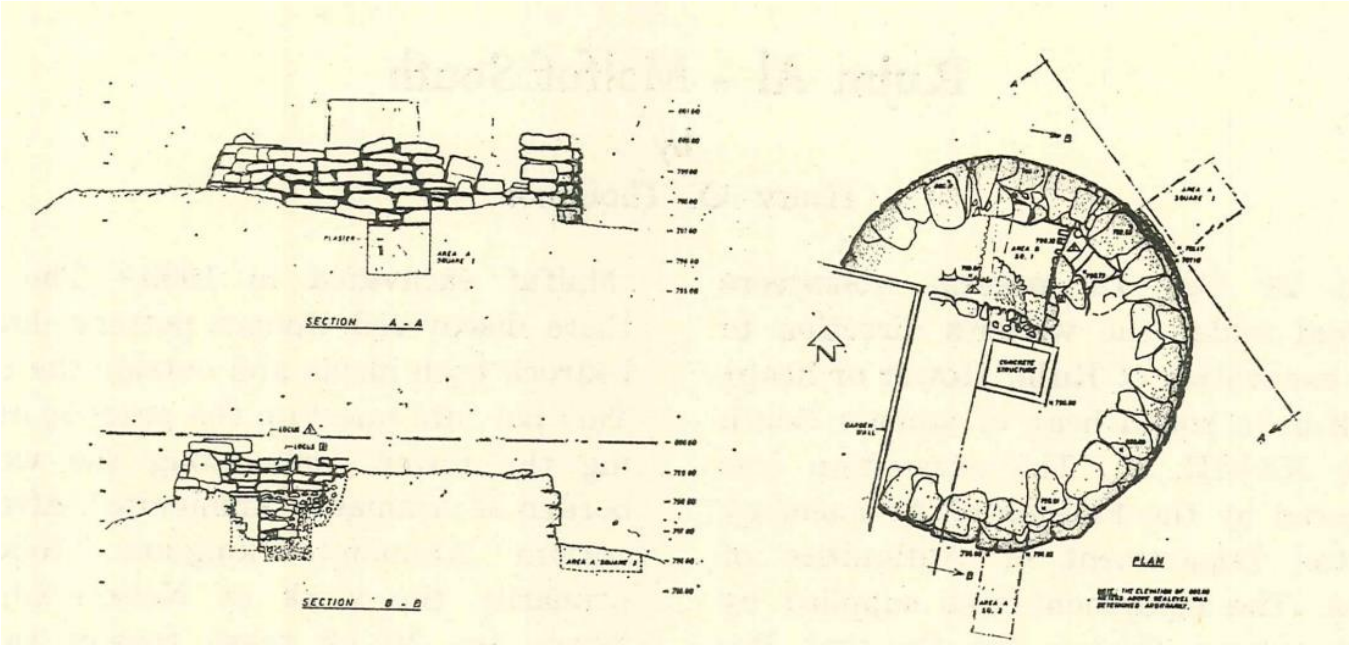

Figure 2.5: The top plan of Rujm al-Malfuf South. It displays in the right drawing in the top right corner the entrance of the circular tower. As depicted in Thompson (1973, p. 48, Figure 1).

2.4 Khirbet al-Hajjar

The archaeological site Khirbet al-Hajjar is strategically located near the Wadi Abu Gharaba, which extends to the Jordan Valley, along with a view over the Wadi Sir and Wadi Kefrein (Thompson, 1977, p. 27; Thompson, 2000, p. 488). This Ammonite tower is in sight with Khirbet al-Kursi and Qasr er-Rônaq, and is situated near arable land, which could be used for agriculture (Thompson, 1977, p. 27; Thompson, 2000, p. 488).

In the summer of 1972, a campaign was launched to excavate this archaeological site (Thompson, 1977, p. 27). It was decided to excavate two squares (see Fig. 2.6), which were two meters from each other. During the excavation, a circular tower was discovered, which had a diameter of 11.7 m, a thickness of 1.8 m and a preserved height of at least 2.65 m in 1972 (Thompson, 1977, p. 29). The top plan (see Fig. 2.7) displays that the circular tower was divided into several rooms, whereas those partition walls varied between a thickness of 0.9-1.7 m and a preserved height of 1.25-1.75 m (Thompson, 1977, p. 27-31).

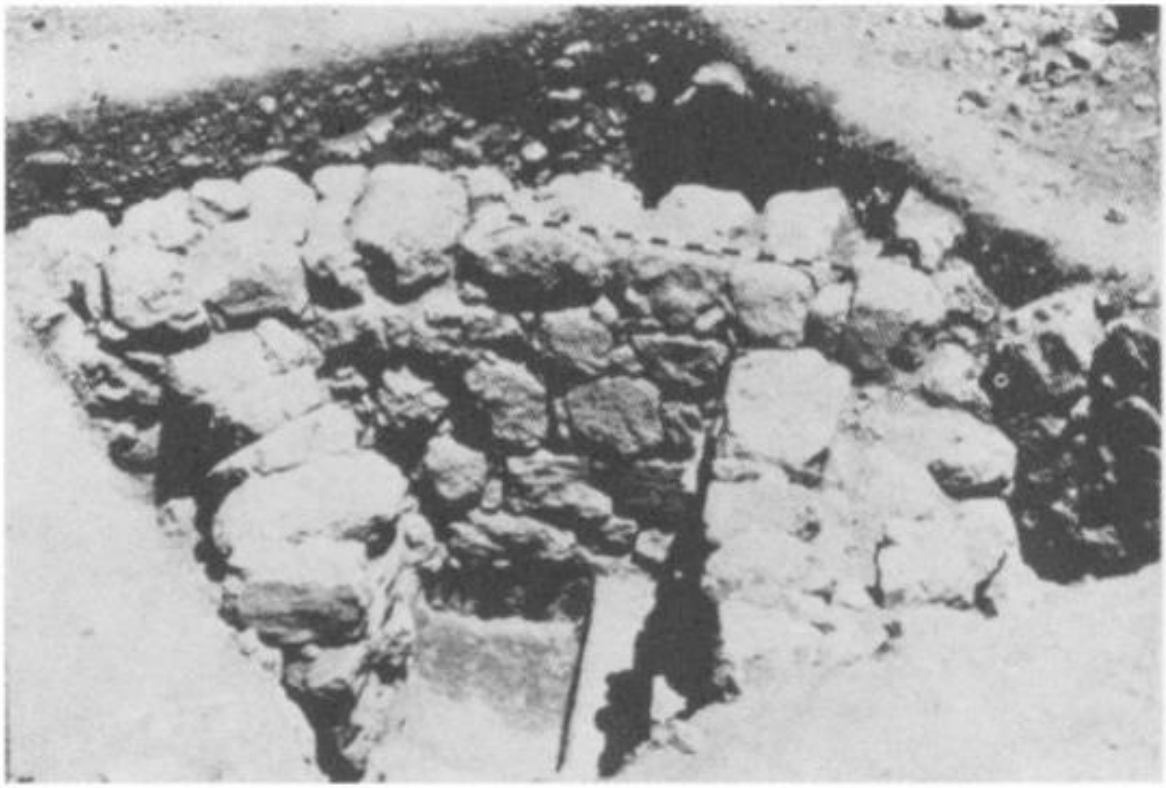

Figure 2.6: Khirbet al-Hajjar. This square of the circular tower corresponds with the left drawing at Fig. 2.7. As depicted in Kletter (1991, p. 35, Figure 4).

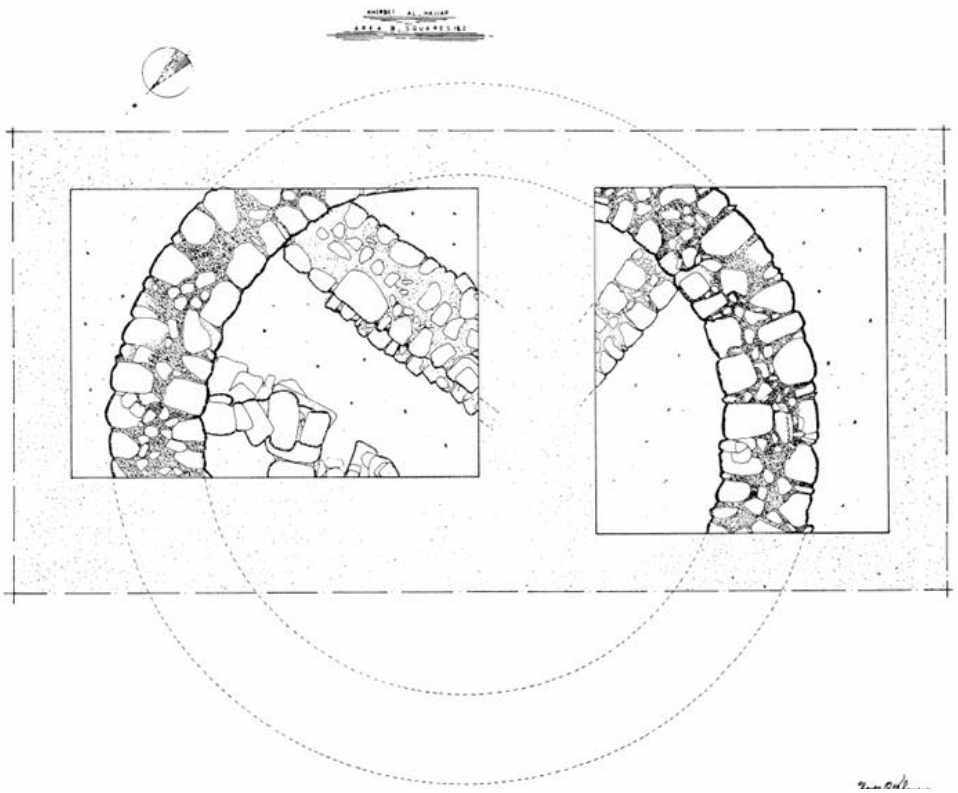

Figure 2.7: Top plan of the Ammonite tower Khirbet al-Haijar, which displays the two excavated grids. As depicted in Thompson (1977, p. 30, Figure 2).

The top soil yielded predominantly Iron Age III / Persian ceramics, with some Byzantine sherds and sherds from the Iron Age I to Iron Age II B periods (Thompson, 1977, p.28-29). After careful analysis, it appeared that the constructors had dug through occupation layers from the Iron Age I to Iron Age II A periods before hitting bedrock, which was used as the interior floor of the Ammonite tower (Thompson, 1977, p. 29). Therefore, Thompson argued the Ammonite tower was constructed in the Iron Age II B period and abandoned in the Iron Age III / Persian period (Thompson, 1977, p. 34). Moreover, Thompson stated in 1977 that this circular tower was the first Ammonite tower to be dated by means of excavation to the Iron Age period in general, because the excavation of Rujm al-Malfuf North in 1969 by Boraas did not uncover any Iron Age ceramics (Thompson, 1973, p. 47; Thompson, 1977, p. 29). Most notably was the finding of a bronze coin of Tyre in the circular tower, which dated to the 4th century BCE (Thompson, 1977, p. 31).

Furthermore, the exterior wall of the Ammonite tower was plastered just like Rujm al-Malfuf North and Rujm al-Malfuf South (Thompson, 1977, p. 31). According to Thompson, the findings of the 20 sling stones could indicate a military function designated to Khirbet al-Hajjar during its existence (Thompson, 2000, p. 485). Unfortunately, it is unclear if the tower still exists, because nowadays, at the location of Khirbet al-Hajjar are houses standing, so it must be assumed that the tower was destroyed in the building process.

2.5 Rujm al-Henu West

The archaeological site Rujm al-Henu West, situated in the middle of fertile fields and closely to Rujm al-Hawi and Rujm al-Henu East in the Baq'ah valley, contains a circular tower, which has a diameter of 12 m and a preserved height of at least 3 m (Glueck, 1939, p. 194-195; McGovern, 1983, p. 110-137). The tower was built directly on bedrock, and this occupational floor was dated by ceramics from the Iron Age II C to Iron Age III / Persian period, while the ceramics on the topsoil of the site were predominantly from the Iron Age II C, some dated to the Byzantine periods, and some Umayyad and Mamluk ceramics at Rujm al-Henu East (McGovern, 1983, p. 113-137). The latter ceramic findings can be correlated to the burials in the complex of Rujm al-Henu West, which date to the Islamic periods (McGovern, 1983, p. 136).

Figure 2.8: Rujm al-Henu West. With on the other side of the road on the right side of the picture Rujm al-Henu East. Photographed from an aerial view by Google Earth Pro. Adapted from Google Earth Pro (made by author).

Most interestingly is the fact that this circular tower (see Fig. 2.8) was not standing alone or nearby any buildings like Khirbet al-Kursi (see Fig. 2.10) but was built into the western wall of the entire building (Glueck, 1939, p. 194-195; McGovern, 1983, p. 110). The Ammonite tower was mostly built out of larger boulders (see Fig. 2.9) in contrast to the rest of the structures at Rujm al-Henu West (McGovern, 1983, p. 110). McGovern argues therefore that the circular tower was already standing before it was built within the western wall of this site (McGovern, 1983, p. 112). The top plan (see Fig. 2.9) displays the Ammonite tower and the boulders of the structure of Rujm al-Henu West.

It looks like the tower is not being divided by a wall on the top plan; however, this is the case on the aerial view from Google Earth Pro (see Fig. 2.8). It is possible that Rujm al-Henu West was located strategically, because it had sight of the Wadi Umm ad-Dananir (McGovern, 1983, p. 113).

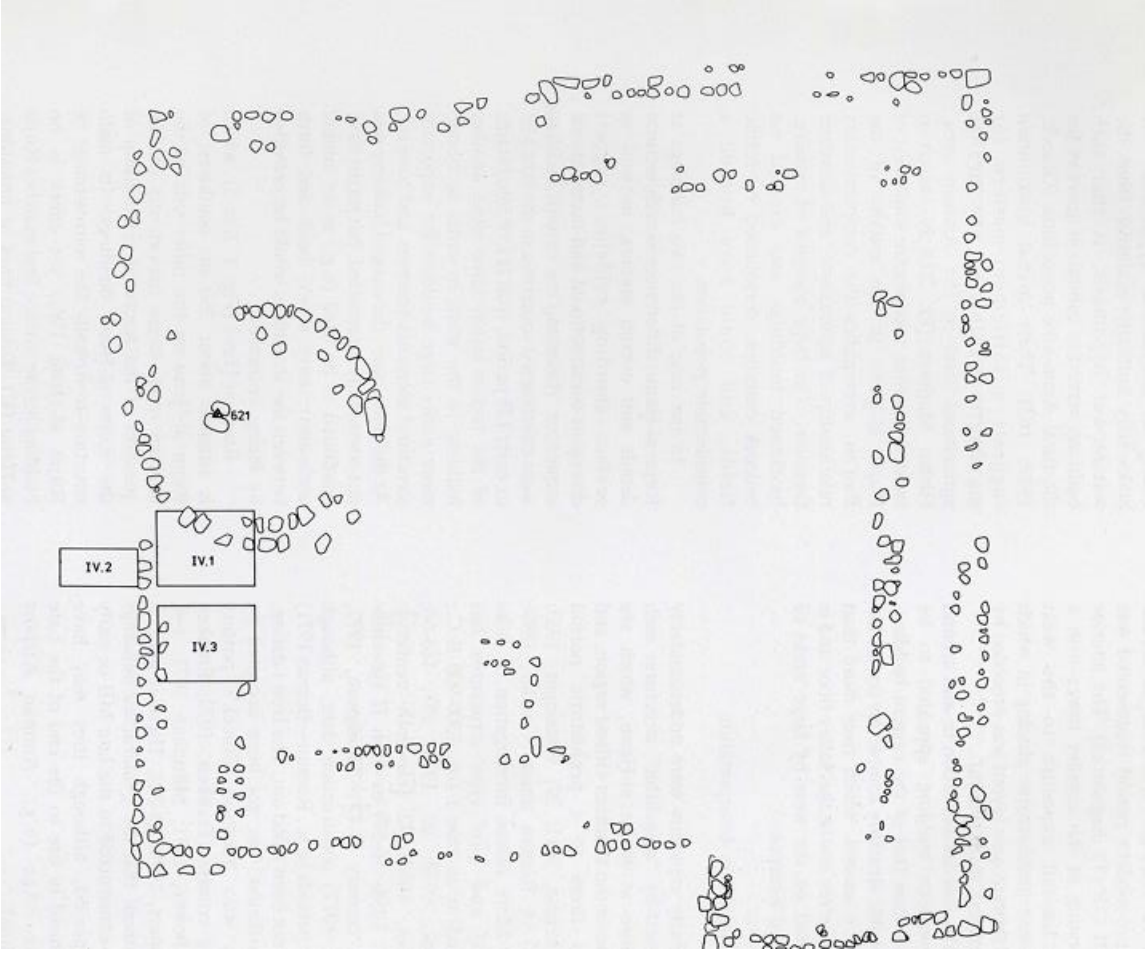

Figure 2.9: The top plan of the Ammonite tower Rujm al-Henu West with on the left side of the drawing the Ammonite tower. As depicted in McGovern (1983, p. 111, Figure 3).

2.6 Qasr er-Rônaq

The archaeological site Qasr er-Rônaq, located closely to Qasr es-Sâr, contained a circular tower with an exterior diameter of approximately 15 m, a wall thickness of 1,7 m, and a preserved height in the 1940s of at least 2,43 m (8 feet) to 2,65 m (Glueck, 1939, p. 155-156; Pape 1952, p. 41). Glueck argues that this structure contains a doorway on the western side and that the structure as a whole was built of flint blocks, which is a peculiar claim, because it is more logical if the structure was built of limestone blocks, which are relatively easy to acquire in the Ammonite region (Glueck, 1939, p. 155-156). The site was located on a strategic spot with a view over the nearby wadi while being surrounded by fertile fields for agricultural purposes (Glueck, 1939, p. 155-156). The ceramic artefacts found in the tower date back to the Iron Age I and Iron Age II A. Around the tower and roughly 100 m in a southern direction from the tower are ceramic fragments dating back from the Roman to the Islamic periods. Glueck claims that the original structures nearby the tower have

been lost due to cultural formation processes like building activities during the Roman to Islamic periods and agricultural activities, like ploughing, in modern times (Glueck, 1939, p. 155-156). Moreover, local people have used some of the blocks of the circular tower in order to build their houses (Pape 1952, p. 41). Currently, from an aerial view from Google Earth Pro, it looks like this site has been completely destroyed. Unfortunately, the surveys did not provide a top plan, picture, or drawing of the Ammonite tower.

2.7 Khirbet al-Kursi

The archaeological site Khirbet al-Kursi located closely to Qasr er-Rônaq, is also located in a strategic location, monitoring the Wadi Dabûq and Qasr er-Rônaq, while being in the middle of fertile fields. The circular tower has an inner diameter of 16 m, an exterior diameter of 22 m, and a preserved height of almost 6 m in the 1940s (Glueck, 1939, p. 162-163). However, nowadays the foundations are hardly visible from an aerial view from Google Earth Pro (see Fig. 2.10).

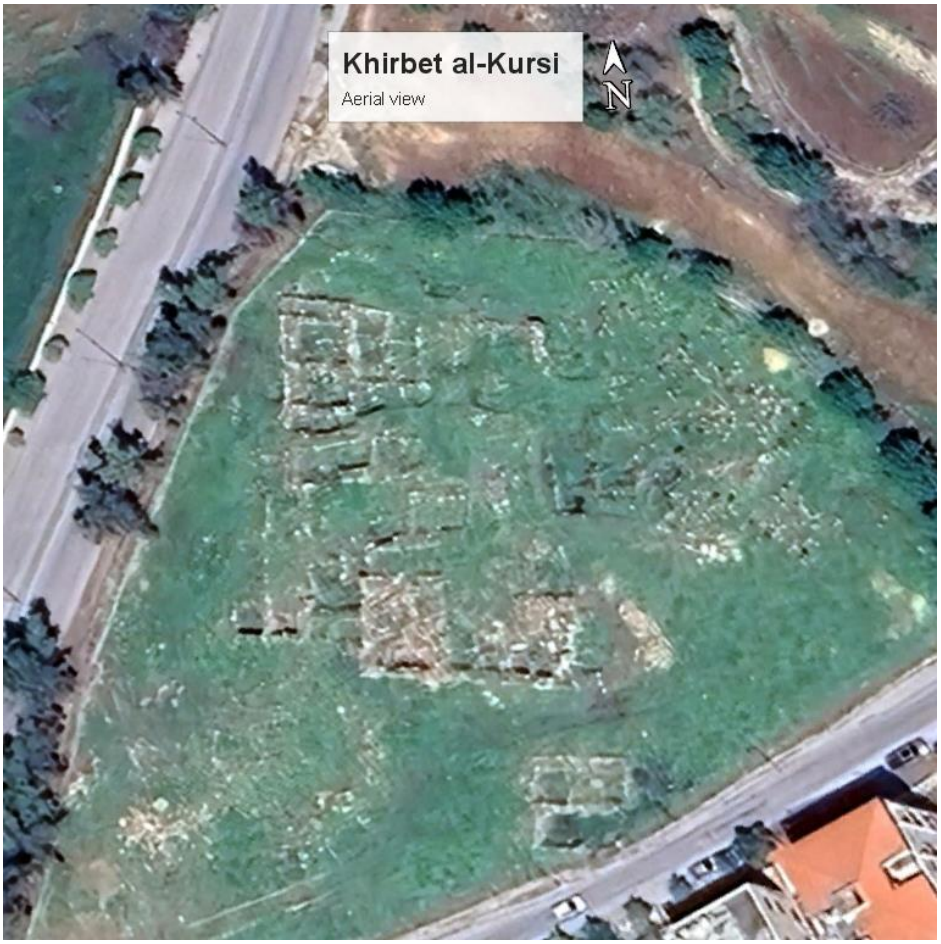

Figure 2.10: The Ammonite tower Khirbet al-Kursi. The circular tower is possibly depicted at the bottom left corner of the picture. Photographed from an aerial view by Google Earth Pro. Adapted from Google Earth Pro (made by author).

Glueck argued that he could easily identify this structure as an Ammonite tower due to its obvious architectural similarities with other circular Ammonite towers (Glueck, 1939, p. 162-163). The circular tower was totally filled with debris, surrounded by structures, and the ceramics found date back to the Iron Age I, Iron Age II A, Roman, and Byzantine periods (Glueck, 1939, p. 162). Furthermore, just like in the description of the previous Ammonite tower there is no floor map, picture, or drawing present of the tower of Khirbet al-Kursi.

2.8 The other Ammonite Towers

After a thorough discussion of the previous six circular Ammonite towers, the other Ammonite towers will be discussed briefly. For a detailed overview of the ceramics found across all the Ammonite towers see, Appendix 3. Qasr Khelda South and Khirbet Jazzir are the only possibly preserved Ammonite towers, whereas all the other Ammonite towers are possibly destroyed. The archaeological sites of Rujm al-Kharabsheh, Rujm al-Qutnah South and Jumeian contained more than one Ammonite tower. They yielded three, two, and five Ammonite towers, respectively. In contrast to Fohrer's interpretation of Jumeian, Ibach notes that there is a possibility to argue that these structures are instead the foundations of a church, because of the found mosaic stones (Fohrer, 1961, p. 63-64; Ibach & LaBianca, 1987, p. 187). Unfortunately, this archaeological site is destroyed, and therefore it will be assumed that Fohrer's interpretation is the most founded. The academic literature on Site F, Sweiwina, Rujm al-Qutnah South, Rujm al-Kharabsheh, Qasr Khelda, Khirbet abu Ghurusch, and Rujm Arkub yielded no exterior diameter, whereas the exterior diameter of the other Ammonite towers varied between 5 and 15 m. Jumeian, Rujm al-Hawi, Rujm al-Mûmani, and Rujm al-Hamman were not positioned on strategic or agricultural locations, whereas Rujm al-Qutnah South, Khirbet Morbat Bedran VIII, and X were located agriculturally near arable fields, and the other Ammonite towers were situated on strategic locations with far-reaching views. Sweiwina, Qasr Khelda, Rujm al-Kharabsheh, and Qasr Khelda South were constructed during the Iron Age II A period, whereas the other Ammonite towers were constructed during the Iron Age I period. In addition, the abandonment of the other Ammonite towers varied between the Iron Age II A, Iron Age II C, and Iron Age III / Persian periods.

2.9 Distribution map of the Ammonite Towers

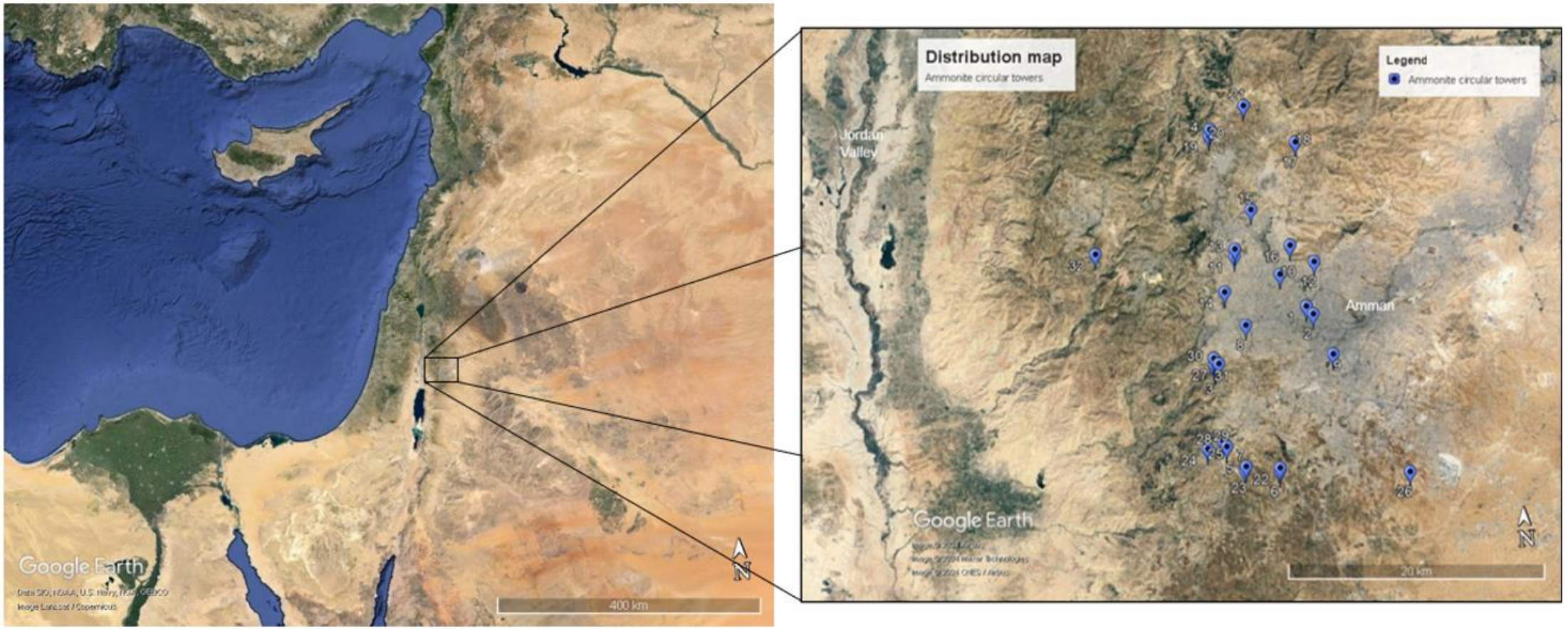

Figure 2.11: The distribution map of the Ammonite towers. Photographed from an aerial view by Google Earth Pro. Adapted from Google Earth Pro (made by author).

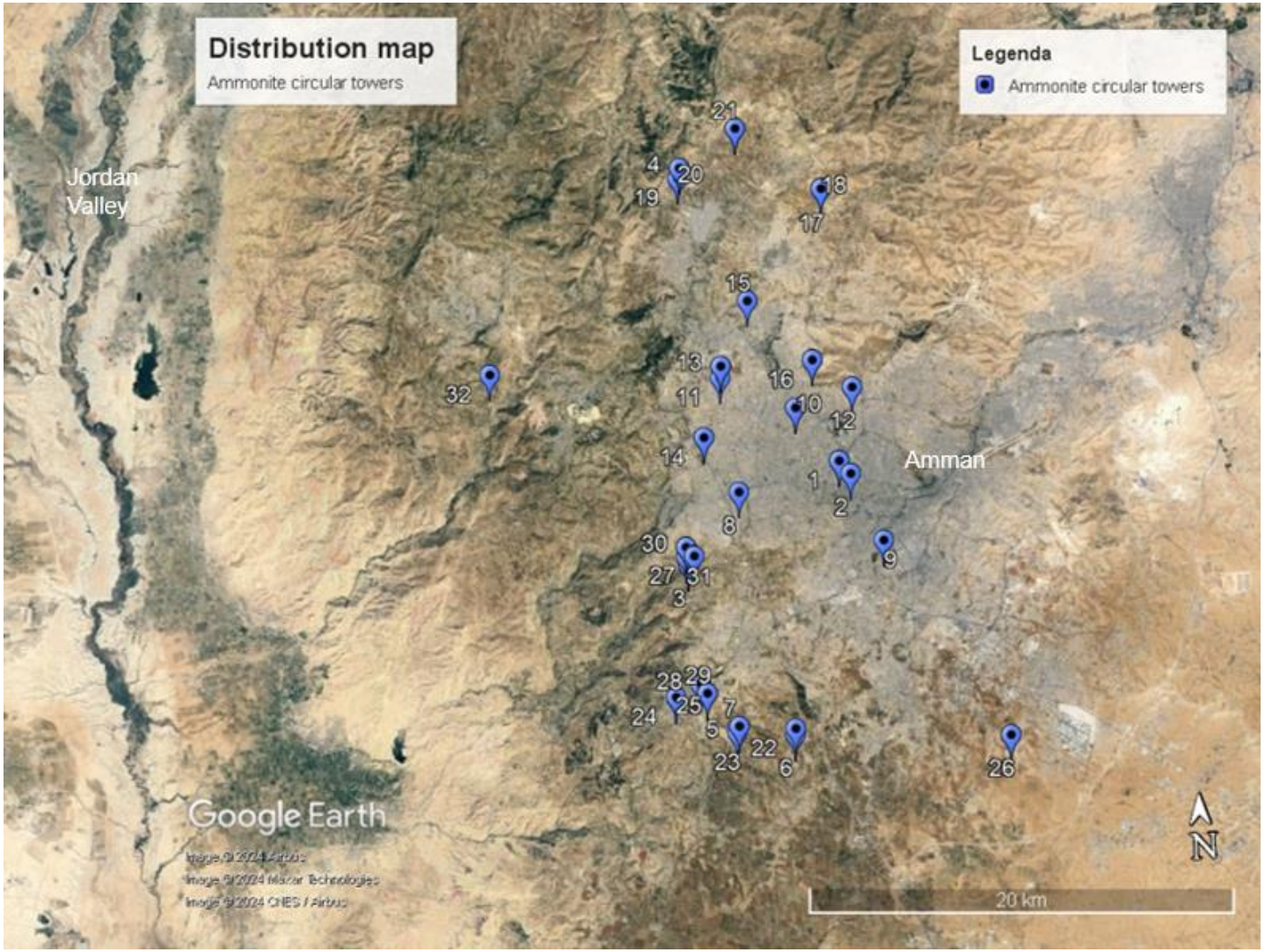

Figure 2.12: The distribution map of the Ammonite towers. Photographed from an aerial view by Google Earth Pro. Adapted from Google Earth Pro (made by author).

2.10 Digital Elevation Map of the Ammonite Towers

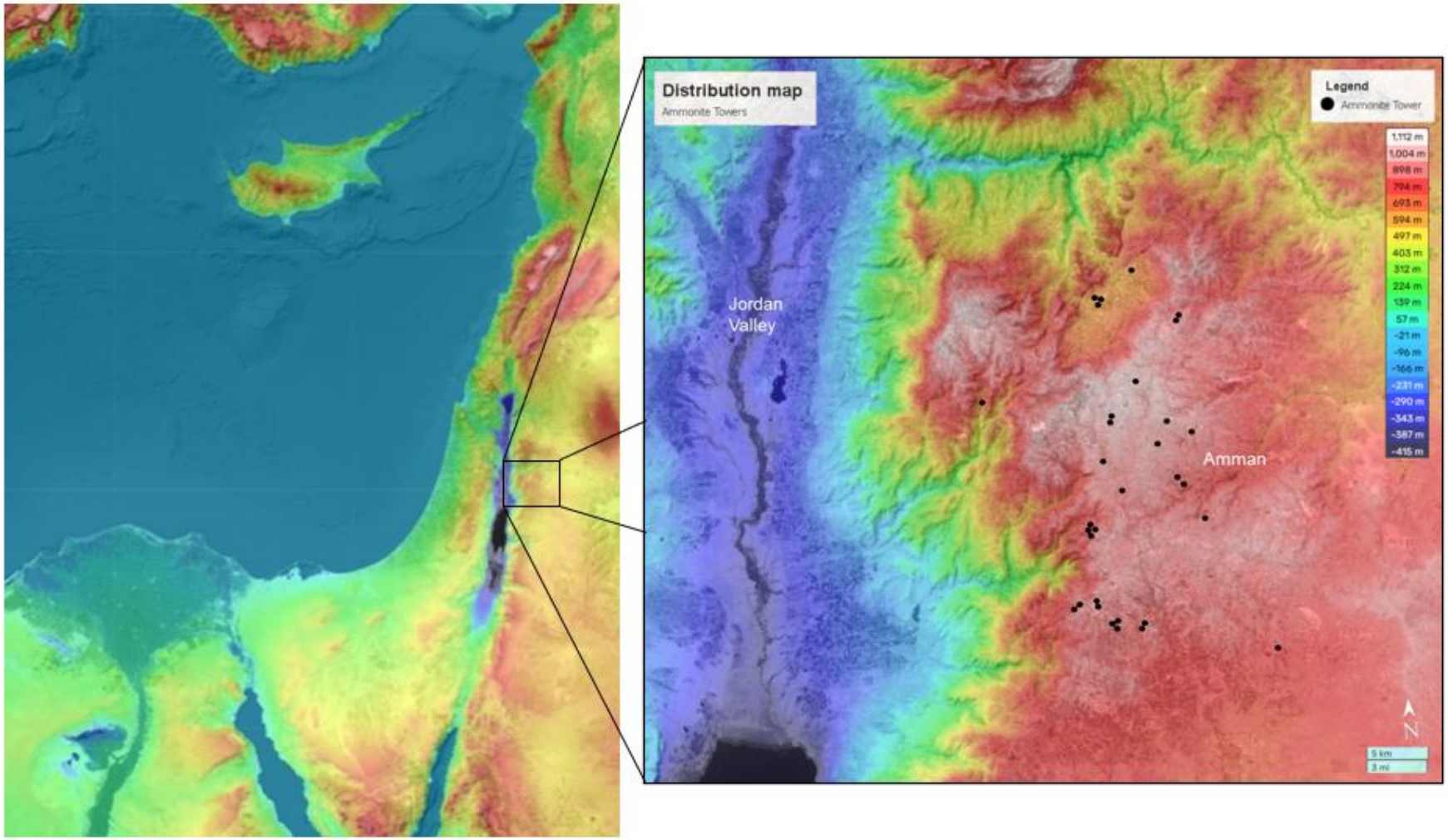

Figure 2.13: Digital elevation model of the distribution map of the Ammonite towers. Adapted from topographic-map.com (made by author).

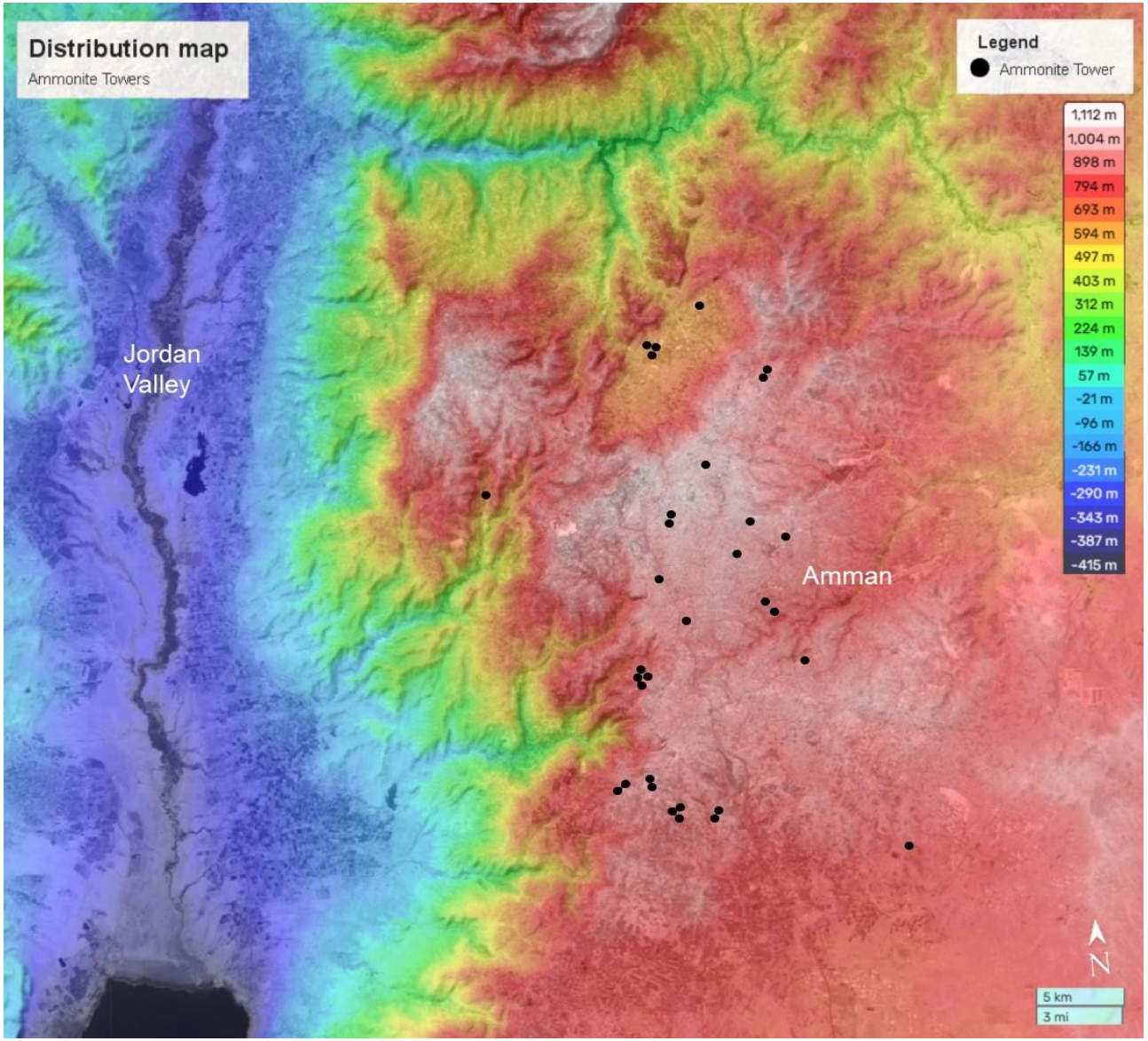

Figure 2.14: Digital elevation model of the distribution map of the Ammonite towers. Adapted from topographic-map.com (made by author).

Chapter 3: Analysis

3.1 Introduction

In this chapter the dataset will be analysed and multiple topics, graphs and distribution maps will be discussed and presented. Firstly, the chronological timeline of construction and abandonment of the Ammonite towers will be discussed, whereas every time period in which the Ammonite towers were utilized will have a map depicting the distribution of the Ammonite towers in the land of Ammon. Secondly, the diameter of the Ammonite towers will be discussed. Thirdly, it will be examined whether the Ammonite towers were originally constructed on their own or with surrounding structures and/or walls. Fourthly, agricultural or strategic defensive considerations for the positioning of the Ammonite towers will be presented along with the possible reasons for why some of the Ammonite towers could be assigned as strategic. Fifthly, the state of the art with regard to the preservation of the Ammonite towers will be discussed. Lastly, the ceramic evidence dated from the Iron Age I to the Mamluk periods that was found across the Ammonite towers will be presented.

3.2 Chronological timeline of construction, utilization and abandonment of the Ammonite towers

Figure 3.1 shows the chronological timeline of construction, utilization and abandonment of the Ammonite towers based on the ceramic evidence found in and around the circular towers described in the academic literature (see Appendices 2-3). Additionally, Figure 3.2 is a visual representation of the utilization of the Ammonite towers from 1200 to 275 BCE with intervals of 25 years in order to represent the time periods appropriately without any squeezing. Firstly, it stands out that the Ammonite towers started to be constructed during the Iron Age I period and that during this period the most Ammonite towers were built. There was not a preceding period with Ammonite tower construction before Iron Age I. This meant that the Ammonite towers were not constructed gradually over time but mainly at once. Moreover, Figure 3.3 depicts how the Ammonite towers were scattered across the Ammonite landscape during the Iron Age I period.

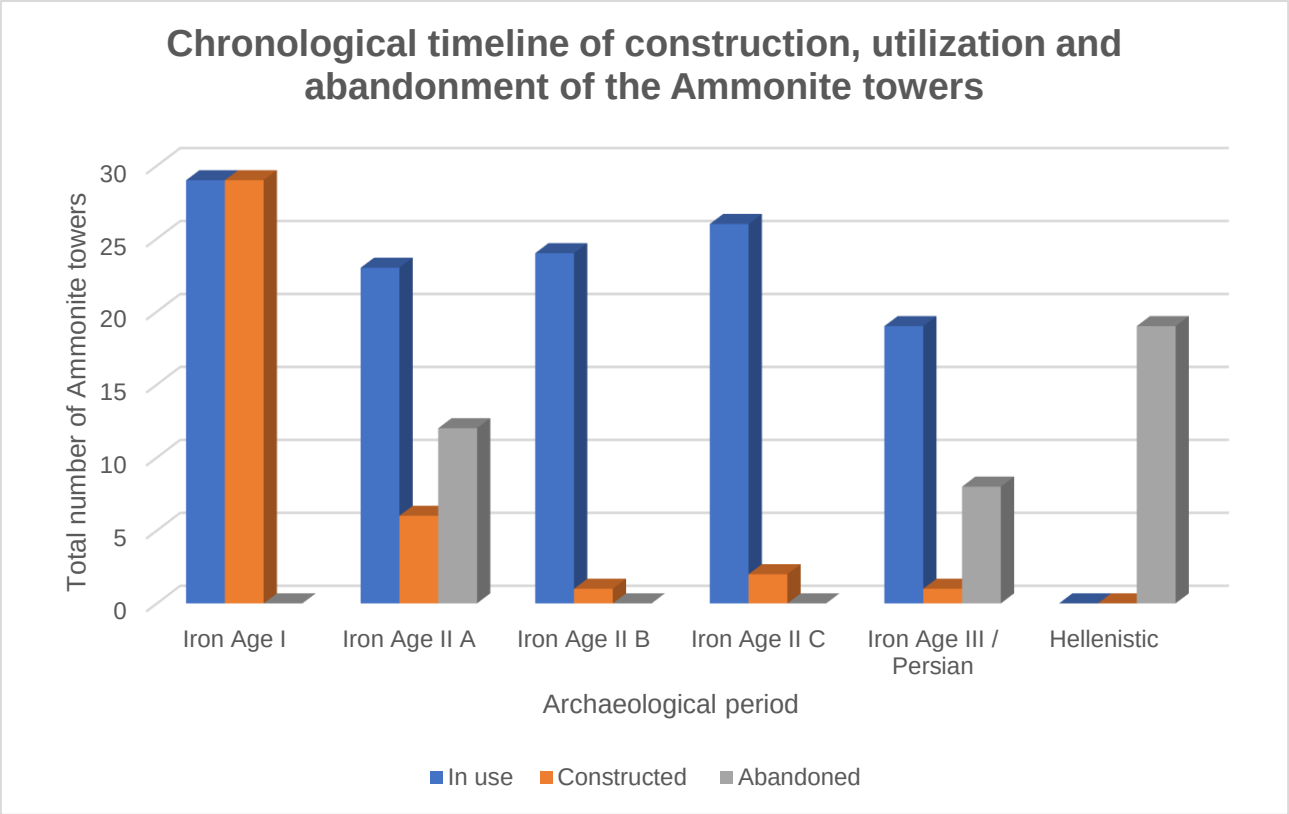

Figure 3.1: The bar graph displays the construction, period of utilization and abandonment of the Ammonite towers (made by author).

The use of Ammonite towers reached a peak during the Iron Age I period, with a total of 29 circular towers. There was a decline in Ammonite tower usage after the transition from the Iron Age I period to the Iron Age II A period. After that, there was a gradual increase in the utilization of the Ammonite towers until the end of the Iron Age II C period. From the transition to the Iron Age III / Persian period, there was a decrease of 26.9% in the use of the Ammonite towers before they were all ultimately abandoned at the end of the Iron Age III / Persian period. The Ammonite towers utilized during the Iron Age III / Persian period did not contain any ceramics, indicating that these circular towers were used during the Hellenistic period. This suggests that the last Ammonite towers were abandoned or went out of use during or towards the end of the Iron Age III / Persian period. Most interestingly, the distribution maps of the Ammonite towers (see Figs. 3.3-3.7) depict that from the Iron Age II C period on, there seems to be less emphasis on Ammonite towers usage in the northern part of Amman. Additionally, Figure 3.7 shows that there was only one Ammonite tower in use in the northern part of Amman, in contrast to the Ammonite towers in southern Amman, where almost all of them stayed in use from the Iron Age I period until the Iron Age III / Persian period.

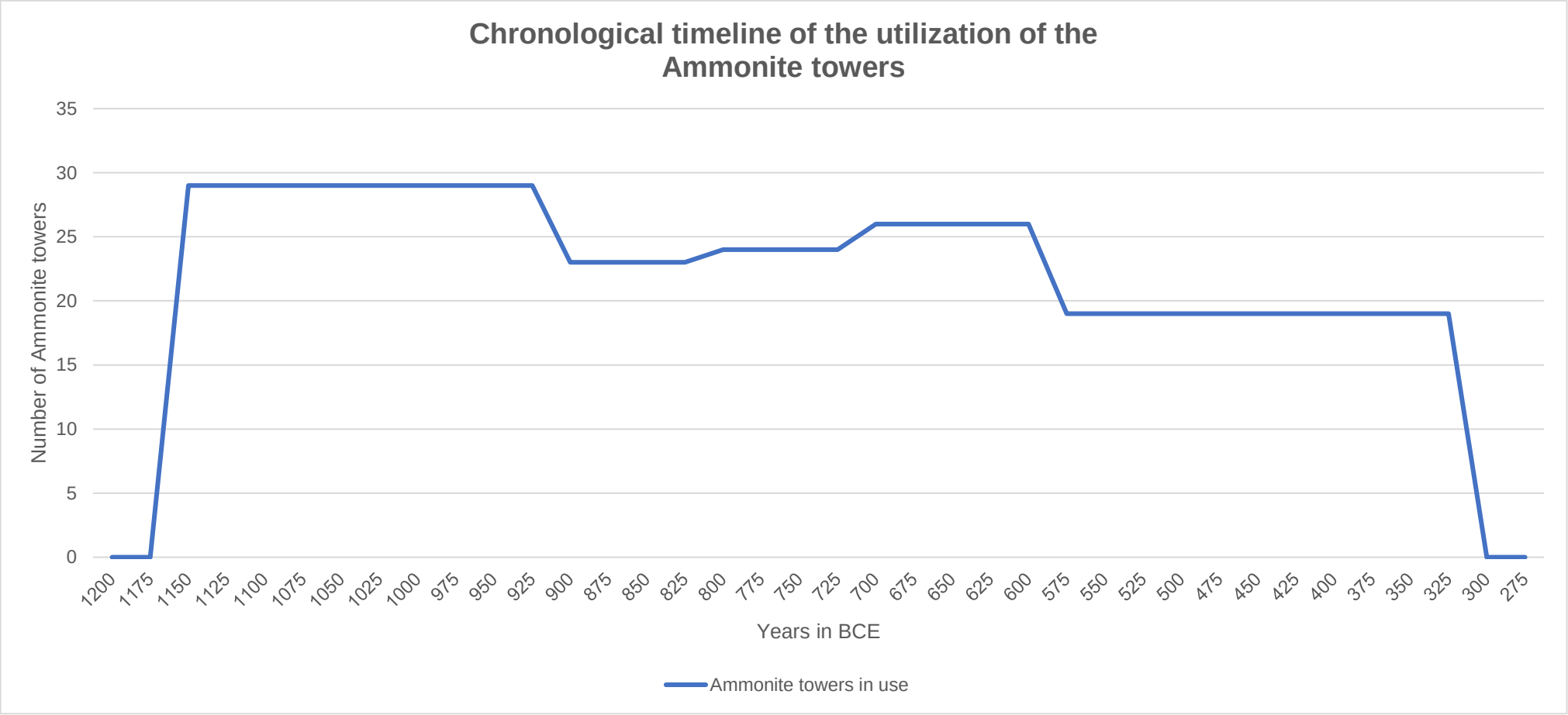

Figure 3.2: A visual representation of the Ammonite tower usage (made by author).

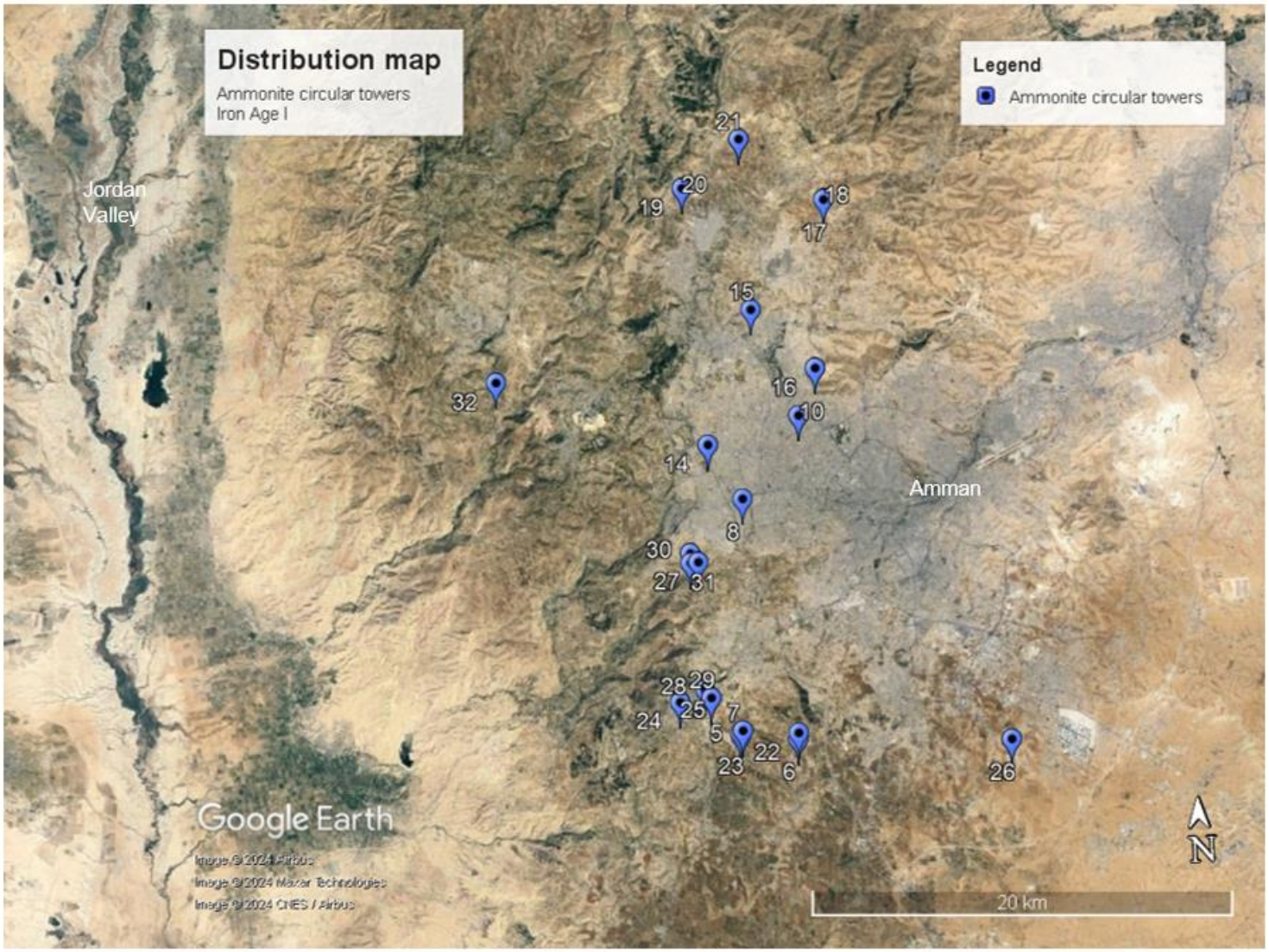

Figure 3.3: Distribution map Ammonite towers in use during Iron Age I. See Fig. 2.11 for research area (made by author).

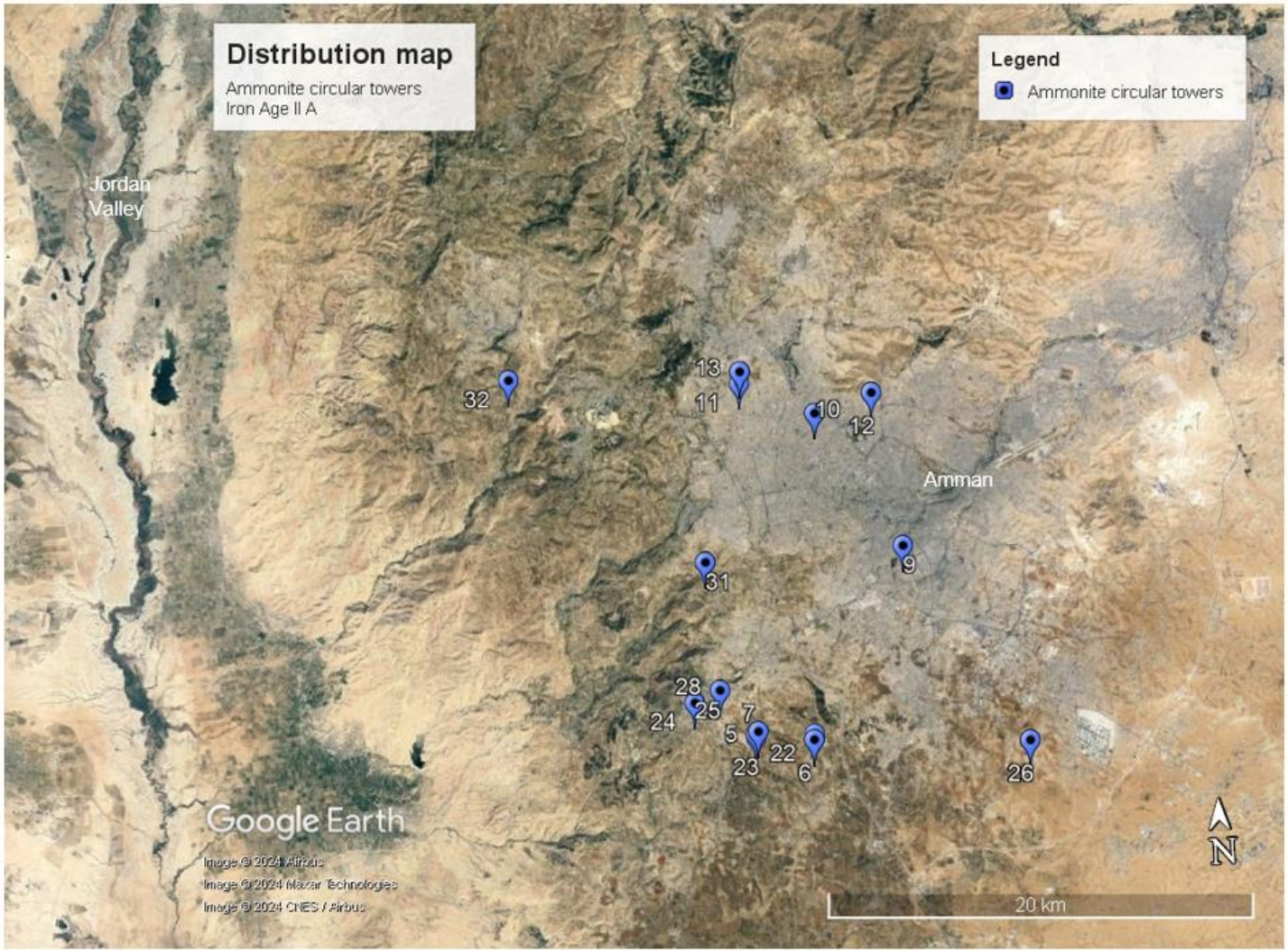

Figure 3.4: Distribution map Ammonite towers in use during Iron Age II A. See Fig. 2.11 for research area (made by author).

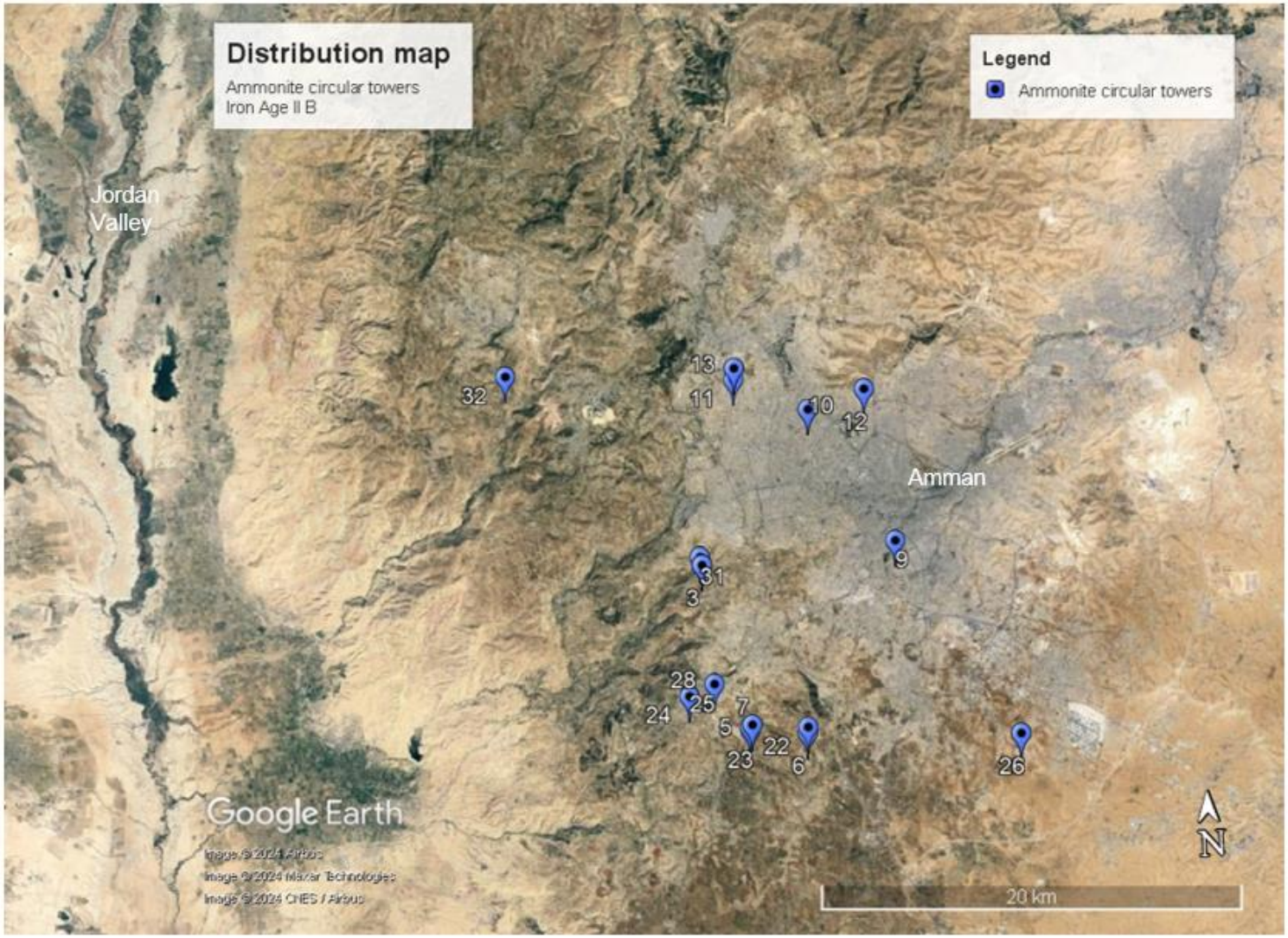

Figure 3.5: Distribution map Ammonite towers in use during Iron Age II B. See Fig. 2.11 for research area (made by author).

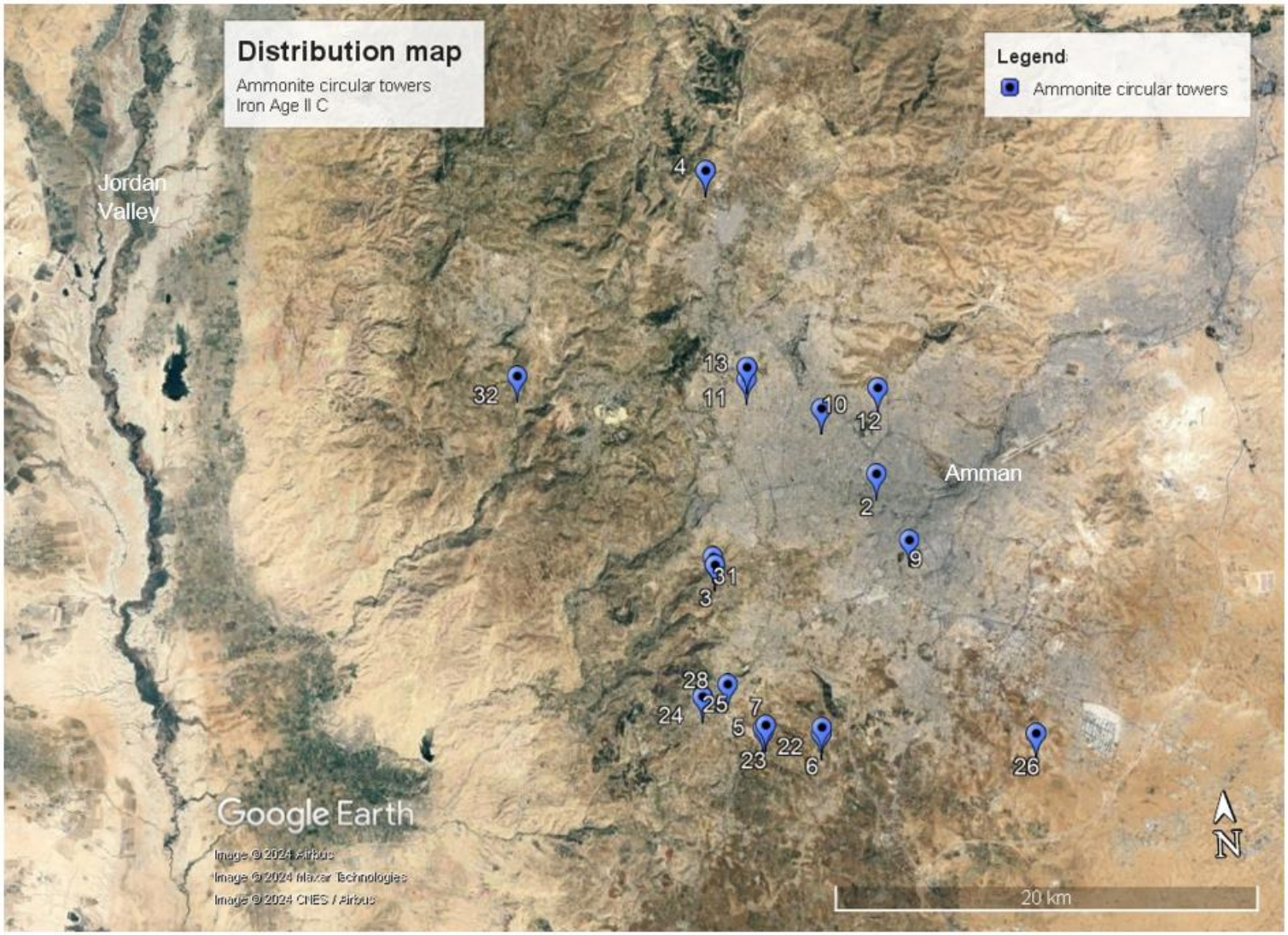

Figure 3.6: Distribution map Ammonite towers in use during Iron Age II C. See Fig. 2.11 for research area (made by author).

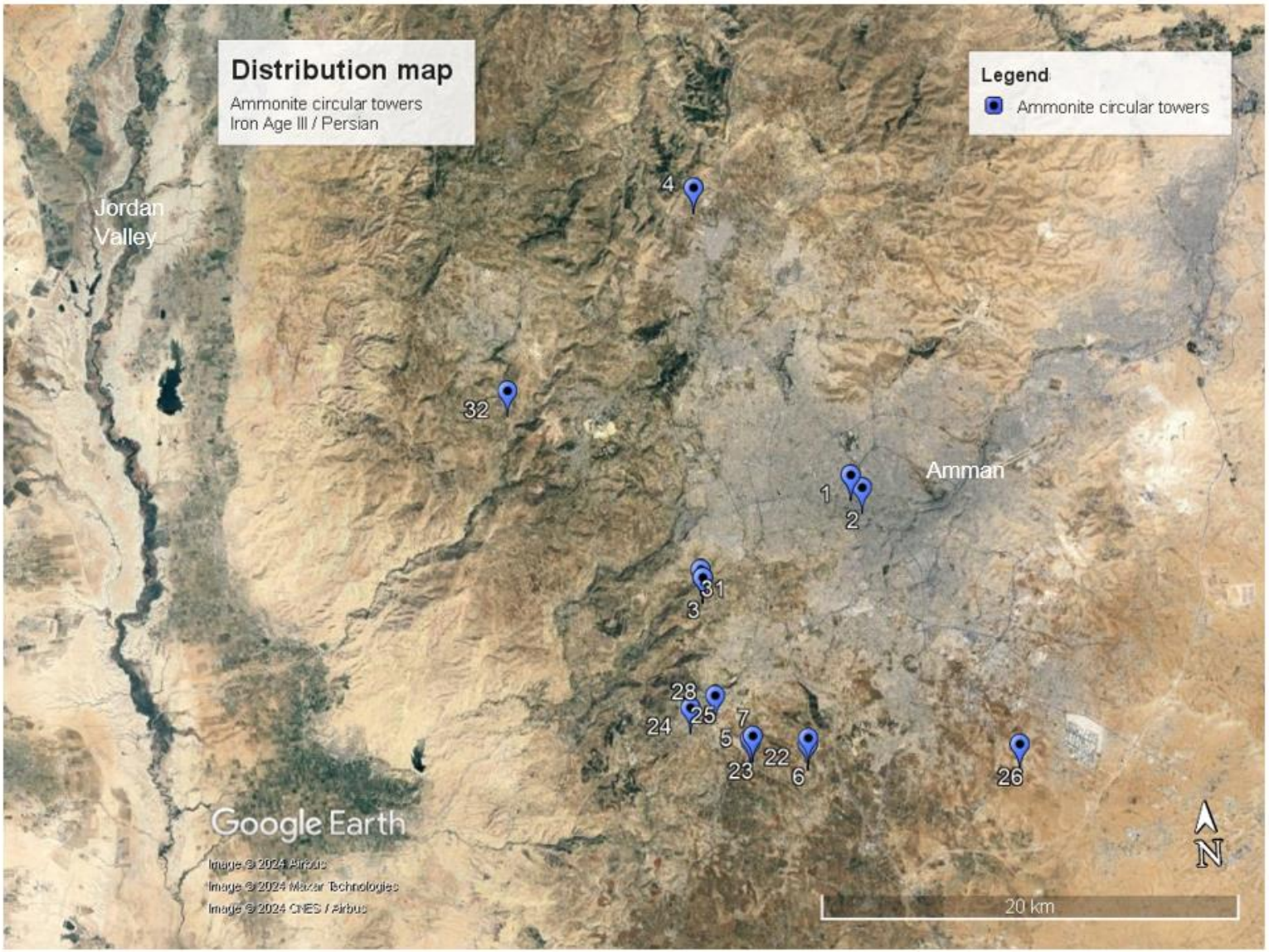

Figure 3.7: Distribution map Ammonite towers in use during Iron Age III / Persian period. See Fig. 2.11 for research area (made by author).

3.3 Exterior diameter of the Ammonite towers

Figure 3.8 displays in a bar graph the exterior diameter of the thirty-nine Ammonite towers. Unfortunately, not every exterior diameter is known of all the Ammonite towers, because the exterior diameter of ten circular towers was not measured or written in the academic literature.

Most of the Ammonite towers have an exterior diameter between 10-15 m, some less than 10 m and there are some exceptions which have an extremely large exterior diameter of more than 20 m, such as Rujm al-Malfuf North and Khirbet al-Kursi. The average exterior diameter of the Ammonite tower is approximately 11 m and the most frequent exterior diameter was 12 m occurring at least eight times.

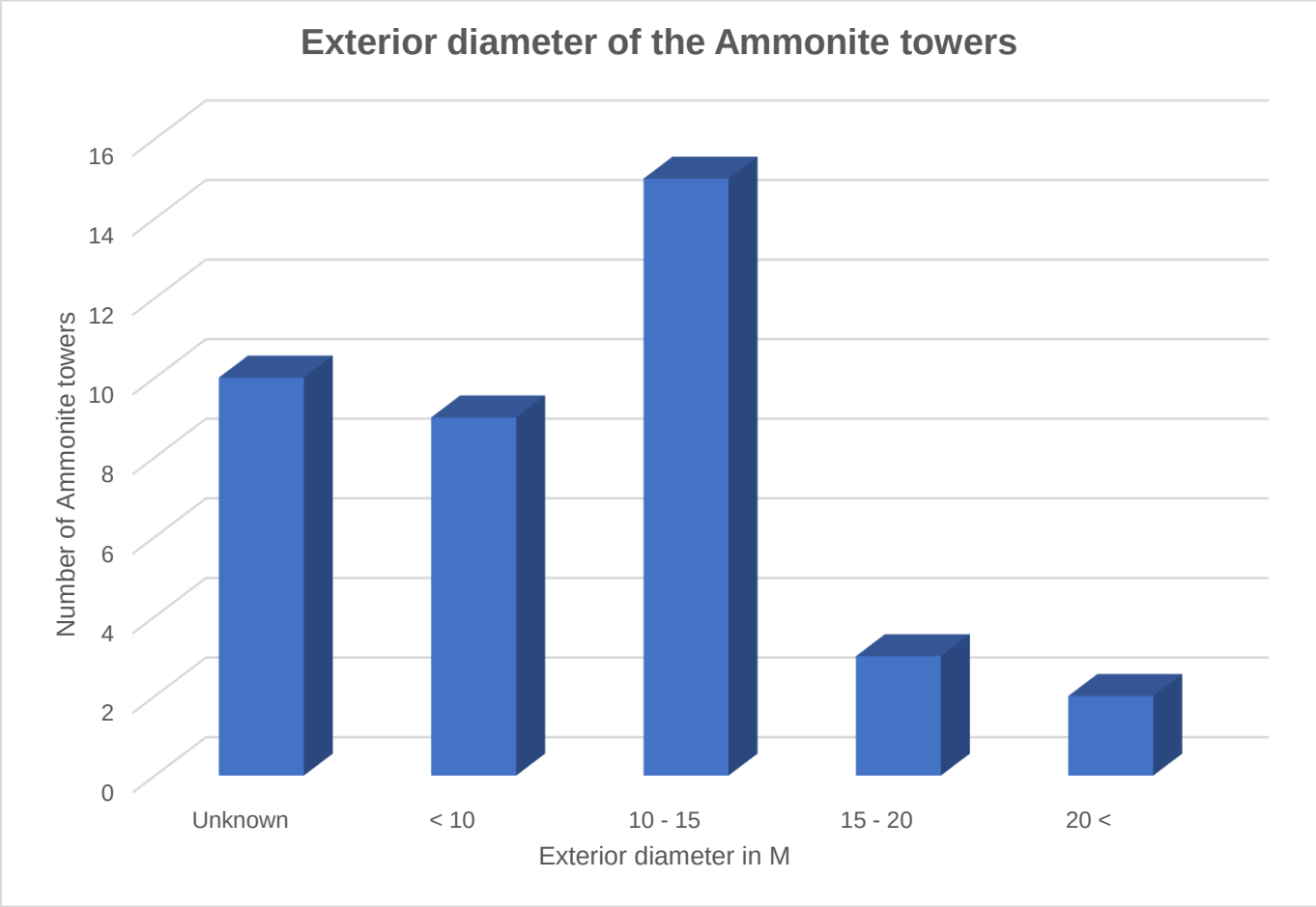

Figure 3.8: The bar graph displays the exterior diameter of the Ammonite towers (made by author).

3.4 Ammonite towers built with(out) adjacent structures

The graph (see Fig. 3.9) depicts that most of the Ammonite towers were originally built to stand alone. However, it appeared that structures were also built against or near to some of the Ammonite towers. The Ammonite tower at Rujm al-Henu West was in following periods of its founding built within a wall, whereas the circular tower at Khirbet al-Kursi was in later periods accompanied with other nearby buildings. Rujm al-Malfuf North has an adjacent building of 27x28 metres next to it. Khirbet Morbat Bedran VIII, and X and Qasr et-Tabakah had adjacent buildings, whereas the Ammonite tower at Al Qasr was built during the same time period as the construction of a nearby wall. It appeared that 87.2% of the Ammonite towers were originally built without adjacent buildings or walls.

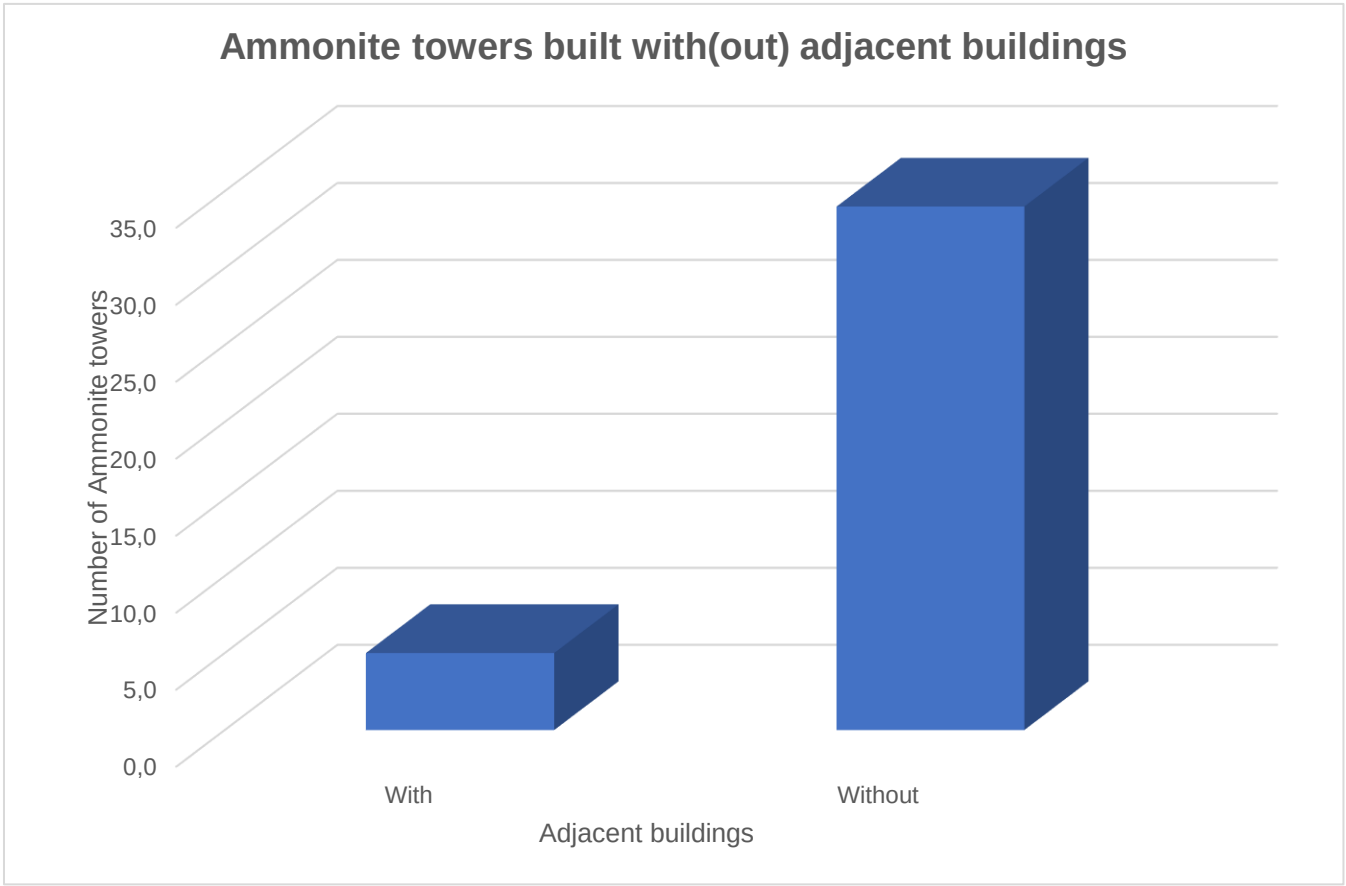

Figure 3.9: The bar graph displays how many Ammonite towers were built with(out) adjacent buildings or walls (made by author).

3.5 Considerations that influenced the positioning of the Ammonite towers

Another interesting topic is the purpose of the location of the Ammonite towers. Why were these circular towers built where they were built? Some scholars, who surveyed these circular towers in Northern Jordan assigned a strategic or agricultural purpose or function to the location of these Ammonite towers. Figure 2.12 displays the distribution of the Ammonite towers on a digital elevation model, whereas every colour in this figure corresponds to a certain height above sea level (see Appendix 2). Figure 2.12 shows that most of the Ammonite towers were located approximately between a height of 900 to 1000 m above sea level. Moreover, some of the Ammonite towers were constructed in lower areas or valleys of approximately 630 m above sea level.

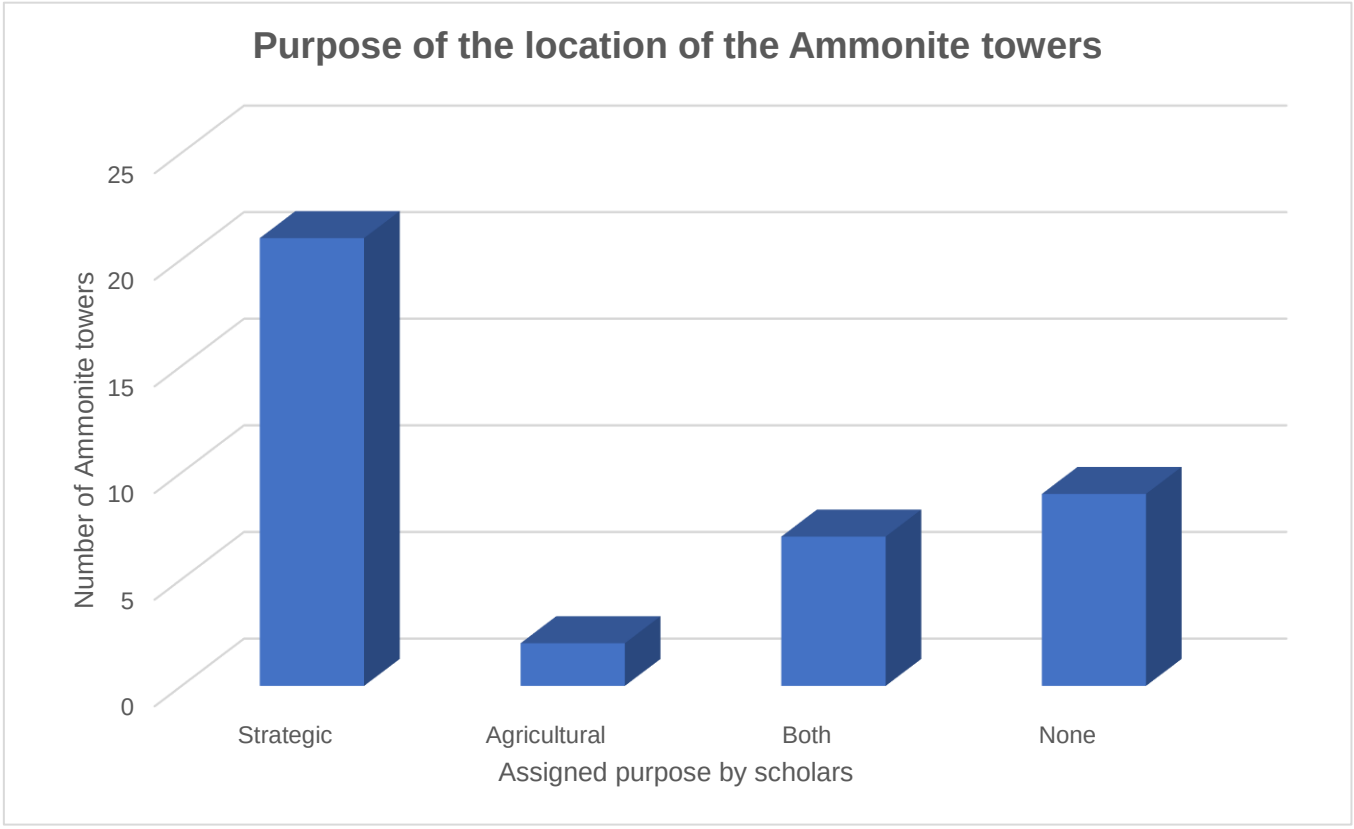

Figure 3.10: The bar graph displays how many Ammonite towers located strategically or agriculturally (made by author).

It must be noted that an Ammonite tower could have multiple reasons to be strategically located. A strategic purpose was assigned to 28 of all the Ammonite towers, whereof 20 circular towers were in sight with other Ammonite towers or settlements and 11 were located on a spot where they could oversee the landscape, highlands or nearby wadi's (see Fig. 3.10 and 3.11). This means that some Ammonite towers had twofold reasons to be strategically located. An agricultural purpose was assigned to 9 of all the Ammonite towers, because they were located nearby or in the midst of fertile land, which would be beneficial for agricultural purposes. A couple of Ammonite towers were assigned to be both strategically as agriculturally located and some Ammonite towers did not yield any strategic or agricultural purpose.

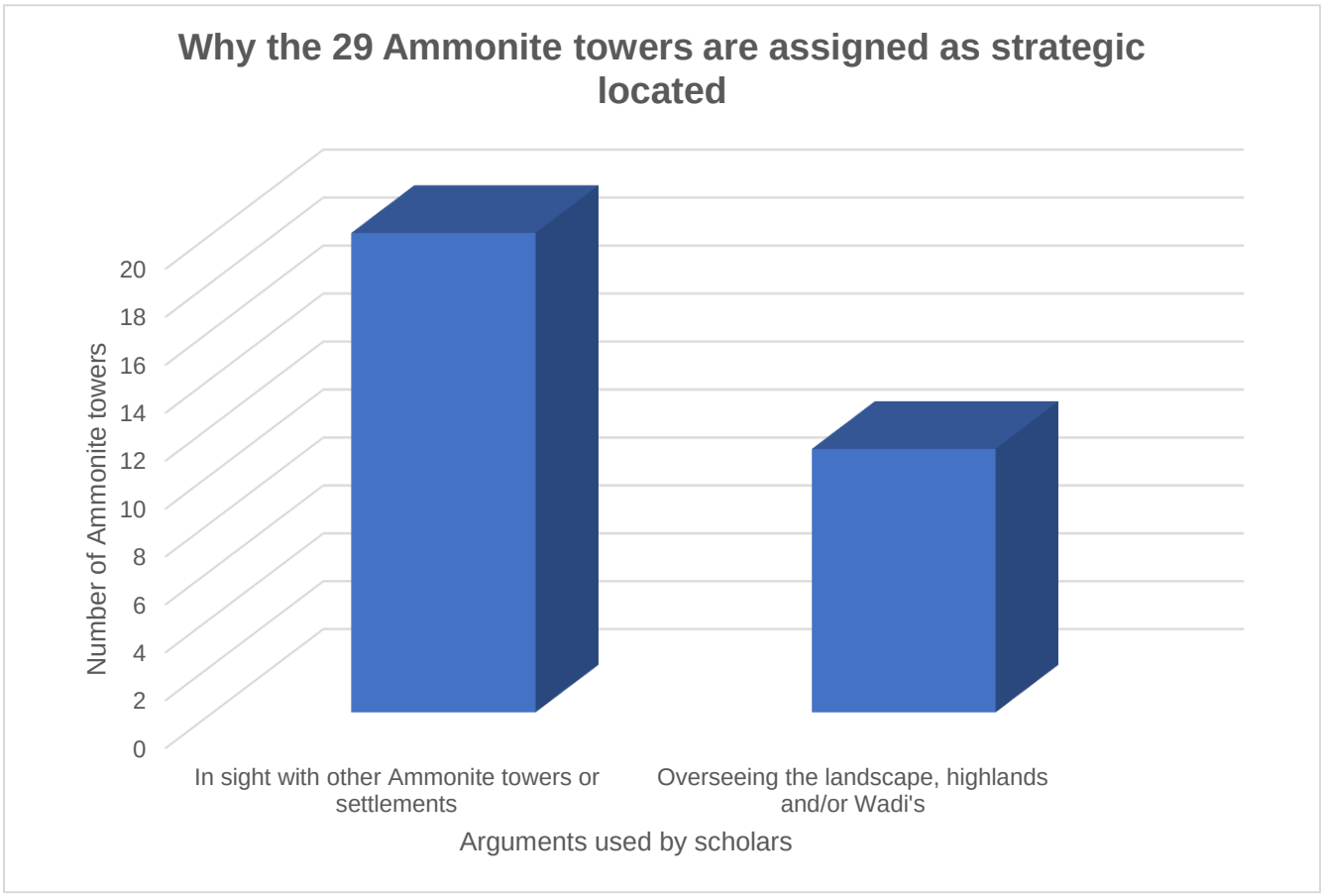

Figure 3.11: The bar graph displays how many Ammonite towers with which reason were located strategically (made by author).

3.6 State of the art with regard to the preservation of the Ammonite towers

What is nowadays the state of the art of the Ammonite towers? Unfortunately, many of the Ammonite towers have been destroyed in the course of time. Whether this was caused by the expansion of the capital Amman or by local people, which used the boulders of the Ammonite towers for own purposes, it is clearly that cultural formation processes heavily impacted the preservation of the Ammonite towers. Figure 3.12 depicts that only 6 Ammonite towers are possibly preserved and 33 are destroyed, meaning that almost 84.6% of all the Ammonite towers, which were surveyed or excavated from the 19th to the 21st centuries are nowadays gone. The best preserved Ammonite towers are Rujm al-Malfuf North, Khirbet al-Kursi and Rujm al-Henu West (see Fig. 2.1, 2.4, 2.8 and 2.10).

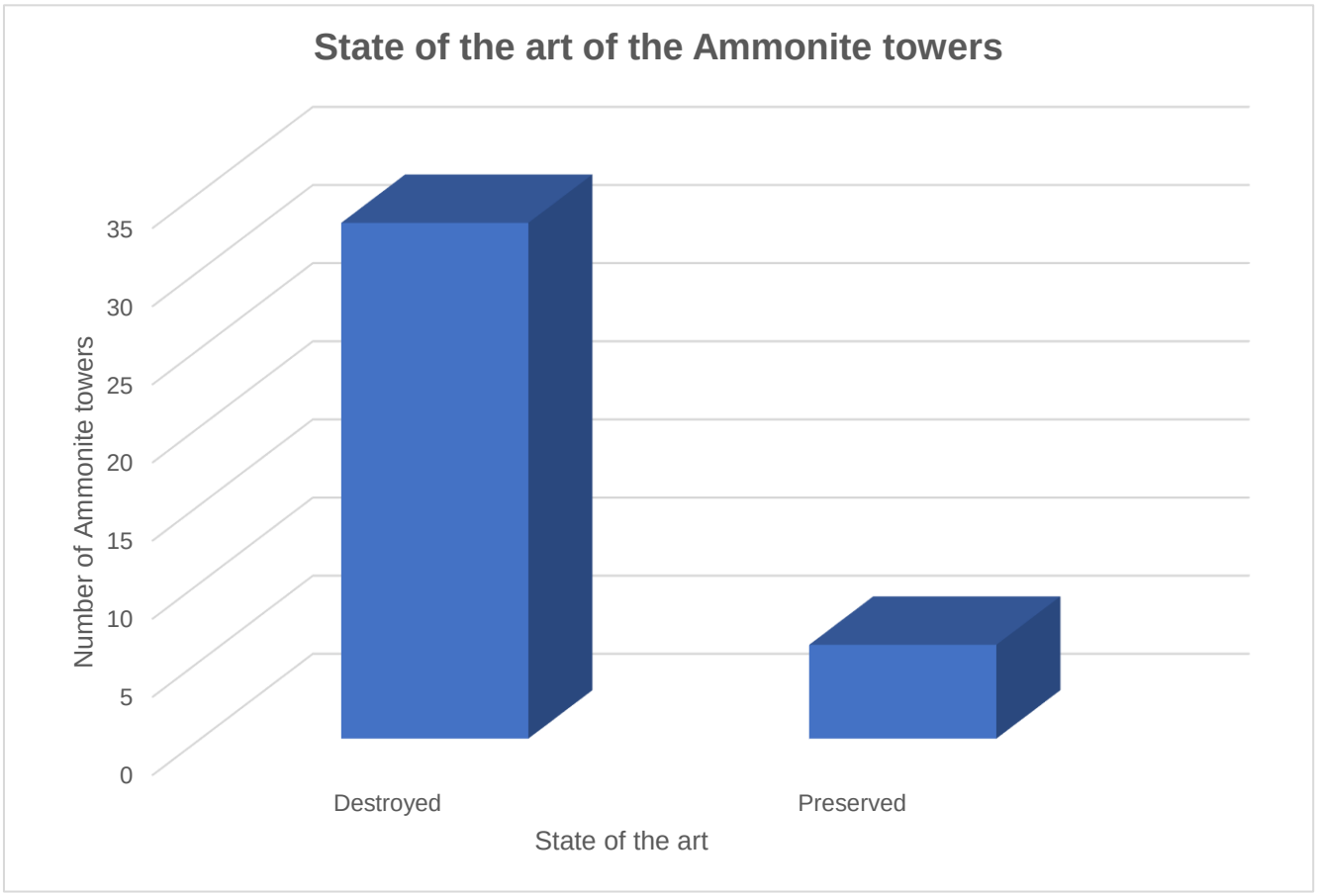

Figure 3.12: The bar graph displays the state of the art of the Ammonite towers (made by author).

3.7 Ceramic evidence found in and around the Ammonite towers

From the surveys and excavations it was evident that the circular towers were constructed from the Iron Age I Period onwards to the Iron Age III / Persian period and utilized by the Ammonites until the end of the Iron Age III / Persian period. It was also apparent that these circular towers were visited in more recent era's. Ceramics from the Hellenistic period up until the Mamluk period were unearthed in and around the Ammonite towers. The archaeological evidence differed from a few to numerous sherds, which interestingly means that the Ammonite towers needed to be frequently visited in these periods in order for archaeologist to excavate or survey these ceramics at the circular towers in the 20th and 21st century (see Appendix 3). Figure 3.13 displays how many Ammonite towers yielded ceramics from which time period. Ceramics from the Byzantine period were most regularly found at 22 different Ammonite towers, which corresponds to 56.4% of all the Ammonite towers. Ceramics from the Roman period were found almost as frequent as from the Byzantine period. Moreover, ceramics from the Ayyubid and Mamluk period were found at 12 Ammonite towers, which is 30.8% of all the Ammonite towers. The least frequent found ceramics across the different Ammonite towers were from the Hellenistic and Umayyad period. Figure 3.13 shows that the Ammonite towers were visited the most during the Roman and Byzantine period or that visitors in these periods just left the most ceramics across all the Ammonite towers.

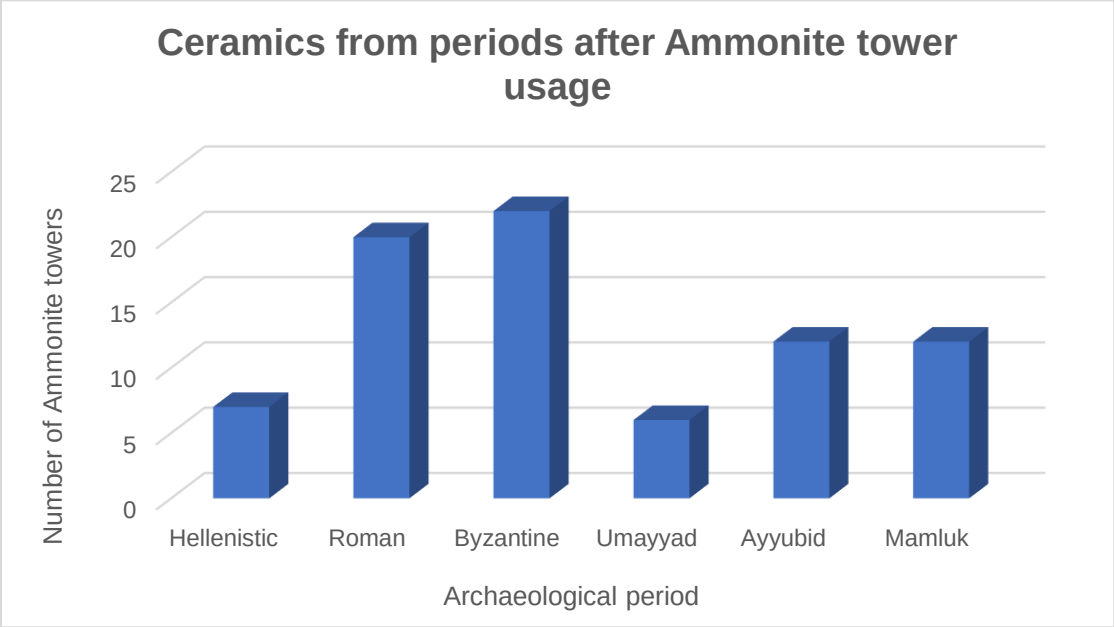

Figure 3.13: The bar graph displays how many different Ammonite towers yielded ceramics of more recent periods (made by author).

Chapter 4: Discussion

4.1 Introduction

In this chapter, the information presented in the previous chapters will be discussed and placed in a broader context. Firstly, the various theories and interpretations on the function of the Ammonite towers presented in the academic literature through the years will be discussed. Secondly, I will give my critique of some of those theories and academic literature that examined the Ammonite towers. Thirdly, the limitations of the dataset presented in this thesis will be discussed. Fourthly, I will give my personal interpretation of the primary function of the Ammonite towers in the land of Ammon. Lastly, I will give my recommendations for future research.

4.2 Theories on the function of the Ammonite towers

Conder was one of the first scholars to mention ruins of circular nature located in the western part of the city of Amman in the 19th century (Conder, 1899, p. 193). He identified these two ruins as watchtowers; probably he was referring to Rujm al-Malfuf North and Rujm al-Malfuf South (Conder, 1899, p. 193). A decade later in the 20th century, Mackenzie set foot in the Ammonite region, and he argued that these latter circular ruins were “a system of fortification” stationed on strategic points overseeing nearby valleys for defensive purposes and belonging to a (Mackenzie, 1911, p. 18-26). In over a decade of surveying Transjordan, Glueck visited many archaeological sites from the Israelites, Ammonites, Moabites, and Edomites dating back to the Bronze and/or Iron Age periods (Sauer, 1986, p. 1). He argued after the first campaigns that the frontiers of the Edomites and Moabites were protected by fortifications and used the experience from examining the Edomite and Moabite regions to interpret his findings on the Ammonite towers to argue for the same case that they also represent a defensive frontier (Glueck, 1940, p. 128-148). Glueck and, earlier, Mackenzie both argued for a well-thought-out strategic placement of the Ammonite towers. Landes agreed with Glueck’s view of a defensive frontier and dated the circular towers to the Iron Age I period (Landes, 1961, p. 72-73).

Later German scholars even went a step further and argued that these circular towers were part of a defensive chain to protect the Ammonite borders (Kletter, 1991, p. 34). Gese started a period of interpretation naming, these circular towers "Grenzfestungen," which were in each other's sight and therefore could signal to each other (Gese, 1958, p. 57). Fohrer even drew a line about what the Ammonite frontier would have looked like along with Ammonite border forts (Fohrer, 1961, p. 58). However, after Reventlow surveyed a part of the Ammonite territory and tried to interpret his findings, he could not build on the hypothesis of Fohrer due to the multiple missing sites breaking the flow of the line of a possible defensive chain of Ammonite border forts (Reventlow, 1963, p. 136-137). Younker's arguments presented in Thompson's article provide a view in which the circular towers were mainly used for agricultural purposes and could, in periods of need, act as a defensive building or as a safe haven, to which Thompson adds that over time a building could have obtained or shifted away from certain functions (Thompson, 2000, p. 488).

4.3 Critiques

According to Zertal, the Ammonite towers descend from an architectural point of view from the circular towers in the Jordan Valley dating to the end of the Iron Age I period and the beginning of the Iron Age II A period (Zertal, 1995, p. 271-272). He argues that the Ammonite towers originated from the circular towers in the Jordan Valley (Zertal, 1995, p. 271-272). In my opinion, this is just a wild guess, with unsubstantial evidence to claim that the Ammonite towers originated in the Jordan Valley. Zertal compares solely Rujm al-Malfuf North, which dates to the Iron Age III / Persian period, while neglecting the academic publications on Rujm al-Malfuf South, Khirbet al-Hajjar, and Rujm al-Henu West, which were already excavated, surveyed, and published before the publication of Zertal's article. In addition, my critique of Zertal's claims is also based on Figure 3.2, which depicts that the vast majority of Ammonite towers were already constructed and utilized during the Iron Age I period. Therefore, I believe that Zertal's comparison is unfounded and lacks information on the other Ammonite towers, which were not even mentioned in his paper.

Another interesting view is that of Kletter, who argues that the Ammonite towers are a representation of the Pax Assyriaca, because they are dated primarily to the Iron Age III / Persian period (Kletter, 1991, p. 33). Moreover, he believes that the distribution of the Ammonite towers cannot be explained by the theory of a line of border forts but is just an expression of the outer limits of the Ammonite territory (Kletter, 1991, p. 39-45). A more recent written work by Craig Tyson claims that Kletter's article has provided the most thorough overview of the Ammonite towers we nowadays have at our disposal (Tyson, 2014, p. 52). However, it appears that the dataset and, therefore, the following conclusions of Kletter's article contain a couple of errors. Tyson has adopted the findings of Kletter on the exterior diameter and construction date of the Ammonite towers, in which he states that the Ammonite towers appeared mostly at the start of the Iron Age III / Persian period and differed in size from 5 to 29 m in exterior diameter (Tyson, 2014, p. 51-52). I observed the following errors in the dataset of Kletter.

Firstly, Kletter talks about "Rujm el-Malfuf buildings" and "Rujm el-Malfuf sites" throughout his whole article (Kletter, 1991, p. 33-45). However, 'el-Malfuf' is certainly not a generic name, but just the name of a site called Rujm al-Malfuf North or Rujm al-Malfuf South. This term cannot be used as a generic term for identifying the circular towers created by the Ammonites. These circular towers have to be named Ammonite towers after their constructors and not just "Rujm el-Malfuf buildings". Secondly, Kletter mentions that no exterior diameter of Site E is known, but it is stated by Fohrer in his article that this circular tower has an exterior diameter of 6.5 to 7 m (Fohrer, 1961, p. 60). Thirdly, Glueck mentions that El Mumani contains a circular wall with an exterior diameter of 28.5 m, but he is not convinced that it is definitely an Ammonite tower (Glueck, 1939, p. 195). Fourthly, one time the interior diameter is used for a certain circular tower, and the other time an exterior diameter is used for another tower. Lastly, and most unexplainably, is the mention of a 29 m exterior diameter of Rujm Madba'ah, which appears to be just "a small, circular flint-block tower, which seems to be about 2.90 m. in diameter" (Glueck, 1939, p. 201). Kletter read Glueck's findings incorrectly involving the exterior diameter of Rujm Madba'ah because the circular tower does not have an exterior diameter of 29 m but of 2.9 m. The following interpretation of Kletter, in which he states that the exterior diameter of the Ammonite towers varies between 5 and 29 m is therefore false

(Kletter, 1991, p. 42-44). Tyson just took over the findings and interpretations of Kletter without even checking Kletter's dataset and argued that the exterior diameter of the Ammonite towers varied between 5 and 29 m (Tyson, 2014, p. 51). It is really extraordinary that such a mistake is made by both of these scholars, because the maximum exterior diameter differs from 29 to actually 22 m.

In my opinion, the Ammonite towers themselves can impossibly be a representation of the Pax Assyriaca, because the vast majority of Ammonite towers were already constructed and utilized during the Iron Age I period and not especially during the Iron Age III / Persian period. Kletter also does not examine when all the Ammonite towers were constructed, utilized, and ultimately abandoned. Other critiques of articles related to Ammonite towers are from Sauer, who criticized the surveys of Glueck. It appeared that during the years Glueck surveyed Transjordan, he often mistakenly accredited ceramic finds to early Iron Age I phases instead of to the later phases of Iron Age I or even Iron Age II (Sauer, 1986, p. 1-10). We have to take into account that timetables change continuously over time as more knowledge is generated. Who could really blame Glueck for these mistakes with the lack of knowledge and resources he had at his disposal and the little time he had to visit, investigate, and survey these ruins, travelling quickly from site to site. In my opinion, with this in mind, he did an excellent job. Due to the expansion of the city of Amman, leading to the destruction of the overwhelming majority of the Ammonite towers, we are almost totally dependent nowadays on the findings of Glueck.

4.4 Limitations

Even after all these years, from the 19th to the 21st century, the functions of the Ammonite towers have been interpreted variously, and these circular towers still remain one of the most intriguing archaeological phenomena in Transjordan. In order to interpret the Ammonite towers, I looked closely at the opportunities but also at the limitations of the dataset. Firstly, half of the dataset for this thesis came from the survey of Glueck, who almost solely dated the found ceramics in and around the Ammonite towers to the Iron Age I/II period. Now, a century after the survey by Glueck, the chronology of the Levant that Glueck used to date his findings has been revised. His dates currently fall under the Iron Age I period in the modern chronology

of the Levant, as outlined in Table 1.1. In his survey, Glueck was limited to the available ceramics laying on the surface and around the Ammonite towers, to which he could only interpret which major time period they belonged.

It is unclear whether or not the ceramic evidence of Glueck is still preserved or accessible. In addition, it can also be questioned to what extent the surveyed ceramics are representative of those time periods in which the Ammonite towers were constructed and utilized, because we do not know the extent, quantity, and quality of the ceramic assemblages of the Glueck surveys. Did these assemblages consist of a lot of ceramics or only some small sherds or fragments? Secondly, as was previously mentioned in the last chapters, the Ammonite towers were often revisited and reused in later periods. In what type of context can we really place the ceramics found during the surveys over the years? Are they from a secondary or even tertiary context? We have to assume that the ceramics that were found during the surveys in and around the Ammonite towers have survived the cleansing of these circular towers over time by different people. Furthermore, these ceramics were of no use to those inhabitants, who abandoned the Ammonite towers.

Thirdly, almost 92.3% of all the Ammonite towers, of which an overwhelming majority have been destroyed over time, have only been surveyed and not excavated, resulting in a tremendous loss of knowledge. Only 7.7% of the circular towers have been excavated, so to what extent can the research conducted on the Ammonite towers be representative of the historical accuracy of the Ammonite towers? Fourthly, the drawings of the Ammonite towers looked almost too good to be true because of the perfect circles, which were not always the case in reality, and the lack of inner partition walls, which were visible from an aerial view from Google Earth Pro but not on the drawings (see Figs. 2.3-2.4 and 2.8-2.9). Did the scholars try to create a more favourable image of the Ammonite towers by adapting and omitting parts of the circular towers? To what extent can this be labelled as academic? Lastly, the surveys of the Ammonite towers from the past centuries were extremely brief, in which the information was crammed into one section or paragraph, mentioning just the location, found ceramics, date, exterior diameter, and occasionally some extra comments.

4.5 My interpretation

The Ammonite towers appeared to have been constructed from large boulders along with smaller stones in a round shape, possibly multiple stories high. The exterior diameter varied from 5 to 22 m and the most frequent exterior diameters fell within the limits of 10 to 12 m. They were located mostly on the top or side of a hill, with sight of other circular towers, wadi's, landscapes, highlands, and valleys. The Ammonite towers are enormous, definitely strongly built, and are still standing after they were constructed three millennia ago. The size of the Ammonite towers and the large boulders (several m) of what they are built from indicate certain architectural expertise. Not everyone possesses the knowledge to construct such large buildings. It must have taken a lot of time, effort, money, and organization to gather and move the materials, construct the circular towers and maintain the people who build these structures. Not just anyone can do this. In addition, we must ask ourselves; who had an interest in constructing these circular towers and who benefited the most from them? It is impossible to know the time period that was needed to construct the Ammonite towers, but we know for sure that it took possibly a long period of time in order to design and build these circular towers. Therefore, the location of the circular towers had to be chosen with great care, which matches with the finding presented in this thesis that 71.8% of the Ammonite towers were strategically located.

In my opinion, the circular towers do not represent a line of border forts, as was previously assumed by the German scholars. Moreover, I do not believe that they originated from the Jordan Valley or that the towers themselves are a representation of the Pax Assyriaca, as previously discussed. The Ammonite towers are gigantic and located mostly on the sides of hills with far-reaching views. They would have been easily visible from a distance and, therefore, also by foreigners. The Ammonite towers would not have been able to withstand, in case of conflict, an army or siege. The Ammonites have been in conflict with neighbouring cultures over time. According to Herr and Younker, the Iron Age I period is characterized by the crumbling of the Canaanite city states and the emergence of 'tribal groups' in Cis- and Transjordan, and the transition to the Iron Age II period is characterized by the total disintegration of the Canaanite city-states and the unification of those 'tribal groups' into 'tribal kingdoms' (as previously discussed in the introduction, see 1.3.4). If the findings of this thesis are placed in the previously mentioned framework by Herr and Younker,

then that could mean that competition with neighbouring cultures and the threat of an attack by outsiders could have influenced the Ammonites in deciding to build the circular towers. Therefore, in my view, the Ammonite towers are among the finest examples of the Ammonite architecture and had a primary defensive function of supervising and controlling the Ammonite territory. Due to the gigantic nature of the Ammonite towers and the fact that they are easily visible from a distance, I believe that these circular towers also simultaneously had a symbolic function to portray the strength and power of the Ammonites to the neighbouring cultures. Moreover, as a secondary function, the Ammonite towers could have been a landmark that indicated Ammonite territory because of their visibility from far away.

If the distribution of the Ammonite towers can be seen as a proxy for which areas needed to be supervised the most, it is interesting to note that during the Iron Age I period, the circular towers were scattered over the Ammonite landscape, and the focus shifted solely to the southern regions during the Iron Age III / Persian period because of the abandonment of the majority of Ammonite towers in the north of the Ammonite territory. Kletter, Routledge, and Tyson claimed that Ammon turned into a vassal of the Neo-Assyrian empire and that this period ensured peace and stability, resulting in the flourishing of the kingdom of Ammon (as previously discussed in the introduction, see 1.3.4). If the shift of focus during the Iron Age III / Persian period to the southern Ammonite territory is placed in the previously mentioned framework, then that could mean that the security and stability brought by the Neo-Assyrians allowed the Ammonites to no longer necessary control certain northern regions. I also believe that, besides these purposes, the function of the Ammonite towers was not static but adjustable and flexible, shifting over time. I agree with Kletter that they could also function as settlements or agricultural buildings because of the great capacity of the Ammonite towers, which have the ability to house lots of people or store the harvest from the arable fields (Kletter, 1991, p. 39-41).

Most of the Ammonite towers were destroyed due to the expansion of Amman, and I believe that the future does not look bright. More and more of the Ammonite towers will possibly be destroyed in the future as time passes. I would recommend trying to protect the remaining Ammonite towers even more than is currently done and revisiting them for a thorough excavation and examination in order to preserve the

knowledge for future generations. In addition, I would recommend surveying the northwestern areas of Amman between Rujm al-Henu West and Khirbet Jazzir, which have not yet been swallowed up by the city, with the aim of finding unknown Ammonite towers in this relatively untouched region by the city of Amman.

Chapter 5: Conclusion

In conclusion, this thesis has presented an overview of the current available knowledge on the circular Ammonite towers in the land of Ammon obtained from the surveys and excavations conducted during the period from the 19th to the 21st centuries. A contemporary assessment of the Ammonite towers has been provided to examine the primary function and extent of their utilization across the Ammonite territory from 1150 to 330 BCE. The research questions of this thesis will be repeated and answered below in the following paragraphs, starting with the sub research questions and ending with the main research question of this thesis.

In this thesis, the locations of the Ammonite towers were depicted differently across various distribution maps. They were extensively discussed, within the limits imposed by the surveys, excavations, and related publications. Additionally, it became evident that these reports were concise in their descriptions, seldom accompanied by illustrations or photos, and almost never provided a comprehensive overview of the ceramic collections found within the Ammonite towers. The brief descriptions are exactly what can be expected from quickly carried out surveys. Nowadays, these archaeological surveys conducted during the 20th century would be identified as incomplete, insufficiently executed, or not up to today's academic standards.

Sub-research questions:

Is there architectural consistency among the circular towers?

The Ammonite towers are gigantic structures built from large boulders with the addition of some small stones, and their exterior was plastered. The exterior diameters of the circular towers vary from 5 to 22 m, and the most frequent exterior diameters were between 10 and 12 m. Some of the Ammonite towers had interior partition walls, and most of them were originally constructed without adjacent buildings. There is certainly homogeneity in architecture visible across the Ammonite towers, and architectural expertise was crucial in the construction process.

What is the chronological timeline of construction and abandonment for the circular towers?

The vast majority of the Ammonite towers were constructed during the Iron Age I period and a few were constructed afterwards during successive time periods. The Ammonite towers were utilized until the end of the Iron Age III / Persian period and started to be abandoned gradually over time from the Iron Age II A period onwards.

Were strategic defensive considerations influential in the positioning of the circular towers?

The Ammonite towers were purposefully positioned on strategic locations mostly on the side of hills where they could oversee the highlands, wadi's, valleys and/or other Ammonite towers and settlements. The positioning indicates that defensive purposes played a major role.

How is the distribution of the circular towers across the land of Ammon characterized, and can discernible spatial patterns be identified?

The Ammonite towers are scattered across the Ammonite territory, situated mostly on hills, and in general have a height above sea level between 900 and 1000. They are located in strategic positions, but no defensive chain of border forts or other spatial patterns can be identified.

What insights can be derived from ceramics and other archaeological findings in and around the circular towers regarding their function and purpose?

The circular towers were utilized by the Ammonites from the Iron Age I period to the end of the Iron Age III / Persian period based on the found ceramics in and around the circular towers. The findings of 20 sling stones at Khirbet al-Hajjar indicate that a defensive military function could be attributed to the Ammonite towers. Ceramics from later periods were found, dated from the Hellenistic to even the Mamluk period, displaying that these Ammonite towers were revisited and possibly reused.

Main research question:

What was the primary function of the circular towers in the land of Ammon in Northern Jordan during the Iron Age?

The Ammonite towers had a primary defensive function during the Iron Age in monitoring the Ammonite territory due to their gigantic nature, strategic location, and far-reaching sight on the highlands, wadi's, and/or valleys. This thesis also suggests that the Ammonite towers had a symbolic function in displaying the strength and power of the Ammonites to neighbouring cultures due to their visibility from far away. Additionally, it argues that beyond these purposes, the function of the Ammonite towers was not static but adjustable and flexible, shifting to the needs of the Ammonites over time. Whether or not they contained functions for housing, agriculture, or something else is not ruled out.

Most unfortunately, the preservation of the Ammonite towers has deteriorated dramatically over the past century due to the expansion of the city of Amman, resulting in just a handful of circular towers left in the landscape of Northern Jordan. This thesis emphasizes that more care must be given to the preservation of these circular towers. These giants have yet to reach their full potential in revealing the stories they carry from periods long, long ago. The circular towers of the Ammonites that were still scattered abundantly across Northern Jordan during the 20th century are now a vague memory of the ancient people that once lived here.

Abstract

This thesis looked into the circular towers located surrounding modern-day Amman, the ancient site of Rabbath-Ammon, the capital of the ancient Ammonites in nowadays Northern Jordan. From the 19th century on, scholars came across these Ammonite buildings, and a variety of interpretations arose, claiming the circular towers to be either border forts, settlements, agricultural facilities, or fortified farmsteads.

A fresh update on this subject is necessary. This thesis is a continuation of the preceding research and will be carried out on the basis of a literature study. We will dive into various subjects, such as the state of the art of the circular towers, their distribution, and the purpose of the Ammonite circular towers in the Iron Age.

Their preservation is currently in great danger due to the ongoing expansion of the city of Amman. Therefore, it is of the utmost importance that these Ammonite towers will be excavated or surveyed in the upcoming years because the surveys conducted in the past centuries are not up to today's academic standards. The results of this study will shed more light into the darkness in order to supplement knowledge in the ongoing discussions on the circular towers of the Ammonites.

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Appendices

Appendix 1:

Id	Location	Name site	Survey or excavation	Name excavation or survey	Number of towers	State of the art	Longitude	Latitude
1	Amman	Rujm al-Malfuf North	Excavation	Boraas excavation in 1969	1	Preserved	35°54'16.53"O	31°57'27.73"N
2	Amman	Rujm al-Malfuf South	Excavation	Thompson excavation	1	Destroyed	35°54'35.90"O	31°57'7.45"N
3	Amman	Khirbet al-Hajjar	Excavation	Thompson excavation	1	Destroyed	35°49'38.08"O	31°55'2.10"N
4	Al Hanou	Rujm al-Henu West	Survey	Baq'ah regional survey	1	Preserved	35°49'58.63"O	32° 5'4.30"N
5	Amman	Jumeian	Survey, site no. 73	Hesban region survey	5	Destroyed	35°50'49.80"O	31°50'45.31"N
6	Amman	Site F	Survey	Hesban region survey	1	Destroyed	35°52'32.45"O	31°50'37.95"N
7	Amman	Site C	Survey, site no. 132	Hesban region survey	1	Destroyed	35°50'53.64"O	31°50'54.74"N
8	Amman	Qasr er-Rônaq	Survey, site no. 206	Nelson Glueck survey	1	Destroyed	35°51'16.91"O	31°56'48.68"N
9	Amman	Sweiwina	Survey, site no. 48-37.1	Archaeological Survey of Greater Amman	1	Possibly destroyed	35°55'28.31"O	31°55'24.28"N
10	Amman	Rujm al-Qutnah South	Survey, site no. 54-33.2	Archaeological Survey of Greater Amman	2	Possibly destroyed	35°53'3.91"O	31°58'51.10"N
11	Amman	Qasr Khelda South	Survey, site no. 55-30.1	Archaeological Survey of Greater Amman	1	Possibly preserved	35°50'52.87"O	31°59'42.25"N
12	Amman	Rujm al-Kharabsheh	Survey, site no. 55-35.2	Archaeological Survey of Greater Amman	3	Destroyed	35°54'46.55"O	31°59'17.99"N
13	Amman	Qasr Khelda	Survey, site no. 56-30.1	Archaeological Survey of Greater Amman	1	Destroyed	35°50'54.96"O	31°59'59.60"N
14	Amman	Khirbet al-Kursi	Survey, site no. 213	Nelson Glueck survey	1	Possibly preserved	35°50'17.95"O	31°58'13.63"N
15	Amman	Rujm al-Jabeihah	Survey, site no. 234	Nelson Glueck survey	1	Destroyed	35°51'48.31"O	32° 1'36.05"N
16	Amman	Rujm 'Ain al-Beida	Survey, site no. 244	Nelson Glueck survey	1	Destroyed	35°53'38.29"O	32° 0'1.80"N
17	Amman	Khirbet Morbat Bedran VIII	Survey, site no. 269	Nelson Glueck survey	1	Destroyed	35°54'9.72"O	32° 4'18.84"N
18	Amman	Khirbet Morbat Bedran X	Survey, site no. 269	Nelson Glueck survey	1	Destroyed	35°54'10.28"O	32° 4'20.11"N
19	Al Hanou	Rujm al-Hawi	Survey, site no. 280	Nelson Glueck survey	1	Destroyed	35°49'54.73"O	32° 4'49.15"N
20	Al Hanou	Rujm al-Hawi	Survey, site no. 280	Nelson Glueck survey	1	Destroyed	35°49'54.88"O	32° 4'49.48"N
21	Balqa	Rujm al-Mûmani	Survey, site no. 274	Nelson Glueck survey	1	Possibly destroyed	35°51'42.19"O	32° 6'0.11"N
22	Amman	Site E	Survey, site E	Fohrer survey	1	Destroyed	35°52'33.73"O	31°50'46.88"N
23	Amman	Khirbet abu Ghurusch	Survey, site M	Fohrer survey	1	Destroyed	35°50'48.54"O	31°50'51.66"N
24	Naour	Arkub umm Kutten	Survey	Fohrer survey	1	Destroyed	35°49'3.94"O	31°51'43.99"N
25	Naour	Rujm Arkub	Survey, site J	Fohrer survey	1	Destroyed	35°49'3.47"O	31°51'43.31"N
26	Amman	Rujm al-Hamman	Survey	Graf Reventlow survey	1	Destroyed	35°58'56.32"O	31°50'19.61"N
27	Amman	Markaba	Survey	Hentschke survey	1	Destroyed	35°49'49.14"O	31°55'15.30"N
28	Amman	Site no. 11	Survey, site no. 11	Hentschke survey	1	Destroyed	35°49'49.48"O	31°51'59.94"N
29	Amman	Shajarat Bil'as	Survey, site no. 12 B	Hentschke survey	1	Destroyed	35°49'59.86"O	31°51'47.30"N
30	Amman	Al Qasr	Survey	Gese survey	1	Possibly preserved	35°49'35.28"O	31°55'29.24"N
31	Amman	Qasr et-Tabakeh	Survey, site no. 5	Gese survey	1	Destroyed	35°49'35.04"O	31°55'14.48"N
32	As-Salt	Khirbet Jazzir	Survey	The Wādī Shu'ayb Archaeological Survey, Project 2016	1	Possibly preserved	35°43'59.30"O	32° 0'6.16"N

Appendix 1: Overview of the dataset.

Appendix 2:

Id	Name Site	Exterior diameter	Date oldest ceramics	Date youngest ceramics	Start date of occupation	End date of occupation	Originally built alone?	Strategic / agricultural	Why strategic	Height above sea level
1	Rujm al-Malfuf North	22	Iron Age III / Persian	Roman period	Iron Age III / Persian	Iron Age III / Persian	No, adjacent buildings	Strategic	Oversight highlands and in view with other towers	877
2	Rujm al-Malfuf South	13	Iron Age I	Mamluk period	Iron Age II C	Iron Age III / Persian	Yes	Strategic	In view with other towers	864
3	Khirbet al-Hajjar	12	Iron Age I	Byzantine period	Iron Age II B	Iron Age III / Persian	Yes	Strategic & agricultural	Located at Wadi Kafrain and view over Wadi Sir	830
4	Rujm al-Henu West	12	Iron Age II C	Byzantine period	Iron Age II C	Iron Age III / Persian	Yes, later wall built around it	Strategic & agricultural	View on Wadi Umm ad-Dananir	622
5	Jumeian	12	Undistinctive Iron Age	Mamluk period	Iron Age I	Iron Age III / Persian	Yes	None	None	874
6	Site F	*unk*	Undistinctive Iron Age	Undistinctive Arabic period	Iron Age I	Iron Age III / Persian	Yes	Strategic	In view with other towers	886
7	Site C	8	Undistinctive Iron Age	Undistinctive Arabic period	Iron Age I	Iron Age III / Persian	Yes	Strategic	In view with other towers	885
8	Qasr er-Rônaq	15	Iron Age I	Byzantine period	Iron Age I	Iron Age I	Yes	Strategic & agricultural	Overlooks Wadi ad-Dheba	902
9	Sweiwina	*unk*	Iron Age II A	Roman period	Iron Age II A	Iron Age II C	Yes	Strategic & agricultural	Located on a rise and nearby Iron Age settlement	922
10	Rujm al-Qutnah South	*unk*	Iron Age I	Undistinctive Arabic period	Iron Age I	Iron Age II C	Yes	Agricultural	None	1004
11	Qasr Khelda South	10	Iron Age II A	Iron Age II C	Iron Age II A	Iron Age II C	Yes	Strategic	Near by Qasr Khelda	1007
12	Rujm al-Kharabsheh	*unk*	Iron Age II A	Iron Age II C	Iron Age II A	Iron Age II C	Yes	Strategic	In view with other towers	949
13	Qasr Khelda	*unk*	Iron Age II A	Iron Age II C	Iron Age II A	Iron Age II C	Yes	Strategic	In view with other towers	1037
14	Khirbet al-Kursi	22	Iron Age I	Byzantine period	Iron Age I	Iron Age I	Yes	Strategic & agricultural	Overseeing Wadi Dabûq	951
15	Rujm al-Jabeihah	15	Iron Age I	Iron Age I	Iron Age I	Iron Age I	Yes	Strategic	Located on a rise and view on modernday Amman	1072
16	Rujm 'Ain al-Beida	10.25	None	None	Iron Age I	Iron Age I	Yes	Strategic	Located on hill with view over the neighbouring areas	1012
17	Khirbet Morbat Bedran VIII	9	Iron Age I	Iron Age I	Iron Age I	Iron Age I	No, adjacent buildings	Strategic & agricultural	Overlooks Wadi Morbat Bedran	898
18	Khirbet Morbat Bedran X	9.8	Iron Age I	Iron Age I	Iron Age I	Iron Age I	No, adjacent buildings	Strategic & agricultural	Overlooks bends of Wadi Morbat Bedran	891
19	Rujm al-Hawi	11.2	Iron Age I	Iron Age I	Iron Age I	Iron Age I	Yes	Strategic	In sight with Khirbet al-Kursi	631
20	Rujm al-Hawi	8.2	Iron Age I	Iron Age I	Iron Age I	Iron Age I	Yes	Strategic	In sight with Khirbet al-Kursi	631
21	Rujm al-Mûmani	15	Iron Age I	Iron Age I	Iron Age I	Iron Age I	Yes	None	None	618
22	Site E	6.5-7	Undistinctive Iron Age	Undistinctive Arabic period	Iron Age I	Iron Age III / Persian	Yes	Possibly strategic	In view with other towers	897
23	Khirbet abu Ghurusch	*unk*	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age III / Persian	Yes	Possibly strategic	In view with other towers	875
24	Arkub umm Kutten	10	Undistinctive Iron Age	Undistinctive Iron Age	Iron Age I	Iron Age III / Persian	Yes	Possibly strategic	In view with other towers	892
25	Rujm Arkub	*unk*	Undistinctive Iron Age	Undistinctive Arabic period	Iron Age I	Iron Age III / Persian	Yes	Strategic	In view with other towers	896
26	Rujm al-Hamman	7.1	Ayyubid period	Mamluk period	Iron Age I	Iron Age III / Persian	Yes	None	None	816
27	Markaba	5	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age I	Yes	Strategic	In view with other towers	834
28	Site no. 11	10.5	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age III / Persian	Yes	Strategic	In view with other towers	922
29	Shajarat Bil'as	8	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age I	Yes	Strategic	In view with other towers	935
30	Al Qasr	10	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age I	No, adjacent walls	Possibly strategic	In view with other towers	842
31	Qasr et-Tabakeh	7	Undistinctive Iron Age	Byzantine period	Iron Age I	Iron Age III / Persian	No, nearby buildings	Possibly strategic	Overlooking Wadi esch-Schita	836
32	Khirbet Jazzir	12	Undistinctive Iron Age	Roman period	Iron Age I	Iron Age III / Persian	Yes	Strategic	Overlooking Wadi Shu'ayb	577

Appendix 2: Overview of the dataset.

Appendix 3:

Id	Name Site	Ceramics	Iron Age I	Iron Age II A	Iron Age II B	Iron Age II C	Iron Age III / Persian	Hellenistic period
1	Rujm al-Malfuf North	Yes, also dated by architecture	None	None	None	None	Some sherds	None
2	Rujm al-Malfuf South	Yes	Few sherds	None	None	Predominantly	Predominantly	None
3	Khirbet al-Hajjar	Yes	Some sherds	None	Predominantly	Predominantly	Predominantly	None
4	Rujm al-Henu West	Yes	None	None	None	Predominantly	Predominantly	None
5	Jumeian	Yes	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	None
6	Site F	Yes	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	None
7	Site C	Yes	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Predominantly, undistinctive Iron Age	Some sherds
8	Qasr er-Rônaq	Yes	Predominantly	None	None	None	None	None
9	Sweiwina	Yes	None	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	None	None
10	Rujm al-Qutnah South	Yes	Predominantly	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	None	None
11	Qasr Khelda South	Yes	None	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	None	None
12	Rujm al-Kharabsheh	Yes	None	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	None	None
13	Qasr Khelda	Yes	None	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	Predominantly, undistinctive Iron Age II	None	None
14	Khirbet al-Kursi	Yes	Some sherds	None	None	None	None	None
15	Rujm al-Jabeihah	Yes	Predominantly	None	None	None	None	None
16	Rujm 'Ain al-Beida	No, dated by architecture	Predominantly	None	None	None	None	None
17	Khirbet Morbat Bedran VIII	Yes	Predominantly	None	None	None	None	None
18	Khirbet Morbat Bedran X	Yes	Predominantly	None	None	None	None	None
19	Rujm al-Hawi	Yes	Predominantly	None	None	None	None	None
20	Rujm al-Hawi	Yes	Predominantly	None	None	None	None	None
21	Rujm al-Mûmani	Yes	Predominantly	None	None	None	None	None
22	Site E	Yes, also dated by architecture	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	Some sherds, undistinctive Iron Age	None
23	Khirbet abu Ghurusch	Yes	Many sherds undistinctive Iron Age	Many sherds undistinctive Iron Age	Many sherds undistinctive Iron Age	Many sherds undistinctive Iron Age	Many sherds undistinctive Iron Age	Some sherds
24	Arkub umm Kutten	Yes	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	None
25	Rujm Arkub	Yes	Some sherds undistinctive Iron Age	Some sherds undistinctive Iron Age	Some sherds undistinctive Iron Age	Some sherds undistinctive Iron Age	Some sherds undistinctive Iron Age	None
26	Rujm al-Hamman	Yes, also dated by architecture	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	None
27	Markaba	Yes	Undistinctive early Iron Age	None	None	None	None	None
28	Site no. 11	Yes	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Predominantly undistinctive Iron Age	Some sherds
29	Shajarat Bil'as	Yes	Predominantly undistinctive early Iron Age	None	None	None	None	Some sherds
30	Al Qasr	Yes	Predominantly undistinctive early Iron Age	None	None	None	None	Some sherds
31	Qasr et-Tabakeh	Yes	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	Undistinctive Iron Age	Some sherds
32	Khirbet Jazzir	Yes	Undistinctive Iron Age fragments	Undistinctive Iron Age fragments	Undistinctive Iron Age fragments	Undistinctive Iron Age fragments	Undistinctive Iron Age fragments	Possibly few fragments

Appendix 3: Overview of the mentioned ceramics in the academic literature of the dataset.

Id	Roman period	Byzantine period	Umayyad / Abbasid period	Ayyubid period	Mamluk period
1	Predominantly	None	None	None	None
2	None	Some sherds	None	One sherd	One sherd
3	None	Few sherds	None	None	None
4	Some sherds	Some sherds	None	None	None
5	Some sherds	Some sherds	None	Few sherds	Few sherds
6	Some sherds	Some sherds	Some sherds, undistinctive Arabic period	Some sherds, undistinctive Arabic period	Some sherds, undistinctive Arabic period
7	Few sherds	Some sherds	Few sherds	One undistictive sherd from Late Arabic period	One undistictive sherd from Late Arabic period
8	Some sherds	Some sherds	None	None	None
9	Some sherds	None	None	None	None
10	Some sherds	Some sherds	Numerous, undistinctive Arabic period	Numerous, undistinctive Arabic period	Numerous, undistinctive Arabic period
11	None	None	None	None	None
12	None	None	None	None	None
13	None	None	None	None	None
14	Several sherds	Several sherds	None	None	None
15	None	None	None	None	None
16	None	None	None	None	None
17	None	None	None	None	None
18	None	None	None	None	None
19	None	None	None	None	None
20	None	None	None	None	None
21	None	None	None	None	None
22	None	Predominantly	Predominantly, undistinctive Arabic period	Predominantly, undistinctive Arabic period	Predominantly, undistinctive Arabic period
23	Predominantly	Predominantly	None	None	None
24	None	None	None	None	None
25	Some sherds	Some sherds	Possibly sherds undistinctive Arabic period	Possibly sherds undistinctive Arabic period	Possibly sherds undistinctive Arabic period
26	None	None	None	Predominantly	Predominantly
27	None	Few sherds	None	None	None
28	Some sherds	Often	None	None	None
29	Some sherds	Often	None	None	None
30	None	Some sherds	None	None	None
31	Some sherds	Some sherds	None	None	None
32	Possibly few fragments	None	None	None	None