Geoglyphs on the Har Karkom plateau (Negev, Israel)

*Federico Mailland**

Summary

The presence of geoglyphs on the Har Karkom plateau had already been identified by Emmanuel Anati since 1994 during the aerial survey of the area.

Figures of large size quadrupeds, made by alignments of yellowish limestone pebbles, clearly appear above the brown ground of tabular flint of the plateau. These figures, even over 30 m long, have been obtained by taking advantage of the natural limestone outcrop, and completing the shapes by drawing with pebbles ventral and dorsal lines, legs and horns. Due to the large size, the shapes of the figures are hardly visible on the ground, but they appear clearly from an aerial view. During the 2007 survey campaign at Har Karkom, it was possible to investigate some of those geoglyphs in details, by means of zenithal pictures taken by a digital camera floating from a helium aerostatic balloon. The ground preliminary investigation of the geoglyphs led to conclude that the stones were intentionally put to form lines, in order to suggest shapes that could be seen only from an aerial view, and that the upper surface of the stones had a very old oxidative patina, by confirming that the lines were drawn in ancient times. Until that time it had been not possible to hypothesize the geoglyph age, but the zenithal pictures led to consider them into a new light. In the middle of a group of Palaeolithic sites, by respecting the hut floors, there are the remains of three geoglyphs with a large quadruped shape, drawn by alignments of limestone pebbles on the flat surface of tabular flint.

The first geoglyph, with a rhinoceros shape, was represented as a full figure, 31.70 m length by 12.20 m height. The geoglyph was obtained by using in part the natural limestone outcrop for the animal body, and adding stone alignments to draw ventral line, legs and horns. The other two geoglyphs are less evident. They have been drawn as contour. One (19 m long) has tumuli and a stone built cyst grave in the middle of its body, which appears as a later addition. It seems to represent an animal with trunk and tusks. The third one, 12 m long, represents a quadruped, maybe a phacocerus.

Dating the geoglyphs to Palaeolithic is considered, as the represented animals were already extinct at the end of Pleistocene in the whole Syro-Palestinian area.

Riassunto

La presenza di geoglifi sull'altopiano di Har Karkom era stata segnalata da Emmanuel Anati sin dal 1994, durante la ricognizione aerea della superficie del plateau.

Grandi figure di quadrupedi, ottenute con allineamenti di pietre in calcare di colore giallognolo, si stagliano chiaramente contro la superficie bruna di selce tabulare dell'altopiano. Figure di lunghezza anche superiore ai 30 m sono state realizzate utilizzando in parte gli affioramenti naturali di calcare, e completando le forme con ciottoli sempre in calcare allineati per disegnare linee dorsale e ventrale, zampe e corna. Data la grandezza delle figure, le forme non sono comprensibili dal suolo, mentre sono individuabili dall'alto.

Nel corso della campagna di ricognizione a Har Karkom del 2007 è stato possibile studiare nel dettaglio alcuni di questi geoglifi, eseguendo fotografie zenitali per mezzo di una fotocamera digitale appesa ad un pallone frenato a elio.

Lo studio preliminare dei geoglifi effettuato sul terreno permetteva di concludere che le pietre erano state poste intenzionalmente a formare allineamenti, in modo da suggerire forme che potevano essere viste solo dall'alto, mentre la patina antica della faccia superiore delle pietre confermava che gli allineamenti erano stati effettuati in epoca antica. Fino a quel momento non era possibile avanzare ipotesi sulla datazione di queste figure. La fotografia zenitale permetteva di considerare i geoglifi esaminati sotto una nuova luce.

Nell'area compresa in mezzo a un gruppo di siti Paleolitici, rispettando i fondi di capanna di questi siti, tre geoglifi in forma di grandi quadrupedi sono stati realizzati allineando serie di pietre calcaree sulla superficie piatta di selce tabulare. Il primo geoglifo rappresenta un rinoceronte, di m 31,70 di lunghezza per 12,20 di altezza, realizzato a figura piena e aggiungendo allineamenti di pietre di cm 20-30 di lunghezza, per completare zampe, linea ventrale, coda e muso dell'animale. Gli altri due geoglifi, di comprensione meno evidente, sono eseguiti a solo contorno e sembrano rappresentare un animale con proboscide e zanne e rispettivamente un quadrupede interpretabile come un facocero.

Per i geoglifi si suppone una datazione al Paleolitico, perché gli animali rappresentati si sono estinti nell'area siro-palestinese alla fine del Pleistocene.

* Federico Mailland
ALA, Associazione Lombarda Archeologica, Italy

Résumé
La présence de géoglyphes sur le haut plateau de Har Karkom avait été signalée par Emmanuel Anati pendant la campagne de recherche du 1994 en faisant la récognition aérienne de la surface du plateau. On peut voir très clairement, sur le terrain brun de silex tabulaire, de grande figures de quadrupèdes obtenus par des lignes de pierres de calcaire jaunâtre. Ces figures, de plus de 30 m de longueur aussi, ont été réalisées en utilisant en partie les affleurements naturels de calcaire, et en complétant les formes pour dessiner la ligne ventrale, dorsale, les pattes et les cornes. La grande taille des géoglyphes rend difficile les reconnaître du terrain, tandis qu'ils sont clairement visibles du ciel.
Pendant la campagne de recherche du 2007 à Har Karkom, de grands géoglyphes ont étés étudiés en détaille par des photographies zénithales, obtenues avec un appareil digital flottant par un ballon à hélium. L'étude préliminaire des géoglyphes, effectué sur le terrain, a permis de conclure que les pierres avaient été posées de propos pour former des lignes, en donnant la suggestion de figures que l'on pouvait regarder seulement du haut, tandis que la patine ancienne de la face supérieure des pierres confirmait que les lignes avaient été faites dans une ancienne époque. Jusqu'à ce moment là il n'était pas possible donner des hypothèses sur la datation de ces figures. La photographie zénithale des géoglyphes examinés a permis de jeter une nouvelle lumière sur leur étude. Dans l'aire comprise au milieu d'un group de sites du Paléolithique, en respectant les fonds de cabanes de ces sites, il y a trois géoglyphes en forme de grands quadrupèdes réalisés en faisant des lignes de pierres calcaires sur la plate surface de silex tabulaire.
Le premier géoglyphe, en forme de rhinocéros, a été réalisé comme une figure pleine, de m 31,70 de longueur et m 12,20 de hauteur. Le géoglyphe à été obtenu par partielle utilisation du naturel affleurement de pierres calcaires claires pour rendre le corps de l'animal, et en ajoutant des lignes de pierres pour dessiner la ligne ventrale, les pattes et les cornes. Les autres deux géoglyphes sont moins évidents et ils ont étés obtenus seul par le contour. Un, de m 19 de longueur, et dérangé par des structures de la période chalcolithique, sembles avoir la forme d'un animal avec trompe et défenses. Le troisième géoglyphe, de m 12 de longueur, représente un quadrupède, peut-être un phacocerus.
Une datation à la période Paléolithique est proposée, parce que les animaux représentés étaient déjà disparus dans l'aire Syro-palestinienne à la fin du Pléistocène.

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Introduction - Geoglyphs around the world

Prehistoric people sometimes undertook the decoration of hillsides or even entire landscapes – a category of art known as ground drawings or geoglyphs. Among the most famous are the giant hill figures of southern England, images made by removing turf above chalk to make a bright white line against a green background. The giant figures are of unknown age and controversy rages over the date of some of them, like the Cerne Abbas Giant or the Long Man of Wilmington. Conversely, there is agreement among scholars that the Uffington Horse is prehistoric. This figure, 110 m long, has been drawn on a side of the White Horse Hill, that overlooks the homonymous valley in the Uffington village (Oxfordshire) and its best view is from the opposite side of the valley. The figure has been dated by means of the optical stimulated luminescence to 1400 B.C. and the date has been confirmed by the finding of coins dating back to the Iron age, representing the image of the White Horse [Miles D. 2003].

In the north-east United States there exist large prehistoric earthen mounds, some of which were built in animal shapes. The best known of these is the Great Serpent Mound of Ohio [Glotzhober R.C. 1994], dating back to 2900 BP, or 2000 years later according to different ^{14}C analyses [Fletcher R.T. 1996, Saraceni J. 1996]. The serpent, which is about 420 m long, would have been a totemic shrine of ancient native people, built on platforms made of earth and stone. In Arnhem Land, north Australia, contemporary aborigines make sand or earth sculptures during mortuary or healing rites: anthropomorphic figures, images of giant fish traps, and others [Berndt R.M. & Berndt C.H. 1954]. It is most probable that such temporary art forms also existed in prehistory. Another form of drawing in the landscape is the so called desert intaglio, made by carving away the darker top layer of rock in the moonscape desert, revealing a lighter sand and subsurface. The difference in colour and relief produces distinct images. These exist in Australia, Chile, Arizona and California. About 300 figures are known in the desert of the American south-west, and ^{14}C dating of organic material growing on gravel in figures near Blythe, California, gave dating of about 1100 years BP [Dorn R.L. 1992]. To the local native Americans, the images are living shrines made by their remote ancestors. In northern Australia, in historic times, large designs were observed on the surface of the plains. They were made in the dry season, while the ground was still damp, by pounding the earth with stones to render it smooth. It is probable that this kind of images, not permanent unlike the desert intaglios, were made there since prehistoric times.

However, the best known examples of desert intaglios are the figures of Nasca, Peru. Those images are best visible from the air and represent geometric shapes or animals – birds, a monkey, a spider, whales – up to 200 m long. Furthermore, they are found among straight lines up to 10 km long. There is agreement on the first theory of Maria Reiche that the geoglyphs were contemporaneous to the Nasca culture and the investigation of the organic material encapsulated into the new rock patina gave ^{14}C dating between 1400 and 2100 BP [Dorn R.L. 1992]. They have been connected to religion and spirituality and interpreted by some scholars [Shimada I. 1999] as ceremonial pathways.

A different kind of surface image is known from Canada. Petroforms were made by setting out several small stones to form large outline figures or geometric shapes. Stone alignments like those are known from the deserts of American south-west and from the northern plains of North America. In Manitoba (Canada) prehistoric inhabitants constructed medicine wheels, i.e. stone alignments in shape of radiating spokes [Steinbring J. 1970]. They were made by placing rocks down into a circle shape, and four lines or more of rocks were put down across the circle, or near the circle. Medicine wheels were used for important ceremonies, teachings, and as sacred places to give thanks to Gitchi Manitou, also known as the Great Spirit. Some of those stone alignments may be 5,500 years old.

Geoglyphs or pebble drawings at Har Karkom

The presence of drawings on the landscape of Har Karkom plateau had already been identified by Emmanuel Anati [Anati E. 1994; Anati E. 1999] during the aerial survey of the area.

Some are lines, geometric arrangements, or abstract shapes; others are anthropomorphic figures or large size quadrupeds, made by lines of yellowish limestone pebbles, that clearly appear above the brown ground of tabular flint of the plateau. Due to the large size, the shapes of the figures are hardly visible on the ground, but they appear clearly from an aerial view.

In the total area of survey (200 square km), forty-three geoglyphs or pebble drawing were identified - large patterns or figures created in stone alignments or by clearing stones from ground surface. Their function is still open to debate. It was thought that they might have been offerings to an invisible celestial entity. It has also been suggested that they indicated holy domains that were symbolised by these images. Some of the sites have traces of trails around them and may have been locations demarcated for performances evoking mythical choreographies [Anati E. 2009].

Out of the 43 geoglyphs, 25 are concentrated on top of Har Karkom plateau and in the western valley (Figure 1). Few are scattered in the area south to Har Karkom mountain or at north, in Beer Karkom area. We cannot exclude that these geoglyphs belong to more than one period and had more than one function. The figures were found in proximity of Palaeolithic, or BAC or rock art sites, but until now it had not been possible to hypothesize their age, apart from few exceptions. One is represented by the abstract lines of pebbles of the Palaeolithic sanctuary HK/86b, entirely made by flint cores and flakes and representing oval shapes. Because of the quantity of Upper Palaeolithic flint implements and the absence of findings from other periods, it was postulated that the geoglyphs belong to the same age as the sanctuary and the flint implements used to make them. Another exception is the row of stones over 100 m long, found near the Iron age site HK/173. The line ends on top of a small hill, with a scorpion figure also made by lines of stones.

The investigation by zenithal picture

During the 2007 survey campaign at Har Karkom, the Author investigated some of those geoglyphs in detail, by means of zenithal pictures taken by a digital camera floating from a helium aerostatic balloon or appended to a kite, according to meteoric conditions. Aerial pictures were taken with the cooperation of the Canadian Experts group, including Paul Bauman and Chris Slater. The maximum altitude above the ground level reached during the April campaign was about 150-200 m.

The explored area was a flat rectangle included between the coordinates north to south 967580 - 967480 and west to east 125330 - 125440 according to the Israeli Grid (OIG). Some 100 m north of that area is a late Chalcolithic structure, the so called Midianite temple HK/24a. In an area of 11,000 m^2 are the remains of four Palaeolithic campsites, named HK/197a-d, where during previous surveys were found flint industries of late Lower Palaeolithic, Middle Palaeolithic or early Upper Palaeolithic, respectively. The Figure 2 reports an aerial picture of the whole area from an altitude of about 100 m above the ground level. The brown colour of the surface is given by a layer of tabular flint that covers the full flat surface of the Har Karkom plateau. The removal of the brown flints lets the underlying layer of fine, yellow loess appear. The remains of the Palaeolithic hut floors, cleared of stones in ancient times, are still clearly visible on the brown surface of the ground.

In between the Palaeolithic campsites there are three animal figures, several m long, made by yellowish limestone alignments, that clearly appear against the brown background. The location of the three figures is shown by the dotted oval lines of Figure 2. Other stone alignments in the same area may require further investigation.

At the ground examination, the geoglyphs were likely obtained by intentionally putting stones to form lines and to complete the shapes suggested by the natural geomorphology. The presence of lichens and

the very old oxidative patina on the upper surface of the stones let to confirm that the lines were drawn in ancient times, though until now it was not possible to have an instrumental measurement of dating.

The zenithal pictures led to consider them into a new light. All the three geoglyphs apparently represent large mammals. The largest one (Figures 3 and 4) is a drawing of a rhinoceros, 31.70 m length by 12.20 m height. The figure has an orientation south-north, with the head on south and the legs on west. The animal was represented as a full figure, by using the natural limestone outcrop and completing the shapes by aligning limestone pebbles to draw dorsal and ventral lines, legs and horns. Anatomic particulars are evident, as a large lower horn and a small upper one above the animal nose, and the outline of the right thigh. The animal is represented half face, with a large body and short, thin legs. Some of the white stones have late rock engravings from the Islamic period.

The second geoglyph (Figures 5 and 6), 19 m long, has been drawn as contour. It has tumuli and a stone built cyst grave in the middle of its body, which appear as later additions, possibly from the Chalcolithic period. The figure has an orientation north-south, with the head on north and the legs on west. Clearly visible are the dorsal line and the posterior legs. Other lines in the anterior part appear as a trunk and two tusks. It likely represents an elephant.

The third geoglyph (Figures 7 and 8) 12 m long, has also been drawn as a contour, with the exception of the muzzle, represented as a full figure. This geoglyph has an orientation south-north, with the head on south and the legs on east. The figure represents a quadruped, also a large mammal, maybe a phacocerus.

Tentative dating

In general, it is very hard to date geoglyphs. When agreement on dating exists, this is based on ^{14}C measurements of organic material included in the patina, reasonably formed after geoglyphs drawing. Conversely, for the Uffington Horse dating was provided by means of optically stimulated luminescence of feldspars and quartz present in the chalk. Either method seems not applicable in the case of Har Karkom. In fact, ancient organic material was not preserved in the stony desert environment of Har Karkom, and the optical stimulated luminescence is apparently not applicable to the case.

Therefore, attempt to dating the three geoglyphs has been made by means of comparative analysis of the drawings and other techniques.

Large mammals, including rhinoceros, elephants and phacoceri, were well represented in the Syro-Palestinian area in the middle-late Pleistocene, and were extinct at the end of Pleistocene era. This phenomenon was due to the large climate changes from humid to dry and to the consequent environment changes, from grassland to desert, which happened during the transition from Pleistocene to Holocene. Rhinoceros, elephant and phacocerus species were present on the Mount Carmel (Israel) during the late Pleistocene [Bate D. 1937]. Rhinoceros were also found in the late Pleistocene levels in Ksar'Aqil (Lebanon) [Hooijer D.A. 1961], Jebel Qafzeh (Israel) [Bouchud J. 1974] and Azraq (Jordan) [Clutton-Brock J. 1970].

Later on, no more fossils of those large mammals are found in the whole area. Only small and mid-size animals leaved there during Holocene, and when prehistoric art flourished on Har Karkom plateau during Holocene, mostly during Chalcolithic and Bronze age, in form of rock engravings, the animals depicted on the rock surfaces were ibexes, antelopes, reptiles and ostriches: some of those animals still leave in the area. In the Roman-Byzantine period, camels and horses were also engraved on the rocks, but there are no shapes like those represented in the three geoglyphs. The big mammals had already been disappeared since millennia.

This implies that the geoglyphs date back to the Palaeolithic period.

From the technical point of view, there is no doubt that during Upper Palaeolithic humans would have been able to perform such kind of stone drawings. Since the beginning of the Upper Palaeolithic, humans were capable to perform paintings, engravings and later on sculptures. Other, less durable forms of art should have been common during Upper Palaeolithic, like earth or sand sculptures, or drawing on the landscape. This last form of art would have required a flat surface, and the availability of non biodegradable material – like stones, or pebbles - in great quantity. At Har Karkom, the flat plateau, and the vivid contrasts of colours between the brown flint, the yellow loess and the grey-yellowish limestone, made the top of the mountain a perfect environment to landscape drawings since people expressed conceptual ideas and created symbols of spirituality. Furthermore, Har Karkom offers now to the Archaeologists a unique chance to find and study very ancient remains, as the mountain was sacred since millennia, its top was forbidden to the people, and frequentation just reserved to few leaders or priests. This helped to preserve intact the ground surface of the plateau, and remains dating back to hundreds of thousand years are still today well evident on the brown ground as they were to the prehistoric people.

To dating the second geoglyph we have a reference ante quem, related to the tumuli and the cist grave that had been built up (during Chalcolithic?) over the stone drawing. Apparently, the geoglyph had already lost its magic or religious significance to the people who went up Har Karkom at the time of the graves. Conversely, the Palaeolithic hut floors did not disturb any of the three stone drawings, and vice versa. Would this witness that the most ancient people climbing the mountain knew the significance of those figures and respected them?

The technique to complete natural forms was used since Palaeolithic times in other forms of art, like rock paintings or rock engravings. According to a common view, the artist completed the form suggested by the natural geomorphology of the rock, by adding paintings and tracing. This process is inherent in the characteristics of the human mind and is not dissimilar to that of the modern artists. Like sculptors, who see shapes under the surface of a marble piece, and who need to keep out from the marble the entrapped shapes, in the same way prehistoric artists would have seen some shapes in the natural limestone outcrop of the plateau and felt the need to complete the figures that the nature suggested to their mind. At Har Karkom, the ability of humans to recognise zoo- or anthropomorphic figures in single stones and to complete their shapes by adding anatomic particulars was demonstrated yet for people living at the very beginning of Upper Palaeolithic, with a relative dating of as many as 40,000 years BP [Mailland F. 2007].

The representation of animal figures is also common to the whole Palaeolithic art and has first been interpreted as a form of magic, designed to ensure a successful hunt and further on as an indication of shamanistic practices, but also totemism or animal worship [Clottes J. 2008].

The stone drawings of animal shapes on the ground may have been a different art category with similar significance. Even the drawing style, with large body and short and thin legs, is similar to those of the parietal Palaeolithic paintings. Disproportion is a common feature of the prehistoric art, mostly that of Palaeolithic, but it should not be interpreted as lack of skill or incapability to perform a naturalistic representation. As a matter of fact, figurative art responds to standards, for which the artist emphasises some most important particulars of the shape. Thus, the large horn above the nose qualifies the animal as a rhinoceros, while the legs, common to all mammals and not qualifying, are represented as much smaller than the body.

The finding is surprising, as for the first time a geoglyph is being attributed to the Palaeolithic period. Har Karkom was the mountain of spirituality since the very beginning of Upper Palaeolithic, and stone drawing on the flat plateau of the mountain may be thought as a further evidence of expression of conceptual ideas and capability to create symbols of spirituality in remote periods.

References

Anati E. Spedizione Sinai: nuove scoperte ad Har Karkom. Studi Camuni – Vol XI Ed. It. 1994, Edizioni del Centro, 112 pp.

Anati E. Har Karkom: 20 anni di ricerche archeologiche. Studi Camuni – Vol XX 1a Ed. It. 1999, Edizioni del Centro, 192 pp.

Anati E. The Sinai dossier. Archaeological discoveries bring new light on the biblical account of exodus. In press, 2009.

Bate D.M.A. Palaeontology: The Fossil Fauna. Part II In: Gai-rod D.A.E. and Bate D.M.A. The Stone Age of Mount Carmel 1937. Oxford University Press.

Berndt R.M. and Berndt C.H. Arnhem Land : its history and its people, Melbourne : Cheshire, 1954

Bouchud J. Etude préliminaire de la faune provenant de la grotte du Djebel Qafzeh prés de Nazareth (Israel). Paléorient 1974, 2(1): 87-102.

Clottes J. Shamanism in Prehistory. Bradshaw foundation. Last accessed March 11, 2008 http://www.bradshaw-foundation.com/clottes/page7.php.

Clutton-Brock J. The Fossil Fauna from an Upper Pleistocene Site in Jordan. J. Zool., London, 1970, 162: 19-29.

Dorn R.L., Clarkson P.B., Nobbs M.F. et al. New Approach to the Radiocarbon Dating of Rock Varnish, with Examples from Drylands. Annals of the Association of American Geographers 1992, 82(1): 136-151.

Fletcher R.V., Cameron T.L., Lepper B.T. et al. Serpent Mound: A Fort Ancient Icon?, Midcontinental Journal of Archaeology, 1996, 21 (1) University of Iowa.

Glotzhober R.C. and Lepper B.T. Serpent Mound: Ohio's Enigmatic Effigy Mound, Ohio Historical Society, Columbus, Ohio, 1994.

Hooijer D. A. The Fossil Vertebrates of Ksar'Akil, a Palaeolithic Rock Shelter in the Lebanon. Zoologische Verhandelingen, 1961, 49.

Mailland F. Witness of Palaeolithic conceptual expressions at Har Karkom, Israel, in E. Anati & J.-P. Mohen (eds.), Les expressions intellectuelles et spirituelles des peuples sans écriture, 2007, Capo di Ponte (CISPE & Edizioni del Centro).

Miles D. et al., Uffington White Horse and its Landscape: Investigations at White Horse Hill, Uffington, 1989-95 and Tower Hill, Ashbury, 1993-4, Oxford Archaeology, 2003.

Saraceni J.E. Redating Serpent Mound, Archaeological Institute of America 49 (6) November/December 1996. Last accessed August 18, 2009 www.archaeology.org/9611/newsbriefs/serpentmound.html

Shimada I. The evolution of Andean diversity: Regional formations (500 BCE-CE 600) In: F. Salomon & S.B. Schwartz (eds.), The Cambridge history of the Native Peoples of the Americas. Vol III South America Part I. 1999

Steinbring J. Boulder Site In Southeastern Manitoba in Walter Hlady (ed.) Ten Thousand Years: Archaeology In Manitoba, Manitoba Archaeological Society, Winnipeg 1970, 223–268.

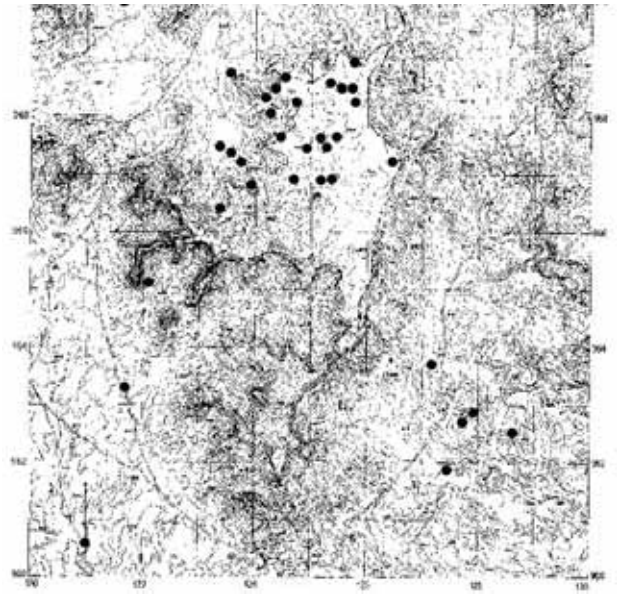

Figure 1: Location of geoglyphs (dots) on the Har Karkom map.

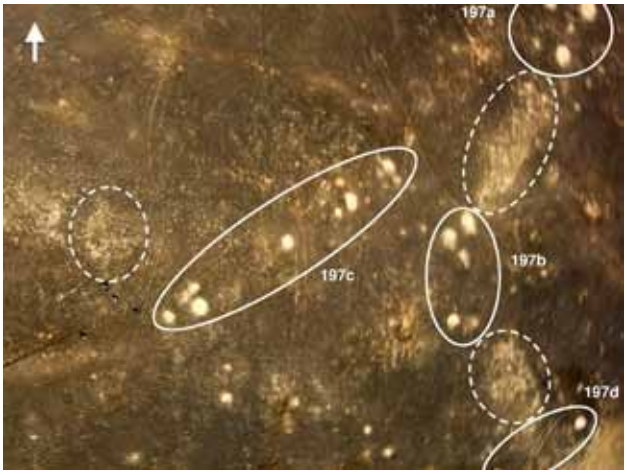

Figure 2: Location of Palaeolithic sites and geoglyphs. Aerial picture from about 100 m above ground level.

Figure 3: zenithal picture of a rhinoceros-shaped geoglyph

Figure 4: drawing from zenithal picture of a rhinoceros-shaped geoglyph

Figure 5: zenithal picture of a geoglyph, representing a trunked animal

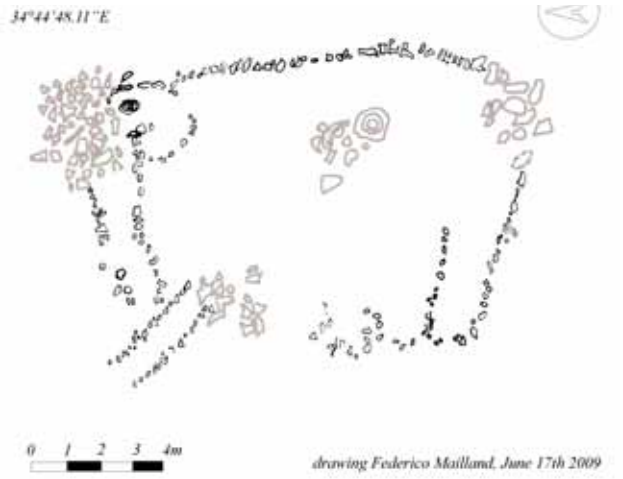

Figure 6: drawing from the zenithal picture of a geoglyph, representing a trunked animal. The tumuli, posterior to the geoglyph, are drawn in gray

Figure 7: zenithal picture of a quadruped-shaped geoglyph

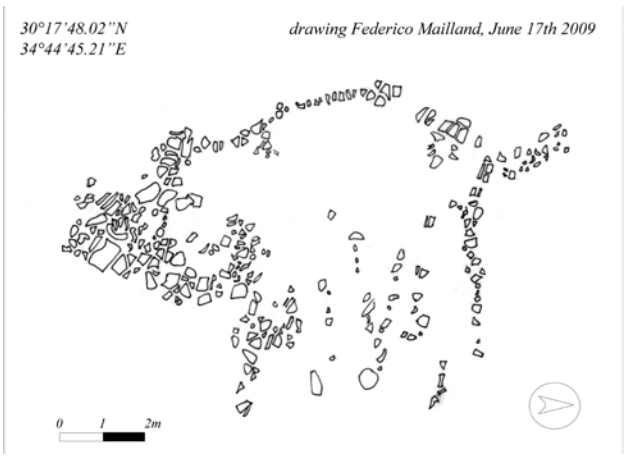

Figure 8: drawing from the zenithal picture of a quadruped-shaped geoglyph