

A Landscape/GIS Perspective on the Thamudic Inscriptions and Rock Drawings of the Wādī Ḥafīr, Southern Jordan

Introduction

Tens of thousands of Thamudic E inscriptions and rock drawings can be found throughout the Ḥismā sandstone desert of southern Jordan. The inscriptions are typically names, genealogies, short prayers to Arabian deities, and enigmatic personal expressions of longing and desire. The contemporary Thamudic rock drawings are incredibly detailed and extremely well executed artistic compositions that focus almost exclusively on the subjects of hunting and camels.

The landscape context of these Thamudic petroglyphs has received little attention, primarily because on first glance their distribution — usually among boulder strewn wadi slopes and isolated rock outcrops — has appeared to most scholars to be either completely random or nearly incomprehensible. With the advent of Geographical Information Systems (GIS), however, we are now in a much better position to unravel the locational and content complexities inherent in Thamudic inscriptional and rock art data.

This paper explores significant patterns in the distribution of nearly 1,000 Thamudic petroglyph sites scattered across the Wādī Ḥafīr of southern Jordan, a narrow canyon that connects the Ḥismā desert with the Rās an-Naqab escarpment. These patterns were revealed through a detailed GIS analysis of site position and content relative to such factors as topography, geology, and hydrology. It will be argued that such analyses represent the best avenue for understanding the real world context in which these important but still poorly understood artifacts were carved.

Location and History of Research

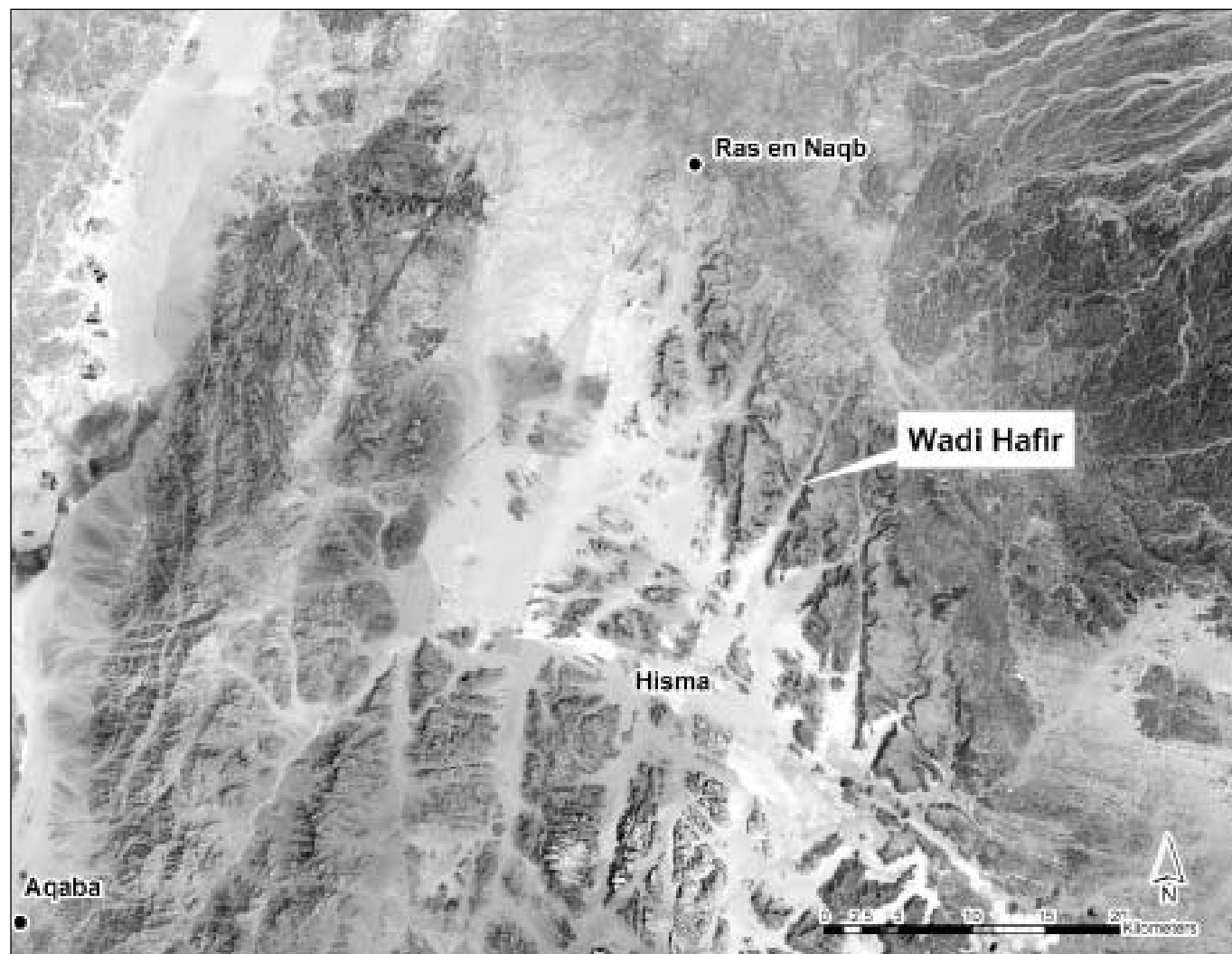
The steep-sided Wādī Ḥafīr gorge is a long and narrow canyon which stretches 15km from the Rās an-

Naqab Escarpment towards the Qā' ad-Dīsī mudflat in the center of the Ḥismā Basin in southern Jordan (FIG. 1). The slopes of the wadi are littered with hundreds of thousands of blackened sandstone boulders that have eroded down from the walls of the canyon over the millennia. These relatively soft stones have served as ideal canvases for the inscriptions and drawings composed by the ancient and modern populations living in and passing through the Ḥismā.

The Wādī Ḥafīr was first systematically studied by the late Dr. William Jobling of the University of Sydney as part of the decade-long al-'Aqaba-Ma'ān Archaeological and Epigraphic Survey (AMAES), 1979-1990. The AMAES spent the better part of four field seasons in Ḥafīr, recording and photographing hundreds of examples of rock art and Thamudic inscriptions, while also locating the area's chief natural resources and archaeological sites (Jobling 1983, 1985, 1988). More recently, the Wādī Iram Archaeological and Epigraphic Survey, directed by Saba Farès-Drapeau and Fawzi Zayadine, has visited and rerecorded several important sites within the valley (Farès-Drapeau and Zayadine 1997, 2004). The informal survey work of Edwardo Borzatti von Löwenstern has revealed a number of interesting sites and features in and adjacent to the Ḥafīr (Borzatti von Löwenstern 1986, 2005; Inglis 1988). Most recently, the author's Wādī Ḥafīr Petroglyph Survey (WHPS) was aimed at revisiting and plotting with a Global Positioning System (GPS) many of the inscription and rock art sites recorded by the Jobling survey.

The Thamudic E Inscription and Rock Art Sites from the Wādī Ḥafīr

The WHPS recorded, photographed, and plotted the location of 563 Thamudic petroglyph sites,

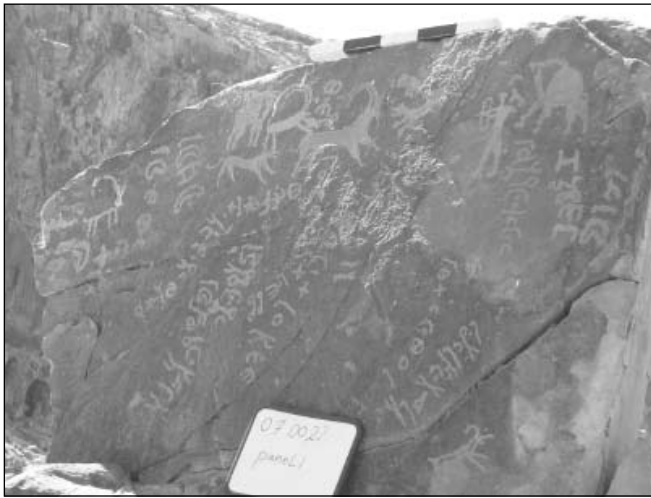


1. Location of Wādi Ḥafir within the Ḥismā Basin of Southern Jordan.

a “site” being defined as any individual stone or rock face that included a Thamudic inscription and/or drawing. Carved on these sites were over 1,700 Thamudic E inscriptions of various types and nearly 250 signed and highly detailed drawings. To this database of sites can be added an estimated 300 Thamudic sites that were visited and photographed by Jobling but not discovered or plotted by the WHPS. Although these sites lack locational GPS data, their relative position in the landscape can still be reconstructed through the notes and sketch maps Jobling made regarding their topographic position. Taken together, the data from both surveys provide a valuable source of information on Thamudic-period inscriptional and artistic activity within the Wādi Ḥafir.

The vast majority of the Ḥafir inscriptions can be classified as Thamudic E (more recently termed

Hismaic) (Macdonald and King 2007) and are broadly dated to anywhere between the late sixth century BC and the late fourth century AD. Personal names, prayers, and contextual information, however, suggest a close overlap with the Nabataean kingdom and its culture (first centuries BC/AD). The inscriptions are, with few exceptions, largely short and often redundant formulae, which typically include only names, extended genealogies, references to accompanying rock art and, more rarely, simple dedicatory prayers/curses and enigmatic expressions of sadness, longing, or desire (FIG. 2). The more common authorship expressions open with the *lam auctoris* and are followed by the carver’s name, his genealogy (usually to one or two generations), and then sometimes reference the name of his tribe. In texts accompanying drawings, the author often specified the name of the depicted



2. Thamudic E inscription and rock art site from the Wādī Ḥafir.



3. “Camel and Rider” scene, composed by Zdmnt son of Rm’l.

animal and/or used the word *khṭt* (to inscribe/inscription, to draw/drawing) to take credit for the carving of an animal or scene. The far less common prayer texts typically ask the deity (usually Lat or Dhushara) to remember (*dhkr*) the companions or tribe of the author or to grant them well being. The even more infrequent emotive texts (which often open with the enigmatic phrase *rb sqm* or *rb sqm srr*) seem to express feelings of heartache and longing for a loved one or companion.

The rock art that can be securely associated with the Thamudic inscriptions (either through textual association, physical relationship, or stylistic grounds) is focused almost exclusively on the subjects of the camel and the hunt, although other motifs, such as horses and combat/battle, do occasionally occur (Jobling 1992). Typically, the camel (most often depicted as the young she-camel or *bkrt*) occurs as an isolated motif or with a mounted “heroic” male rider (FIG. 3). The hunt motif occurs either as an isolated depiction of a hunted animal (usually the ibex, oryx, or ostrich) or, more strikingly, as a composite narrative scene involving the animal, hunters, hunting dogs, and weapons (FIG. 4). Although both motifs must reflect the reality of ancient Bedouin life in the Ḥafir to some extent, it is also important to note that the camel and the hunt were important ritual symbols in pre-Islamic Arabian society (Eksell 2002: 138-161; Stetkevych 1993: 27-42, 1996: 60-63).

Applying GIS and Spatial Analysis to Epigraphic and Rock Art Data

With this background in mind, we can now turn to



4. Hunting scene composed by Bjlt son of Zdlh.

how a landscape perspective can provide greater insight into our understanding of these fairly enigmatic remains. As modern archaeological practice has revealed, GIS provides an important set of tools for analyzing the spatial relationships inherent in archaeological data (Wheatley and Gillings 2002). Ongoing research in the Wādī Ḥafir suggests that such tools are equally useful to those who deal with ancient inscriptions and rock carvings.

First, given the large number of Thamudic sites now recorded for the Ḥafir and the wadi’s relatively contained and restricted topography, the Ḥafir represents an ideal location to study patterns in the distribution of sites and their content. Ideally, such an analysis might reveal patterns that are relevant to how we interpret the meaning and function of the petroglyph sites. For example, we can ask,

“do sites cluster around certain resources?” or “do prayers to particular deities focus on only select landscape features?” These questions and many others can best be addressed through a landscape/GIS perspective.

Second, looking at site distribution through a GIS simply provides a more visual and accessible means of understanding and ultimately interpreting our data. Not only does a simple GIS distribution map show us where recorded sites occur within the landscape, but that map can also be overlaid with topographic and geological data, aerial photos and satellite imagery, as well as information about the position of man-made features and natural resources. With all of this information brought together, it is far easier to compare and contrast significant site characteristics and, moreover, a GIS facilitates such comparisons by having a range of options for symbolizing and highlighting contrasting data. With appropriate data, a GIS also provides the ability to generate 3-D models of the landscape we are studying. Although such models can create cool “virtual worlds” that allow us to visit and “fly through” our landscapes at the touch of a button, such surface models also form the basis of powerful analysis tools, such as perception or “viewshed” modeling and hydrological modeling (Wheatley and Gillings 2002: 107-124).

The real power of GIS, however, lies in its ability to query and analyze spatial relationships between and among sites that share certain characteristics. These characteristics — defined as “attributes” — are the non-spatial data that we deem to be significant about a Thamudic site. For example, for each site we can identify the number of inscriptions present, the names of the various authors and their genealogies, the occurrence of particular artistic motifs, or the presence or absence of prayers or emotive texts. Put simply, a properly ordered GIS can identify almost any element of an inscription/rock art site that we think might be significant for our research. With this attribute data stored in a GIS, we can then search for and display all sites that meet certain criteria. For example, we can search for all sites that have hunt motifs or all sites that have a prayer to Dhushara, or better yet all sites that meet both criteria. We can also do the operation in reverse, looking at sites that are spatially correlated to see if they share any common characteristics.

When viewed against topographic or satellite

imagery, we are then able to study highlighted sites relative to the position of man-made and natural features that might have been significant. In this regard, the ability of a GIS to generate new information from the merging of map layers and site characteristics is significant. For example, a “viewshed” analysis can help us understand what parts of the surrounding landscape a person could see from a particular location, while the creation of a “density surface” allows us to see what sites or group of sites have the highest concentration of Thamudic inscriptions.

A GIS/Landscape Analysis of Thamudic Sites of the Wādī Ḥafīr

Although the locational analysis of Thamudic sites in the Wādī Ḥafīr is still at a preliminary stage, certain patterns are evident in both the content and distribution of sites that allow us to draw conclusions about where and possibly why inscriptions and drawings were carved in this valley. Likewise, the absence of certain spatial patterns allows us to discount some generalized socio-cultural hypotheses about why petroglyph sites might cluster in an environment such as the Wādī Ḥafīr.

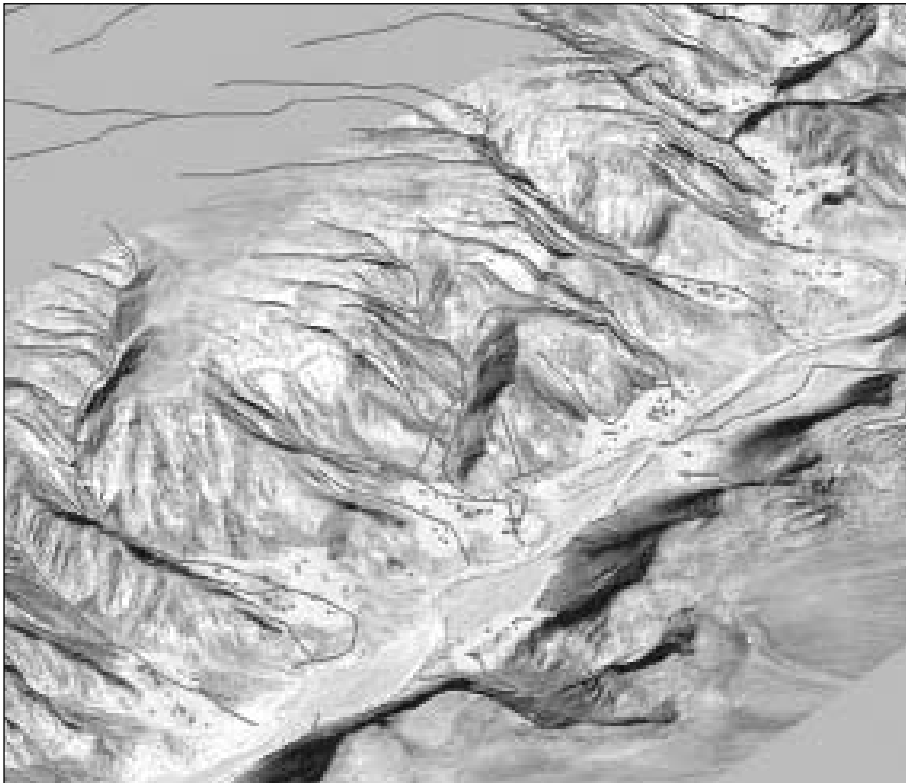
We will deal first with those hypotheses that are not born out by the spatial distribution data. First, there seems to be little evidence that the Wādī Ḥafīr was a major or even alternative international trade and transit route from the Ḥismā to the Edomite plateau as initially proposed by Jobling (Jobling 1985: 219). Nearly all of the inscriptions located within the narrow confines of the Ḥafīr are of the local Thamudic E/Hismaic variety, with only a handful of Nabataean, Thamudic B, and Thamudic D inscriptions known. Furthermore, the Thamudic E inscriptional/rock art sites are distributed fairly evenly across the entire length and breadth of the wadi, with little large-scale clustering that might suggest the existence of well-established stopping posts, camps, or way stations. However, the wadi’s large number of inscriptions, its gradual and relatively easy ascent north to the Edomite plateau, and the existence of a number of well-worn tracks up the escarpment suggest the Ḥafīr was an important route for the local pastoral population. Pastoralists would have utilized this natural and well-watered corridor as they moved their herds seasonally between the highlands and the desert.

There is also little spatial evidence to suggest that certain kinds of Thamudic inscriptions or rock

art were tied or linked to specific places or locations within the landscape of the Ḥafir. Neither prayers nor emotive expressions, for example, can be associated exclusively with particular landmarks or topographic wadi features that we might deem to be significant — cairns, high places, springs, exceptional stones, natural pools, narrow clefts, etc. Rather, these evocative and obviously personal texts can be found almost anywhere there was good carving to be had, usually amidst the normal and unremarkable boulder scree covering the valley slopes. As such, it does not appear that these kinds of texts were used to ritually “mark” or “identify” sacred or culturally meaningful locations within the landscape. Similarly, there is little evidence that either the camel or hunt motif was carved at selected locations within the wadi. Again, both motifs are found throughout the entire wadi and neither can be exclusively linked to any specific locale or even tied to a general topographic situation, such as along the valley floor or high in a tributary wadi. Therefore, there is nothing to indicate that particular human activities like ibex hunting or camel herding/grazing were singularly associated with selected places within the landscape and topography of the Ḥafir. Apparently, these images were far more symbolic than functional, more idealized than real.

A locational analysis of Thamudic sites, however, does provide some positive insights. Within the wider, seemingly random distribution of sites within the Ḥafir, there are noticeable pockets of site clustering. In these areas, usually measuring anywhere from tens of meters to several hundred meters in diameter, carving sites are concentrated together and/or show an exceptional amount of inscriptional and drawing activity relative to the space they occupy (FIG. 5). By creating a “density surface” of Thamudic inscriptions in the Ḥafir GIS database, it is possible to pinpoint those areas of the wadi that witnessed the most carving activity. And where were people choosing to carve their names, prayers, and drawings? Satellite imagery and ground truthing indicate that many clusters occur in the gently sloping, boulder-filled tributary wadis of the Ḥafir, usually situated in “open” areas or clearings that offer a slight vantage point over the immediately surrounding terrain.

When the inscriptional clusters are viewed against the natural drainage networks of the Ḥafir, however, even more information is revealed. Nearly all of the clusters are located at precisely those points in the tributary wadis where the maximum amount of runoff from torrential winter rains would have gathered and merged as it wound its way

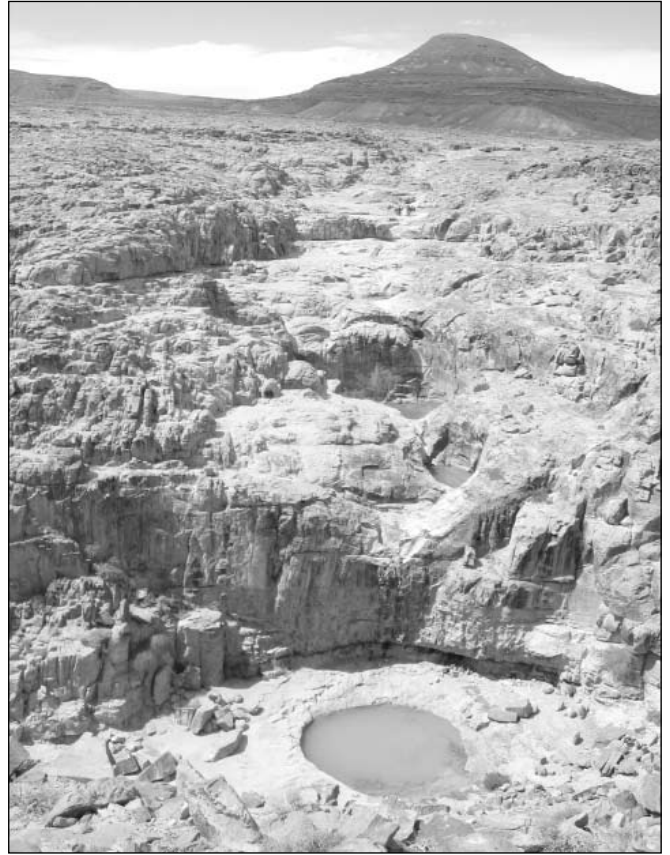


5. Density-surface map showing “clusters” of inscriptional activity.

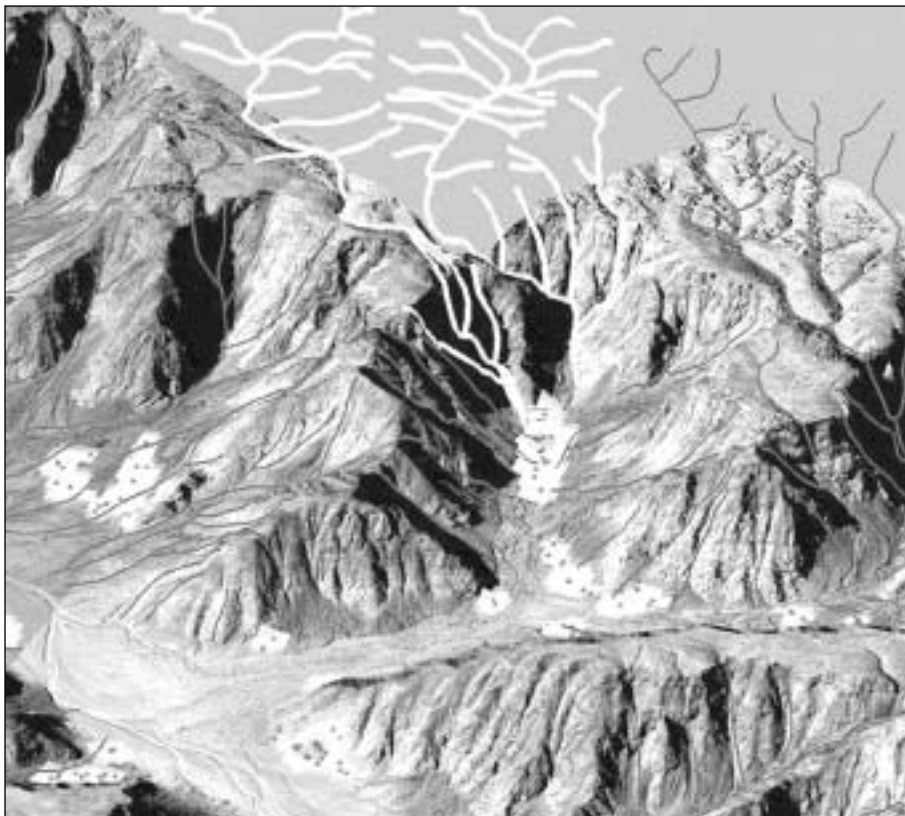
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through the natural drainage path of the Ḥafir (FIG. 6). In these areas where water flow was maximized, standing pools of water left over from winter flood events would have provided short-term but relatively abundant water resources for pastoralists, their herds, and even wild animals sought by hunters. Even when the pools had dried up, the seasonal saturation would have provided concentrated areas of green pasture that could be exploited by local pastoralists and their herds for much longer periods. The close relationship between seasonal water availability and inscriptional activity is evident at the Mughur cascades in the northern hills above the Wādī Ḥafir (FIG. 7). Here, a drainage network that extends across several kilometers of gradually sloping terrain collects and channels winter runoff into a series of cascading pools, the lowest and largest of which was broadened and deepened in antiquity. In and around the runoff collection pools, the WHPS recorded 52 different sites with over 100 Thamudic inscriptions and 22 rock drawings, a clear indication of this water catchment's importance.

A GIS analysis of petroglyph sites also reveals much about the individual families that were exploiting the seasonal water and pasture resources of the Ḥafir over the course of several generations. Of



7. The cascades of Mughur.



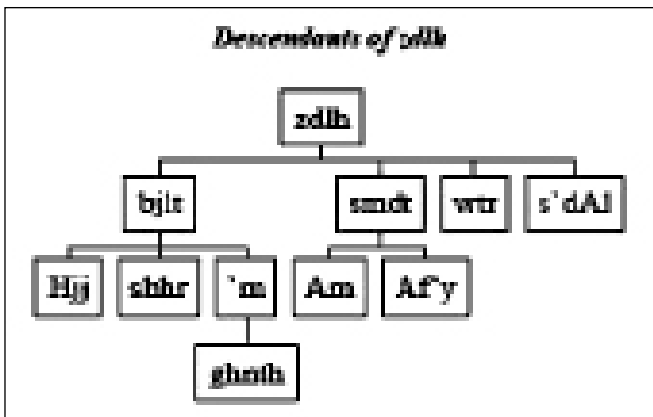
6. Terrain model showing inscriptional cluster at the terminus of a major drainage system.

the several hundred individuals who signed their names to drawings within the Ḥafīr, nearly a third can be identified as coming from either of two families, the descendents of *Zdlh* or the descendants of *Rm'l*. The activities of both families in the Ḥafīr extended over a period of at least four to five generations and, as seen in the *Zdlh* family tree (FIG. 8), the presence of multiple brothers/siblings can be identified within a single generation. Interestingly, the similarities in carving style and artistic themes between generations suggest the methods and techniques of rock carving were passed on from father to son. This is particularly evident for members of the *Zdlh* line who carved primarily hunting scenes and used similar artistic conventions to depict individual actors within the scene (hunters, dogs, ibex, weapons). Compare, for example, the style and themes of the scene composed by *Bjlt* (FIG. 4) with that carved by his son *Ḥjj* (FIG. 9). Finally, there is

limited evidence that individuals would sometimes carve their names and drawings on the same rocks that bore the signatures of other members of their family (fathers, brothers, cousins). Thus far, however, there is no clear evidence that either of these families limited their activities to certain locales within the Ḥafīr or focused their artistic carving around particular topographic features; both families seem to have moved quite widely throughout the wadi and even into neighboring wadis. For example, in her survey of the nearby Wādī Judayd, Geraldine King recorded several inscriptions from members of the *Zdlh* family (King 1990: 752, #5).

Conclusion

A landscape/GIS approach thus provides a better context for assessing and analyzing the content and distribution of these unique “artifacts” of human creativity that dot the Arabian Desert. Within the Ḥafīr, we have seen that petroglyph sites do not cluster in discrete zones or areas as might be expected along a major trade route, nor do they seem to mark individual locales of possible symbolic or cultural significance, such as high places, cairns or areas reserved for hunting or camel herding. Rather, Thamudic petroglyph sites can be found almost anywhere within the Ḥafīr. Within that overall distribution, however, a clear pattern emerges — Thamudic sites tend to cluster near the confluences of the expansive drainage networks found within the wadi’s numerous tributaries. Such a distribution indicates that the Ḥafīr was an important source of seasonal water and pasture for the



8. The attested descendants of *Zdlh* in the Wādī Ḥafīr.



9. Hunt scene composed by *Ḥjj* son of *Bjlt*.