Investigations at Ramat Saharonim: A Desert Neolithic Sacred Precinct in the Central Negev

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Investigations at the open-air shrine and cairn complex at Ramat Saharonim in the Makhtesh *Ramon in the central Negev reveal a sacred precinct or ritual center with a focus on a mortuary cult, attributable to the Late Neolithic, ca. 5000 B.C. The four shrines are aligned with the setting sun of the summer solstice, along with other landscape features. The three tumuli excavated, roughly contemporary with the shrines, revealed primary and secondary burials and intentional bone realignment. Excavations at Shrine 4 allow detailed reconstruction of site formation processes, demonstrating long-term development of the features of the complex. In general, the megalithic aspect of the site, the symbolic aspects of the alignments, and the attribution to the Late Neolithic suggest a close relationship between the rise of the desert cult and tribal society associated with the earliest introduction of domestic herd animals into the central Negev.*

INTRODUCTION

As with the transition from hunting-gathering to farming in the Mediterranean zone, the rise of pastoral nomadism in the desert periphery entailed far-reaching transformations in the basic cultural matrix of the desert. The shift from hunting animals to herding them marked a fundamental transformation to a society based on ownership of the basic means of subsistence, and the consequent need to preserve those means, and entailed profound concomitant change in virtually every realm of society (e.g., Ingold 1980). Archaeologically, it should come as no surprise that the earliest evidence for elaborate shrines reflecting public ritual and mortuary cult in the southern Levantine deserts, in the Late Neolithic ca. 5500–5000 B.C., only slightly postdates the earliest infiltration and adoption of herd animals—sheep and goat—replacing hunting as a primary subsistence base.

The presence of ancient cult and mortuary sites in the deserts of the southern Levant has been known since the late 19th century—for example, from Palmer's (1872: 121) discovery of the *nawamis* fields of east Sinai. These sites exhibit a wide range of types and functions, from single stelae, groups of stelae, and elaborate arrangements of standing stones, to tumuli and fields of tumuli and other mortuary structures, and on through various types of other constructions, usually lumped into the general rubric of "open-air shrine" (see especially Avner 1984; 1990; 2002; also Yisrael and Nachlieli 1998). Other difficult-to-classify features, such as the "K-Line" (e.g., Haiman 2000) may also be included in the general category. The general class of cult structures ranges in date from the sixth millennium B.C. through recent times—as, for example, in open-air mosques—and thus has been associated with the complete complement of cultures known in the desert from the historical and protohistorical periods.

In terms of the earlier part of this long time span, several recent investigations provide important background for the excavations at Ramat Saharonim. The earliest of these is the systematic exploration of the nawamis fields at Ein el Hudera (Bar-Yosef et al. 1977) and Gebel Gunna (Bar-Yosef et al. 1986) in Sinai. These studies documented the nawamis, cylindrical corbel arched buildings usually 4–8 m in external diameter and 2 m high, as mortuary structures dating to roughly the early fourth millennium B.C. They reflect a local pastoral society (e.g., Goren 1980) organized at a tribal level, with cultural links to Egypt. Later analyses (Bar-Yosef et al. 1983; Hershkowitz et al. 1985) also established a seasonal and cosmological aspect to the nawamis; doorways are aligned to the west, facing the setting sun, with deviations apparently in accordance with the season of construction but with modalities suggesting seasonal preferences. The focus on the setting sun clearly has symbolic meaning and is tied to Egyptian beliefs in the connections between death, the west, and the setting sun.

The tumulus fields of the central Negev are conceptually similar to the nawamis in terms of spatial clustering of the structures and their mortuary associations. However, unlike the nawamis, tumuli excavations have usually (but not always) shown them to be empty of burial remains, either from poor preservation or perhaps the removal of the bones (e.g., Haiman 1992). Also contrasting with the nawamis, burial goods are rare in the tumuli, rendering chronocultural attribution problematic. Although rectangular tumuli have usually been attributed to the Intermediate Bronze Age (= EB IV = MB I), Haiman (1992; 1993) has suggested that the standard round tumuli be dated to the Early Bronze Age, based on a pattern of geographic association with large Early Bronze Age campsites. Avner (2002: 154–55) has presented radiocarbon dates indicating earlier occurrences, and, anticipating later discussion, the Ramat Saharonim excavations indicate a deeper history with the tradition of tumulus burial beginning in the Late Neolithic.

Open-air shrines, sometimes referred to as temples, have also been investigated. Yogev (1983) excavated a courtyard shrine with stelae in a cist in the focal corner of the shrine, in the Uvda Valley, dated to the sixth millennium cal B.C. Eddy and Wendorf (1998; 1999: 36, 39) documented a rectangular shrine in eastern Sinai similar to those at Ramat Saharonim, also dating it by radiocarbon to the sixth millennium cal B.C., and Rothenberg (1979: 125, fig. 28) excavated another, suggesting it be dated to the Pre-Pottery Neolithic on the basis of associated artifacts. Given the absence of artifacts at virtually all other such sites, and their consistent Late Neolithic attribution, it is likely that the shrine at Ein Yarka was built on an earlier occupation. More significantly, Avner's (e.g., 1984; 1990; 2002; Avner and Carmi 2001) pioneering long-term research program on the desert cult has documented numerous shrines in the Negev and Sinai, many typologically identical to those of Ramat Saharonim. He, too, has dated the origins of these structures to the Late Neolithic and has noted solstice alignments which he has interpreted in a cosmological framework drawn from later Mesopotamian civilization (Avner 2002: 102–3). On this basis, he suggests a winter sunrise as opposed to a summer sunset orientation.

With respect to Ramat Saharonim itself, Cohen explored the site in the 1970s, publishing plans and a few surface artifacts in his doctoral thesis (1986: 8–9, pls. 5–6; also see Avner 2002: table 14.9–12) and later in his synthetic study of the Negev Highlands (1999: 21–24). Informal test excavations were also conducted but never published. Chronologically, Cohen attributed the site to the Chalcolithic period based on surface artifacts, including several tabular scrapers (Cohen 1999: fig. 9:1, 2, 7) and a simple bifacially retouched knife (Cohen 1999: fig. 9:11). In fact, tabular scrapers as a class appear in the late stages of the Pottery Neolithic (second half of the sixth millennium B.C.) (Rosen 1997: 75) and continue through the Early Bronze Age. The bifacial knife is not diagnostic. Initial assessments based on survey work also tended toward the Early Bronze Age attribution (Rosen and Rosen 2003), especially based on the strong architectural similarities between the Early Bronze Age tumuli in the Negev Highlands (Haiman 1992; 1993) and those of Ramat Saharonim.

The investigations at Ramat Saharonim were initiated in order to build on these pioneering works. The general goal of the project was to survey the site (Rosen and Rosen 2003) and excavate part of it in a methodologically rigorous fashion in anticipation that the greater detail would provide answers to some of the questions concerning the early desert cult not yet resolved. Three sets of issues were to be addressed:

1. The explication of the relationships, chronological and cultural, between the different components of the site, using a suite of field and laboratory methods, including assays in both radiocarbon and optically stimulated luminescence (OSL) dating.
2. The documentation of the stratigraphy of a shrine in order to understand its construction, its original form, the different phases of development, and the post-abandonment formation processes that result in the current site features.
3. Examination of the relationship between the site, the landscape, and other natural features, including astronomical aspects (cf. Tilley 1994; Carmichael et al. 1994).

The first phase of the project, initiated in 1999, consisted of the intensive mapping of the site (Rosen and Rosen 2003). A large-scale map of the entire precinct was prepared, and 1:20 stone-by-stone plans of each shrine were completed. The solstice orientation of the shrines was also documented.

THE REGION AND THE SITE AREA

The cult complex at Ramat Saharonim (Israel Grid 1434/0035) is located south of Mt. Ardon in the eastern half of the *Makhtesh* Ramon, a large erosional cirque (e.g., Y. Avni 1993; Zilberman 2000) located in the southern Negev Highlands (fig. 1). The region is a rocky desert, receiving roughly 75 mm of rainfall per year, and is characterized by sparse Saharo-Arabian vegetation (e.g., Rosenan and Gilead 1985a; 1985b; Danin 1983: 35, 53). Surface sediments are reg soils, and the shrines rest on a developed desert pavement with a sandy substrate. The tumuli rest on limestone bedrock. Geomorphologically, the site is located in a shallow valley formed between sets of parallel cuesta cliffs varying in height from roughly 2 m in the west to up to 5 m in the east (fig. 2). Geologically, the site lies on the transition from the Lower–Middle Jurassic Ardon Formation (Zak 1968) (primarily, limestone with clays, marls, and some sandstones) to the Middle Jurassic Inmar Formation (sandstone) (fig. 3).

Historically, the area has been primarily the realm of pastoral nomadic societies. The Azazmeh and Saidiyyin Bedouin tribes inhabited the region in the 19th and early 20th centuries. During the periods of classical antiquity, the Early Islamic and Byzantine, Roman, and Hellenistic periods, pastoral sites of various kinds dominate the archaeology of the *Makhtesh* Ramon, including most notably Nabataean campsites (e.g., Rosen 1993). Indeed, the site lies adjacent to the Nabataean spice route leading from Petra to Gaza (e.g., Cohen 1982). Although intensive run-off irrigation farming was practiced in desert areas somewhat farther north, in the Irano-Turanian zone, this region remained unexploited agriculturally. With respect to sites prior to the classical era, survey in the general region has revealed campsites primarily from the Early Bronze and Intermediate Bronze Ages, although not in the immediate vicinity of the site. Neolithic sites are known from the northern Arava (e.g., Taute 1994), farther south, in the Uvda Valley (e.g., Goring-Morris and Gopher 1983; Avner 1990), and in higher areas to the west and north (e.g., Noy and Cohen 1974; Rosen 2002; Goring-Morris 1993; Simmons 1981). Across the Rift Valley, the highlands of southern Jordan saw the evolution of village and urban settlements from the Neolithic through the Bronze Age in a less arid environment more suitable to sedentary and agricultural pursuits. No habitation sites are found in the immediate vicinity of Ramat Saharonim.

GENERAL SITE DESCRIPTION

The Ramat Saharonim sacred precinct (fig. 2) consists of three areas: (1) the Shrine Area, with four shrines and associated installations; (2) Ramat Saharonim East, consisting of 14 tumuli on two parallel cuesta cliffs east of the Shrine Area; and (3) the Southern Ridge, with 16 tumuli aligned on the cuesta cliff south of the Shrine Area and Ramat Saharonim East. In addition to the cult complex, a sandstone quarry for the production of milling stones is located approximately 100–200 m north of the Shrine Area, probably dating to the Early Bronze Age (Abadi 2003; Abadi and Rosen in press).

The Shrine Area consists of four courtyard shrines (numbered Shrines 1–4; fig. 4). A detailed description

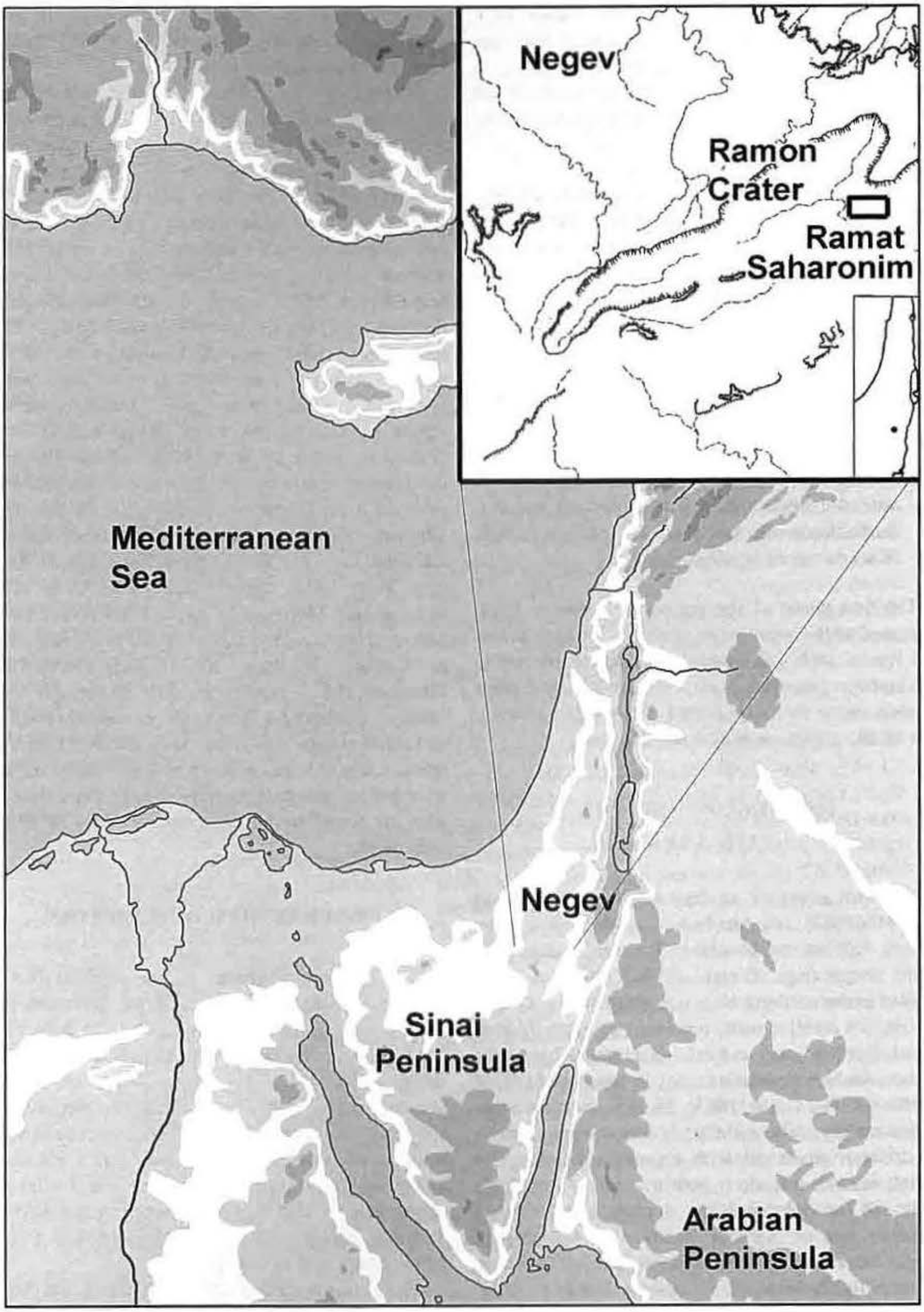

Fig. 1. Location map showing the *Makhtesh* Ramon and the Negev in the Levant, and the location of Ramat Saharonim within the *Makhtesh* Ramon.

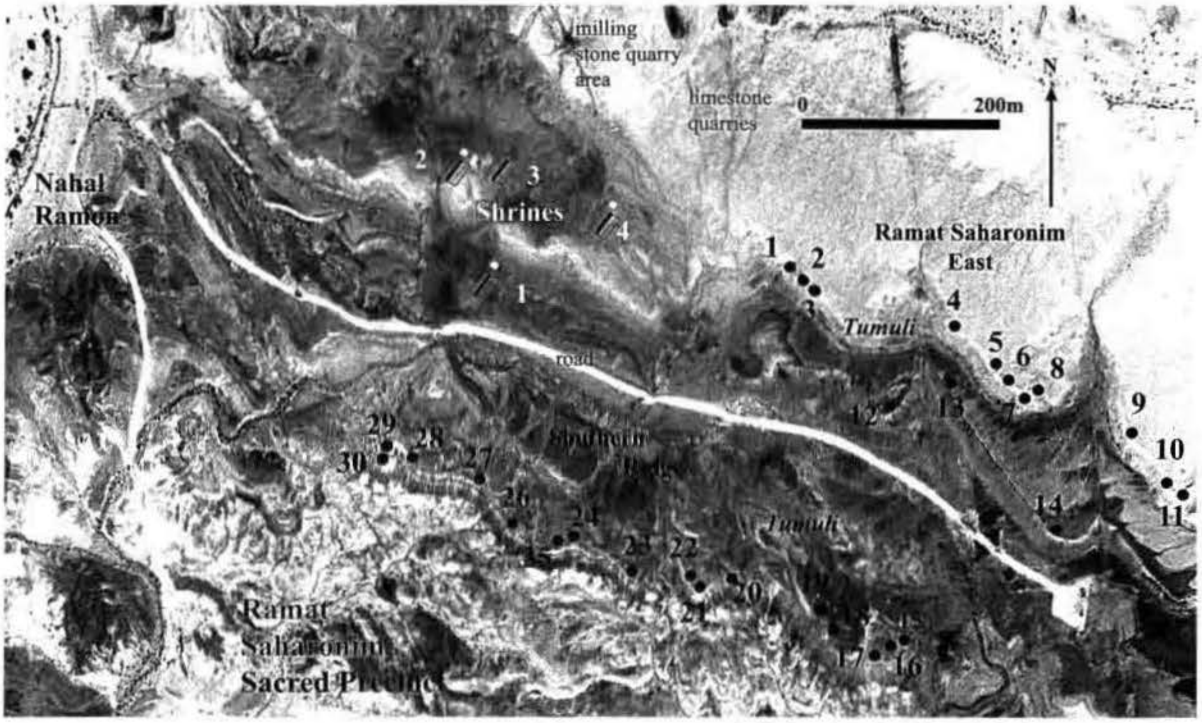

Fig. 2. Aerial photograph of Ramat Saharonim with site features indicated.

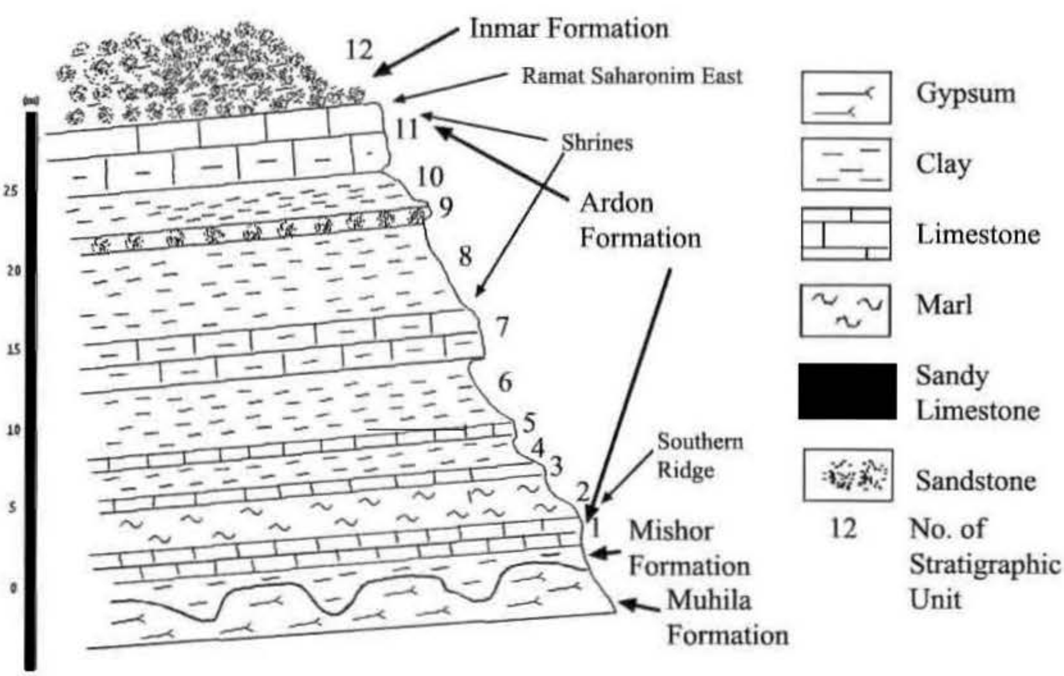

Fig. 3. Geological section of Ramat Saharonim. Note that vertical scale is not applicable to horizontal measurements.

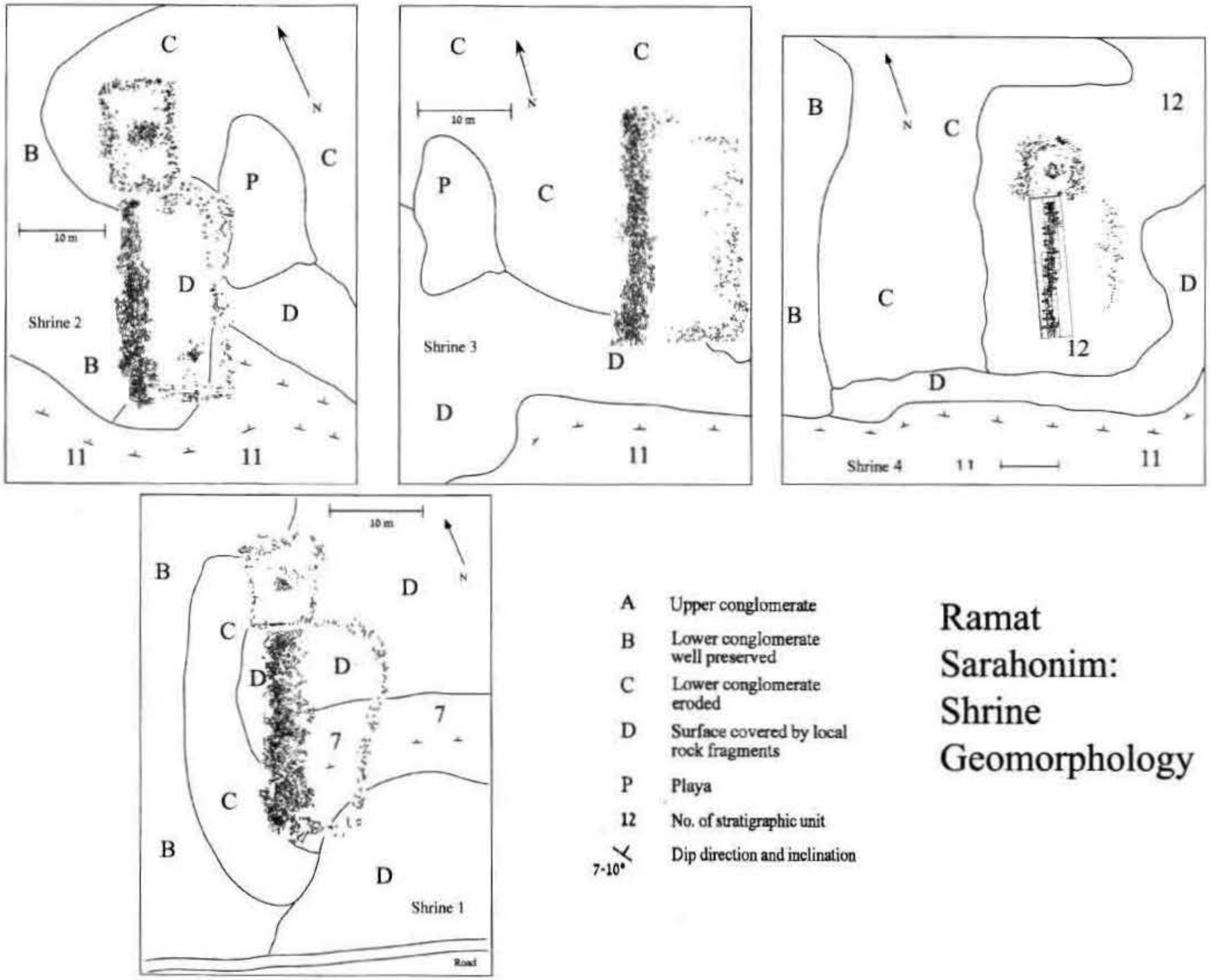

Fig. 4. Detailed schematic of shrines in relation to geological and geomorphological units. Scales are approximate.

Fig. 5. Northwest view of unexcavated Shrine 3 toward Lower Cretaceous volcanic Mt. Ga'ash and the northern wall of the *Makhtesh* Ramon. Note the orientation between low hills on either side of the shrine.

of the individual shrines[1] as based on survey has been presented in the report on the site survey (Rosen and Rosen 2003; also see Cohen 1999: 21–24; Avner 2002: table 14:10–12), but several features derived from the survey are important for understanding the nature of the complex, as well as its chronology and development. First, each shrine shows two components, a larger, primary rectangular structure, and a smaller, more squarish secondary one, located on the north side of the primary. Although Shrine 3 lacks this structure, it shows remains of a different character, vaguely reminiscent of the secondary structures associated with the other shrines, but constructed in a different fashion and less well preserved. Avner (2002: 120–22, 126) has referred to these pairs of structures as temple pairs or twin temples, implying their contemporaneity and suggesting they constitute male and female pairs, perhaps specific gods and goddesses. In this light, the importance of establishing the chronological relationship is clear.

The primary structures are each on the order of 20–22 m in length. They consist of a large forward wall on the west side of the rectangle, built of two rows of large limestone blocks or slabs with a space of 20–40 cm between the rows, and in the east, a courtyard, fenced off by a single row, single course, or small stone slabs. This fence is now fallen but originally stood upright, as reflected in a few slabs still embedded in the ground in Shrine 1. The source for the limestone blocks (see discussion below) is local. The western walls originally stood to a height of about 1.5 m, based on the preserved height of the walls and the quantity of stone fall on the surface and found in excavation.

The secondary structures, built on the north side of the primary shrines, are square or near square structures, approximately 8 m on a side, built of what appears to have been a single row and single course of rounded wadi cobbles placed carefully one against the other. They each also show an internal feature: a small stone pile, poorly preserved and difficult to describe. The source for the stones of the secondary structures appears to be conglomerate exposures located in the immediate vicinity of the shrines (fig. 5). The contrast with the primary structures is striking. As above, Shrine 3 does not show a similar secondary structure, although small "fence" slabs suggest that some other feature reminiscent of the secondary structures was present (contra Cohen 1999: fig. 23; Avner 2002: fig. 5:2).

In addition to the secondary structures, nondescript stone scatters in roughly linear patterns, apparently partially the results of human activities, and a few small constructed features such as boxes made of small limestone slabs, are located around 30 m west of Shrines 1, 2, and 4 and coincide with conglomerate exposures. Avner (2002: 116–17, fig. 5:2) refers to these remains as "circle chains," but it is difficult to see any patterns.

The 30 large tumuli at Ramat Saharonim East and the Southern Ridge are arranged in two rough lines along the parallel cuesta cliffs, somewhat converging toward the east. The tumuli are each 4–8 m across at the base and about 1–2 m high, constructed of limestone blocks. In many cases, a margin of larger stones is evident around the basal circumference, with the remaining stones of the cairn piled more haphazardly on top. Most of the tumuli are concave on top, and excavations at other sites (e.g., Haiman 1992; 1993), as well as at Ramat Saharonim, indicate the presence of burial cists inside, often lacking skeletons, at the base of the tumulus. A single cairn (Tumulus 30) opened in the 1980s by archaeologists working for the Israel Department of Antiquities

[1] The term "shrine" is employed here in order to avoid some of the pitfalls of using loaded terms such as "temple" or "sanctuary," which resonate with other meanings, such as house of god, or providing shelter, etc. Other options, such as "cult structure," perhaps technically more correct, seem awkward.

revealed a skeleton (Y. Israel, personal communication, 2000).

The specific locations of the features in the complex were clearly chosen for their positions amid the small-scale topographic relief and larger-scale landscape features. Alignments of the shrines were determined by landscape features—most notably a large, black volcanic mountain in the distance (fig. 5)—and to accord generally with the setting sun of the summer solstice, with azimuth deviations from only 2° to 8° (Rosen and Rosen 2003). Three of the four shrines were placed so as to view this solstice sunset in the shallow depression between two low hills (fig. 5). The orientation toward specific geographic features in the northwest strongly supports the summer solstice sunset interpretation of the alignment, as opposed to the winter sunrise suggested by Avner (2002: 102–3), for which no geographic patterns are evident. Although it is difficult to perceive any clear patterns with respect to the placement of the tumuli vis à vis the shrines, the cliffs constitute false horizons, with the tumuli visible in silhouette from great distances, seeming to integrate visually with more distant ridges.[2] The shrines are located at the open (east) end, between the two lines of tumuli. They are, on one hand, set off from the tumuli, and on the other, merge with them, forming a large-scale complex. There can be little doubt as to the deliberate choice in these alignments and the placement of the site features.

THE GEOLOGY AND GEOMORPHOLOGY OF THE SITE

The special nature of the cult complex at Ramat Saharonim suggested that detailed explication of its geological and geomorphological contexts might offer important insights into understanding various issues of site location, feature placement, construction, and general site formation. To this end, the following investigations were undertaken:

1. A detailed geological section of the site area was constructed (fig. 3), providing a key for understanding the nature of the site sediments, their distribution, and their ultimate origins.
2. Detailed geological and geomorphological maps of both the general site area and the Shrine Area were constructed (figs. 4 and 6), allowing better comprehension of the details of the placement of individual archaeological features in the landscape.
3. Geoarchaeological survey (on which the section and maps were based) also located special geological features, such as the limestone quarries/exposures from which the building materials for the primary shrines and tumuli were taken. This survey also documented the location of the conglomerate exposures from which the cobbles used in the construction of the secondary structures originated.

The geological section was constructed using an exposure east of the site area, in the area of the watershed between Nahal Ardon and Nahal Ramon. The section tilts 7°–10° to the north, resulting in a typical layered cuesta. The specifics of the section are summarized in figure 3. The uppermost unit of the section, the Inmar Formation, dates to the Middle Jurassic. It provides the source materials for the sandstone milling stone quarries mentioned earlier (Abadi 2003; Abadi and Rosen in press). The tumuli and shrines are associated with different facies of the Ardon Formation, dating to the Lower–Middle Jurassic (fig. 3). The transitional Triassic–Jurassic Mishor Formation lies beneath the Ardon Formation.

In addition to the geological section, geological and geomorphological mapping defined important features in the landscape (fig. 6). Survey was conducted using a 1:5000 color aerial photograph produced by Ofek Aerial Photographs Ltd. in 1989, enlarged to 1:4000. Geologically, Ramat Saharonim can be divided into two areas. The geology of the eastern area is relatively straightforward, consisting of a sequence of cuestas tilted 7°–10° to the northeast. The area is cut by a number of generally north–south dikes, especially evident in Unit 11, the limestone capping layer of the Ardon Formation which forms the primary cuesta and on which the tumuli of Ramat Saharonim East rest.

The western area is more complex than the eastern, the result of a northwest–southeast fault which created structural, geomorphological, and topographical anomalies relative to the eastern area. The subsidence of the block south of the fault line created a long, shallow valley into which Nahal Ramon penetrated at least twice during the Pleistocene, depositing two conglomerate units along both the main channel and its tributaries. The two units are 15 m

[2]Yuval Yekutieli suggested the possibilities of a relationship between the distant ridges and the tumuli on the nearby cliffs.

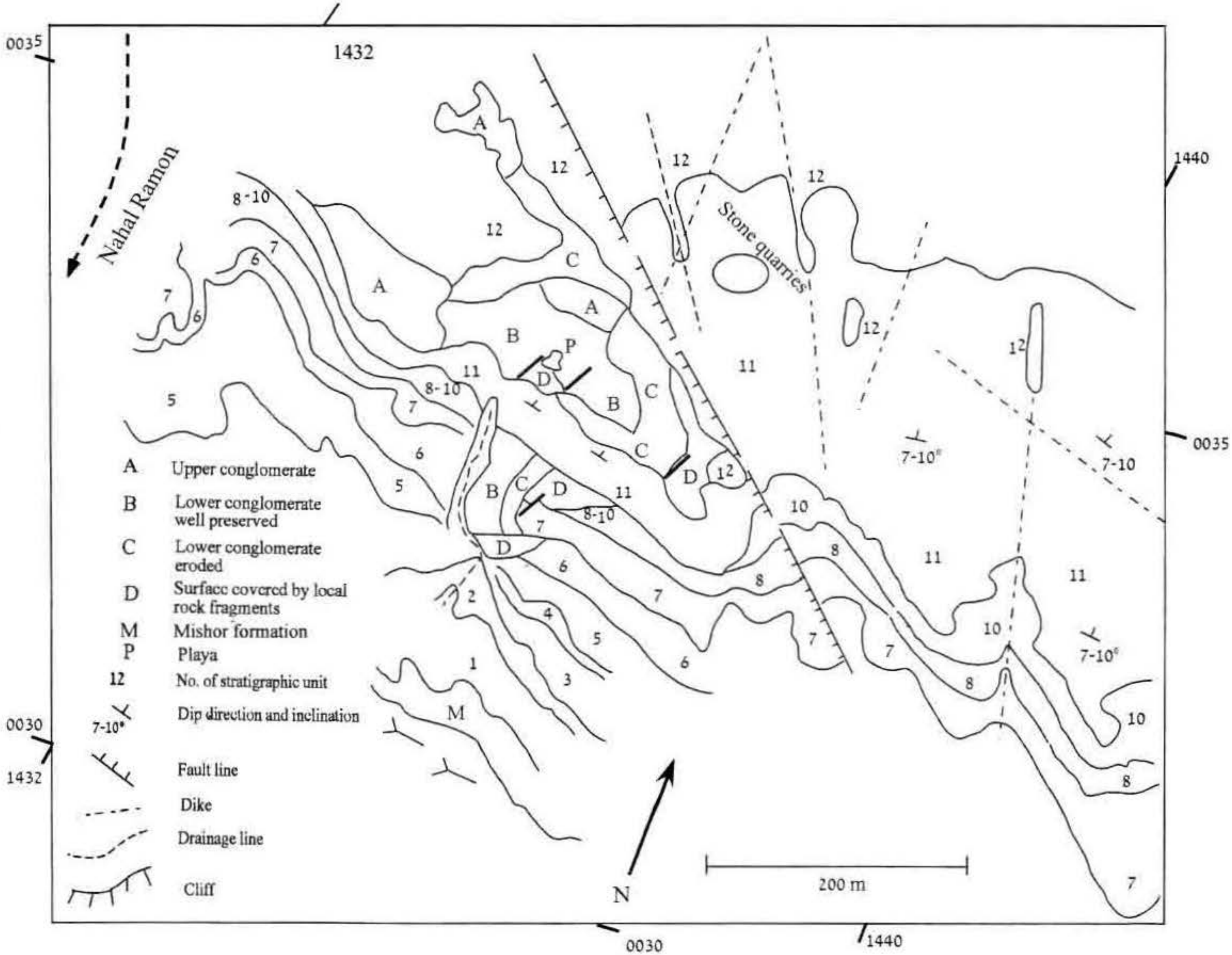

Fig. 6. Map showing geomorphological and geological features. The stratigraphic unit numbers correspond to the stratigraphic units in figure 3.

and 10 m above the modern channel of Nahal Ramon. They show similar components, primarily large cobbles, 20–40 cm in diameter, of limestone, dolomite, flint, hard sandstone, and basalt, the bedrock of *Makhtesh* Ramon. These terraces are located in close proximity to the shrines and provided the source materials for the secondary structures of the shrines.

The geoarchaeological survey focused on the areas in the immediate vicinity of the shrines (fig. 5) but extended throughout the site area. Of particular note is the presence of small-scale quarries from which limestone blocks were pried out of the bedrock using fissures already present in the bedrock, providing blocks 40–60 cm in length and 20–40 cm thick. These quarries are particularly notable in Unit 11 of the Ardon Formation, 200–300 m north of the shrines and somewhat closer to the tumuli of Ramat Saharonim East. No drag marks were evident between the quarries and the shrines or the tumuli.

Although knowledge of modern geological science was obviously not a prerequisite for situating the Ramat Saharonim shrines in ancient times, earth sciences analyses indicate that the locales chosen for the shrines are indeed unusual. For example, the variety of surface colors and textures, reflected in the different geological and geomorphological units present in the direct vicinity of the shrines, contrasts significantly with the eastern part of Ramat Saharonim. Shrines 1 and 4 are even aligned with color contrasts such that the structures demarcate unit distinctions, reflected in surface colors and textures. It is difficult to be unequivocal in reconstructing the specific motivations and decisions in the placement of the shrines on one spot or another; however, given the solstice alignment and the clear topographic decisions in placement, micro-decisions based on surface colors and textures do not seem too far-fetched. Of course, speculation as to meaning is beyond our reach.

EXCAVATIONS AT SHRINE 4

Following the earlier survey work resulting in 1:20 stone-by-stone site plans (fig. 4; also Rosen and Rosen 2003), excavations at Shrine 4 were conducted according to a meter grid square (fig. 7) and arbitrary levels (spits) of 5 cm. In the presence of discernible surfaces (the original land surface), the arbitrary spit level was abandoned in favor of the natural surface. Deflation in the courtyard area of the shrine, beyond the area immediately adjacent to the primary wall, rendered excavation in this area pointless, and it was not tested. All sediments were sieved through 2- to 3-mm mesh, but in the event, no in situ artifacts were recovered. Several sections were intentionally left intact, both for later investigation and for stratigraphic documentation. That is, the entire length of the shrine wall was not excavated since total exposure was considered both scientifically unnecessary and potentially damaging to later research. The interior of the primary wall comprised smaller cobbles in an apparently intentional fill (fig. 8). This was cleared in the squares opened, but the in situ blocks of the primary wall were left in place, leaving the wall itself intact.

The excavations revealed a massive double wall, with 20–40 cm between the rows filled with cobbles and smaller slabs (fig. 8), which served as the western wall of the primary shrine. The double wall was built of large limestone blocks, some up to 450 kg (based on linear dimensions and a specific gravity of 2.5 for limestone), and many greater than 100 kg. The wall is preserved to a height of approximately 0.75 m. Considering the stone fall present on both sides of the structure, the original height of the wall can be estimated at about 1.5 m, and a conservative estimate of the total mass of the western wall, including internal fill, is 30 tons.[3]

Stratigraphically, four general units can be defined surrounding the double wall, on either side and also at each of the ends (figs. 9, 10):

Unit I: The modern land surface in the vicinity of the shrine, beyond the confines of the site itself, is a deflated desert pavement. It shows a stony gravel and cobble surface with a substrate of red sandy clay or silt with calcium carbonate nodules, probably reflecting Pleistocene pedogenesis known in the Negev Highlands (cf. Avni and Porat 2002).

Unit II: The upper surface of the excavation consists of a crust of silt, sand, and gravel 1–2 cm thick, with occasional limestone blocks fallen from the double walls resting on and in it. This surface

[3] Avner (2002: 100) suggests a general height of half this for open-air sanctuaries, but his suggestion was made prior to excavations at Ramat Saharonim and the documentation of large quantities of stone fall. He also suggests that some of the slabs were set horizontally, sort of as roofing slabs. This was indeed the apparent picture based on survey, but is not borne out in excavation. The apparent roofing slabs are fallen and not present over most of the double wall.

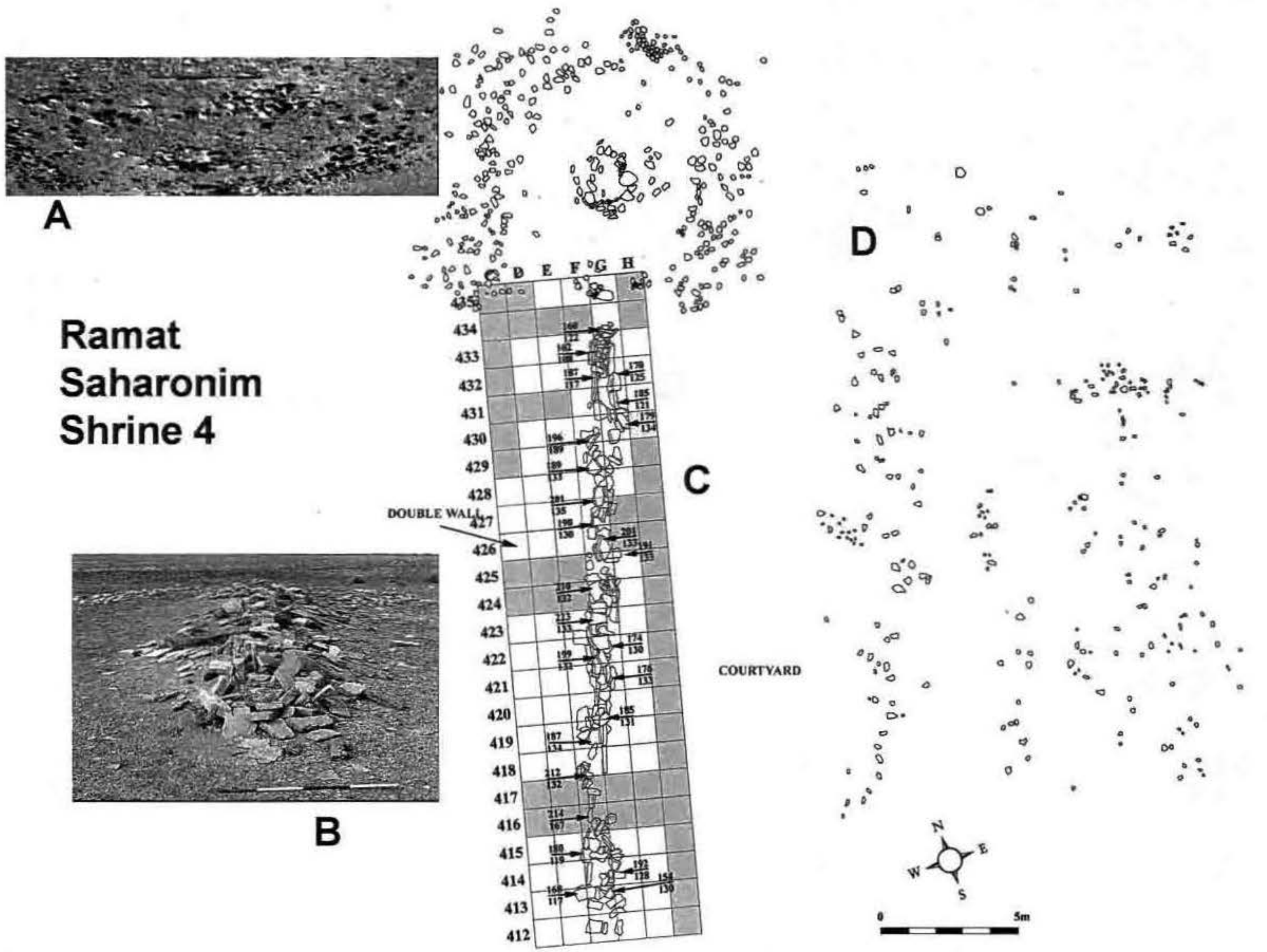

Fig. 7. Plan of excavations of Shrine 4: (A) photograph of secondary structure; (B) photograph of primary structure before excavation; (C) grid and plan of excavations of primary structure; (D) plan of unexcavated areas. Note that the darkened areas in excavation grid are unexcavated.

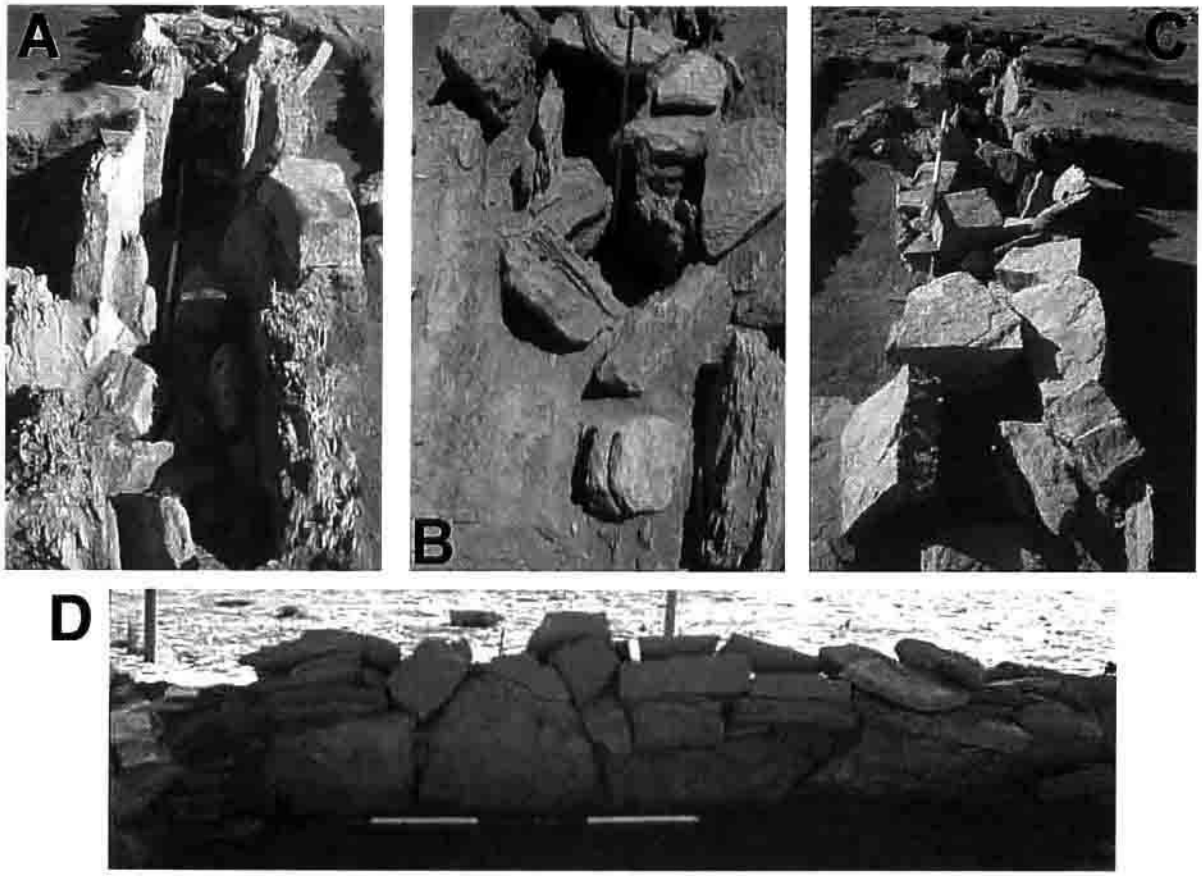

Fig. 8. Photographs of primary double wall: (A) portion of wall with some interior fill during/after excavation; (B) portion of wall before excavation; (C) view of entire wall after excavation (note that the foreground is unexcavated; also note the presence of sections left in place); (D) view of section of the western face of the primary wall.

reaches to the top or to within a few centimeters of the top of the preserved wall height and slopes away from the wall.

Unit III: This layer is comprised of light gray-brown silt and sand. It is 20–40 cm thick adjacent to the double wall and tapers to a feather termination away from the wall. It lies directly beneath the upper surface crust and also abuts the double wall. As on the surface layer, limestone blocks fallen from the wall are found in it, marking different stages of wall collapse. Lenses and sublayers, marking episodes of deposition, can be distinguished within the general unit. These do not occur within all sections and do not reflect general episodes.

Unit IV: This layer is a red sandy clay or silt horizon, with small nodules of calcium carbonate, 20–50 cm thick, only the upper part of which was exposed during most of the excavation. It constitutes the remains of the original land surface at the time of shrine construction and is essentially the same as the modern land surface, but has been disturbed and is lacking the desert pavement. The contact between this layer and Unit III is sharp and clear. The deeper parts of this layer are more consolidated, supporting the idea of disturbance of the upper portion. Indeed, activities by the excavators around the site destroyed the desert pavement, leaving a horizon equivalent to the one exposed during excavation. The double wall penetrates this layer, indicating the excavation of two narrow foundation channels into which the limestone blocks of the wall were placed. Occasional limestone blocks are found resting on this surface, but these are less common than in the upper strata. In some cases, these may represent support stones, and in others, stone fall. This layer grades into the modern land surface 3–4 m from the site.

The stratigraphic relationship between the features of the site and the units described above suggests a clear developmental sequence in the site formation (fig. 11). This is summarized in four stages:

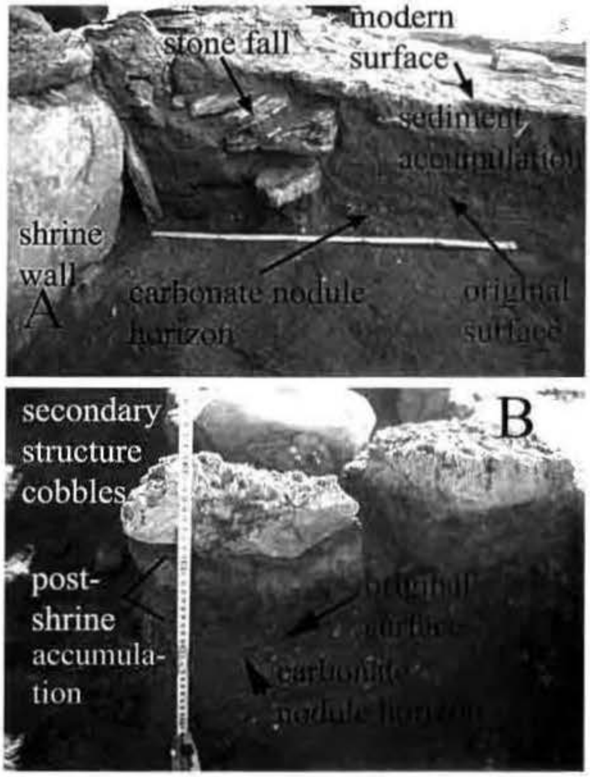

Fig. 9. Ramat Saharonim Shrine 4 stratigraphy photographs: (A) Section C-F/425–426; (B) stratigraphy of secondary structure in Square F35.

Stage 1—Pre-occupation (fig. 11:1): The landscape is essentially flat, with a cover of small gravel (2–5 cm; desert pavement), the uppermost part of a young desert reg soil, underlain by the gravel-free A horizon comprising fine sand and silt (Amit, Harrison, and Enzel 1995) and essentially the modern land surface beyond the immediate proximity of the shrines (Stratigraphic Unit I). The uppermost reg soil developed on top of an erosional surface, which truncates a late Pleistocene calcic paleosol, characterized by carbonate nodules within a red silty matrix that developed on a sandy-silty unit of the Jurassic Inmar Formation.

Stage 2—Construction and initial use (fig. 11:2): This phase consists of the construction of the primary double wall, ca. 1.5 m high. It is also possible that the courtyard fence was constructed at this time, but there is no firm evidence concerning this. The activities in and around the shrine destroyed the desert pavement (Stratigraphic Unit I), leaving only the soft and porous silt and sand A horizon of the reg soil and underlying paleosol (Stratigraphic Unit IV). During the course of use, one may assume some maintenance and repair, perhaps even cleaning. Activities around the shrine would have tended to reduce the accumulation of sediments. One hearth was present on the original land surface in close proximity to the shrine wall (Sq. 432E), and charcoal, perhaps from another hearth not preserved, was recovered from the surface a few meters south of that (Sq. 422F). The stratigraphic context of the hearths, and their proximity to the wall, is strong evidence that they are in fact associated with shrine activities.

Stage 3—Abandonment (fig. 11:3): With the cessation of activities around the shrine, the massive double wall acted as a sand trap, accumulating windblown sediments (Stratigraphic Unit III) all around the structure, like a dune, above the original land surface (Stratigraphic Unit IV). The higher elements of the shrine, now in disrepair, fall onto these sediments at different stages of accumulation (in fact, beginning early, presumably shortly after abandonment). The accumulation of sediments abutting the primary wall itself constitutes a significant change in topographic relief in the previously flat landscape, and although the courtyard wall restricted drainage in the short term, the double wall changes the basic drainage patterns, resulting in increased erosion beyond the zone of accumulation. The destruction of the original desert pavement in the vicinity of the structure also exposes unprotected areas to wind deflation and to local erosion caused by runoff (from the increased relief) during the infrequent rain events. This causes the stones of the courtyard fence to topple, and after the upright stones have fallen, pedestals are formed (as a consequence of differential erosion/deflation caused by the protection offered the fallen stones) on which some of the courtyard fence stones still rest (fig. 11:3). Human destruction may also play a role here as well, given the widely scattered distribution of the courtyard fence stones, which is difficult to explain by natural process alone.

Stage 4—Secondary structure construction (fig. 11:3 lower): The sediments accumulating adjacent to the primary wall create a slope also on the north and south ends of the structure, ultimately capped by the surface crust (Stratigraphic Unit II). Round conglomerate cobbles of the subsidiary structure are placed on these accumulations, resting in and above Stratigraphic Unit II (figs. 9, 11). Therefore, they must postdate the double wall construction by some significant span of time, probably thousands of years (see Absolute Chronology below).

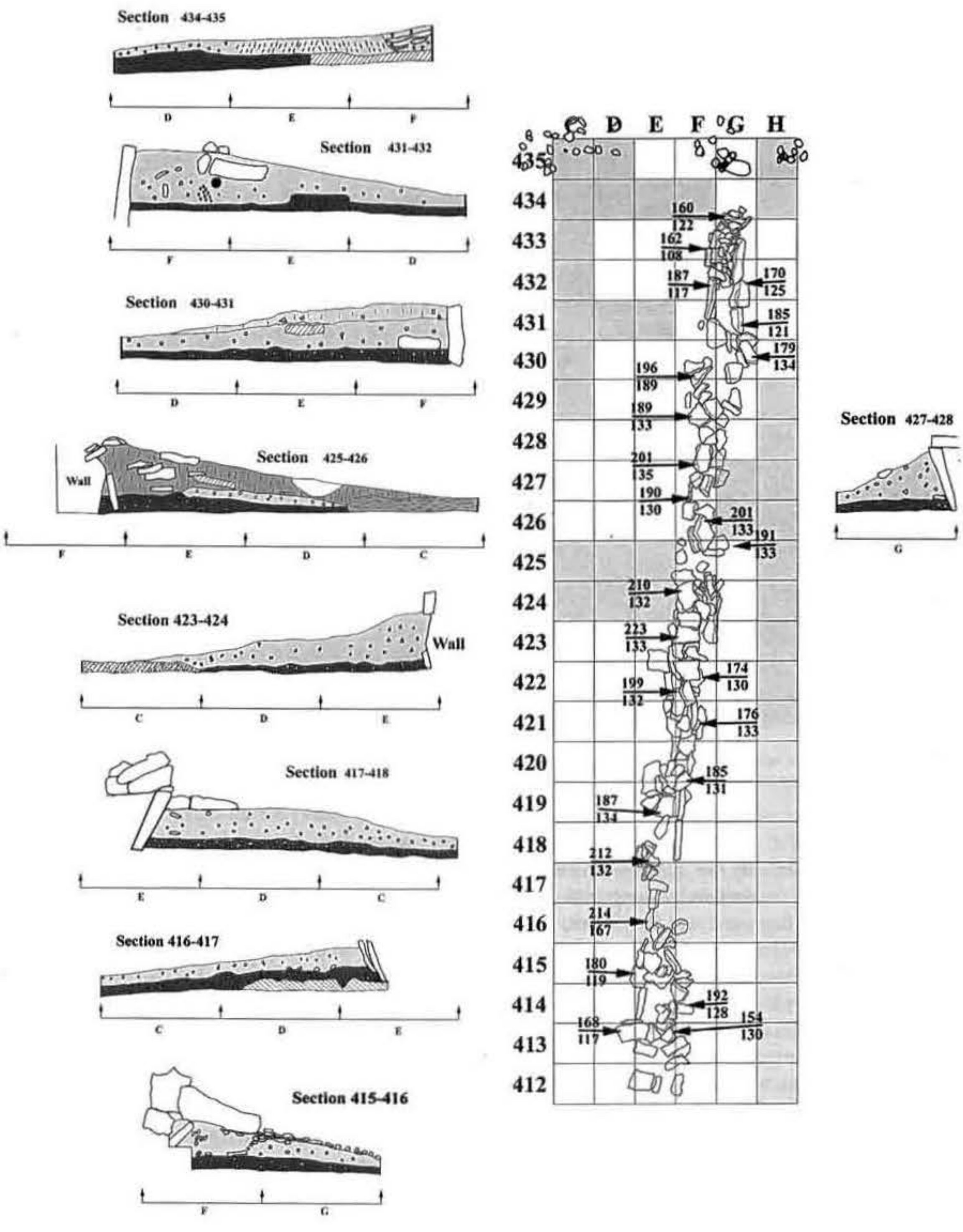

Fig. 10. Ramat Saharonim Shrine 4 section drawings.

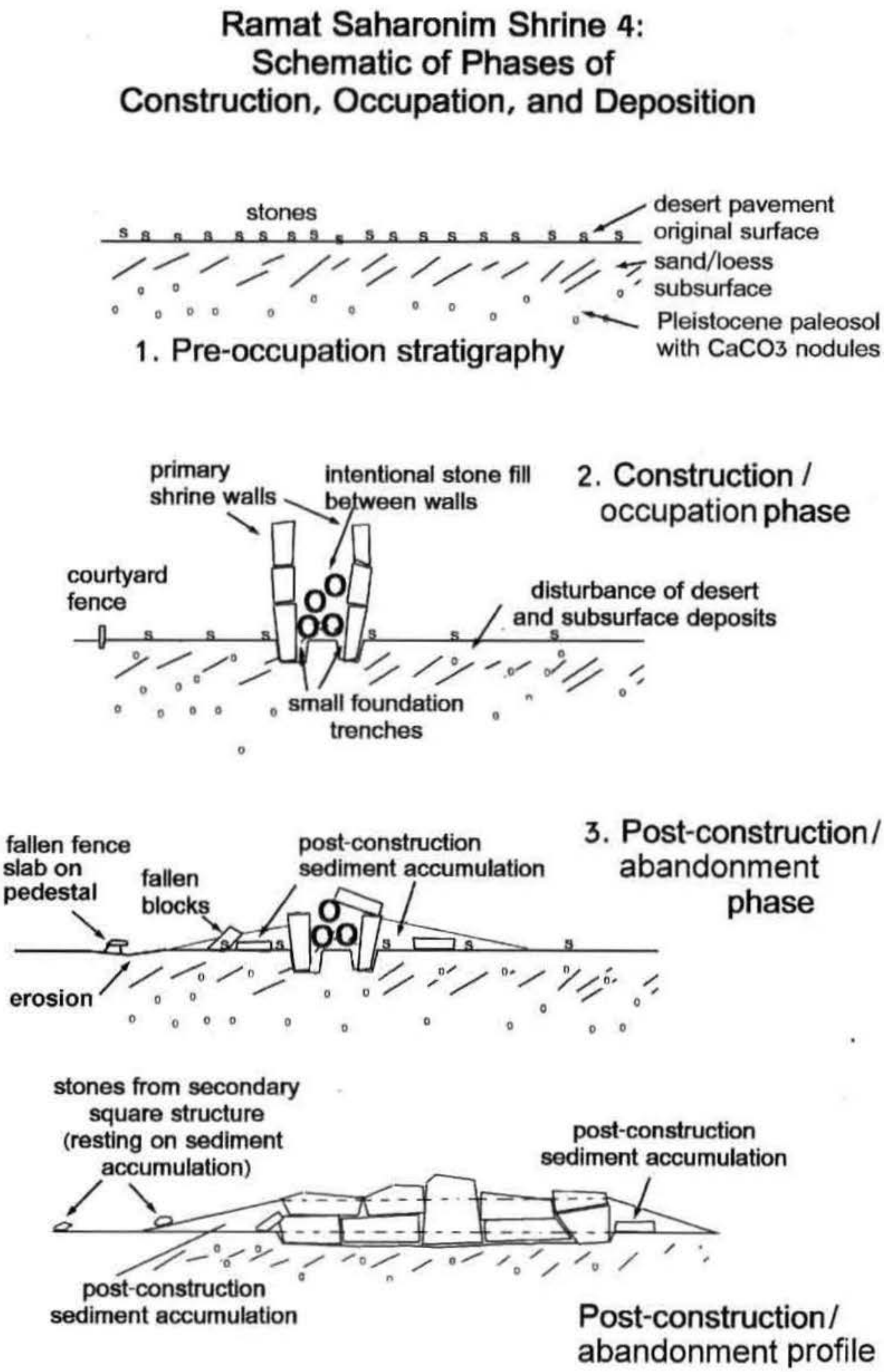

Fig. 11. Ramat Saharonim Shrine 4 site formation sequence.

Fig. 12. Tumulus 28 looking west, with Tumulus 29 in the background.

EXCAVATION OF TUMULI 28, 29, AND 30 ON THE SOUTHERN RIDGE

Tumulus 28, Tumulus 29, and Tumulus 30—the westernmost tumuli on the Southern Ridge (figs. 2, 12)—were excavated. Excavations were conducted from the top down into the cist of each tumulus such that the structure of each was left intact. All sediments were sieved through 2- to 3-mm mesh.

The basic structure of the tumuli is identical to that described by previous scholars (e.g., Haiman 1992; 1993). Tumulus construction begins with the excavation of a shallow pit—in the case of Ramat Saharonim, no more than 20 cm deep due to the shallow depth of surface sediments on the limestone layers of the Ardon Formation. The interior wall of the tumulus was then constructed around the shallow pit. A ring of large margin stones was placed delimiting the outer edge of the tumulus. The interior cist was constructed using horizontal slabs of varying lengths to form a rough oval or polygon. At some point the body (or bodies) were placed in the cist, and slabs were placed over it (or them). The massive superstructure of the tumulus, between the wall of the cist and the margin stones, was constructed more haphazardly. It is likely that the cist was also covered in the process of building the superstructure, although it is difficult to determine whether the stones in the interior are intentional fill or fall. Given the repeated use of the tumuli, accessibility to the cist must have been considered in construction.

The excavations revealed remains of seven individuals,[4] six of whom could be associated with the period of the construction of the tumuli. The seventh, found in the upper level of Tumulus 29, clearly represents a later reuse of the tumulus, and indeed lies almost a meter above the very poorly preserved remains of an individual on the lowest surface of the tumulus.

Tumulus 28

Tumulus 28 has a relatively small cist opening at 1.75 m (above datum), with a rectangular shape oriented northwest–southeast. From the top, the cist narrows from 0.70 to 0.60 m in width, but increases from 0.85 to 1.20 m in length. A few isolated human bones were found as high as 1.65 m, being probably moved by later disturbance. The main level of bone was found from 1.25 to 1.13 m. Two different areas, the southeast and the northwest, were clearly recognized during the dig. Scattered fragmented bones mixed with numerous small slabs and stones (fig. 13A) filled the southeast half of the cist. At least two adult individuals were part of this assemblage. At the bottom, a right hand was found connected in a dorsal position and articulated to an ulna. Several anatomically coherent assemblages—thoracic vertebrae clustered with ribs, a skull fragment on top of an atlas,

[4]A more detailed physical anthropological report is under preparation.

Fig. 13. Tumulus 28: (A) view of cist before exposure of skeletal remains; (B) view of lower part of articulated skeleton in northwest half of cist.

and a mandible with a hyoid bone—were also uncovered. That is, there was at least one primary inhumation in this area, even if major disturbances destroyed the burial(s) afterward. The northwest half of the cist was protected by a large slab. The removal of this slab revealed the lower part of a skeleton (from the fourth lumbar vertebra to the feet) in full articulation (fig. 13B). Preliminary examination in the field suggests these are the remains of an adult male, lying on his back with the legs flexed on the left side, perpendicular to the vertebral column. We assume that the anatomical clusters seen in the southeast half of the cist are part of the same individual. The body was oriented in a southeast–northwest direction, with the head against the southeast wall of the cist. Beneath the bones, the surface of the cist was carefully paved with large and medium-sized slabs (fig.13B).

Fig. 14. Tumulus 29: (A) view of upper skeleton, a secondary use of tumulus, (B) the lower scatter of bones.

Tumulus 29

Tumulus 29 has the largest cist of the three tumuli excavated (1.60 × 1.10 m). The opening is pentagonal in shape, oriented northeast–southwest. The highest point of the tumulus is at 2.12 m, and the highest human remains were discovered at 1.68 m. At this level, a well-preserved and complete skeleton of an old woman (over 60 years old) was found. The body was placed on the left lateral side with the head lifted up (fig. 14A). The legs were flexed as well as the arms, which were tight to the body with the right hand under the chin and the left under the thorax. Pieces of desiccated leather surrounded the whole skeleton, suggesting burial in a tightened sack or shroud. Around the skull, pieces of a different kind of organic material, perhaps rope made of vegetal fibers, were also found. The excellent state of preservation, the preservation of the leather, and the high location in the tumulus suggest that this burial was "intrusive" to the tumulus, as reflected clearly in the radiocarbon and OSL dates fixing the burial to the

Fig. 15. Tumulus 30: (A) central cluster of bones with wall effect on south side; (B) closeup view of articulated foot.

second half of the first millennium B.C.E. (see later discussion). The proximity to the Nabataean spice route (e.g., Cohen 1982) suggests a Nabataean cultural attribution.

Under this skeleton, the internal structure of the cist was organized with slabs one on top of the other filling the east half of the cist down to the bottom of the tumulus and a fill of infiltrated sandy matrix on the west side, in which a second cluster of human remains was found between 1.02 and 0.89 m high (fig. 14B). Only about 40 bone fragments, in a very poor state of preservation, were found scattered. These include pieces of long bones, vertebrae, ribs, and teeth. More detailed study is necessary before attempting to interpret this assemblage in terms of funerary treatment, but there is no doubt that this is part of the initial use of the tumulus. Small slabs paved the bottom of the cist immediately beneath the bones.

Tumulus 30

Tumulus 30 is 1.84 m high. The opening of the cist (0.95 × 0.75 m) was pentagonal and oriented northeast–southwest. The cist was filled by infiltrated sediment almost to the top. Its internal structure was organized with two rows of slabs one above the other on the north side from 1.36 to 1.19 m high. Slabs were absent from the central part of the cist, and the south edge of these areas is filled only by sediment. A few isolated bones were found between the slabs at the northwest corner of the cist, but the major layer of human remains was found beneath the level of the slabs in the central and north part of the cist. No bones were found on the south side, and a very clear "wall effect" is shown (fig. 15A). This could be either the result of a perishable structure, which prevented the deposit of the body or bones in this area, or the result of a specific taphonomic process in this area that destroyed the remains afterward. In fact, the alignment of the bones at the limit of the empty area suggests that the existence of a hard perishable structure, now gone, is the most likely hypothesis. Analyses of the sediment samples taken from this area will help to answer this question.

The level of bones was approximately 20 cm thick. Isolated bones were mixed with parts of articulated skeletons. All categories of bones are present: long bones, skulls and mandibles, hand and foot bones, girdle, and thorax. A minimum of three adult individuals is present in the assemblage. At least two of them remain partially articulated at the bottom of the pit (one complète left foot and leg [fig. 15B], one complete right hand and forearm, and a skull articulated with the mandible), but later disturbance does not allow reconstruction of the original position of the bodies. The few additional remains suggest that a secondary burial was also made in Tumulus 30. According to the disturbances, the cist was visited several times for funerary purposes, and the burials were probably not contemporaneous but successive ones. The final stage of the grave, with two skulls lying against each other and a cluster of long bones at the center of the cist, is certainly a deliberate reorganization of the bones. Eight *Conus* shells, with holes drilled in the flat end to form beads, were also recovered at the burial level. Four of these were found in a cluster between foot bones in articulation and a skull (fig. 15B).

The bones in Tumulus 30 were resting in a shallow basin filled with stony sediment. The bottom is

TABLE 1. Radiocarbon Determinations

Lab code	Context (square, depth)	Type	^{14}C Age ± 1σ years B.P.	Calibrated age B.C.	Calibrated age B.P.	$\delta^{13}C$ ‰ PDB
RTT 4663	Shrine 4 (422F, 1.40–1.42)	Charcoal	6180 ± 40	5210–5050 (68.2%) 5280–4990 (95.4%)	7170–7000 (68.2%) 7230–6940 (95.4%)	−24.6
RTT 4665	Shrine 4 hearth (432E, 1.94)	Charcoal	5945 ± 45	4910–4730 (68.2%) 4940–4710 (95.4%)	6860–6680 (68.2%) 6890–6660 (95.4%)	(−23)
RTT 4664	Tumulus 29 Upper burial	Leather	2225 ± 35	380–200 (68.2%) 390–200 (95.4%)	2330–2150 (68.2%) 2340–2150 (95.4%)	−20.4

situated in the middle of the cist, 1.03 m above datum, at approximately the base of the tumulus itself. At this level, the cist was much larger than the upper opening (1.30 × 1.50 m). Under the basin, a sandy, soft sediment was present, similar to the sediment covering the upper part of the cist.

Summary and Discussion

The excavation of the westernmost tumuli of the Southern Ridge reveals well-preserved cist burials. Two are pentagonal-shaped with a major axis oriented northeast–southwest like the shrines, and the third one is rectangular with an axis perpendicular to the previous ones. In each tumulus, human remains were discovered, clearly associated with the initial construction of the cist, with slab covers and/or pavements. At least six adult individuals were buried in these three tumuli during the Late Neolithic. Several thousand years later, Tumulus 29 was reused by Nabataeans (most likely) for the inhumation of an old woman. The Neolithic remains are very poorly preserved, and the bones crumbled on touch. At least three burials were primary inhumations. With the exception of the half skeleton in Tumulus 28, which was well protected by a large slab, the original position of the bodies at burial could not be reconstructed because the Neolithic people reorganized the bones after the decay of soft tissue. Nevertheless, given the articulated anatomical clusters at the base of the cists, it is clear that the bodies were not covered immediately by sediment. The state of preservation of the articulations shows that the decay occurred in an empty space, allowing small movements of the bones during the process of decomposition. More likely, and in accord with geomorphological analysis (see discussion below), the bodies were covered by stone slabs and the sediment infiltrated the graves later. Secondary burial is also likely to have been part of funerary customs at Ramat Saharonim, at least in Tumulus 30. This tumulus is the best preserved and seems not to have been reopened since Neolithic times. The state of preservation of the scattered remains in Tumuli 28 and 29 are more difficult to interpret as secondary inhumations because the poor state of the assemblages could also be the result of taphonomic processes.

Although cist burials are also known from Pottery Neolithic contexts in Jordan (e.g., Banning 1995; 1998: 224), they differ in numerous particulars, including social context (sedentary farming villages), the presence of grave offerings like pots, the exclusive practice of primary burial, and the absence of tumulus superstructures. These contrasts undoubtedly reflect the fundamental contrasts between the lifeways of the desert and the sown.

Finally, it is important to emphasize that the burial remains from the Ramat Saharonim tumuli suggest a closer behavioral relationship with the Sinai nawamis tombs than previously assumed. Whereas previous assessments tended to view the tumuli as single-episode, single-burial tombs, in significant contrast to the nawamis, the reused and multi-burial tumuli at Ramat Saharonim suggest similarities not recognized in earlier studies.

ABSOLUTE CHRONOLOGY

In the virtual absence of material culture remains associated with the Ramat Saharonim complex, two independent methods of dating, ^{14}C and OSL, were assayed in order to place the site in historical context. A detailed discussion of the methods and results has been published elsewhere (Porat et al. 2006), but a review here will allow better evaluation of the dates in light of the detailed site description.

The method of radiocarbon dating is well known (e.g., Mook and Waterbolk 1985; Ramsey 1995), and the results of the determinations are presented in table 1. The two dates from Shrine 4 derive from charcoal fragments associated with the contact between Units III and IV, that is, the original land surface associated with the construction of the shrine. They clearly place the construction ca. 5000 cal B.C., the Late Pottery Neolithic in standard Levantine chronological terminology, and to the early phase of the Timnian in Rothenberg's (e.g., Rothenberg and Glass 1992) desert framework.

Although both dates derive from well-controlled contexts, RTT-4665 from a small in situ hearth and RTT-4663 from a concentration of charcoal on the original land surface, given only two dates (the total charcoal recovered), it is difficult to assess the minor difference between them. Although they overlap at the 2-sigma confidence interval, in general the construction of four shrines and 30 tumuli supports the likelihood that the span in the dates reflects a long period of site use, implying that the difference in dates is meaningful.

The ^{14}C date for the upper burial in Tumulus 29 suggests a Hellenistic/early Nabataean reuse of the tumulus. Beyond dating the burial itself, and possible implications for an early use of the southern spice route, the relatively close agreement between the ^{14}C determination and the OSL date (see below) lends greater confidence to the chronology in general.

Luminescence dating methods (Aitkin 1998) date the last sunlight exposure episode in a mineral's history and use signals that are acquired by mineral grains such as quartz or feldspar from the natural environmental radiation. The magnitude of OSL signal is related to the total radiation that the sample received. Since the OSL signal is sensitive to sunlight, exposure to the sun during transport and deposition of the sediment will reduce the previously acquired OSL signal to zero ("bleaching"), and after burial it will grow again. These methods are used extensively for dating Late Pleistocene to Holocene aeolian, alluvial, fluvial, and colluvial sediments, and major applications include palaeoseismology, palaeoclimate, landscape evolution, and prehistoric sites. In order to date an archaeological installation, one needs to sample sediments (preferably aeolian) deposited close to the time of construction that are likely to have been exposed to sunlight. Appropriate sediment contexts include two basic types: (1) sediments underlying stones used for construction wherein presumably the uppermost sand grains were exposed to the sun prior to the placement of stones, thus providing a maximum luminescence age for the site, and (2) sediment filling interstices between construction stones which presumably accumulated soon after the construction or abandonment of the site. This age will be a minimum age for the site. By combining the two types, the age of the site can be constrained.

The need for alternative dating methods stems from the anticipated paucity of charcoal on the site, and indeed, the OSL dates provided the only means of dating the earlier phase of tumulus construction and use. The details of the methods as applied to Ramat Saharonim are published elsewhere (Porat et al. 2006; also see Porat 2002). Briefly stated, two techniques were employed, one utilizing single aliquots (on the tumuli and the shrine) whereby a large number of quartz grains (several thousands) are measured together, and the second utilizing single grain analyses. Results are summarized in table 2.

With respect to the tumuli at Ramat Saharonim, one can safely assume that all the sediments within them, between the slabs above and below the burials, and between the stones of the cist walls, accumulated after burial (see Porat et al. 2006 for detailed discussion). The bodies were not covered with soil, as no soil is available in the area, but with stone slabs (see also discussion of skeletal remains above). The infiltrating grains are fine, wind-borne, and were blown into the tumulus through gaps in the stones. Therefore, they were most likely well bleached at the time of deposition, and their age would give a minimum age for burial.

The sample collected from the same level as the skeleton in Tumulus 28 (RS-8) gave an age of 6000 $\pm$ 600 years B.P., and a second sample (RS-9), taken 2 cm lower, gave 7500 $\pm$ 700 years B.P. In Tumulus 29, the sample (RS-11) from the sediment underlying the feet of the skeleton gave 1800 $\pm$ 170 years B.P., while a second sample (RS-10), taken from under a stone in the wall of the cist, from the same level as the upper, well-preserved skeleton, gave an age of 2000 $\pm$ 200 years B.P. Evidently, the two burials are of different ages, supporting the idea of secondary use of Tumulus 29. As these ages are from sediments deposited after burial, the burial in Tumulus 29 took place about 7500 $\pm$ 700 years ago, and the burial in Tumulus 28 about 2000 $\pm$ 200 years ago.

In the shrine, both pre- and post-construction sediments were identified. At the time of construction, the uppermost part of the surface sediment on which the stones were placed was disturbed and mixed, exposing a layer of several centimeters to sunlight (a similar process happened during the excavation, when a large number of people treaded the surface). This layer could potentially give the time of con-

TABLE 2. Summary of Optically Stimulated Luminescence (OSL) Dates

Single Aliquot Measurements

Sample	*Depth (m)*	*De (Gy)*	*Dose rate*	*Age (ka) B.P.*	*Youngest age (ka) B.P.*
Shrine 4:					
RS-1	0.4	26.8 ± 7.9	1122 ± 66	23.9 ± 7.7	12.5
RS-2	0.5	41.2 ± 10.5	1273 ± 24	32.4 ± 8.3	19.7
RS-3	0.45	20.8 ± 7.6	1071 ± 23	20.8 ± 7.1	9.3
RS-4	0.5	16.8 ± 5.5	980 ± 60	17.2 ± 5.7	9.4
RS-5	0.4	73 ± 21	1218 ± 76	60 ± 18	41
RS-6	0.5	11.9 ± 2.5	993 ± 23	12.0 ± 2.5	8.8
RS-7	0.2	234 ± 19	1543 ± 76	152 ± 14	60
Tumuli					
T28 RS-8	0.8	11.8 ± 1.2	1975 ± 28	6.0 ± 0.6	
T28 RS-9	0.8	14.7 ± 1.4	1960 ± 28	7.5 ± 0.7	
T29 RS-10	0.7	3.5 ± 0.35	1714 ± 26	2.0 ± 0.20	
T29 RS-11	0.7	3.0 ± 0.27	1650 ± 26	1.8 ± 0.17	

Single Grain Measurements

Sample	*No. of grains*	*De (Gy) Main peak*	*Dose rate*	*Age (ka) B.P.*
RS-1	12/30	4.7 ± 1.4	1122 ± 66	4.2 ± 1.3
RS-2	32/73	8.2 ± 2.6	1273 ± 24	6.4 ± 2.1
RS-3	27/36	5.4 ± 2.4	1071 ± 23	5.0 ± 2.2
RS-4	30/40	5.7 ± 1.5	980 ± 60	5.8 ± 1.6
RS-5	9/42	5.4 ± 0.7	1218 ± 76	4.8 ± 0.8
RS-6	23/34	6.1 ± 2.6	993 ± 23	6.1 ± 2.6

struction, when the placement of stones sealed the sediments off from further exposure to sunlight. After construction and abandonment, sand accumulated along both sides of the main wall. Later, stones collapsed and covered the accumulated sand, sealing it from further exposure. The sand under the collapsed stones and between standing stones will give a minimum age of construction.

All single aliquot analyses from the shrine showed a very large intra-aliquot sample scatter (table 2). The samples with the highest scatter and oldest ages are those that were collected close to the base of the site, from the layer that was disturbed during site construction. One obvious reason for these large scatters and old ages is that in some of the sediment grains, the OSL signal was not fully reset during transportation, and they carried a substantial residual signal at the time of deposition. The aliquot with the lowest dose equivalent (De) would contain the largest proportion of well-bleached grains, and the age calculated from it could indicate the true time of deposition. For each sample, such an age was calculated from the lowest aliquot (table 2), giving an age range for the samples from 41,000 to 8800 years B.P. So, even the ages calculated from the lowest De values are very scattered and probably too old, considering the age obtained from the tumulus, the radiocarbon dates, and the archaeological evidence. Apparently, even these youngest aliquots contain grains not reset at the time of deposition.

Single grain measurements (Bøtter-Jensen et al. 2000) of hundreds of individual grains from the shrine showed a mixed population of young and old ages. For each sample, there is a distinct peak distribution in the young ages (4000–6000 years B.P.) with a tail of older grains (see Porat el al. 2006). This confirms our inference from the single aliquot measurements that some of the grains in the sediment were not well exposed to sunlight at the time of deposition, and that the OSL signal of these grains was not fully zeroed. It must be noted that each sample also contains young grains, with ages as young as 3000 years B.P., indicating that deposition continued for many thousands of years.

Ages calculated from the younger grain population for all samples cluster between 4200 and 6400 years B.P. (table 2), with an average of 5400 ± 800 years B.P. for all six samples. This age is internally consistent, and it conforms better to the archaeological data. This is a post-construction age and thus is a minimum age of the shrine. Given the radiocarbon dates from the shrine and the OSL dates from Tumulus 28, we may assume that the shrine and the tumulus were constructed and used at the same time; the younger age of the shrine OSL dates could be attributable to the longer use of the shrine, and/or the time required for sediment accumulation. If the shrine were in use for a long time, sedimentation and hence burial would have begun only after it was abandoned.

Although no absolute dates were obtained for the northern secondary structure, it is clearly later than the primary structure. Given that the discrepancy between the OSL dates and ^{14}C dates runs on the order of 1000–2000 years, that some effort was made to obtain OSL dates as close to the interface between the original surface and the sand/silt accumulation as possible, and that the stones of the secondary structure lie on the sand/loess accumulation some 2–3 cm above the contact line, one can approximate a chronological gap at least on the order of 1000–2000 years between the construction of the two structures.

THE RISE OF THE DESERT CULT

Given the special orientations, the association with complex mortuary behavior, and the special construction, the cultic nature of the complex at Ramat Saharonim seems clear. Two additional points add further strength to this interpretation and provide additional grist to the interpretive mill. First, although a very light scatter of lithic artifacts is present in and around the site, none were recovered in direct association with Shrine 4 during excavation. This contrasts greatly with all domestic sites of the Neolithic, Chalcolithic, and Early Bronze Age periods of the region, which invariably show high densities of lithic artifacts, usually numbering in the tens of thousands, or more. No other artifacts, besides the eight shell beads in the tumuli, were found. This scarcity of artifacts is typical of desert cult sites and has constituted one of the prime difficulties in their interpretation (cf. Avner 2002: 114–15).

Second, no domestic sites were found within at least a 2-km radius of the site, from any period. A milling stone quarry, dated roughly to the Early Bronze Age, but possibly earlier[5] (Abadi 2003; Abadi and Rosen in press), is located about 200 m north of the site, adjacent to sandstone outcrops, and the Nabataean inn at Ein Saharonim is located about 2 km south, but no contemporary (Late Neolithic) sites have been discovered, nor any other habitation sites from other periods.

Thus, the complex at Ramat Saharonim is clearly a cult site, undoubtedly linked to mortuary behavior (see also Rosen and Rosen 2003). Beyond the obvious burials in the tumuli, and the elaborate behaviors associated with the burials, the summer solstice setting sun alignment can also be placed in such a mortuary context. Certainly the setting sun in the west signified death in ancient Egypt (e.g., Erman 1894: 310), and clear parallels exist between the tumulus fields of the Negev and the Early Bronze Age I nawamis tomb fields of Sinai, already tied to Egypt. The summer solstice, marking the dry season in the Near East, is the season of death, in marked contrast to the winter and spring, the seasons of rain and rebirth. The absence of domestic sites and activities in the vicinity of the complex also suggests a distinction between the sacred and the profane, and of course, the living and the dead, classic contrasts in the anthropology of religion and cult (e.g., Eliade 1959; Douglas 1999).

It is also possible to place Ramat Saharonim, and the general phenomenon of these early desert shrines, into a larger context. First, in contrast to the northern agricultural zones where cult sites and elaborate ritual practices, including mortuary rites, appear perhaps as early as the Natufian and most certainly in the Early Neolithic (e.g., Cauvin 2000; Goring-Morris 1997; Kuijt 2001; Schmidt 2001), the desert PPNB, a hunter-gatherer society (to be distinguished from the agricultural village cultures found in better-watered areas), shows no evidence for special cult

[5]Dating the surface deposits of the quarry is difficult. The background scatter of a few diagnostic flint artifacts included materials attributable to the span from the Pottery Neolithic through the Early Bronze Age. The preference for the Early Bronze Age date derives from the petrographic links to Early Bronze Age milling stones, but this is only suggestive and cannot be considered strong evidence for attribution. The quarry may be contemporary with the sacred precinct; it still does not constitute a habitation site.

sites or structures.[6] The earliest evidence for the adoption of domestic animals into the desert economies, in the form of domestic herd dung deposits in rockshelters in the region, is dated to ca. 6000 B.C. (Rosen et al. 2005; also see Goring-Morris 1993; Rosen 2002). Thus, there is a coincidence between the earliest herding and the rise of a centralized cult, with a probable lag time between the first herding and the earliest ritual constructions.

Reasons for this connection are not difficult to suggest. With the rise of herd economies and the need to ensure the well-being of the animals, territoriality increases as a means of maintaining access to grazing grounds and water (cf. Ingold 1980). This, in turn, requires new social tools to mark, defend, and legitimize the territories (cf. Renfrew 1984; Kinnes 1982; also see Marx 1977 for relationship between tribal organization and territoriality). In this, and in the contrasts with the preceding Pre-Pottery Neolithic society, we can trace the rise of tribal society (e.g., Parkinson 2002 and papers therein).

Ramat Saharonim embodies several aspects of this newly developing form of desert social group. A mortuary cult, as embodied in large-scale mortuary structures and cemeteries, has long been associated with increased territoriality (e.g., Renfrew 1984; also Bar-Yosef and Alon 1988: 28, for similar suggestions concerning Nahal Hemar and Ein Gedi). The presence of ancestors justifies ownership, cemeteries, and corporate ownership (Kinnes 1982). Large tumuli, set on false horizons, are clearly intended to be seen and to send a clear message of territory. In the case of Ramat Saharonim, the tumuli may be marking a tribal border, since Late Neolithic sites are present in the Arava Valley, south and east of the *Makhtesh* Ramon, but are relatively scarce in the central Negev. It may be noted that the Bedouin graveyard at Ein Saharonim, only 2 km south, marked the 19th- to 20th-century tribal border between the Azazmeh and Saidiyyin tribes (for map of tribal borders, see Bailey 1980: map 11.3). In the same sense that the cemetery seems to have marked the tribal border in recent times, the tumulus field may have functioned in a similar fashion.

Furthermore, the seasonal aspect also plays a role. The orientation of the shrines indicates some kind of aggregation at the summer solstice. The absence of occupational accumulations indicating long-term campsites suggests short-term gatherings, perhaps of selected segments of the society. It is difficult to reconstruct the rituals themselves, but the coincidence of the solstice shrines with burials and territoriality suggests tribal identity as one focus of the rites. The presence of secondary burials with the primary burials, suggesting a transport of bones, and the reorganization of bones within the tumuli, are part of this system.

Finally, the megalithic aspect of Ramat Saharonim requires special consideration. The massiveness of the construction, both in the large size of individual stone blocks and in the overall mass of both the shrines and the tumuli, contrasts significantly with the desert cult and mortuary structures from other periods. For example, open-air mosques, the best-understood and best-dated cult structures in the Negev (e.g., G. Avni 1994; Rosen and Avni 1997: 17–18, figs. 4:26–27, 5:10–11), would seem conceptually similar to the Ramat Saharonim shrines, especially in the stress on specific directionality, the care taken in the neat and orderly placement of the construction stones, in the scarcity of associated artifacts, and in the construction of a symbolically enclosed space that is nevertheless open. Yet the mass of the Ramat Saharonim shrines constitutes an overwhelming contrast with the rather delicate aspect of typical open-air mosques and with the majority of other desert cult structures (cf. Avner 1984; 2002; Yisrael and Nachlieli 1998).

In historical context, this megalithic aspect reflects the organization of labor an order of magnitude greater than that of the preceding desert Pre-Pottery Neolithic societies[7] (cf. Renfrew 1984: 165–99). That this labor could be drafted is undoubtedly a function of the power of the cult ideologies also embodied in the shrines. The stability of the system, reflected in the building of four shrines and tumulus construction over what must have been several generations, and in the continued power of the place as a symbol over the long term, is suggestive of the long-term importance of such cults for desert nomadic societies.

[6]Although the PPNB site of Nahal Hemar in the Judaean Desert has been interpreted as a cult site, it is best associated with the Judaean Hills and the Shephelah (Bar-Yosef and Alon 1988: 28) and is thus linked to the core area of the agricultural PPNB.

[7]It is important to distinguish here between the large PPNB sites of southern Jordan, the megasites, clearly integrated into a larger sphere of PPNB sedentary agricultural society and located in the Mediterranean and steppe zones east and southeast of the Dead Sea, and the smaller-scale hunter-gatherer societies located in the deeper desert. Although located due west of the megasite region, Ramat Saharonim, and the central Negev in general, is more arid than the Petra/Basta region, environmentally comparable to areas in Jordan farther south, and essentially comprises a different environmental (and cultural) zone.

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