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ANIMALS IN PREHISTORIC ART
The Euro-Mediterranean region and its surroundings

ANIMALIAK HISTORIAURREKO ARTEAN
Euro-Mediterranean eskualdea eta bere inguruak

LOS ANIMALES EN EL ARTE PREHISTORICO
La región Euro-Mediterránea y su entorno



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REVISTA ARKEOGAZTE ALDIZKARIA

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Animaliak Historiaurreko Artean: Euro-Mediterranean eskualdea eta bere ingurua

Los animales en el arte prehistórico: la región euro-mediterránea y su entorno

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MILK, MEAT AND HEAVY LOADS: DIACHRONIC CHANGES IN CAMEL PETROGLYPH DEPICTIONS FROM THE NEGEV DESERT

Esnea, haragia eta zama astunak: aldaketa diakronikoak Negev basamortuko petroglifoetako gamelu-irudietan

Leche, carne y cargas pesadas: cambios diacrónicos en los petroglifos con representaciones de camellos en el desierto del Néguev

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Abstract

This research is based on 296 camel petroglyphs from four surveyed areas within the Negev Highlands, Israel. We divided the camel petroglyphs into four styles, each represents the camel in a specific form with reoccurring attributes that are embedded with cultural information and meaning. Each of the styles was attributed to a chronological period based on the colour of their patina and related inscriptions. We demonstrate stylistic changes over time that may be related to transformations in the economic exploitation of camels and possibly to the introduction of a different camel breed associated with population movement into the region. The symbolic role that the camel may have played in past Negbite societies is also discussed.

Key words

Camelus dromedarius; Southern Levant; Camel breeds; Rock art.

Laburpena

Ikerketa hau 296 gamelu-petroglifoen azterketan oinarritzen da, Negeveko (Israel) lur garaietan prospektatutako lau eremutan identifikaturikoak. Gamelu-petroglifoak lau estilotan banatu ditugu, bakoitzak animalia hauek modu jakin batean irudikatzen dituelarik, informazio eta esanahi kulturala duten ezaugarri errepikariekin. Patinaren kolorean eta inskripzioetan oinarrituta, estilo bakoitzari aldi kronologiko bat esleitu zitzaion. Denboran zehar eman diren aldaketa estilistikoak egiaztatu ditugu, gameluen ustiapen ekonomikoaren aldaketekin lotuta egon daitezkeenak eta baita, seguruenik, gamelu-arraza desberdin bat sartzearekin zerikusia dutenak, eskualdeko populazio-mugimenduari erlazioz. Gameluak iraganeko gizarte negbitetetan izan zuen paper

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sinbolikoa ere aztertu da.

Hitz-gakoak

Camelus dromedarius; Hegoaldeko Levante; Gamelu-arrazak; Labar-arte.

Resumen

Esta investigación se basa en el estudio de 296 petroglifos de camellos procedentes de cuatro áreas prospectadas dentro de las tierras altas del Néguev, Israel. Hemos dividido los petroglifos de camellos en cuatro estilos, representando a este animal de una forma específica en cada uno, con atributos recurrentes que albergan información y significado cultural. Cada uno de los estilos se atribuyó a un período cronológico basado en el color de su pátina y las inscripciones relacionadas. Hemos demostrado cambios estilísticos a lo largo del tiempo que pueden estar relacionados con transformaciones en la explotación económica de los camellos y, posiblemente, con la introducción de una raza de camellos diferente, asociada con el movimiento de población en la región. También se ha analizado el papel simbólico que pudo haber desempeñado el camello en las sociedades negbititas del pasado.

Palabras Clave

Camelus dromedarius; Levante meridional; Razas de camello; Arte rupestre.

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1. Introduction

Most of the rock art in Israel is found within the Negev Highlands, a mountainous part of the Negev Desert with rocky terrain of limestone, dolomite and chalk, covering ca. 2500 km² (Figure 1). Average temperatures range from 8° C (winter) to 26° C (summer). It is a semi-arid region with 60–120 millimeters annual rainfall; vegetation is sparse, consisting mostly of annual plants and low shrubs (ORNI and EFRAT, 1973:173).

The Negev rock art consists of petroglyphs, most of which are pecked or engraved on limestone boulders of Eocene age which have developed a dark, outer patina known as 'desert varnish' (DORN, 2007). With the making of the petroglyph, the dark patina of the rock is broken and the inner, light-colored limestone is exposed. With time the patina re-forms, covering the exposed engraving and slowly darkens (Figure 2). The time-lapse between the exposure of the limestone and the development of the dark-colored patina is unknown. Among other factors, moisture, sun-exposure and subsequently, the panels' inclination and azimuth, affect the rate of patina development and darkening. Relative

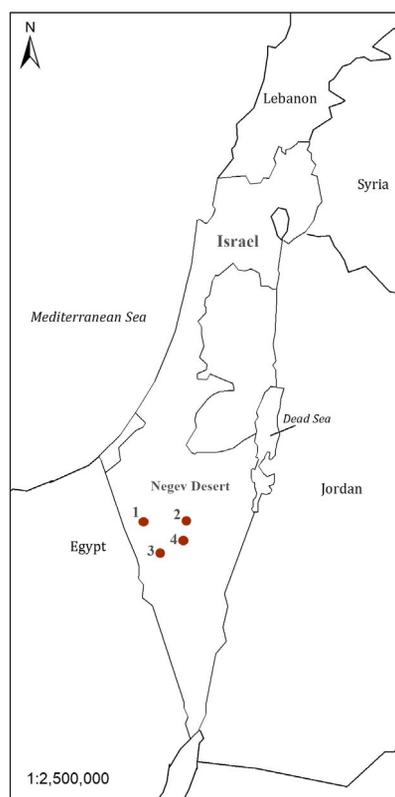


Figure 1. Map of research area and the rock art sites documented. 1. Giva't HaKetovot, 2. Har Michia, 3. Nizzana Basin, 4. Ramat Matred.

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Figure 2. Petroglyphs on limestone with a dark patina. D.E.D at Har Michia north rock art site.

dating of petroglyphs is possible based on the extent of patination, with lighter-coloured petroglyphs of younger age, and darker ones older. In the Negev, some petroglyphs were pecked or engraved on limestone boulders that lack desert varnish. In this case even the slightly weathered petroglyphs are difficult to see and decipher as they lack the dark-light colour contrast (Figure 3).

The implements used for making the Negev petroglyphs varied from flint to metal tools. Flint is found in abundance throughout the region and many rock art sites are associated with earlier Middle Paleolithic activity areas (mostly knapping sites). These dense scatters of flint tools and their refuse, offer ample engraving,

hammering and pecking tools. Few engravings present precise, well-formed thin lines made by a metal tool.

Precise dating of petroglyphs is notoriously difficult (e.g. BEDNARIK, 2002). In the Negev, relative dating may be applied to some petroglyphs based on the motif or subject depicted whose age is known from the archaeological record. For example, the presence of an extinct or introduced animal, particular weapon types, saddle forms etc., or linguistic inscriptions. As yet, radiometric methods have not been implemented on Negev rock art. Within the known constraints of dating rock art, we present the Negev petroglyph chronology as



Figure 3. Petroglyphs on limestone, Bedouin phase, Ramat Barnea.

given by EISENBERG- DEGEN and ROSEN (2013). The earliest visible rock art of the Negev dates to the Early Bronze Age (late 4th - 3rd millennium BC). Few panels may include older motifs possibly dating to the Chalcolithic (ca. mid 5th- early 4th millennium BC) or Late Neolithic periods (early 5th millennium BC). Upper and Epi-Paleolithic rock art might exist but if so, it has yet to be identified (or dated) with certainty.

Over the millennia, the Negev experienced several fluctuations in population number and size and character of human settlement, reflecting the variety of populations and cultures who occupied the region (AVNER *et al.*, 1994:265-295; ROSEN, 2008:115-132). These changes appear to be reflected in the quantity of rock art (roughly) associated with each period, the setting of the rock art and subject matter

depicted, which mirror facets of these time periods. There were a number of periods when rock art was more intensively made, but the bulk of images may be associated with the Roman-Byzantine and Early Islamic periods (ca. 1st - 2nd centuries BC – 10th century AD) and Bedouin phase (ca. last 200 years). However, as most motifs were continuously used over several rock art periods, often with a similar style employed (EISENBERG-DEGEN and ROSEN, 2013), the association of a specific petroglyphic element with one of these periods, rather than another, is often difficult to determine.

The Negev rock art may be roughly divided into five engraving phases (EISENBERG-DEGEN *et al.*, 2016). The earliest engraving phase consists almost entirely of ibex. At times these images are accompanied by anthropomorphic figures and/

or dogs. In the second engraving phase we see images of equids, a relatively restricted variety of abstract marks with foot prints added. The camel image is seen frequently within the third and fourth engraving phases. The fifth, most recent rock art phase, is chiefly aniconic in nature, though it does include occasional engravings of camels, ibex, donkeys and sometimes cars and airplanes.

Here we discuss four Negev Highland rock art assemblages, with horned ungulates that account for some 47% of the depicted zoomorphs. Most of these can be recognized as adult, male Nubian ibex (*Capra ibex nubiana*) due to their long, back-sweeping horns. The one-humped dromedary camels (*Camelus dromedarius*), the focus of this paper, are the second-most common zoomorph identified (12%) and the most commonly depicted domestic animal. In addition, some 18% of images represent unrecognizable zoomorphs. In most cases these are simplified stick images, made in a minimalistic linear fashion - such as a horizontal body and legs with no distinct attributes by which to identify the species.

2. The Zooarchaeological Record of Camels

In the deserts of the Levant, remains of wild camels (cf. *Camelus thomasi*), have been documented in prehistoric sites spanning the Pleistocene (e.g. GRIGSON, 1983; MARTINI et al., 2015). Towards the end of the Pleistocene they appear to have become extinct, or at least underwent extirpation in this region, as their osteological remains are not found thereafter in either fossil or archaeological deposits (HORWITZ and ROSEN, 2005). However, wild camels continued to inhabit the adjacent Arabian Peninsula as attested to by finds from the United Arab Emirates dating to the second half of the 5th millennium BC (BEECH et al., 2009).

Based on current genetic and archaeozoological research, the earliest finds of domestic dromedary camels occur during the Iron Age II, at the transition between the 2nd

and the 1st millennium BC (sometimes between 1500 and 1000 BC) on the southeast coast of the Arabian Peninsula, although the transition to domestication may have begun earlier (e.g. UERPMANN and UERPMANN, 2012; CURCI et al., 2014; ALMATHEN et al., 2016). From this region the domestic animals dispersed rapidly into neighbouring areas. A gazeteer of domestic camel remains from archaeological sites in Jordan, Israel and the Palestinian Authority is given in HORWITZ and ROSEN (2005: Table 2). Some of the pre-Iron Age finds noted in this table have been directly dated (e.g. Jericho, Shiqmim - GRIGSON, 2014) demonstrating that they are either intrusions from overlying layers or represent modern intrusions. Thus, it is apparent that claims for pre-Iron Age camel remains from this region need to be treated with extreme caution. The first robustly dated domestic camel remains appear in the Negev Desert as an introduced animal in the last third of the 10th century BC i.e. Iron Age II (SAPIR-HEN and BEN-YOSEF, 2013). This provides a clear chronological terminus post quem for images of camels in the rock art of the Negev.

Once they enter the region, camel remains are most frequent in sites directly associated with trade routes (e.g. Iron Age II-Persian periods at Tell Jemmeh- WAPNISH, 1981; Islamic period Pella KÖHLER-ROLLEFSON, 1989), but uncommon in others.

The camel is a multi-purpose animal and is exploited today for its milk, skin, wool and meat as well as used for transportation, labour and even racing. Since its domestication, this species does not appear to have been subjected to intensive selective pressures even though different camel breeds (ecotypes) are recognized in different parts of the world. They are generally classified according to their uses - for meat, dairy, dual purpose or racing (WARDEH, 2004) and the current basis for breed recognition includes a mixture of different criteria: socio-ethnographic, ecological/ geographic, morphological and utilitarian. Only recently have genetic studies been applied to clarify affinities between breeds (e.g. ALMATHEN et al., 2012; ELTANANY et al., 2015).

Identification of camel breeds in the archaeozoological record has, to date, been largely unsuccessful. This is due to the problem of applying the different criteria (listed above) to distinguish between them based on osteological remains. Moreover, the generally small size of archaeological camel bone assemblages, and hence the paucity of measurable bones and teeth, has limited our ability to distinguish between wild and domestic camels (STUDER and SCHNEIDER, 2004). Despite the limitations inherent in the archaeozoological samples, attempts have been made to identify different camel types. Thus, the exceptionally large camels found in the Umayyad period deposits at Pella were interpreted as possibly representing dromedary x bactrian hybrids that were bred especially to carry heavy burdens (KÖHLER-ROLLEFSON, 1989). Furthermore, metric analysis of camel remains from the site of Petra ez-Zantur has hinted at the presence of a few heavily-built dromedaries, either a large breed or alternately castrates, that were used as beasts of burden in the Roman period (STUDER and SCHNEIDER, 2004). Given that morphologically these remains resemble dromedaries and not bactrians, the possibility that they represent hybrids was rejected by the researchers. In sum, there are only a few archaeozoological indications for the exploitation of different camel breeds in the Southern Levant.

3. The Negev Highlands Rock Art Record analysis and conclusions

The data presented in this paper are based on four different rock art assemblages documented in the Negev Highlands: Har Michia (No. of elements recorded 4346, including 73 camels), Giva't HaKetovot (No. of elements recorded 1486, including 20 camels) Ramat Matred (No. of elements recorded 1891, including 26 camels and a further 66 camels documented separately) and a section of the Nizzana Basin Survey (No. of elements recorded 3400, not counting stray marks, including 111 camels, also see SCHWIMMER, 2015). When summed, these data comprise a sample of 296 camels, and demonstrate that zoomorphs (including

ibex, camels, equids, and canines - especially dogs represent ca. 12% of the Negev Highlands rock art assemblages. Birds (especially ostrich), felines, reptiles and cattle account for only a small percentage of motifs in the surveyed assemblages (EISENBERG- DEGEN, 2012; SCHWIMMER, 2015).

In these petroglyphs, dromedary camels are the second most commonly depicted zoomorph. Usually ranging in size between 10-20 cm, they are shown sideways on, presented in a linear, outline or fully engraved form. Most camels are linear with the body consisting of a single horizontal line, the legs are formed by four parallel vertical lines. In most cases their stance shows them as static, but some images evoke movement. Camels occur in panels either as individual animals, multiple animals in a camel train or in a group, with or without riders. In many instances accoutrements are shown such as saddles or reins, and in some petroglyphs the camel is tethered, shown by a line connecting two legs.

Scenes showing other uses of the camel or its products are not depicted. For example, ethnographic data indicates that camel droppings were collected and dried for fuel (DICKSON, 1951:415); female camel urine was used by women to wash their hair and for medicinal uses (DICKSON, 1951:415; JABBUR, 1995:221); the hide was used for making containers, troughs, tent covers and sandals; foot pads were fashioned into shoes or soles for sandals; the fur served for weaving bags, tent-cloth panels, or saddle covers (JABBUR, 1995:218-219); the tail could be made into rope (BULLIET, 1975:60) while camel bones were used for making bone-tools (STUDER and SCHNEIDER, 2008), or as writing tablets (NEGEV, 1977). None of these uses are depicted in the Negev rock art.

In this paper, the camel engravings have been classified chronologically using the colour of their patina, associated inscriptions with the same patina which were written in several ancient languages such as Thamudic dialects (1st and 2nd c. AD), Safaic (1st c. BC through 4th c. AD), Nabataean (2nd c. BC through 4th c. AD) and



Figure 4. Camel petroglyph, Ramat Matred.

Early Islamic (7th-8th c. AD) (MACDONALD, 2000; WOODARD 2008), as well as the presence of engravings of Bedouin tribal markings (wusum) spanning the last 200 or so years (EISENBERG-DEGEN, 2006). We also tracked changes in the style of the camel engravings and have classified them into four types (Table 1). The animals differ in the manner in which they were executed and in the specific morphological (ears, feet, hump shape) or associated features (saddles, reins, cameleers), that are shown.

3.1 The Hump

Camels, as all zoomorphs, are presented in the Negev rock art in profile, emphasizing the shape and size of the hump, its most salient attribute (Figure 4). The hump of some ridden camels is unclear, while in a few depictions of

long-necked quadrupeds that were tentatively identified as camels (excluded from the present research), the animals have no humps at all. Presentation of clearly humped camels is the main trend. Humps are shown as triangular in shape, rounded as a half circle, presented as a low narrow arc placed on the body line or a horse-shoe shape. The hump may vary in size, being so large as to cover the entire length of the body, or small, set on the front or back section of the body.

The camel's hump is an accumulation of fat which helps insulate the camel's body from the desert heat. The fat also serves as a reserve and when the camel is thirsty or overworked, the fat of the hump is metabolized, and the hump becomes more flaccid, at times even reduced to a type of skin flap. Thus, it reflects the health status of the camel, with the hump of a well-fed animal assuming plumpness of form and hardness of the

texture. Camels under the best care and health status will have a large, pyramidal shaped hump which covers most of the back. Thus, a large hump depicted in the rock art indicates not only the health status of the camel but also reflects on its owner (DICKSON, 1951:414). Such a camel has clearly been treated well, given ample food and water. It may therefore serve as an indication that the camel's owner is wealthy, or that he is honest as he respects and looks after his herd.

3.2 Hoofs

As noted above, the Negev camel petroglyphs are generally schematic and include few details. Hoofs may be an exception. The camel's hoof is a large pad and constitutes a salient anatomical feature at the end of the foot. It is adapted to stop the animal from sinking into the soft desert sands while the widening toes on a camel's hoof provide additional grip on different sediments. The pads are thick so as to protect the foot in scorching surface temperatures which may reach 20° C more than the air temperature.

Although not presented in detail in the early engravings, in the later petroglyphs (Early Islamic period), pads are denoted on occasions as a rounded mark, or thickening, at the base of the camel's legs. The depiction of hoofs appears to reflect an artistic expression of social and cultural change. One panel from the Har Michia North rock art site may present camel foot prints which descend the panel's vertical surface (Figure 5).

3.3 Neck and Head

In all camel depictions, the presence of an elongated and extended neck is another salient feature. Even in images where the body is schematically drawn, identification of a zoomorph as a camel is often possible given the presence of a long neck. The camel's neck may be presented erect with the head at an up-turned angle suggesting braying. Other petroglyphs present camels with relaxed slightly curved necks (Figure



Figure 5. Possible camel hoof prints descending the panel (emphasized with Photoshop), Har Michia north.

6). Few camels are presented with their neck extended downwards as if grazing.

In the petroglyphs, eyes of zoomorphs (and anthropomorphs) are at times indicated. This is achieved by leaving a small bit of patina in the engraving, resulting in a small 'patina island' eye. In other cases, the eye may be a drilled depression. Very few of the Negev camel petroglyphs have eyes.

Camel petroglyphs from Transjordan usually have ears (LITTMANN, 1904) and these are occasionally depicted in the Negev, usually on camels associated with the more recent engraving phases. The depiction of ears is at times technically challenging. For example, looking at a three-



Figure 6. Camel petroglyph, Ramat Matred.



Figure 7. Three camel caravan, Ramat Matred.

camel caravan (Figure 7), the second and third camels are portrayed with two ears each. The first camel has only one ear. Two ears were originally engraved but due the closeness between the two engraved lines, the patina between the two did not sustain the engraving of the second ear, that chipped off and formed a single engraved line.

Other physical features of the face which characterize the camel that are not exhibited in the petroglyphs, are the bushy eyebrows, two rows of long eyelashes, the hair-lining of the ears, narrow nostrils, and stiff haired lips (HEIDE, 2010: 337). However, body hair is sometimes drawn.

3.4 Teats

Female camels have udders with four teats located close to the two hind legs. Few camel petroglyphs in the Negev depict udders or teats. The isolated examples that do (which occur mainly in the earliest engravings), are unnaturalistic and present four large teats below the hump and body line (Figure 8). The camel, unlike bovines, do not 'store' milk in the udder but rather 'let down' the milk after stimulation (by the calf or hand massage, WERNERY, 2006:15- 17). Thus, even milk camels do not have such large, full udders as those depicted in the petroglyphs.



Figure 8. Camel with teats, Ramat Matred.



Figure 9. Camel with a calf, Ramat Barnea.

Few petroglyphs present a camel with a calf below, between its legs, in which cases the teats are usually not depicted (Figure 9). A unique example of a female camel, calf, and person milking her, may be seen in Figure 10.

Camel milk is available practically year-round. It substitutes at times for water in the desert and forms a regular and important part of the desert-dwellers diet (JABBUR, 1995:199, 215, for camel milk properties and herd demography see HORWITZ and ROSEN, 2005). Yet this aspect of camel herding is not depicted distinctly or commonly in the Negev rock art.

3.5 The up-turned tail

Camel tails reach 0.50 m in length, extending down to the knees of the hind legs. In the Negev rock art the tail may be depicted as slack, extending downwards, straight as a horizontal line extending from the camel, or up-turned. The majority (55%) of camels in the earliest petroglyphs are depicted with tails up-turned in a curved fashion. In later styles the percentage of up-turned tails drops to 33% on average. These findings are statistically significant considering that other tail positions include straight, or down turned. At times the tail is not depicted or obscure and its position remains unclear.

Transjordanian camel petroglyphs are often accompanied by an inscription in ancient North Arabian consisting of the artist's name and a word (bkr, bkrt, gml) denoting the camel.

In ancient North Arabian there is a linguistic distinction between male and female camels. The female camel is "bkrt" (Arabic bakra) while the male camel is called "gml" (Arabic jamal) or "bkr" (male camel calf). Thus, the inscriptions help the observer identify the sex and age of the camel in the petroglyph (CORBETT, 2010:117-126). A consistency in the camels' sex and the way it is depicted was noted (MACDONALD SEARIGHT, 1982). Female camels were presented with up- turned tails (WINNETT, 1957 nos. 60 and

803; WINNETT and HARDING, 1978 for example nos. 2018, 2112, 2763, 2731 and 3615b) while male camels, were presented with slack tails, and at times a penis (CORBETT, 2010:121). The up-turned tail of the camel appears to have been a gender-specific artistic convention accepted and known to the rock art makers of the Harra and Hismā deserts in Jordan, and the Negev Desert in Israel (CORBETT, 2010:120; EISENBERG-DEGEN and ROSEN, 2013).

The connection between female camels and up-turned tails may be rooted in the fact that when a pregnant camel is approached by a person, it will turn up it's tail. To this day, camel herders use the up-turned tail as an indication of a gestating camel (WOSENE, 1991). We may therefore conclude that the predominance of up-turned tails in the early Negev camel depictions indicates that most are females. However, a camel with a slack, long tail may, or may not, represent a male camel. Male camels, identified as such by the inclusion of a penis, were not found to date within the Negev rock art assemblage.

In the Negev, camels with up-turned tails appear in the earliest camel engraving phases and continued to appear through to the latest phase. MUSIL (1928:349) noted that female camels with slender bodies are the preferred riding camel for covering long distances as they are harder than the male camel. Whereas survival and continuity is assured by the female camel, labour and trade are carried out using the male camel (TEKA, 1991).

3.6 Saddle types

In the Negev, riding camels are presented in a few forms; with a saddle and reins but no rider, with a rider but no saddle or reins, or combinations of all elements. Saddles are infrequently depicted and never in full detail. Recognition of the saddle type is important as it can offer much information. Baum (2015) documented three saddle types used for the dromedary - Somali saddle used for pack camels which sits in-front of the hump; South Arabian riding saddle, introduced ca. 1200



Figure 10. Human milking a she camel with young suckling to 'letdown' the milk. Nahal Shazar.

BC, which sits behind the hump; North Arabian saddle, introduced ca. 500 BC, which sits on the hump and is used for riding and packing. Thus, from the placement and shape of the saddle depicted in the rock art, it is possible derive its function (riding, pack or for warfare), date and geographic influence.

However, mixed readings and identification of saddle types have been offered for much more detailed and refined camel images than those depicted in the Negev petroglyphs. For example, in the Lachish Reliefs, which depict the Assyrian victory over the Kingdom of Judah in 701 BC, there are several depictions of saddled camels. BULLIET (1975:75) identifies some saddles in these reliefs as representing South Arabian saddles and others as cushion saddles placed over a saddle cloth. BARNETT (2016) has pointed out several variations and details while FRENCH (1988:64) believes that these depictions in fact represent North Arabian saddles. In contrast, BULLIET (1975:91) has suggested that the earliest representation of the North Arabian saddle is on a Roman coin dated to 58-54 BC on which the Nabatean king Aretas is depicting as surrendering, while PARR (1990:81) considers the coin image to represent a cushion saddle.

The South Arabian saddle with a U-shaped cushion set behind the hump, seems to have been the earliest of the three saddle types identified thus far in the Negev petroglyphs (Figure 11a). This saddle was fashioned for bearing the loads of a single household (BAUM, 2015) and is ill-suited for transport of heavy weights over extended distances (BULLIET, 1977:40-55).

South Arabian saddles have been in use since the 9th century BC as this saddle type is depicted on the bronze gates of the ancient Assyrian site of Balawat dating to 859-824 BC. Later depictions include 1st century BC Yemenite funerary reliefs (BULLIET, 1975: 96). Riders placed behind the hump may be using the South Arabian saddle type, may represent women, or possibly even a raiding scene (MACDONALD, 1990). The Somalia camel saddle, with a wooden saddle bow placed in-front of the hump, is not depicted in the Negev petroglyphs.

Women may also ride in a hooded saddle (Utfā), or in an elevated more elaborate ceremonial saddle known as Tola. These are placed over the saddle rather than suspended between two camels as the movement make this type of litter very uncomfortable (ROBINSON, 1931). It has been proposed that in Saharan rock

art, camel palanquin depictions with no clear functional association, may serve as symbols of women (Soleilhavoup 2002). No examples of this type of saddle are known from the Negev petroglyphs.

The most common saddle shape in the Negev rock art is a V-shape placed on top of the camel's hump (with or without a rider Figure 11b), indicating a North Arabian saddle or Shadad-type saddle. Two or three lines extend from the camel's hump indicate the saddle, or more precisely, the holding knobs of the saddle. When both saddle and rider are depicted, then the rider is set in the center of the V-shape (Figure 11c). The saddle handles are presented in front of the hump, at the base of the camel's neck, usually as a knob. Rarely they are shown, as a ψ form indicating a Tuareg-type saddle (Figure 11d), a riding version of a pack saddle, which is considered a descendent of the North Arabian saddle and was commonly used in the Sahara (BAUM, 2015). In Figure 11d, we see that the Tuareg saddle is intentionally superimposed on an earlier footprint. The footprint was integrated into the later camel engraving with part of the footprint lines serving as reins as well as offering the camel engraving a terminus post quem of the Roman period (EISENBERG-DEGEN and NASH, 2016).

The North Arabian saddle, which places the rider on the hump (BAUM, 2015; DOSTAL, 1959), was extensively used in warfare as it offers the rider better control over the camel and the elevated position is a more efficient attacking position (BAUM, 2015). This saddle includes a saddle bow (a development dated to the mid-1st millennium BC), saddle cloth, breast strap and tail strap. Breast and tail straps are at times shown in the Negev depictions. Some camels have a line extending downward from their body. Of these, a number are presented as being ridden such that the line may represent a saddle strap.

In Figure 11b we see two camel petroglyphs engraved on the same panel, both camels have a saddle but no rider i.e. an empty seat. Traditionally, this 'empty seat' denotes

the absence of someone, or something, of great symbolic significance. It usually refers to the lavish palanquin in the Haj caravan which was transported either empty, to symbolize the absent Sultan, or containing a Quran or other object of high symbolic value. The tradition of an unriden camel or palanquin is known from pre-Islamic times in the Middle East and appeared in religious processions and even in major battles (BLAKE, 2013:95-97; PETERS, 1996:165). In the Ramat Matred example, a palanquin is not depicted but perhaps the empty saddle held similar connotations and meanings.

4. Chronology of Camel Styles

Grouping the camel petroglyphs according to form, it becomes evident that there are at least four styles within the Negev rock art. Each style is composed of a number of different aspects: The form of the camel (linear, out lined or fully pecked), hump size, shape and form (linear, out lined or fully pecked), technique (pecking, scratching, engraving). Each style is also characterized by a distinct hump shape (or shapes) and size. The styles appear to have evolved chronologically, based on the colour of their patina and the presence of associated inscriptions or wusum. The combination of these elements make up the styles (Table 1).

4.1 Style I (N=109 elements, 40.98% of all camel depictions)

The earliest Negev camels are characterized by large outlined humps (Figure 12). In Style Ia, the hump extends over the entire back of the camel, covering the length of the four legs (Fig 12. a-b). Slightly later (Style Ib, Figure 12c-d), we see linear camels with elongated outlines and round humps. The humps are set in the center of the body and are slightly narrower than those of Style Ia, covering at times only the distance between the camel's second and third leg. The majority (over 55%) of the latter camel petroglyphs represent female camels They are presented either with an up-turned tail, teats, or young. The four camel petroglyphs with a young calf, are all of Style I. Style I camels are rarely

Munsell chart 7.5 YR												
Style	N	%/ all camels	2.5/1-4/4		4/6-5/4		5/5-6/8		7/1-7/8		8/2-8/6	
Style I	109	40.98%	72	66.05%	19	17.43%	11	10.09%	2	1.83%	2	1.83%
Style II	4	0.02%	2	16.66%	0	0.00%	1	16.66%	0	0.00%	1	33.33%
Style III	127	48.10%	35	27.55%	21	16.53%	58	45.67%	9	7.08%	8	6.30%
Style IV	24	9.02%	4	16.60%	1	4.16%	5	20.83%	8	33.33%	3	12.50%
Total	264	98.12%	112	42.10%	41	15.41%	75	28.19%	19	7.14%	15	5.63%

Style	Tail				Domestication											
	Up	Straight	Down		Reigns	Ridden	Saddle	Led by Man	With Young							
Style I	63	57.79%	22	20.18%	16	14.67%	8	7.34%	14	12.84%	4	3.65%	3	2.75%	4	3.67%
Style II	2	33.33%	0	0.00%	2	33.33%	0	0.00%	1	16.66%	1	16.66%	0	0.00%	0	0.00%
Style III	41	32.28%	13	10.23%	47	37.00%	15	11.80%	17	13.38%	14	11.02%	11	8.66%	0	0.00%
Style IV	8	33.33%	4	16.66%	3	12.50%	2	8.33%	6	25.00%	5	20.83%	0	0.00%	0	0.00%
Total	114	42.85%	39	14.66%	68	25.56%	25	9.39%	38	14.28%	24	9.02%	14	5.26%	4	1.50%

Table 1. Summary of camel petrogllyph corpus studied.

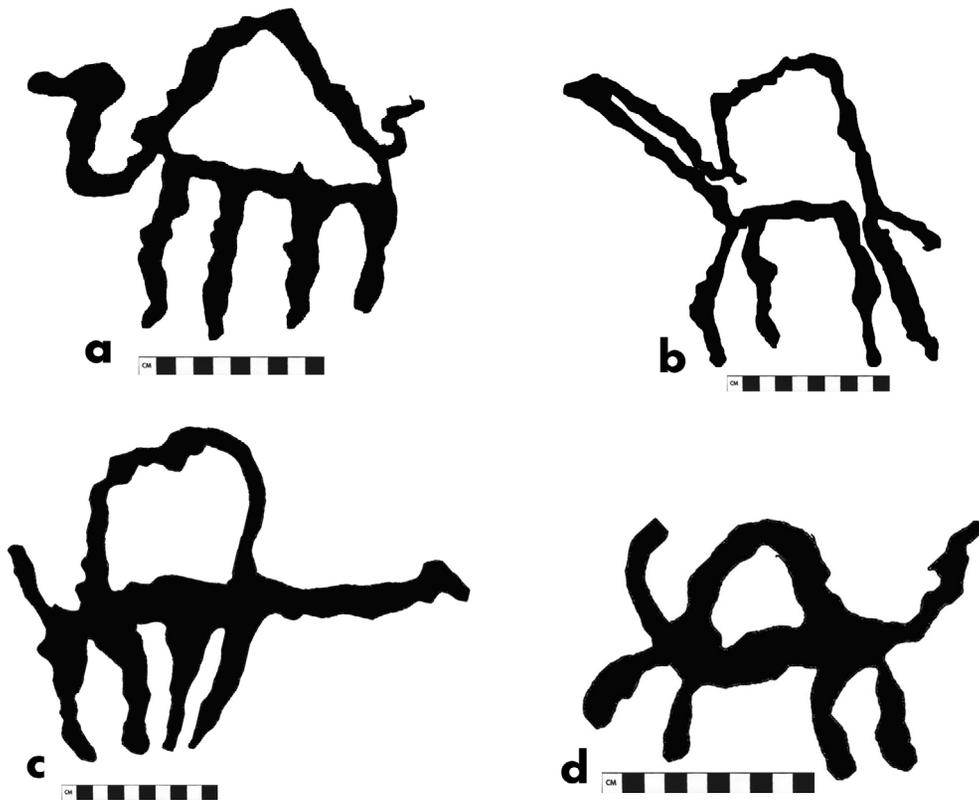


Figure 11. Style I, a-b Style Ia, c-d Style Ib.

presented with a cameleer or rider. The camels of Style I lack ears, hoofs or other physical details. Over 65% of Style I camel petroglyphs have reformed patina of the darkest shades (Munsell chart 7.5 YR 2.5/1-4/4, Table 1). It is difficult to date this Style though most petroglyphs of this style clearly predate the Roman period. It is possible that some of Style I camels date to the Iron Age and the first introduction of the camel into the Negev region.

4.2 Style II (N=4 elements, 0.15% of all camel depictions).

Less than 1% of the Negev camel corpus are represented by Style II (Figs. 13). The few examples are consistent in the manner the camel is formed, the hump size, shape and form as well as the technique used. The camels of this

Style are characterized by the competence of the engraver, the type of rock surface chosen for engraving as well as the shade of the reformed patina. One of the Style II camels is pecked into a light colored lime stone (Fig 13. a) that has not developed a dark patina crust, while the other three are pecked into boulders with a dark patina (Figure 13 b-d).

Style II present elegant large humped camels made with flowing lines. The details, made in outline, are on the one hand more implied, especially as the lines of Style II do not always meet, but also pay more attention to detail and the physiological characteristics of the camel's body, neck and hump. The hump is large forming a continuous part of the body. At times the camel's hair is indicated with short lines extending from its body and tail. The fluid style of these camel petroglyphs stands in contrast to the

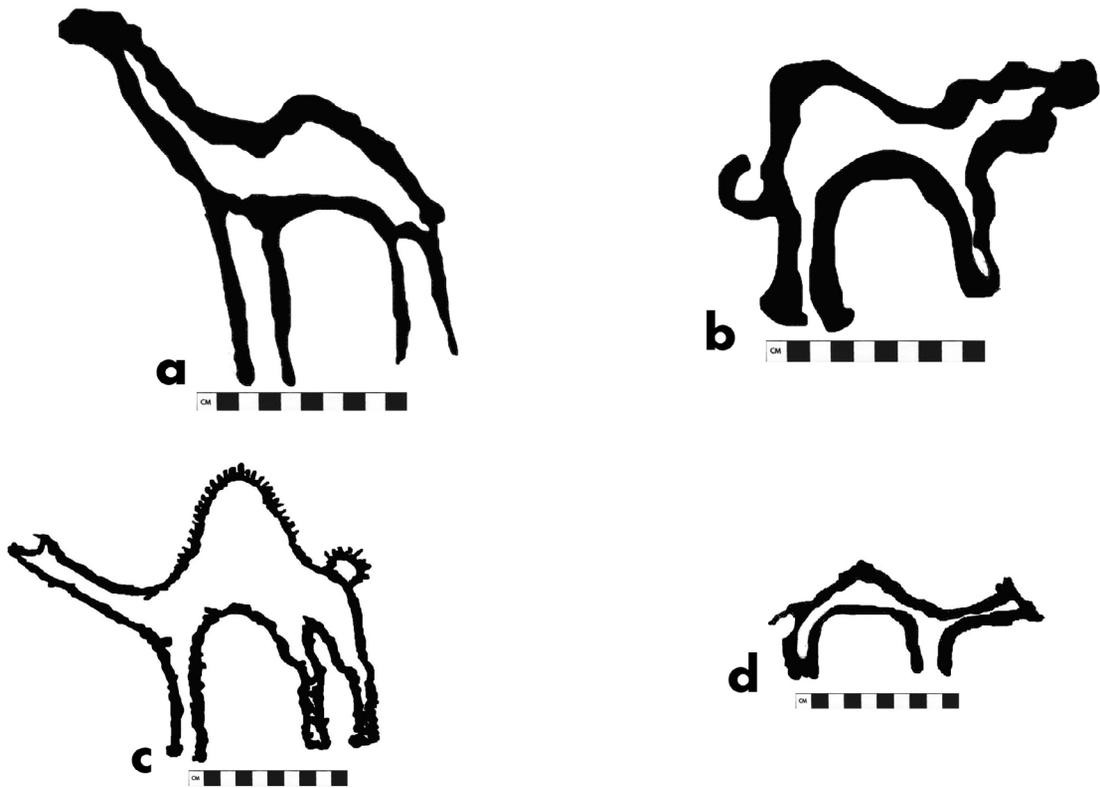


Figure 12. Style II.

minimalistic linear Styles I and III, which are the prevalent forms of the Negebite rock art style. A number of Style II camels were accompanied by a Safaic inscription. Style II camels closely resemble the camels in northern Jordanian rock art (see for example WINNETT, 1957:729, no. 3615 b) which are often accompanied by such inscriptions which date to the 1st century BC through 4th century AD. Thus, the northern Jordanian inscriptions and camel petroglyphs as well as the Negev Style II camels, probably date to the Roman Period.

4.3 Style III (N=127 elements, 48.10% of all camel depictions)

Alongside the continuity in style, certain and subtle changes are seen in the form of the camel petroglyphs. These changes are evident in the camel hoofs which are often presented, many

times thickened and emphasized, while ears that are likewise often featured. In Style III, the hump size, shape and form are the most diverse (Figure 14). Depicted are large humped camels with emphasized hoofs, and at times with a fully pecked hump – probably dating to the Roman and Byzantine periods or later (Figure 14a-b). There are also camels with a small hump in the center of the back, not covering the distance between the legs (Fig 14c- d). This hump may be rounded, horseshoe-shaped or square. Relatively small horseshoe-shaped humps may also be placed on camels shown with a fully pecked or outlined body. The techniques used to make Style III petroglyphs is more diverse including pecking and engraving. The majority (45.67%) of these camel petroglyphs have reformed patina that ranges between 5/5-6/8, Munsell chart 7.5 YR (Table 1).

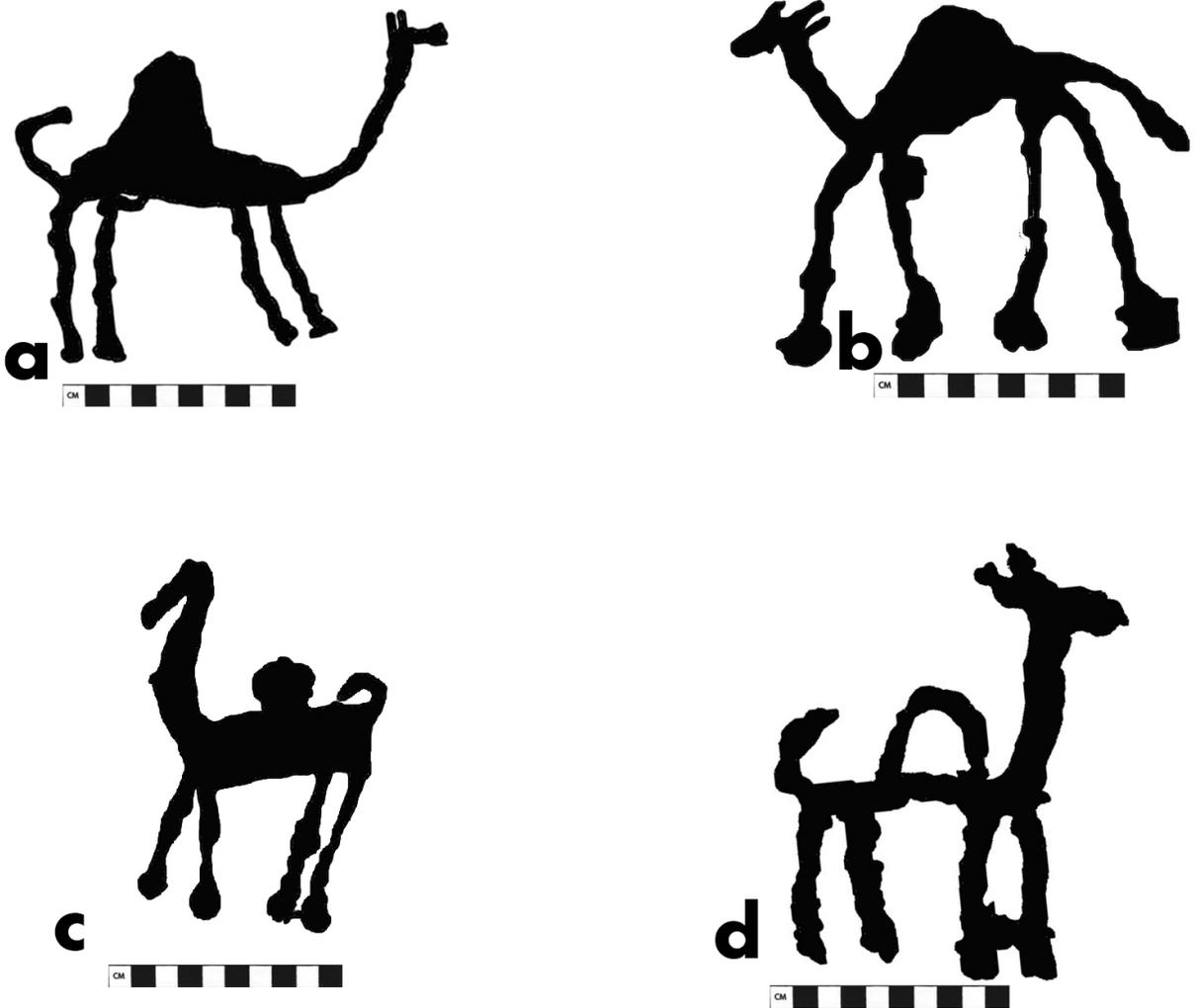


Figure 13. Style III.

Several camel petroglyphs present attention to anatomical details such as the form of the legs, body and ears which are engraved more often at this time. Compared to the Style I camel petroglyphs, Style III presents a higher percentage of animals with long, downturned and slack tails (37% in Style III versus 14.67% in Style I). Over 10% of the Style III camels have clear signs of domestication as they are depicted with a cameleer, reins, saddle and/or a rider. Indeed, the majority of camel petroglyphs with riders/saddles

fall in Style III, though some are presented entirely unrelated to people.

Style III camel petroglyphs have a slightly lighter color of the reformed patina than the Style II engravings (Table 1). They are at times associated with Arabic inscriptions which date some of the petroglyphs, especially the small humped camels, to the Early Islamic period (7th – 10th centuries AD).

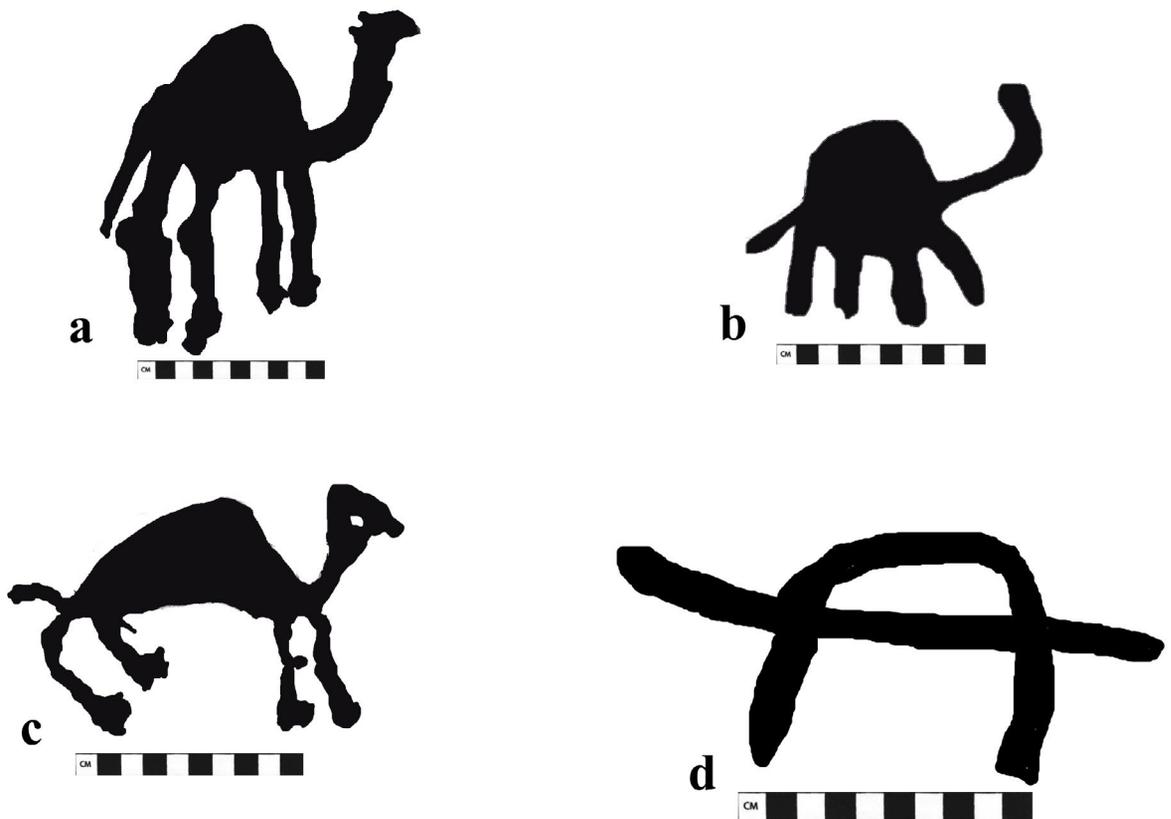


Figure 14. Style IV.

4.4 Style IV (N=24 elements, 9.02% of all camel depictions)

Style IV is not as consistent as Styles I-III. Attribution of petroglyphs to Style IV is first and foremost based on the very light color of the reformed patina, indicating their recent date.

5. Discussion

Camel petroglyphs may be read on several levels. We should keep in mind that each and every individual experiences a unique encounter with this rock art. One that is affected by our cultural upbringing but also by the person's mood at that given moment, the time of day and the visibility of the petroglyph. Even if two individuals view rock art together, the image

may resound for each one differently. Likewise the same image offers different meanings to the same person when viewed on different occasions. How therefore can we hope to understand the camel petroglyphs as their makers did, or as their contemporary audience did? For the 21st century audience, the most meaningful interpretation of the camel petroglyphs is one that retells the history of the land and its peoples. Consequently, we may look at the depiction of the camels' form, place it within a style and then infer its chronological and cultural affinity on which interpretation may be based.

To begin with, camel petroglyphs may be interpreted as representations of daily life, with the image acting as an extension of the animal's economic utility within ancient nomadic societies. Thus, the changing styles reflect shifts

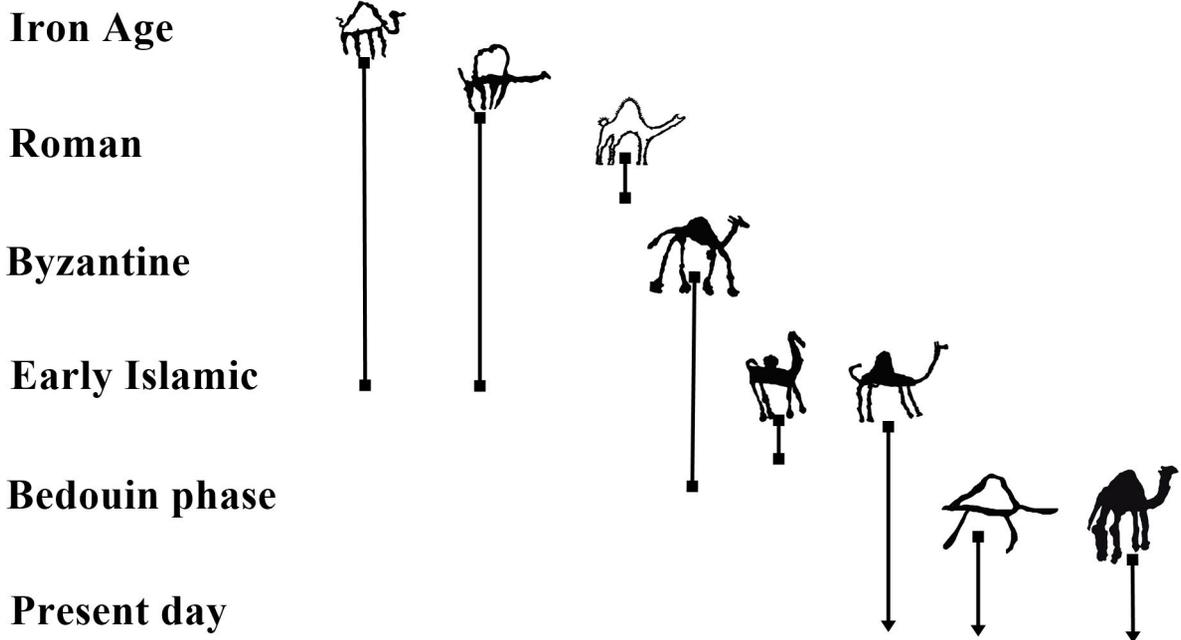


Figure 15. Chronological development of camel petroglyphs.

in the economy, the introduction of a new camel breed and the movement of people into, and/or, passing through the Negev.

Although this purely economic explanation is tempting given the realistic representation of camel trains, riders with spears etc., it is most likely that the camel petroglyphs are also aniconic and represent the symbolic world of past desert societies. Thus, the changing styles reflect shifts in the economy, the introduction of a new camel breed and the movement of people into, and/or, passing through the Negev.

Although this purely economic explanation is tempting given the realistic representation of camel trains, riders with spears etc., it is most likely that the camel petroglyphs are also aniconic and represent the symbolic world of past desert societies. Thus, the camel may have acted like a totem and its depiction may have served as a symbol of a culture, embodying

aspects of the societies ideological and value systems (e.g. KÖHLER-ROLLEFSON, 1993).

Indeed, the camel petroglyphs are imprinted with a culturally-formed consensus. CORBETT (2010: 124: 150), suggests that they held specific cultural and religious meanings and associations. Interpretations may then attempt to relay an emic meaning achieved through the study of Southern Levantine and Arabian mythology and iconography. Examples of these different interpretations of the Negev camel petroglyphs are presented below, and are considered as complementary rather than exclusive.

5.1 Gods, Devotees and Offerings

The Hellenistic Syrian god Arsu, god of the caravans was regularly portrayed as a heroic armed figure mounted on a female camel. Thus, an engraving of an anthropomorph riding a camel

may portray Arsu. Some researchers suggest that even the image of the camel itself came to represent the power and presence of the god (ROSTOVITZ, 1932: 112), while as noted above, camels depicted with a saddle but no rider may reflect the absence of the god, symbolize an absent ruler or the absence of something else of symbolic value. Numerous terracotta, and occasionally bronze, camel (and horse) figurines, with or without riders, have been unearthed in Nabataean cities, houses, temples and tombs (TUTTLE, 2009). It is unclear whether the camel riders represent deities, heroes or gods. Some figurines bear inscriptions of offerings to Nabataean deities, setting the figurines within a votive context (EL-KHOURI, 2002:109). Through the offerings the devotee could ask the gods for protection and guidance in business and daily life (ROSENTHAL-HEGINBOTTOM, 2003). The figurines from the domestic realm “were probably placed in special places in the house, with the belief that the figurines would serve to protect and save the people” (EL-KHOURI, 2002:110). Terracotta camel figurines associated with tombs may have been believed to help transport the dead through to the afterlife (GLUECK, 1966: 242).

In pre-Islamic Northern and Central Arabia, the camel was regularly offered as a sacrifice to Arabian deities, local gods and in memory of the ancestors (HAYAJNEH, 2006). Female camels were also ritually sacrificed and buried at the graves of their masters, a ritual that continued into the Nabataean period (FARAJAT and NAWAFLEH, 2005: 392). Some suggest (EL-KHOURI, 2002) that the miniature clay camel figurines found in large numbers at Petra may represent substitute sacrificial offerings to Nabataean gods. In the same vein, the camel petroglyphs accompanying Thamudic dialects, Safaic and Nabataean texts may have acted as symbolic offerings (CORBETT, 2010:141-142).

5.2 Evolution of Style

The strength of the present research is the large sample size and limited geographic

extent of the depictions studied. The camel petroglyphs discussed here come from rock art sites constrained within a 25 km (east-west) by 10 km (north-south) section of the Negev Highlands, and the patterns noted between sites accord completely. Notably, in this research we have managed to empirically tie the stylistic changes to a narrow range of different colors of the reformed patina, as well as associated inscriptions, and so define time-frames for each Style (Figure 16).

It is possible that the different Styles in the rock art depictions showing the different-sized and shaped humps, reflect camel breeds even if the other visual differences between modern camel breeds are not expressed in the rock art imagery. Today, aside from geographic and cultural affinities, camel breeds are discerned one from another based on their overall body size, color, length of hair, legs, ears and teats, as well as shape and placement of the hump (ABDALLAH and FAYE, 2012: 273-279). Three camel breeds have been identified in Saudi Arabia, two of which are of special interest to us here. The first group consists of sizeable camels with large, rounded or pointed humps set in the middle of the back, i.e. similar to those of Styles I and II. These camels are especially adapted to desert areas and are considered good, or even ‘the best’, milk producers. Thus, it is suggested here that the large humped camels of Styles I-II represent primarily a breed of milk camels. The Style I, large humped camels with a hump covering the majority of the animal’s body, appear to have been a popular icon and were engraved roughly over the same time period throughout this geographic area, and perhaps beyond.

The second camel ecotype comprises relatively slight camels from the hill and beach region of Saudi Arabia. These camels have small-sized humps set on the hind part of the back and are ‘multipurpose’ animals (ABDALLAH and FAYE, 2012: 273-279). They resemble those depicted in Style III. The appearance of a small horseshoe-shaped humped camel, may then be tied to the Islamic conquest of the 7th century AD (GILL 1997). At this time, there was increased movement of Arab tribes into the region, although there is

some evidence for earlier movements of tribes into the Negev (KATSAP and SILVERMAN, 2016). In this period, people appear to have brought with them camels that were ridden, used as pack animals, as well as milked i.e. multipurpose camels. These camels may be considered as a different breed than the milk camels exploited in earlier periods in the Negev. Looking at the petroglyph data, roughly the same percentage of camels of Styles I-III are depicted as being ridden (see Table 1.), i.e. even though the large humped camels were initially a milk breed, they too were probably ridden sometimes. The subsequent Negev camel petroglyph styles, especially Styles III and IV, have unique attributes that clearly tie them to cameleers and so perhaps to camel trains and trade.

The Negev camel petroglyphs follow the same evolution as those from Elkab in the Eastern Desert of Egypt (HUYGE, 2002:195). Style III camels - that are with outlined humps, develop into smaller but fully peaked humps. The dates offered for these changes at Elkab are likewise in agreement with the Negev, placing this stylistic change in the Early Islamic period. However, the large humped camels of Style I seem to be missing from the Eastern Desert repertoire.

5.3 The Movement of People

The differences noted between Style I and II in the Negev camels are, as noted above, chronological. Style II highlights the extensive involvement in long distance movement of people and trade goods through the region. It is dated to the Roman period based on the association with ancient North Arabian inscriptions.

Style III is found throughout the entire survey area and attests to the full integration of the camel into the economy and subsistence of local desert communities. It can be related to the 7th century Islamic conquest and arrival of a new population in the region. The Style III camels are characterized by the appearance of a reduced, horseshoe-shaped camel hump, which may represent a new camel breed.

The third example of identifying the movement of people (or ideas, knowledge) through the Negev comes with the depiction of the Tuareg style saddle (discussed above).

In Style IV camel depictions are often associated with wusum which point to their recent date (ca. past 200 years). These petroglyphs may be tied to the latest migration of Bedouin into the Negev in the late 18th and 19th centuries (from arid regions of Arabia, Transjordan, Sinai and Egypt) in the wake of Napoleon's invasion of Egypt and Palestine in 1798-99 and subsequently during the rule of Muhammad Ali in Egypt (YAHIEL *et al.*, 2012).

5.4 A Changing Economy

The main differences noted between Styles I – II and Style III are reflected in the form of the hump. We suggest that the large versus small humps represent two distinct camel breeds. Style I – II with large humps and up-turned tails represent female milk camels and so reflect a focus on camel herding for milk production. The large humped camels may also represent idealized representations of healthy camels and so are symbols of a strong and healthy human society.

The camels of Style III probably represent a new breed that was introduced into the Negev in the Early Islamic period. This was a multipurpose camel, which could be milked but was also used as a beast of burden and for riding. The introduction of Style I and III camels both reflect important and pivotal moments, ones that had deep and meaningful impacts on the Negev's economy and subsequently, culture.

Firstly, the initial introduction of camels in the Iron Age II resulted in the expansion of the diet of the inhabitants of the Negev and other desert regions. Adding camels to herds of goats and sheep which were raised in the region, expanded the subsistence base of the people. In modern-day societies when camels are raised with caprines, aside from labour they

serve as the main milk producers but also as a meat provider (primarily culling of male camel calves and sacrifices). Camels are hardy (able to withstand changes in body temperature, water consumption and a range of food types) and so are able to endure harsh desert conditions, a fact that is especially essential for survival through drought years. Beyond meat and milk camels also provide skin and wool used for weaving (CHAND *et al.*, 2009).

Most importantly, the camels adaptation to transport heavy loads in hot and very arid environments, their use in agricultural labour and for riding and carrying goods - for both civilian and military purposes - revolutionized the manner in which people could exploit deserts. Camels enabled people to migrate for further distances and carry more baggage, such as a tent (ROSEN and SAIDEL, 2010). They also served as effective mounts and baggage carriers in military campaigns. Perhaps their most significant contribution to the region was that they facilitated the development of distant trade, so expanding the economy since a healthy pack camel can carry loads of one third to one half of their body weight over long distances (SCHWARTZ, 1986). Camel trains proved to be a cost-effective mode for transporting goods in the Near East and, as argued by BULLIET (1975), were probably responsible for the abandonment of wheeled carriages used for transport in the Roman Middle East. Thus, from the Iron Age onwards, the domestic camel enabled the development and expansion of the network known as the "incense route" (e.g. POTTS, 1988; MILLAR, 1998; JASMIN, 2005; HABAS, 2009).

According to pre-Arabic poetry, the nomad had a special relationship with the she-camel who took on the role of mediator in poems. As CORBETT (2010: 128) explains, "It was a natural being so important to daily human existence that it was ultimately culturally appropriated to help describe and mediate people's relationships with each other and the natural and supernatural worlds around them." The male camel with a broad, muscular frame, appears in the poetry almost exclusively as a beast of burden in relation

to the clanswomen and their belongings as they abandoned a campsite and rode into the desert. The female camel is presented in the poems as loyal and trustworthy, bearing her master through the desert wastes. The female camel carried a symbolic burden reflecting the hardships, aspirations, and underlying purpose of the poet hero's journey. The female camel was a symbolic vehicle for mediating certain liminal episodes of the shared human experience, especially death and the sacred (CORBETT, 2010: 131). In the Negev we see a preference to depict female camels. The economic aspects are hinted at with the prevailing large humped, upturned tail in female camels and large teets as seen in Style I petroglyphs. But this gender specification seems related to the camel as a provider rather than a mediator. However, other features noted by CORBETT (2010) may be identified in the Style II camels, and these may be tied to a specific people and culture (also through their poetry highlighting the camel's role and underlying meaning and significance).

Notably, the introduction of the camel would have affected the social structure and organization of everyday life; a member of the household would accompany the camels to pasture, another would perhaps milk them, and a third would spin camel wool into thread for weaving. The ancient owners, as today, would probably have known each camel and when engraving its petroglyph, might have depicted a specific individual rather than a generic 'camel'. In conclusion, the camels depicted in Negev rock art serve as a key to the social, economic and symbolic world of past communities that inhabited this region.

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