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ARCHAEOLOGY

KHIRBET BEIT ʿATÂB AND THE MÛGHÂRET BIR EL HASÛTAH CAVE COMPLEX: A MULTI-PERIOD ARCHAEOLOGICAL SITE IN THE JERUSALEM HILLS

Abstract: Khirbet Beit ʿAtâb, strategically located in the Jerusalem Hills, has attracted scholarly attention since the 19th century, yet fundamental questions about its most enigmatic feature—the Mûghâret Bir el Hasûtah cave complex—have remained unresolved. Previous researchers debated whether this extensive underground network represents an artificial hiding system or a natural karstic formation. This study synthesizes archival research, field observations, and speleological analysis to demonstrate that Mûghâret Bir el Hasûtah represents a natural karst system enhanced through selective human modifications for refuge purposes. Morphological analysis reveals diagnostic evidence of phreatic cave formation, while constructed retaining walls and passage constrictions indicate deliberate human adaptation. The site exhibits multi-period occupation from the Iron Age through the Ottoman period. A *kokhim* tomb indicates late Second Temple–period Jewish settlement, whereas Crusader remains may correspond to the documented Bethaatap estate. The columbarium installation provides chronological parameters from the Hellenistic through Byzantine periods. Rather than functioning as a direct fortress-to-spring tunnel, the 104 m cave system served refuge purposes, following patterns documented throughout Judean Hills hiding complexes. This integrated approach to natural feature adaptation characterizes sustainable settlement strategies in the semi-arid Jerusalem Hills environment.

Keywords: *Jerusalem Hills, karst caves, hiding systems, Crusader period, Second Temple period, Beit ʿAtâb, Bar Kokhba Revolt, natural cave modification.*

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INTRODUCTION

Khirbet Beit ʿAtâb, strategically positioned on a hilltop in the Jerusalem Hills, has intrigued researchers since the first European explorations of Victor Guérin in 1868 and the Survey of Western Palestine in 1873. Despite over 150 years of scholarly attention, fundamental questions about the site's most enigmatic feature—the Mûghâret Bir el Hasûtah cave complex—have remained unresolved. Previous researchers have debated whether this extensive underground network represents an artificial hiding system carved by human hands or a natural karstic formation minimally modified for use. These interpretations have implications for understanding the cave's function, chronology, and relationship to the fortress above and spring system

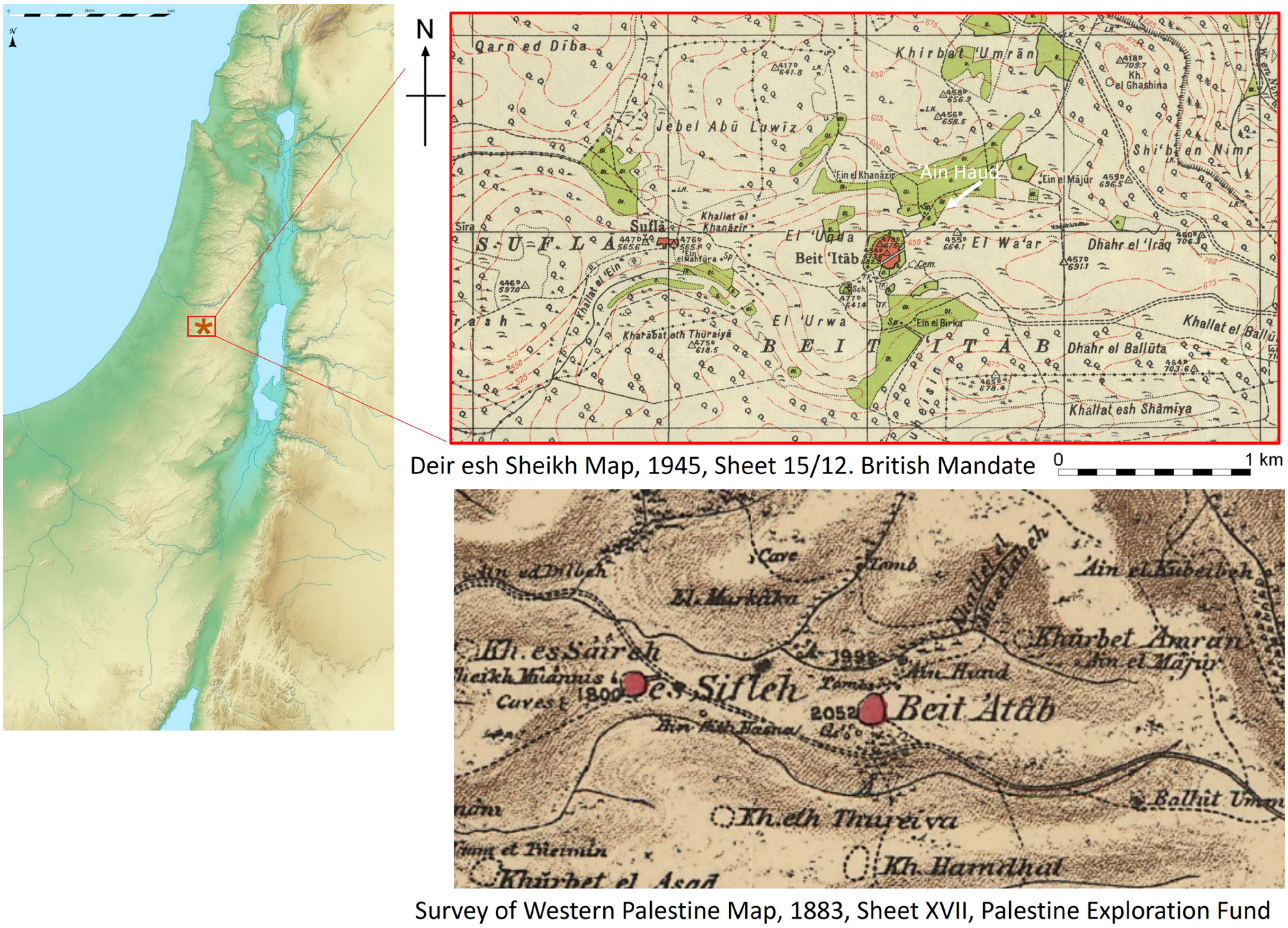

Fig. 1. Composite location map of main sites mentioned in the article (B. Zissu; British Mandate Survey; SWP).

below. Moreover, no comprehensive study in English has yet synthesized the components of the site while considering recent Judean archaeological research. This reexamination of the site synthesizes archival research, field observations, and a renewed speleological analysis to demonstrate that Mûghâret Bir el Hasûtah represents an integration of natural karstic cavities with planned modifications—a finding that reframes our understanding of how ancient communities in the Jerusalem Hills adapted existing geological features for strategic purposes. By resolving the long-standing debate over the cave's origins, this study provides insights into the technological capabilities and defensive strategies employed at this site from the Iron Age through the Ottoman period.

Beit ʿAtâb is a fortified site,[1] located on a hilltop on the western slopes of the Jerusalem Hills (grid reference 205106/626893; elevation 660 m above sea level), on the watershed dividing two valleys that drain the region—Nahal Ha-Meʿara and Nahal Dolev (Figs. 1–4).[2]

The site is situated on limestone strata of the Yehudah Group of the Cenomanian Age, specifically the Aminadav

[1] Also spelled Beit ʿItab بيت عطاب. The ancient name of the site is unknown. AGMON (2022) traces the toponym through linguistic and historical sources, arguing that it derives from the enigmatic "Tatami" in the Septuagint (Joshua 15:59) and represents an ancient Amorite settlement from the Middle Bronze II. Although his methodology of using toponymic suffixes for dating settlements is innovative, the specific identification of the modern ruins with the ancient Tatami remains unconvincing given the limited archaeological evidence and the speculative nature of several linguistic reconstructions. As will be demonstrated below, medieval documents indicate that in the 12th century the site was known as Bethaatap, from which it appears that the Arabic name preserves a version of this form. Eusebius mentions a place called ʽΗνὰδ in the tribal inheritance of Issachar, following Joshua 19:21 (where the site appears as ʿEn Hada [עֵין חַדָּה] in Hebrew). In discussing this biblical location, he notes by association a contemporary place with a similar name, ʽΗναδάβ, located near the tenth milestone on the road from Jerusalem to Eleutheropolis: "ʼΗνὰδ (Jos 19, 21) χλῆσον ʽΙσσάχαρ. ἔστι δὲ κώμη νῦν ἐτέλει ʽΗναδάβ, ἀπιόντων ἀπὸ ʽΕλευθεροπόλεως εἰς Αἴλιαν, περὶ τὸ ι' σημεῖον." ʽΗναδάβ held little significance in Eusebius's estimation since it lacks biblical mention.
Scholars generally accept the identification of Beit ʿItab with Eusebius's ʽΗναδάβ (ABEL 1938, 316, 369; AVI-YONAH 1976, 55; NOTLEY/SAFRAI 2005, 92; TSAFRIR/DI SEGNI/GREEN 1994, 120). Jerome, who translated the Onomasticon into Latin, followed Eusebius's account precisely: "Enada in tribu Issachar. est autem usque hodie quaedam villa nomine Enadab pergentibus de Eleutheropoli Aeliam quasi in decimo miliario" (EUSEBIUS 1966, 94–95).
Additional support for this identification, previously unnoticed by scholars, may be found in the name of the spring adjacent to the ruin (see below). The spring is known in Arabic as ʿAin Haud, a name that evokes the biblical place name in Issachar's inheritance, ʽΗνὰδ, with which Eusebius opens his discussion.

[2] The present study was conducted with the generous support of the Jeselsohn Epigraphic Center for Jewish History at Bar-Ilan University. We extend our gratitude to Dr. David Jeselsohn, Dr. Danny Bickson, Dr. Yosef Spiezer, Dr. Gital Simkovic, Debby Stern, Carina Docks-Brandt and Yotham and Tamara Zissu for their valuable assistance in data collection and analysis.

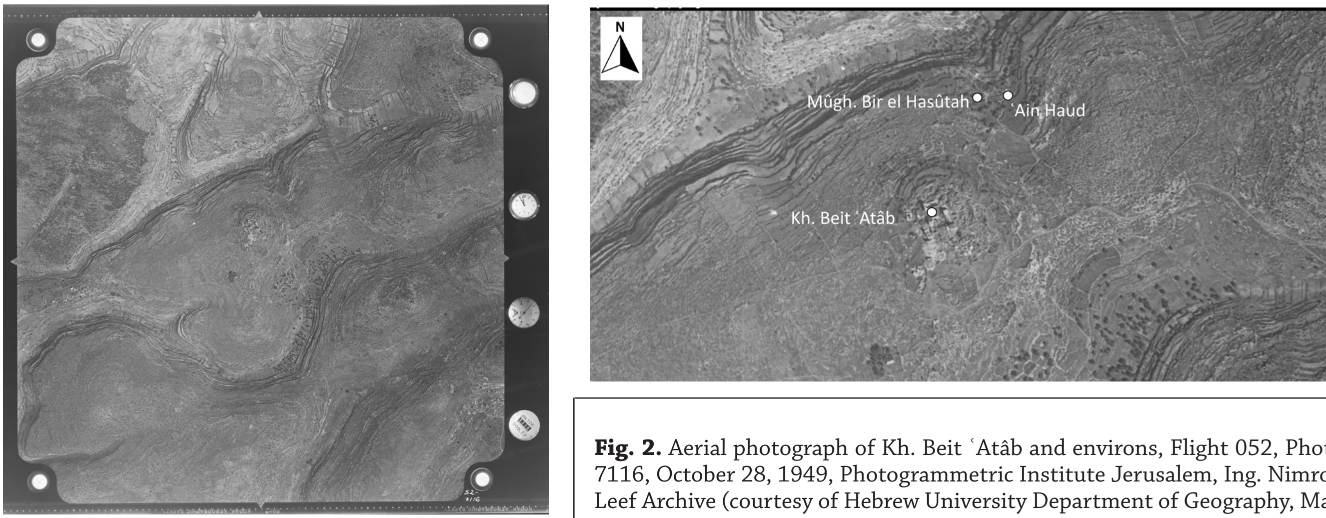

Fig. 2. Aerial photograph of Kh. Beit ʿAtâb and environs, Flight 052, Photo 7116, October 28, 1949, Photogrammetric Institute Jerusalem, Ing. Nimrod Leef Archive (courtesy of Hebrew University Department of Geography, Map Collection and Aerial Photography Site).

Fig. 3. Khirbet Beit ʿAtâb: aerial view toward the northeast (photo by B. Zissu).

Formation.[3] The formation is approximately 100 m thick and consists of hard, bedded limestone and dolomite (Fig. 5). Mûghâret Bir el Hasûtah (the cave system discussed below) also developed within the Aminadav Formation, whereas the ʿAin Haud spring emerges from the underlying Moza Formation, which consists of 10–20 m of yellowish marl. This marl serves as an aquitard, above which springs typically develop in the Jerusalem Hills.[4]

Victor Guérin's 1868 visit marked the beginning of European documentation of the site. During his travels through the region, Guérin recorded the settlement as the main village in the district of al-Arkub (الأركوب), with 600 inhabitants. His eye was drawn to the ancient remains scattered throughout the village, noting that the sheikh's house and several other nearby houses were built directly upon the site of an ancient fortress. He observed that several vaulted cellars had survived from this earlier structure and concluded that the fortified remains at the site predated the Crusader period.

Beyond the visible architectural remains, Guérin was particularly intrigued by local traditions concerning the site's defensive capabilities. The inhabitants shared with him their belief that a tunnel, now blocked, had once connected the fortress to the nearby spring. According to local memory, this underground passage had enabled the fortress defenders

[3] ARKIN 1976; ARKIN 1980.
[4] SNEH 2009.

Fig. 4. Khirbet Beit ʿAtâb: aerial view toward the southwest (photo by B. Zissu).

to obtain water during enemy attacks without exposing themselves to danger. However, Guérin approached these claims with caution, expressing reservations about confirming such underground passages, as he recognized that local imagination often created fictional accounts of secret supply routes.

Despite his skepticism about the tunnel folklore, Guérin recorded the local traditions without entering the underground system himself. His documentation proved remarkably prescient, as his architectural dating aligned with subsequent archaeological findings.

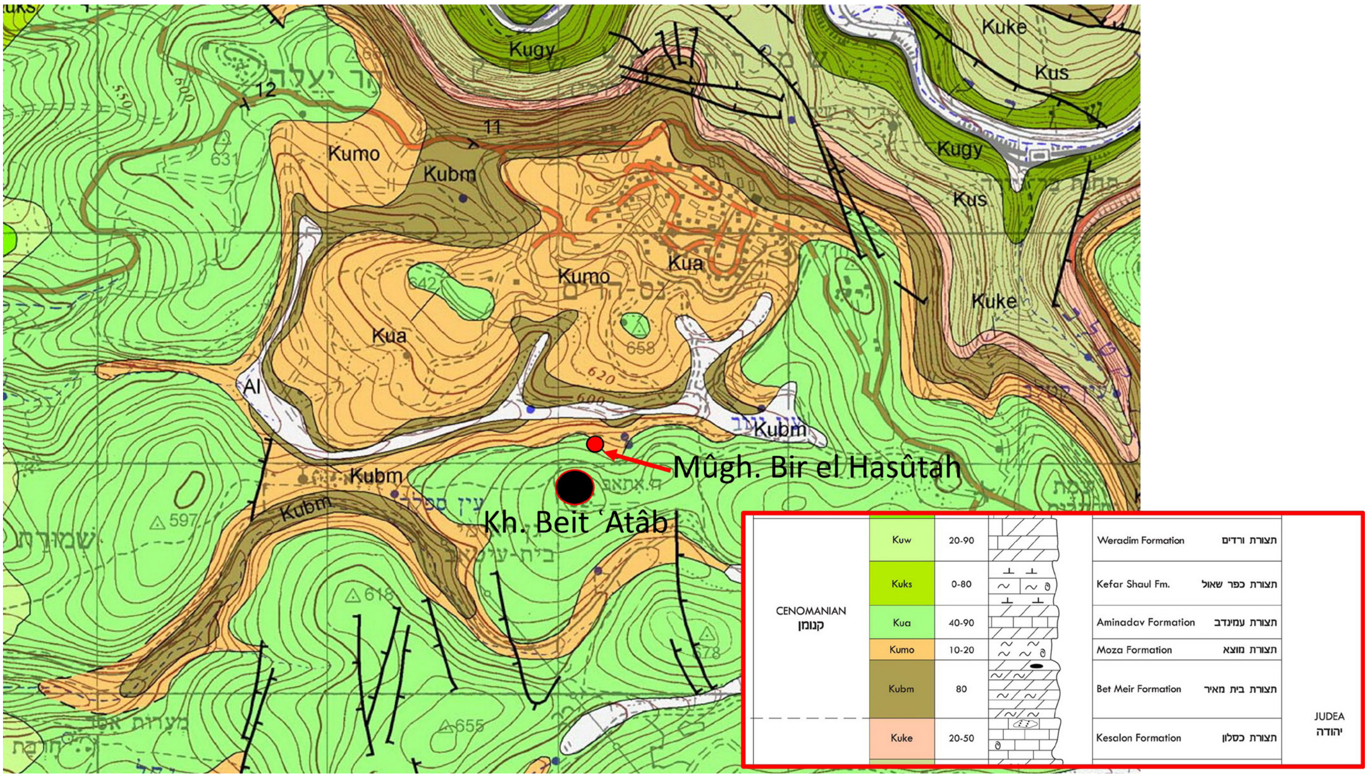

Fig. 5. Location of main sites discussed in the article on a geological map (SNEH 2009).

On October 23, 1873, Claude R. Conder and Herbert H. Kitchener of the Survey of Western Palestine conducted the first systematic documentation of Beit ʿAtâb (Fig. 1). They described the settlement as a small village standing on a remarkable knoll of rock that rose some 60 to 100 feet above the surrounding hilly ridge. The knoll struck them as extremely bare and rugged, and though not positioned at a particularly great elevation compared to the surrounding hills, Beit ʿAtâb appeared very conspicuous from all directions due to its strategic location.

The village's water supply system particularly impressed the explorers. Although cisterns existed among the houses, the primary water source was ʿAin Haud, the largest of three springs in the area. Two additional springs served the settlement: ʿAin el-Khanzireh to the west, near which they observed a rock-cut tomb, and ʿAin Beit ʿAtâb to the southeast. The Survey team established their camp in the little valley near ʿAin Haud, northeast of the village.

The built environment consisted of stone construction featuring a tall central house and one or two other two-story structures. The explorers noted that the site had once been the seat of a family called Beit Lehhâm, who served as village mukhtars until their control was eliminated by Abu Ghosh raiders between 1853 and 1856.

The most remarkable feature documented by Conder and Kitchener was the cave system beneath the village (Fig. 6). They described "a remarkable cavern (Mûghâret Bir el Hasûtah) [that] runs beneath the houses" and interpreted it as "a gallery leading towards the spring (ʿAin Haud) from the centre of the village."[5]

Their measurements recorded the cave as "some 250 feet long, running in a south-south-west direction" with "average height ... about 5 to 8 feet, and its width about 18 feet." The eastern entrance featured "a vertical shaft 6 feet by 5 feet and 10 feet deep, in the sides of which are niches, as if for lamps" (see Chamber A below). This shaft gave the cave its name, as "it is from this shaft that the cavern has been called Bir, or 'well.'"

The surveyors noted the layout of the underground complex: "The cave is not straight ... but the general direction is first 34° for 65 feet, then 6° true bearing for 74 feet, then 71° for 50 feet." They observed that the cave narrowed significantly toward its western end, where "the width ... is 8 feet, and the height only 3 to 4 feet. The end is here blocked."

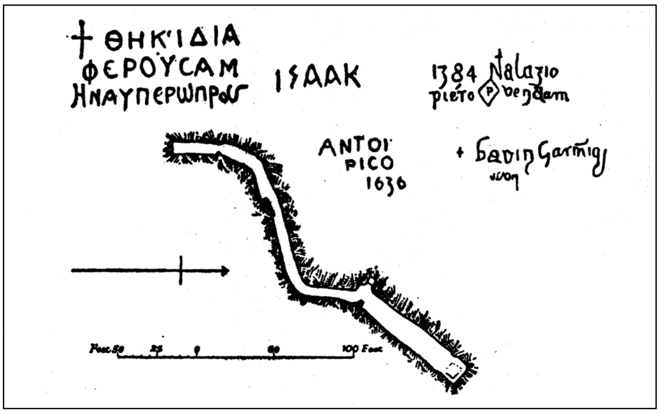

Fig. 6. SWP plan of Mûghâret Bir el Hasûtah (CONDER/KITCHENER 1883, 137).

Importantly, they concluded that the cave was "evidently artificial" and "rudely hewn in the rock," though they noted that "a few small stalactites occur on the walls." The cave extended to within "50 or 60 yards of the spring," suggesting its function as an underground water access route.[6]

Conder and Kitchener proposed identifying Beit ʿAtâb with the biblical Rock of Etam mentioned in Judges 15. They argued that the position of the site and the existence of a cave or cleft suggested the identification of Beit ʿAtâb with the Rock of Etam, while distinguishing this from Solomon's Etam, which they believed was situated farther east, probably near the so-called Pools of Solomon.

Their etymological analysis of the cave name provided additional support for this identification. They discovered that while "Bir el Hasûtah ... has not, as far as I can find, any meaning in Arabic," it "corresponds with the Hebrew word, חסותה, Hasutah, which is translated 'a place of refuge.'" This led them to conclude that "the name seems to indicate that this place has been used from a very early time as a lurking or hiding place, as we gather it to have been in the time of Samson."[7]

The topographical argument strengthened their case further. Beit ʿAtâb stood on a rocky knoll that answered well to the meaning of the Hebrew word סלע ("rock")—quite bare of trees and consisting almost entirely of hard, barren limestone. They positioned the site geographically within the appropriate biblical context, noting its proximity to Zorah and Eshtaol and its location on the border of the hill country of Judah.[8]

Dimitri Baramki, the inspector of the Mandatory Department of Antiquities, visited the site on several occasions in 1942 and 1944 and briefly described vaulted buildings surrounding the central courtyard. He attached three photographs to his reports, which are preserved in the Israel Antiquities Authority archives; these indicate the state of preservation during this period (Fig. 7).[9] An interesting addition by Baramki, which does not appear anywhere else, relates to the name of the fortress: "The Crusader Castle

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5 CONDER/KITCHENER 1883, 137.

6 Alongside the plan of the underground system, Conder and Kitchener documented in a schematic manner four inscriptions: a Greek funerary inscription beginning with the typical formula ΘΗΚΗ ΔΙΑΦΕΡΟΥΣΑ (though it remains unclear whether the name Isaac, copied nearby, forms part of this inscription), and three graffiti left by European visitors, two of them dated to 1384 and 1636 (Fig. 6; CONDER/KITCHENER 1883, 137). The apparent presence of European visitors at this remote site in the Jerusalem Hills raises questions about both their motivations and the circumstances that enabled access during periods when the site and region were under Muslim control. It seems that these inscriptions were copied at the Church of the Holy Sepulchre, and inadvertently appeared in the margins of the sheet containing the cave plan.

7 CONDER/KITCHENER 1883, 22–23. According to MARCUS 1993, the meaning of the Arabic name is "hiding pit" or "concealment well".

8 The identification of the Rock of Etam, Samson traditions, and their later developments are beyond the scope of the present article. The first author previously proposed identifying the Rock of Etam with an elevated cliff above Nahal Sorek, northwest of Kh. Beit ʿItab (GASS/ZISSU 2009).

9 https://archives.iaa.org.il/zoom/zoom.aspx?folder_id=15382&type_id=&id=84739.

Fig. 7. Two photographs taken in 1944: a. pointed arch leading into one of the rooms east of the main courtyard; b. main entrance to the compound from the south; both are now destroyed (photos by D. Baramki).

Fig. 8. Ground-floor entrance from the courtyard to a vaulted basement chamber below the hall house, looking north (B. Zissu).

Fig. 9. Doorway fitted with a drawbar mechanism in a vaulted chamber below the hall house, looking south (B. Zissu).

is called el Haush (الحوش)". [10] *El-haush* is Arabic for "the courtyard" or "the enclosure"—a very appropriate name for this site, which was centered around a courtyard.

Denys Pringle explored the site in 1989 as part of his survey of secular buildings in the Crusader Kingdom of Jerusalem.[11] He documented architectural remains of a hall house measuring 29×13.3 m, which originally featured a ground-floor entrance equipped with defensive installations (visible in Figs. 2, 4, 8, and 9). The entrance was protected by a slit machicolation and secured by a door fitted with a drawbar mechanism, providing access to a vaulted basement chamber below. From this ground level, a staircase constructed within the thickness of the left wall provided access to the now-vanished upper floor of the original structure.

During a subsequent phase of construction, this hall house was incorporated as the northern end of a more extensive courtyard building, alternatively identified as a *maison forte*. This expanded complex measured 40–45.7 m east–west by 59 m north–south and comprised four vaulted series of rooms arranged around a central courtyard (Figs. 10–12). The main entrance to this courtyard complex was positioned on the southern side (Fig. 7b).[12]

In conjunction with this later building campaign, the original hall was given architectural modifications, including the installation of a first-floor entrance and the construction of an external staircase ascending from the courtyard level. These alterations effectively integrated the earlier hall house into the expanded residential complex partly preserved in the center of the courtyard; this complex is difficult to date without systematic excavation (Figs. 10–12).[13]

Rehav Rubin discussed the typical architecture of Crusader manor houses in the Jerusalem Hills: robust structures, usually built around a central courtyard, featuring characteristics of Crusader construction including large vaults, sturdy corners constructed with stones having marginal dressing, and a somewhat fortified appearance.[14] These structures are adjacent to agricultural systems and are

[10] https://archives.iaa.org.il/zoom/zoom.aspx?folder_id=15382&type_id=&id=84738.

[11] PRINGLE 1997, 26–27.

[12] For a discussion of the site in the context of Crusader manor houses and farmhouses, see BOAS 1999, 68–75.

[13] MARCUS 1993, 126–128, Site 109-108, attributed these remains to construction during the Syrian Peasant Revolt of 1834–35 against the rule of Ibrahim Pasha of Egypt (MANNA 2009), a period when additional fortified villages were established throughout the Jerusalem Hills and Samaria regions.

[14] RUBIN 2018, 92–104.

Fig. 10. One of the entrances to the courtyard from a vault, south of the main courtyard (B. Zissu).

Fig. 11. Vaulted (Ottoman-period?) room west of the central courtyard, looking east (B. Zissu).

Fig. 12. Vaulted (Ottoman-period?) room west of the central courtyard, looking west (B. Zissu).

usually close to a spring, even if not directly attached to it. At least some of these structures can be identified with place names mentioned in documents from the Crusader period.

Rubin attempted to reconstruct a Crusader estate that is well described in Crusader documents: the estate of Johannes Gothman. In 1157, this Frankish knight was captured along with other important knights in a battle fought in the Jordan Valley. Gothman's family was forced to sell his estate to the Church of the Holy Sepulchre in 1161 to pay his ransom and secure his release from Muslim captivity. The detailed sale document, preserved among the registration documents of the Church of the Holy Sepulchre, provides valuable information about a rural estate in the Jerusalem Hills. The documented sale includes five properties: Bethaatap, Culi, Derxerip, Derhassen, and Gastina Leonis.[15] All five sites appear to be located southwest of Jerusalem, though scholarly consensus exists regarding the identification of only some of these toponyms. Bethaatap appears to be the central site of this estate.[16] The Frankish architectural remains at our site, combined with the reference to Bethaatap in 12th-century documentation, support its potential identification with the medieval toponym.

We returned to the site in the early 1990s for the Nes Harim map survey on behalf of the Archaeological Survey of Israel,[17] prepared a detailed plan of the fortified Frankish complex built on the summit (Fig. 13), and examined additional structures within and around the complex, including buildings, rock-cut tombs (see below), and a cemetery from the Ottoman period. On the surrounding slopes, two rock-cut columbarium installations were reexamined. One of these installations forms the entrance to Mûghâret Bir el Hasûtah.[18] Surface pottery collected during the survey was dated to the Middle Bronze Age IIB, Iron Age III, and Hellenistic, Early Roman, medieval, and Ottoman periods (Fig. 14).

We examined a rock-cut tomb (AT1.1) and a neighboring cavity (AT1.2) (Figs. 15–22) located on the western slope of the site, approximately 200 m west of the southwestern corner of the ruins, in an open area where some Ottoman-period foundations of stone buildings and tombs are scattered (Figs 3, 23–24).

15 BRESC-BAUTIER 1984, docs. 87–88, 135, 146, 200–203, 261–266, 283–287.
16 RUBIN 2018, 92–104; ELLENBLUM 2010, 161–164; ELLENBLUM 1991, 220–221.
17 WEISS/ZISSU/SOLIMANY 2004, 52–53, Site 66, 15-12/56/2, aerial photo on cover.
18 TEPPER/SHACHAR 1983; SCHWAGER 1992; see also below.

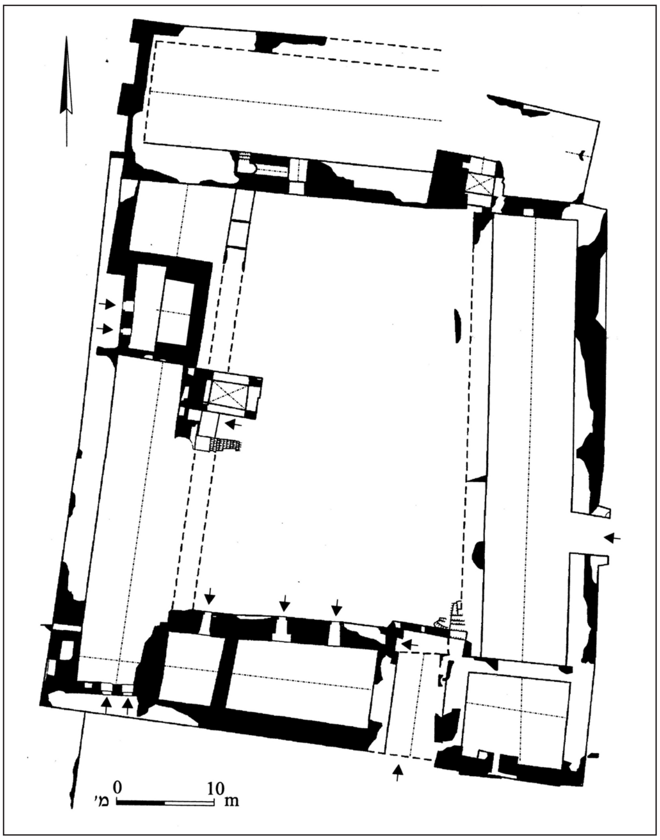

Fig. 13. Detailed plan of the fortified complex prepared in the early 1990s (after WEISS/ZISSU/SOLIMANY 2004, 52–53; Site 66).

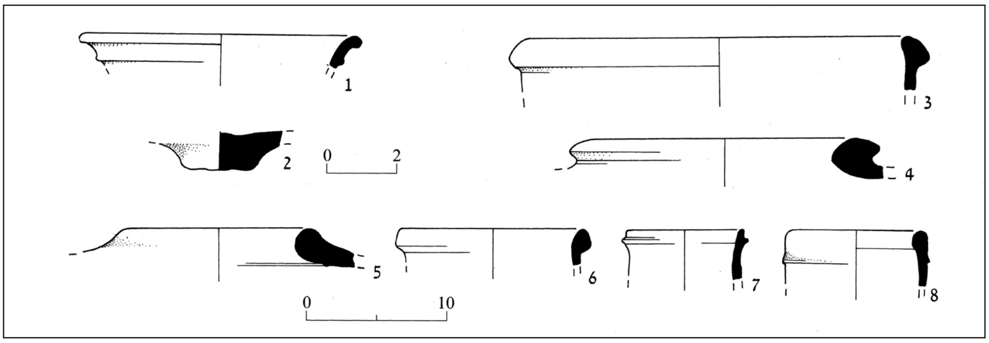

Fig. 14. Pottery fragments collected on the surface of Kh. Beit ʿAtâb, with numbered references corresponding to the profiles drawn in the figure. Middle Bronze Age IIB2: 1. jar; Iron Age III: 2. lamp base; 3. cooking pot; 4, 5. storage jars (pithoi); Hellenistic period: 6. jar; Early Roman period: 7. flask; medieval period: 8. jar (WEISS/ZISSU/SOLIMANY 2004, Fig. 67, 2).

The tomb entrance is approached through an elongated rock-cut courtyard 5 m long and 3.2 m wide. In the eastern part of this courtyard, an entrance decorated with recessed frames leads to the tomb chamber. The chamber, which has a rectangular plan, measures 3.2×2.7 m, with a ceiling height of 1.1 m. A rectangular standing pit measuring 1.5×0.7 m and 0.4 m deep was cut in the center of the chamber. Three *kokhim* (burial niches) were cut into the chamber walls: two on the eastern side (opposite the entrance) and one in the southern wall. The niches are 1.9 m long, 0.7 m wide, and 0.9 m high.

Two passages in the northern part of the chamber and the northern part of the tomb courtyard damaged the tomb's original form and connect it with a neighboring cavity (AT1.2). These connections between the tomb and cavity were created after the tomb fell out of use.

The main entrance to cavity AT1.2 allows descent via three steps through a vault constructed of fieldstones and mortar covering an elongated entrance. The cavity floor opposite the entrance descends steeply to the southwest, creating a lower level beneath tomb AT1.1. Cavity AT1.2 is 11 m long and 5.5 m wide, with a maximum height of 3.2 m. The cavity has an irregular shape with niches hewn into its walls that may have accommodated olive press installations of the beam-and-screw type, though no olive press weights or other diagnostic features were found. Traces of hydraulic plaster were preserved along the upper portions of the chamber walls and in the area of the steps at certain levels, suggesting that this cavity may have initially served as a water cistern before being converted to an olive press.

The *kokhim* tomb AT1.1, though poorly preserved, can be regarded as a *fossile indicateur*, contributing to an understanding of the site and its history. In rural Judea, such tombs were hewn between the late 2nd century BCE and the early 2nd century CE and primarily served the Jewish population. Tombs were typically carved outside the boundaries of the built areas of settlements; their location therefore indicates the site's original boundaries. The tomb under discussion features a decorated facade suggesting ownership by a family of means.

This type of rock-cut tomb served extended families and featured both external and internal components. External elements included courtyards, vestibules, tomb markers, and occasionally ritual baths—spaces utilized by pallbearers and mourners. Internal elements included burial chambers with benches, niches (*loculi*; *kokhim*), arcosolia, and other architectural features designed for burial purposes. The tomb entrance, typically a small square opening sealed with a blocking stone, separated these external and internal spatial zones.

During the Early Roman period, Jews employed a two-stage burial process. Initially, the corpse was placed in a *kokh* within the burial chamber. After flesh decomposition (approximately one year), the bones were collected and transferred to either a secondary niche or an ossuary within the tomb.[19]

Archaeological surveys and excavations around Jerusalem have revealed approximately 900 rock-cut *kokhim* tombs within the necropolis surrounding the ancient city. These tombs date to the final 150 years preceding the city's destruction by the Romans in 70 CE, providing substantial comparative data for written sources.[20] The urban necropolis extended 3–5 km around the city walls, creating a boundary between urban and rural settlements, with tombs clustered

[19] RAHMANI 1994; HACHLILI 2005; KLONER/ZISSU 2007; MAGNESS 2012.

[20] HACHLILI 2005; KLONER/ZISSU 2007; REGEV 2004.

Fig. 15. Entrances to the rock-cut tomb and neighboring cavity AT1.1–AT1.2, looking east (B. Zissu).

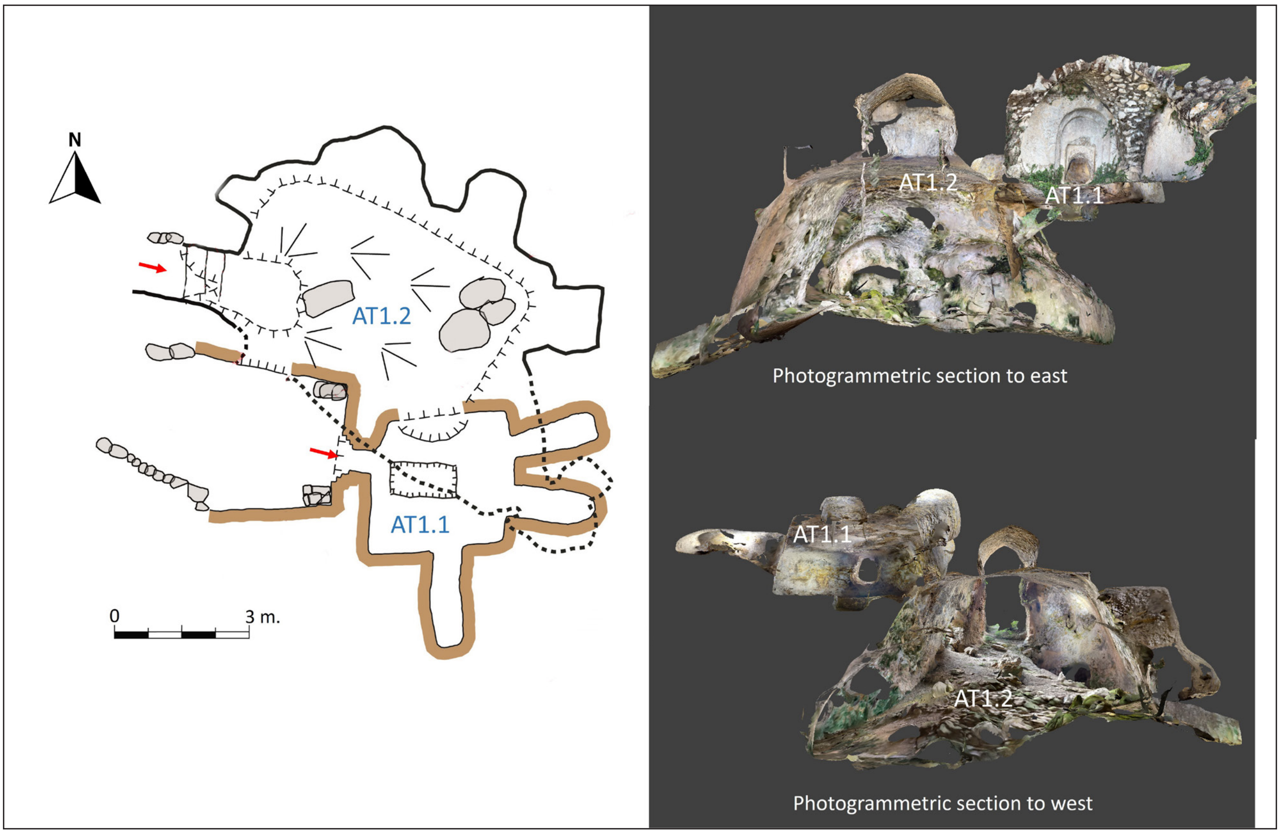

Fig. 16. Plan and two photogrammetric sections of the rock-cut tomb and neighboring cavity AT1.1–AT1.2 (S. Ya'aran, B. Zissu).

Fig. 17. Entrance decorated with recessed frames, rock-cut tomb AT1.1, looking east (B. Zissu).

Fig. 18. Burial chamber of rock-cut tomb AT1.1, looking southeast (B. Zissu).

on valley slopes and in cliff faces.[21] Similar tombs have been documented in rural Judea at sites from the relevant periods.[22]

[21] KLONER/ZISSU 2007; SHTOBER-ZISU/ZISSU 2018.

[22] E.g., HADAS 1994; HACHLILI/KILLEBREW 1999; ZISSU 2005.

THE SPRING (FIG. 25)[23]

ʿAin Haud (meaning "the trough spring") issues approximately 300 m north of the site. This is a tunnel spring,

[23] MARCUS 1993, 126–128.

Fig. 19. Cavity AT1.2 and rock-cut tomb AT1.1, with the wall pierced at ceiling level, looking east (B. Zissu).

Fig. 20. Detail of rock-cut tomb AT1.1, as seen from AT1.2, looking southeast (B. Zissu).

with a tunnel approximately 40 m long and three shafts descending to it. The upper shaft is 7 m deep, the middle one is 4.5 m deep, and the lower one is blocked. Spring water flows through the tunnel and is collected in a built collection chamber measuring 4×4 m with a vaulted ceiling. From here the water flowed to a collection pool measuring 2×2 m with steps descending to its floor. However, the original outlet to the external pool is blocked, and in its place a pipe is now used for watering sheep.

The spring system was used over an extended period and underwent numerous repairs, most recently from 1970 to

Fig. 21. Detail: remains of the olive press (?) in the northern wall of cavity AT1.2, looking north (B. Zissu).

Fig. 22. Rock-cut details in the ceiling of cavity AT1.2 (B. Zissu).

1990. Modern elements are integrated into the system and incorporate secondary use of ancient components, making it difficult to date the system without dismantling it and conducting a proper excavation.[24]

[24] A careful examination of plaster from various construction phases might assist in dating the different components (PORATH 2002; VAN ZUIDEN/ASSCHER 2021). The earliest phase of the spring may date to the Iron Age. RON 1977, 246–249; RON 1985; RON 1992 and YECHEZKEL/FRUMKIN/TZIONIT 2022 discussed dating challenges and provided evidence for dates from Iron Age II onwards at several springs in the Judean Hills. Other spring systems in the area, including ʿAin Qobi, ʿAin Ẓuba, ʿAin Ḥandaq, Sataf, ʿAin Yael, ʿAin Ḥanya, ʿAin el-Hadaf, and Battir, feature similar components. Although clear-cut archaeological evidence for dating these systems remains elusive, several details suggest an early chronology.

Fig. 23. Ottoman-period tombs on the western slope of the site, approx. 200 m west of the southwestern corner of the site, looking south (B. Zissu).

Yechezkel *et alii* documented 210 spring tunnels throughout the central mountain range, particularly in the Jerusalem Hills region.[25] Such tunnels likely first appeared in the region during the Iron Age II, around the 8th century BCE. The similarity among these systems supports the hypothesis that by the Early Roman period, residents of Judea had developed systematic methods for exploiting scarce aquifer water, channeling it through tunnels to collection pools, and distributing it to irrigated agricultural systems.

Spring tunnels addressed fundamental human water needs and enabled the establishment of rural settlements and irrigated agricultural landscapes in semi-arid regions.

BRIDGING THE HISTORICAL AND SCIENTIFIC RECORD

The historical documentation spanning the years from Guérin's 1868 observations through Pringle's architectural analysis establishes the multi-period significance of the site, but fundamental questions about the origins and function of the underground system remained unresolved. Although local traditions referred to subterranean connections between the fortress and spring, the conflicting interpretations of early explorers, who viewed the cave as entirely artificial, and later researchers who questioned this assumption highlighted the need for systematic speleological investigation.

The gap between historical documentation and archaeological understanding reflects broader methodological challenges in cave archaeology, where morphological analysis often provides more reliable evidence of formation processes than surface observations alone. Furthermore, the continued occupation of the site and modification of it across multiple periods created a palimpsest of human interventions that required careful separation from natural geological processes.

To resolve these longstanding debates and provide a definitive assessment of the character of the cave system, our renewed examination employed both traditional archaeological examination and speleological analysis. This integrated approach sought to distinguish between natural karst formation, deliberate human rock-cutting, and secondary modifications—distinctions crucial for understanding both the cave's original function and its role

A detailed study of the tunnel system capturing spring flow at Wadi Biar in the northern Hebron Hills, part of the Roman-period water supply system for Jerusalem (MAZAR 2002), employed C^{14} dating of plaster samples that suggested construction in the mid-1st century CE and restoration in the 2nd century CE (YECHEZKEL *et alii* 2021).

[25] YECHEZKEL/FRUMKIN/TZIONIT 2022.

Fig. 24. Detail of closing door in situ in one of the tombs on the western slope of the site (B. Zissu).

Components of 'Ain Haud Spring (after Marcus 1993, fig. 25):

1. Stone-lined shaft (diameter: 0.7 m)
2. Tunnel (length 15 m)
3. Stone-lined shaft (diameter: 0.6 m)
4. Tunnel (length 17 m)
5. Blocked shaft
6. Hidden reservoir (depth: 1 m, water depth 0.8 m)
7. Collection pool with steps
8. Trough

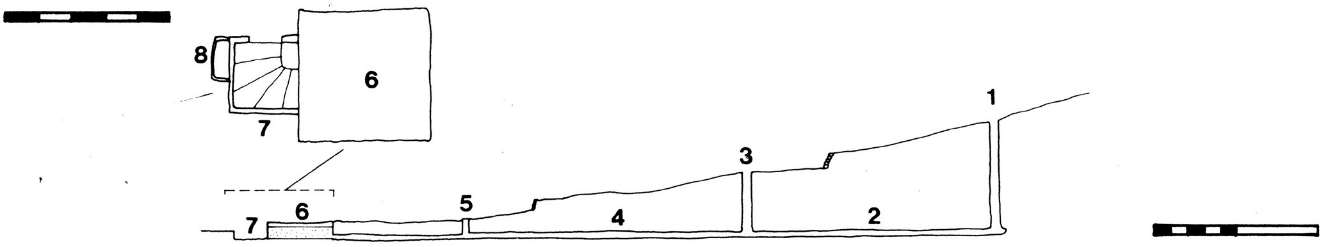

Fig. 25. ʿAin Haud spring: plan and photographs (M. Marcus and B. Zissu).

within the broader defensive infrastructure of Khirbet Beit ʿAtâb.

MÛGHÂRET BIR EL HASÛTAH REEXAMINED

Previous Research Interpretations

In 1983, Yigal Tepper and Yuval Shachar reexamined Mûghâret Bir el Hasûtah.[26] They described it as a rock-cut (artificial) cavity 83 m long that connects the village center to the spring area in the valley to the south, emerging at the surface through a columbarium installation located at some distance from the water source. They identified three sections in this cavity: (a) an entrance through a columbarium; (b) an elongated chamber approximately 20 m long, 5 m wide, and up to 3 m high; (c) a slightly winding tunnel approximately 60 m long, 3 m wide, and 1 m high.

Tepper and Shachar interpreted this system as an underground hideout, though they acknowledged offering no definitive proof of this function. They noted that insufficient data exists to determine the chronology of the hewing of the cave. In their opinion, this underground system differs in character from typical hiding complexes found elsewhere in Judea. They also distinguished it from conventional spring tunnels common throughout the Judean Hills,[27] emphasizing that such tunnels serve hydrological purposes—primarily to increase and direct spring flow—rather than hiding, refuge, and concealment.

In 1991, Gad Schwager conducted a systematic reexamination of Mûghâret Bir el Hasûtah on behalf of the Israel Cave Research Center and concluded that it represents a predominantly natural karst formation containing some evidence of anthropogenic modification.[28] He deliberately refrained from drawing definitive conclusions regarding the cave's potential function as a hiding or refuge system.

Schwager's examination of the cave system revealed a complex speleological formation. His analysis identified the cave entrance as providing access through a hard limestone cliff face to Chamber A, a square columbarium chamber with a collapsed ceiling. In his view, this chamber represented the only entirely artificial component within the system, featuring a breach in its western corner that connects to the continuation of the karst cave.

Beyond this artificial entrance chamber, Schwager documented what he regarded as a predominantly natural karst system extending southwest through multiple chambers. The cave's morphological characteristics led him to conclude that the system represents a phreatic passage network formed during periods of water table saturation. He identified diagnostic evidence including the distribution of solution cupolas, cross-sectional morphology of phreatic passages, highly variable passage dimensions, and significant longitudinal gradient variation. The absence of systematic anthropogenic tool marks throughout extensive passage segments supports his interpretation of natural formation processes.

Schwager's topographical analysis revealed significant spatial constraints that challenge interpretations of the cave as a direct fortress-to-spring connection. He calculated approximately 70 m horizontal distance with 26 m vertical relief between cave extremities and fortress remains, and a similar 70 m distance between the columbarium and the adjacent spring. His conclusion emphasized that morphological characteristics of the entrance zone and Chamber A preclude direct subterranean connectivity between fortress and spring via the cave system, suggesting more complex utilization patterns than simple linear access routes.

Geological Context and Setting

In 2019 the authors reexamined Mûghâret Bir el Hasûtah (Fig. 26). The cave developed in rocks of the Yehudah Group from the Cenomanian Age, specifically the Aminadav Formation.[29] This formation is 100 m thick and is built of hard, bedded limestone and hard, bedded dolomite, in which some horizons of quartzolite can be found. The lower part of the cave may touch the roof of the yellowish Moza Formation marl, which constitutes a water-retaining layer in this area and above which the ʿAin Haud spring flows.[30] Crumbling yellowish material (the result of karstic weathering that affected the chamber walls), cracked gray limestone, and dolomite rock can be discerned on the cave walls.

The cave entrance opens onto the bank of a shallow valley that descends from south to north and contains the ʿAin Haud spring; only 90 m separates the spring from the cave entrance.

Chamber A: The Columbarium Entrance

The entrance itself (3.2×1.4 m) is situated within a hard limestone cliff face approximately 3 m high (Fig. 27) and provides access to a square columbarium chamber (Chamber A) with a partially collapsed ceiling. Numerous collapsed rocks at the entrance indicate that its current form resulted from the collapse of the cliff face, which created the horizontal entrance as it appears today.

Chamber A possesses an additional (original) upper opening through which one can climb 2.5 m to reach the ground surface (Figs. 28–30). We assume that prior to the rock collapse and creation of the horizontal entrance, access to the chamber was gained through this upper vertical opening. The absence of any horizontal entrance marked in the SWP plan supports this assumption (Fig. 6).

Chamber A is 3.8 m wide and 4.3 m long. Evidence of artificial excavation is visible throughout the chamber, which exhibits a rectangular shape. The chamber walls contain circular columbarium niches of non-uniform shape and distribution, arranged on three levels. These niches do not fully utilize the available wall space, suggesting that they represent a secondary installation within Chamber A rather than part of the original construction phase.

[26] TEPPER/SHACHAR 1983; KLONER/TEPPER 1987, 276.
[27] RON 1977; RON 1985; RON 1992; YECHEZKEL *et alii* 2021; YECHEZKEL/FRUMKIN/TZIONIT 2022.
[28] SCHWAGER 1992.
[29] ARKIN 1976; ARKIN 1980.
[30] SNEH 2009.

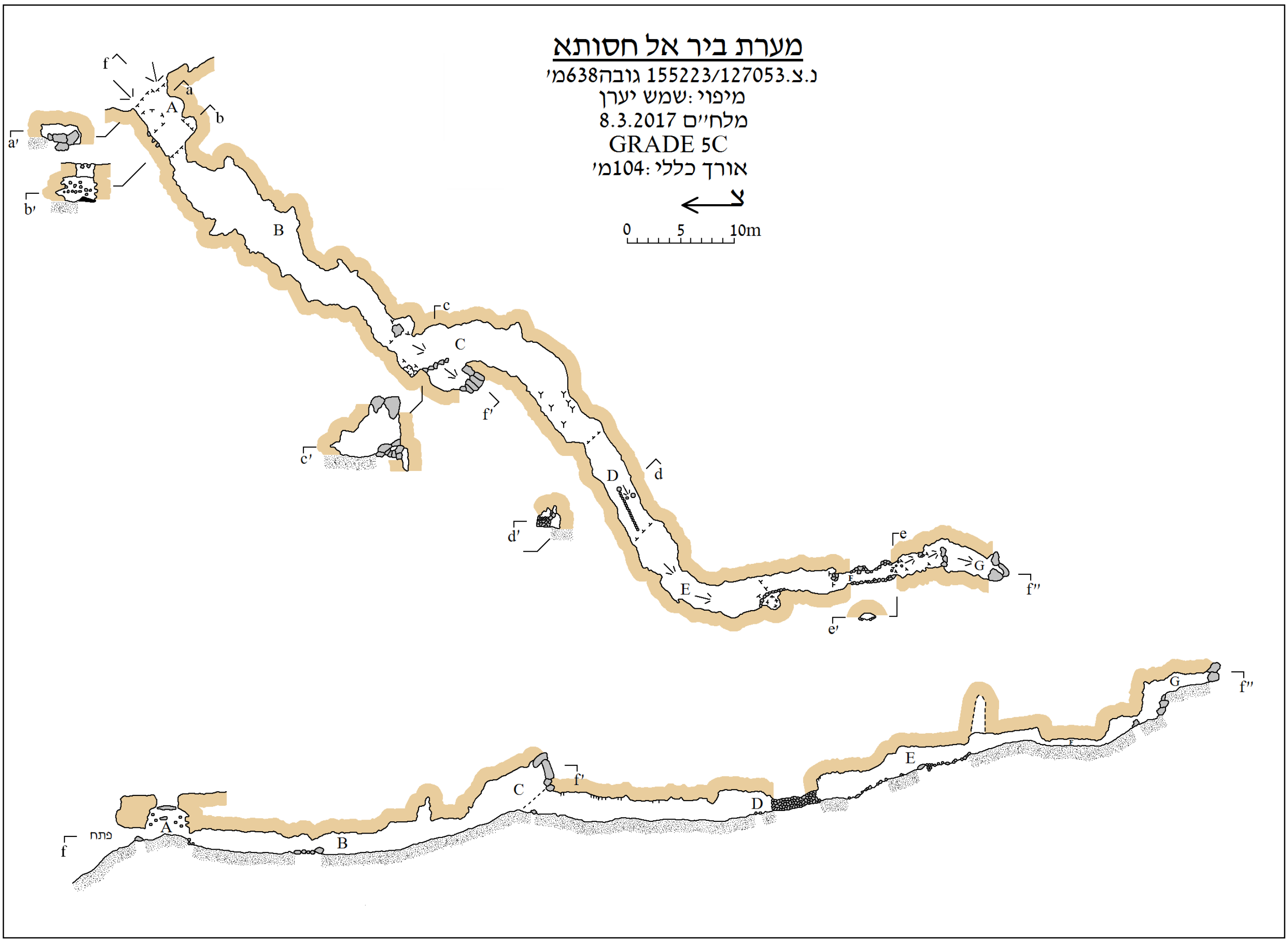

Fig. 26. Mûghâret Bir el Hasûtah: new plan and section (S. Ya'aran).

Fig. 27. Mûghâret Bir el Hasûtah: entrance to Chamber A in a hard limestone cliff face (B. Zissu).

Fig. 28. Mûghâret Bir el Hasûtah: original shaft leading into Chamber A from the surface (B. Zissu).

An additional columbarium was found nearby (Fig. 31). Rock-cut dovecotes (columbaria) are common installations in and around Judean settlements, dating to the Hellenistic period (3rd century BCE) through the Byzantine era (7th century CE) and revealing pigeon husbandry systems that supported ancient economies.[31]

Two points merit consideration regarding the location of the columbarium installations here, positioned downslope from the site near the spring and fertile valley lands: First, the installations were apparently hewn to produce manure for fertilization of fields, representing one of the primary functions of columbarium installations.[32] Second, given that columbarium installations are documented from the Hellenistic period through the late Byzantine period, the columbarium under discussion was likely hewn within this time frame. As noted, the columbarium carvers breached the existing underground chamber system and adapted it to their requirements. The presence of the columbarium therefore provides a potential chronological marker for dating the initial human use and adaptation of Mûghâret Bir el Hasûtah.

The Main Cave System: Chambers B through G

Chambers B and C: The Primary Passages

In the southwestern part of Chamber A, a low opening measuring 0.6×1.6 m leads to Chamber B (Figs. 26, 30). Chamber B is 4.9 m wide and 25 m long; its height is approximately 2 m. In its walls are cracks and many natural niches, on the chamber floor are soil and rock fragments, and in the ceiling are cracks, some of which reach a height of 5 m (Fig. 32).

[31] Archaeological investigations across Israel have documented over a thousand columbarium installations (TEPPER 1986; TEPPER 2007a). The chronological development shows large-scale Hellenistic installations capable of housing thousands of pigeons for industrialized production (especially at Maresha), smaller Roman-period installations often converted from existing structures, and Byzantine innovations making possible agricultural expansion into desert environments. The Judean Shephelah contains approximately 900 rock-cut columbarium installations with an estimated 170,000 nesting niches, while over 20 Negev facilities demonstrate specific adaptations to arid conditions by means of aboveground tower construction and integration with agricultural systems (TEPPER 1986; ZISSU 1995; HIRSCHFELD/TEPPER 2006; MICHAEL 2024).

[32] Functionally, columbaria served three primary purposes that explain their widespread distribution. Pigeon droppings provided high-quality fertilizer containing 1.75 percent nitrogen, important for maintaining soil fertility in nutrient-poor environments, with individual installations capable of producing 10–11 cubic meters annually (TEPPER 2007b; TEPPER *et alii* 2017). Pigeons also served as food sources and fulfilled cultic functions for Temple sacrifices in Jerusalem, where substantial quantities were required for individual offerings.

Fig. 29. Mûghâret Bir el Hasûtah: Chamber A, looking toward the entrance (B. Zissu).

Fig. 30. Mûghâret Bir el Hasûtah: entrance to the underground complex from Chamber A (B. Zissu).

Fig. 31. Remains of the columbarium installation on the northeastern slope of the site (B. Zissu).

Fig. 32. Mûghâret Bir el Hasûtah: Chamber B, looking southwest (B. Zissu).

From Chamber B, one can continue southwest and ascend a talus to Chamber C, which is 6.7 m wide, 22 m long, and 5 m high. In the western part of this chamber is a steep talus of rocks and soil ascending to a blocked opening with large stones, from which material flow into the chamber is evident (Figs. 33–34). Around the opening are signs that may indicate hewing (Fig. 35). Near the entrance to Chamber C and close to the western wall of the chamber is a natural pit 1.2 m deep.

Fig. 33. Mûghâret Bir el Hasûtah: Chamber C, looking southwest: steep talus of rocks and soil ascending to a blocked opening (B. Zissu).

The broad passage in Chambers B–C exhibits extensive fracturing. The rock shows evidence of active weathering processes, including carbonate dissolution and hydrological flow, with characteristic small solution cupolas, enlarged dissolution fractures, and secondary calcite precipitation throughout.

Chamber C, Southern Section: Evidence of Modification

Continuing southwest through the cave to the southern part of Chamber C, one reaches an area where the cave floor stops rising. There one can see evidence of illegal excavations. In this area there is much moisture and there are active stalactites that drip a little water into the chamber. The ceiling

Fig. 34. Mûghâret Bir el Hasûtah: Chamber C, looking west; the blocked opening (B. Zissu).

Fig. 35. Mûghâret Bir el Hasûtah: Chamber C, looking north, with some signs of hewing on the wall (B. Zissu).

is aligned and presents a uniform plane whose corners are rounded and curved to meet vertical walls (Fig. 36). Natural karstic chimneys coated with speleothems underwent hewing and leveling upon reaching the ceiling of Chamber C, but the soft, crumbling rock preserves almost no typical hewing marks along the ceiling (Fig. 37). Despite the absence of clear hewing marks, we believe that this section is of natural origin but was expanded and arranged through rock-cutting.

Chambers D through G: The Terminal Sections

From Chamber C one can continue southwest to Chamber D. This chamber is 2.3 m wide and 11 m long. In its southern part the chamber becomes narrow and begins a section with a supporting wall built of fieldstones (Fig. 38); this construction blocks part of the natural chamber and creates a tunnel 0.9 m wide, 5.2 m long, and 1.2 m high (Fig. 39).

Chamber D contains several morphologically significant features. The eastern wall exposes a prominent stratigraphic contact where speleogenesis occurred, with an upper unit of reddish-brown karst breccia containing centimeter-scale limestone clasts overlying massive, fractured bedrock. A major east–west structural fracture traverses the chamber, representing the primary control for cave development (Fig. 40). Most intriguingly, the southeastern ceiling contains a vertical chimney passage blocked by rock debris, apparently an intentional anthropogenic blockage of a former surface connection.

Chamber E opens on the other side of the stone-built section. This chamber is 2.2 m wide, 12.5 m long, and 2.3 m high, and its floor is covered with soil and rock fragments. The chamber rises at a steep slope and curves southward.

A step in the ceiling and an additional built wall adjacent to the western wall of the chamber mark the beginning of Chamber F. The chamber is 1.9 m wide, 13.3 m long, and 1.1 m high. At the chamber entrance and adjacent to its western wall is a built supporting wall that prevents the collapse of a small karstic area located to the west. The chamber contains a karstic chimney 5 m high.

Regarding human use, we documented constructed walls in Chambers E and F, which we interpreted as passage constriction rather than structural reinforcement. These modifications created low tunnels requiring locomotion on hands and knees, suggesting deliberate control of access through the system.

Chamber F continues southward to a ceiling step that leads to a narrow chamber 6 m long, 1.2 m wide, and 0.5 m high (Fig. 41). This section is the only place in the cave where crawling is necessary to progress further; here, too, it appears that stones were moved from the crawlway to two stone piles adjacent to the walls of the narrow section.

The crawlway ends in Chamber G. This chamber is 2.4 m wide and 6 m long, with a maximum height of 3.5 m. The chamber has two levels with a makeshift wall of collapsed rocks between them, standing like a terrace in the center of the chamber. In the southern part of the chamber, collapsed rocks block the continuation of the cave; this point is the farthest from the entrance and the highest in the cave chamber, located about 104 m from the cave entrance and about 19 m higher than it.

Morphological Analysis and Formation Processes

The principal morphological evidence bearing on karstic cave formation processes is evident throughout the system:

a. The distribution of solution cupolas at multiple locations.

Fig. 36. Mûghâret Bir el Hasûtah: the southern part of Chamber C, looking southwest; note the aligned ceiling with rounded corners and vertical walls (B. Zissu).

Fig. 37. Mûghâret Bir el Hasûtah: ceiling in the southern part of Chamber C; natural karstic chimney coated with speleothems after hewing and leveling (B. Zissu).

b. Diagnostic cross-sectional morphology of phreatic passages.[33] Chambers B–E exhibit rectangular to rounded cross-sections with width-to-height ratios exceeding unity, whereas the E–G interval displays elliptical to circular cross-sections.

c. Highly variable cross-sectional dimensions of passages, including abrupt changes between proximate locations. Systematic passage constriction occurs

[33] Cf. JENNINGS 1985, 144–147.

Fig. 38. Mûghâret Bir el Hasûtah: Chamber D looking southwest; remains of supporting wall on the left and tunnel on the right (B. Zissu).

Fig. 39. Mûghâret Bir el Hasûtah: tunnel in Chamber D looking southwest (B. Zissu).

before Chamber D and after Chamber E, followed by immediate enlargement.

d. Significant gradient variation in longitudinal passages, which is particularly pronounced in the E–G chamber sequence.

e. The absence of systematic anthropogenic tool marks throughout extensive passage segments, which would have been diagnostic evidence of excavated origin.

Based on this morphological analysis, we tend to agree with Schwager that the cave system represents a phreatic passage network formed during periods of water table

Fig. 40. Mûghâret Bir el Hasûtah: east–west structural fracture in Chamber D (B. Zissu).

Fig. 41. Mûghâret Bir el Hasûtah: Chamber F looking south to a narrow section leading into Chamber G (B. Zissu).

saturation.[34] Following drainage and water table decline, vadose zone processes became dominant, characterized primarily by water infiltration and diverse calcite precipitation, resulting in wall crusts, minor speleothem development, and flowstone formations.

[34] BÖGLI 1980, 151–155.

Human Modifications and Functional Interpretation

Although abundant and unequivocal evidence of anthropogenic activity—including cutting and enlarging—exists throughout the cave system, the specific nature of the blocked continuation in Chamber G and the sealed chimney in Chamber D remains problematic. Clearly, that

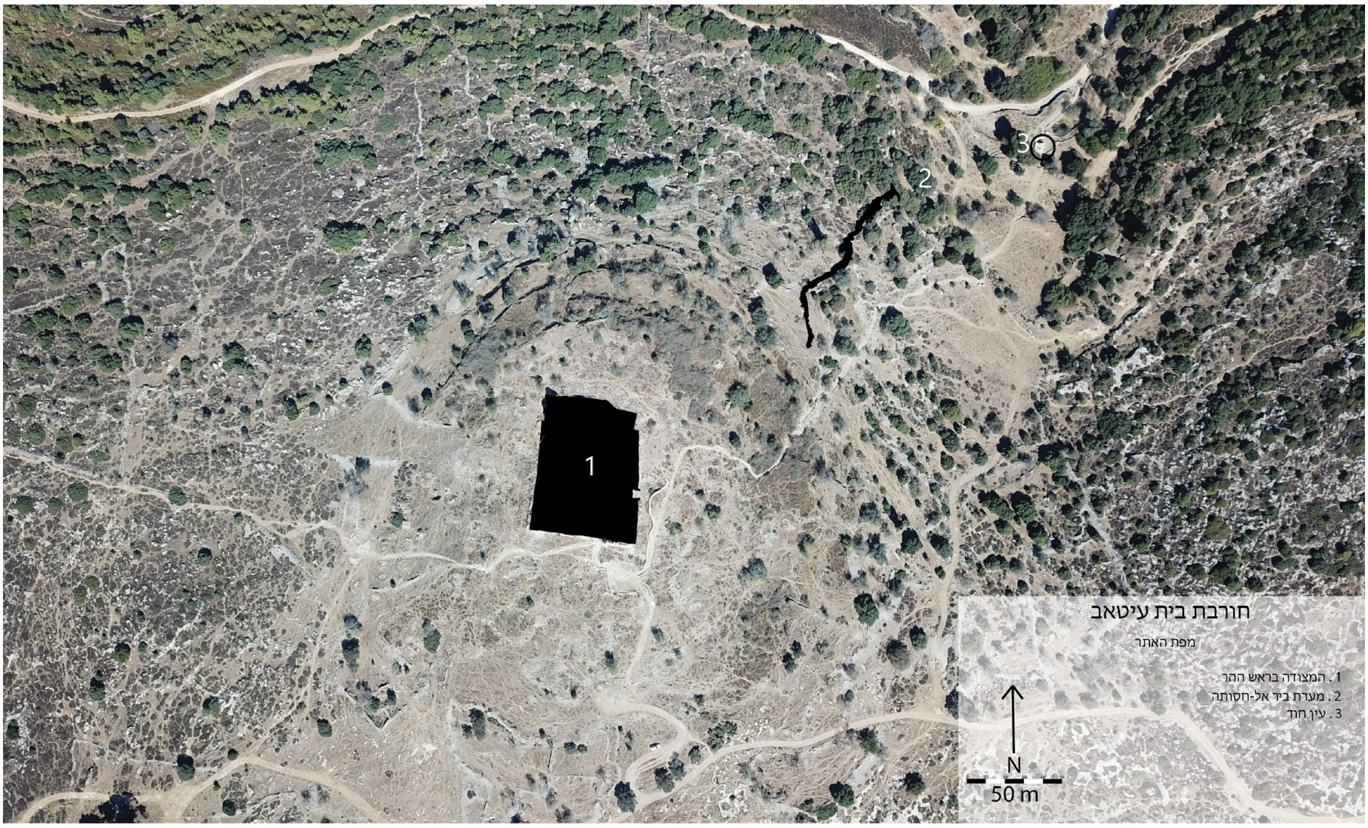

Fig. 42. Vertical aerial photograph showing true size, location, and the spatial relationship between Kh. Beit ʿAtâb, Mûghâret Bir el Hasûtah and ʿAin Haud (B. Zissu, S. Ya'aran).

rock-cutting created connections between the subterranean system and the surface environment. Even assuming such surface connectivity, however, significant spatial separation exists between cave extremities and fortress remains—approximately 70 m horizontal distance with 26 m vertical relief (Fig. 42). Similarly, the distance between Chamber A and the adjacent spring is approximately 90 m. Topographical constraints and the morphological characteristics of the entrance zone and Chamber A preclude direct subterranean connectivity between fortress and spring via the cave system.

Thus, to summarize our renewed examination, the cave is predominantly natural, though parts of it were enhanced and expanded through hewing. Although its orientation does lead from the fortress toward the spring, significant gaps remain between its extremities and both the fortress and the spring. Without excavation and discovery of the continuation, it is impossible at present to prove use as an escape tunnel from the fortress or a concealed access tunnel to the water source. Nevertheless, we believe the cave was used for hiding purposes.

In our opinion, when Chamber A was constructed, a passage was breached into a series of natural chambers. The ancients recognized the potential of this underground system and adapted it for purposes of hiding and refuge. They encountered a series of karst chambers and modified them through selective excavation, possibly adding an additional shaft to the surface and constructing retaining walls that served the dual function of structural support and passage constriction, creating difficult-to-traverse tunnels—a characteristic feature of hiding systems in Judea.

Recent advances in research on Judean hiding systems have revealed natural karst chambers throughout the region that served as refuges, including the nearby Tasit Cave[35] and Teomim Cave,[36] and the more distant Abud Cave[37] and Elkana Cave.[38] Some systems combine natural chambers with human-excavated tunnels, as exemplified by the ʿAin ʿArub Cave south of Gush Etzion.[39] In all these systems, rich archaeological material was discovered from the time of the Bar Kokhba Revolt (132–136 CE), indicating installation and significant activity during this period.[40] A possible function was to secure and protect valuable materials, rather than to act as a defensive barrier against aggressors.[41] In many of these caves assemblages of finds from the Middle Ages were also uncovered.[42]

The intermittent periods of unrest caused by centuries of war and turmoil affected the local population and likely created an ongoing stream of refugees.[43] William of Tyre, in his *Chronicon* (late 12th century CE), describes this geographical region as fraught with danger, conditions that compelled

[35] ZISSU 2023.
[36] ZISSU *et alii* 2011.
[37] ZISSU *et alii* 2016.
[38] ZISSU *et alii* 2014.
[39] TSAFRIR/ZISSU 2002.
[40] ZISSU/KLONER 2014; ESHEL/ZISSU 2019; RAVIV/ZISSU 2022.
[41] ZISSU *et alii* 2021.
[42] Medieval finds from refuge and hiding caves are currently being studied by Shem-Tov SASSON (in preparation). In the Nahal Bet ʿArif cave in northwest Judea, a rich assemblage from this period was discovered (RAVIV *et alii* 2024).
[43] BURGTORF 2021.

the local population to seek shelter in caves.[44] Similar circumstances likely prevailed during the Mamluk period.

Our interpretation represents a synthesis of two scholarly approaches. Conder and Kitchener, along with Tepper and Shachar, viewed the system as entirely artificial and human-excavated, while Schwager characterized it as predominantly natural (excepting the columbarium chamber A). We propose viewing it as a natural karst system enhanced through human hewing and adaptation—a natural hiding and refuge complex that was refined through additional construction and hewing, following patterns well documented throughout the Judean Hills.

DISCUSSION: SITE COMPONENTS AND THEIR SPATIAL RELATIONSHIPS

The reexamination of Khirbet Beit ʿAtâb reveals a multi-period site whose spatial organization demonstrates effective integration of defensive, hydraulic, and agricultural installations. The relationship between the fortress, spring system, cave complex, and associated features reflects adaptive reuse strategies employed across successive occupation periods.

The site's geological setting proved fundamental to its sustained occupation. Situated on limestone and dolomite bedrock of the Aminadav Formation, with springs emerging from the underlying Moza Formation marl, the area provided both defensive advantages and water security. The ʿAin Haud tunnel spring system exemplifies this exploitation of geological features. Its 40 m tunnel with multiple access shafts represents well-documented engineering techniques, making possible a reliable water supply in a semi-arid environment.

The spatial arrangement of major site components reveals both possibilities and limitations for integrated functioning. Although Mûghâret Bir el Hasûtah lies only 90 m from the spring, with the fortress positioned to command both features, the 70 m horizontal distance and 26 m vertical relief between cave extremities and fortress remains effectively preclude the cave's function as a direct escape tunnel. This topographical reality necessitates a more nuanced interpretation of the cave's role within the defensive strategy for the site.

Our morphological analysis demonstrates that Mûghâret Bir el Hasûtah exhibits characteristics consistent with natural karst formation, including solution cupolas, phreatic passage cross-sections, highly variable passage dimensions, and the absence of systematic tool marks throughout most segments. However, clear evidence of human modification appears in the constructed retaining walls within Chambers D–F and the artificial columbarium installation in Chamber A. These modifications indicate deliberate adaptation of natural features rather than wholesale rock-cutting.

The columbarium provides important chronological parameters, as such installations typically date from the Hellenistic through the Byzantine period. Its apparent function—manure production for agricultural fertilization—connects directly to agricultural activities within the nearby valleys. The deliberately constructed crawlways conform to architectural principles documented in Judean hiding systems, particularly those associated with the Bar Kokhba Revolt (132–136 CE).

Evidence of late Second Temple–period occupation emerges from the *kokhim* tomb AT1.1, which indicates settlement by a Jewish population between the late 2nd century BCE and early 2nd century CE. The tomb's location 200 m west of the fortress helps establish the original spatial extent of the settlement. The subsequent conversion of the associated cavity AT1.2 from water cistern to olive press demonstrates the systematic functional adaptation of installations across different periods.

The Crusader-period remains, including a hall house and *maison forte* measuring 40–45.7 m east–west by 59 m north-south, may correspond to the Bethaatap estate documented in 12th-century records. The proximity of these structures to agricultural lands and water sources indicates the continued emphasis on agricultural production throughout the medieval period.

The development pattern of the site reveals coordinated exploitation of defensive positions, water access, and agricultural resources. The spring tunnel system provided water security while the fortress commanded the surrounding terrain, creating an integrated defensive and economic landscape. This coordination becomes particularly evident in the pattern of adaptive reuse that characterizes site development across multiple periods—evident in tomb conversion, cave modification, and architectural integration.

Rather than replacing existing features entirely, successive occupants consistently modified natural and constructed elements to serve new functions. This approach maximized available geological and hydrological resources while minimizing construction investment. Such strategies align with documented patterns throughout Judean Hills settlements, where communities systematically adapted natural features for defensive and economic purposes.

The broader regional context supports this interpretation. Similar cave adaptations are documented at Judean sites including the Tasit, Teomim, and ʿAin ʿArub caves, indicating utilization of natural features during periods of conflict. The evidence suggests that Mûghâret Bir el Hasûtah represents a natural karst system enhanced through selective human modifications to serve hiding and refuge functions, rather than an entirely artificial construction.

The spatial relationships between site components ultimately suggest coordinated land use planning that maximized available resources across multiple occupation periods. This approach, combining natural geological advantages with targeted human modifications, made possible sustained occupation and economic activity from the Iron Age through the Ottoman period, demonstrating the enduring strategic value of this location within the broader settlement pattern of the Jerusalem Hills.

44 WILLELMUS 1986, 1, 462 (Book 10, Chapter 8); WILLIAM 1943, 1, 426.

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