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Hunting with kites in Armenia

Olivier Barge, Jacques Élie Brochier, Jwana Chahoud, Christine Chataigner, Emmanuelle Régagnon, Wael Abu-Azizeh and Rémy Crassard

Access in recent years to high-resolution satellite imagery via online platforms such as Google Earth and Bing Maps has provided a wealth of information for many scientific subjects, among them archaeology. In the years following 2010, comprehensive satellite coverage of the Near East and the Caucasus became available, enabling the discovery of large archaeological structures in remote and hard-to-reach areas. This has renewed scholarly interest in ‘desert kites’, huge structures apparent from above. In recent years the known number of kites has drastically increased to more than 5200 structures (31 December 2016).

Desert kites (or simply ‘kites’) consist of long stone walls or alignments, called ‘drivelines’ (also called ‘arms’ or ‘antennae’), that converge towards an enclosure flanked by smaller circular structures, called ‘cells’. The joint presence of these three elements – drivelines, enclosure, and cells – distinguishes kites from other constructions sharing the widespread principle of long walls converging towards a structure meant to enclose or trap animals. Desert kites can be huge structures with drivelines several kilometres long and enclosures that cover several hectares. Excavation of the cells has shown them to be rounded hollow structures, walled with rough fieldstones, and sometimes several metres in depth. Kites are among the most imposing structures built in recent prehistory and early historical times. Their geographical distribution in such a vast area, from Arabia to Kazakhstan, is impressive, and many details about their function and chronology remain contentious or poorly understood. From 2012 to 2017, a research project entitled ‘Globalkites’ (www.globalkites.fr) was set up to shed additional light on these matters. The project greatly increased the number of known kites and prompted scholars to attribute greater significance to something we decided to call the ‘kite phenomenon’ (Crassard et al. 2015), which profoundly reassessed their spatial extent.

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The Gazelle's Dream

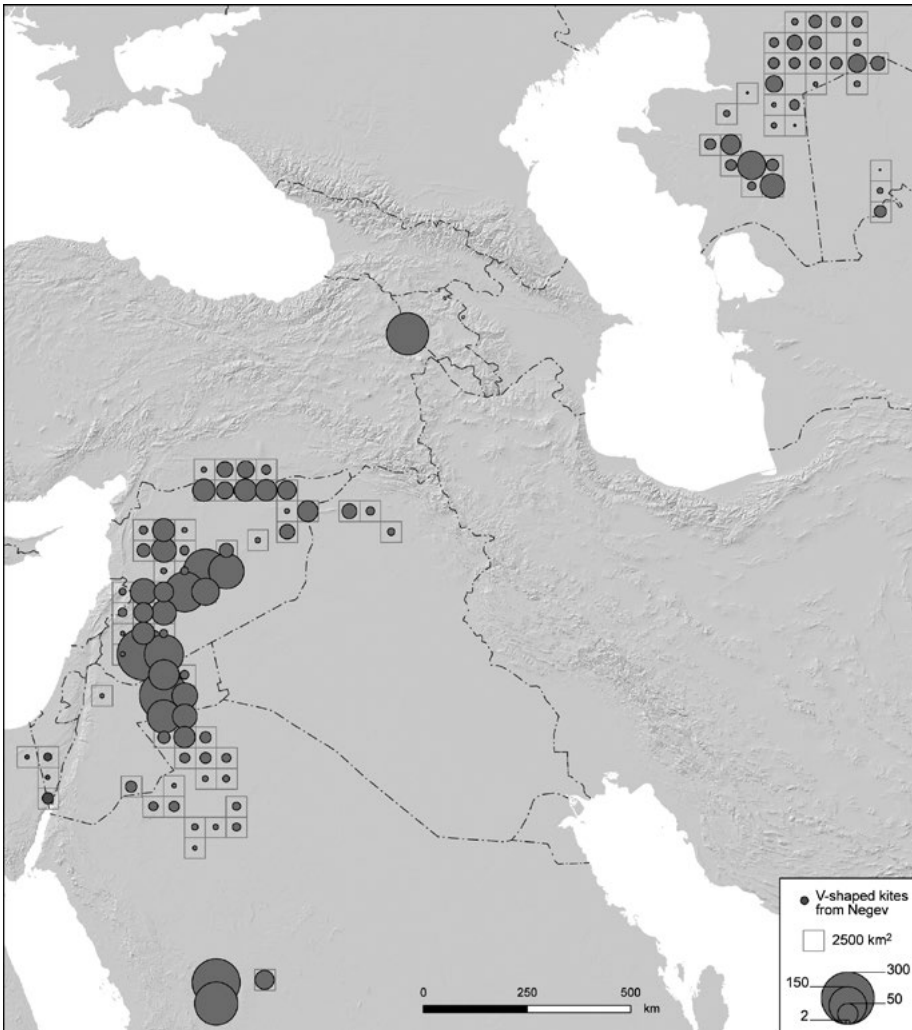


Figure 4.1. Distribution and density of desert kites (number of kites by meshes 50 km wide).

In the case of Armenia, the project identified almost 200 kites on the lowest south-western slopes of Mount Aragats, in the western part of the country, which until this study were entirely unknown in the Caucasus. In the 1980s, a group of similar structures was discovered and studied considerably further north by Yagodin (1998), on the Ustyurt Plateau of Kazakhstan and Uzbekistan. Excavation and surveys in 2013 permitted the Globalkites team to surmise that the Ustyurt kites were part of the wider kite phenomenon and shared many characteristics with the Aragats kites (Barge et al. 2016). This raised important questions about the overall role of the Armenian kites within the wider kite phenomenon, and the part they played in the potential diffusion of kite construction and use. Most importantly, the structures may provide a link between the Ustyurt kites and

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those of the Near East, despite their vast separation in space. A firm grasp of kite chronology is clearly of paramount importance if one wants to establish any such links, but unfortunately many uncertainties remain because few Near Eastern and Central Asian kites have been reliably dated (Zeder et al. 2013: table 1).

This chapter discusses the discovery, distribution, morphology, and architecture of the Aragats kites. It uses a comparative approach to highlight the distinctive characteristics of the Armenian group, while at the same time reaffirming their embeddedness in the wider kite phenomenon. Chronology, function, and potential prey species are also touched upon.

Discovery

The first kites in Armenia were recorded in 2009 by geologist Arkadi Karakhanyan of the National Academy of Sciences of Armenia (Karakhanyan 2010). Fieldwork by the Globalkites project in 2011 established that these structures possessed all the necessary kite components – drivelines, enclosures, and cells – and allowed investigators to draw a preliminary map validating satellite observations. This initial campaign was followed by three further seasons in 2012, 2013, and 2015 that included archaeological excavation. An independent team from the University of Haifa simultaneously explored a set of kites located at the eastern end of the distribution area of the Aragats kites (Nadel et al. 2015).

Distribution: a dense and isolated entity

The Armenian kites are a long way from other groups of kites elsewhere in the Middle East and Central Asia. They are located 415 kilometres from the kites of the Jazira region of Upper Mesopotamia, and 850 kilometres from those of the Ustyurt Plateau (Figure 4.1). High-resolution satellite images have not revealed any desert kites in the areas in between despite meticulous searches for them. It is possible that a number of kites in these regions are not visible on satellite images due to their poor state of preservation, or because they insufficiently contrast with their environment. It is, however, also not unreasonable to think kites are effectively absent here, since they are easily identifiable on the slopes of the Aragats. The satellite images used are of the same quality, with equivalent resolution, and the environmental context of the regions under investigation is comparable in terms of geology, vegetation, and occupation. The Aragats kites should, therefore, be considered an isolated group.

The Aragats group is not only remarkable for its location, but also for the density of its kites. So far, 192 structures have been identified, lying within a depression measuring approximately 50 kilometres north–south and 40 kilometres east–west, covering an area of 1200 square kilometres. This means that the group has one of the highest densities of desert kites among their general distribution, comparable to that of the Harrat al-Shaam in north-east Jordan and the Harrat Khaybar in western Saudi Arabia (Figure 4.1).

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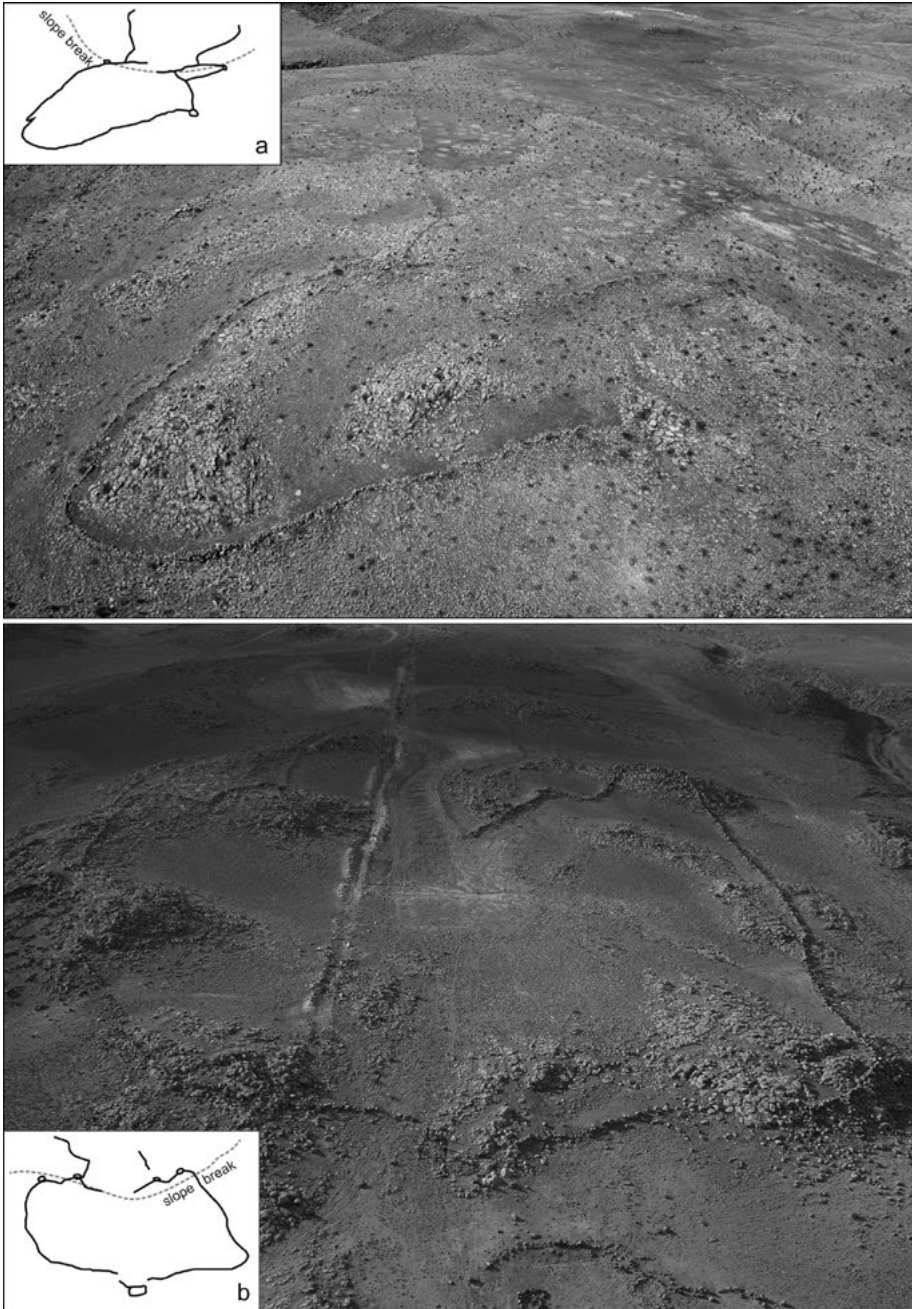


Figure 4.2. Oblique aerial photographs of kites AM7 (a) and AM67 (b) with schematic kite representations in the insets.

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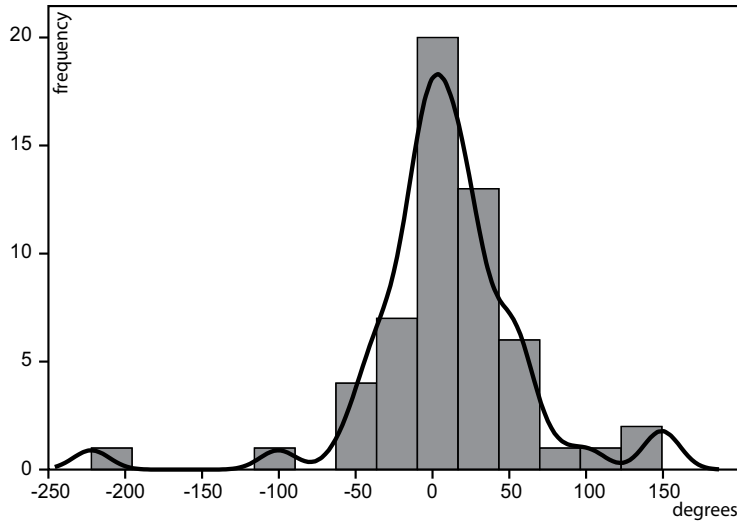


Figure 4.3. Distribution and Gaussian kernel smoothing of angular differences between the opposite directions towards which the kites open and the mean of the directions towards which the local slopes are oriented.

The Armenian kites are located in western Armenia (Plate 4.1), on the south and south-west basalt slopes of Mount Aragats at altitudes between 900 and 1600 metres, which are relatively low elevations in the regional context. They are all found not far from the modern cultivated plains they overlook. It is possible that kites were originally also constructed on these plains, but, if so, their traces have now been erased by cultivation. There is a high density of kites in the west of the area, with linear-arranged groups in the south and halo-shaped groups in the north-west. These arrangements can be explained from the observation that the kites run along the downstream eroded fringes of lava flows. In three-quarters of the kites, the break in the slope of this eroded flow-front was chosen for the entrance of the kite. Drivelines here extend onto the flat, slightly inclined and regular surface of the flow, while the enclosure is built downhill in the lava flow-front's chaotic and sloping topography (Figure 4.2). Rocky outcrops are often included within the enclosed space, as if it were necessary for the latter to have a high topographic complexity. This recurrent placement of the kites – along the eroded fringes of old lava flows, at low altitudes, and in close proximity to the plain – is characteristic of the Aragats group.

The orientation of the kites generally follows the orientation of the slopes on which they are built, with enclosures being located downslope and facing uphill (Figure 4.3) (Brochier et al. 2014). However, there are several exceptions in the west of the area (Plate 4.1), where kite entrances, even when they are built on the break of a slope, face downhill. Most kites are oriented west/north-east. This orientation may simply reflect the slope of the region (Plate 4.1) but could also be related to animal migration routes. Only a fraction of kites form linear arrangements with similarly oriented entrances (Plate 4.1), and the majority of these are not

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connected with their closest neighbour. In contrast to kites in the Jordanian Harrat al-Shaam (Betts 1982; Kempe and Al-Malabeh 2013: fig. 5; Barge et al. 2015b: fig. 2, 3, 8) and certain kites on the Ustyurt Plateau (Yagodin 1998; Yagodin et al., this volume), the Aragats kites are not organised in true 'chains'; that is, they are not physically connected to one another, with the same opening orientation.

Construction: a specific morphology?

In most cases high-resolution satellite images enable a basic recording of individual kites, including the total number and length of their drivelines, the surface area of their enclosure, and the number and distribution of their cells. These data were collected for all Armenian kites for which this was possible, amounting to a total of 162 (out of 192) structures. Similar data were obtained for a sample of 600 kites, representative of their entire area of distribution from Arabia, the Near East, and Central Asia, so that the Armenian group could be compared against the wider kite population.

DRIVELINES

The drivelines of Aragats kites consist of continuous low walls that are only a single course high. The walls are of simple dry-stone construction and are, on average, about 50 centimetres wide and only a few decimetres high. The absence or low volume of collapse suggests that the walls would not have been much higher when the kites were in use. This feature, which is not unique to the Aragats kites, demonstrates that low walls would have been sufficient to drive animals. In most cases kites have two drivelines (Figure 4.4a). Kites with no or only one driveline are rare, but occur with a slightly greater frequency in Armenia than elsewhere. Field surveys have shown that the lack of drivelines on satellite images indeed reflects true absence. It cannot be excluded that some of these structures would have had temporary drivelines or drivelines made of perishable materials. However, in most cases natural features in the area, such as abrupt slopes, would have functioned as a driveline. Most kites without drivelines have their enclosure located upslope, facing downhill, which is contrary to normal placement. Kites with more than two drivelines are rare. The Aragats drivelines are relatively short when compared to those of the global sample (Figure 4.4b). Most often they are a few hundred metres long. Some examples are only tens of metres long. There are no drivelines that are several kilometres long, as for instance in Jordan or northern Arabia (Barge et al. 2015a: fig. 5).

ENCLOSURES

The simple dry-stone enclosure walls are, as a rule, higher and wider than those of the drivelines, sometimes reaching two metres in height and 1.2 metres in width. Enclosures normally have a roughly circular (case AM64, Figure 4.5) or triangular shape (cases AM14 and AM15, Figure 4.6), and sometimes have protrusions giving them the shape of a star (case AM4, Figure 4.7). Protrusions

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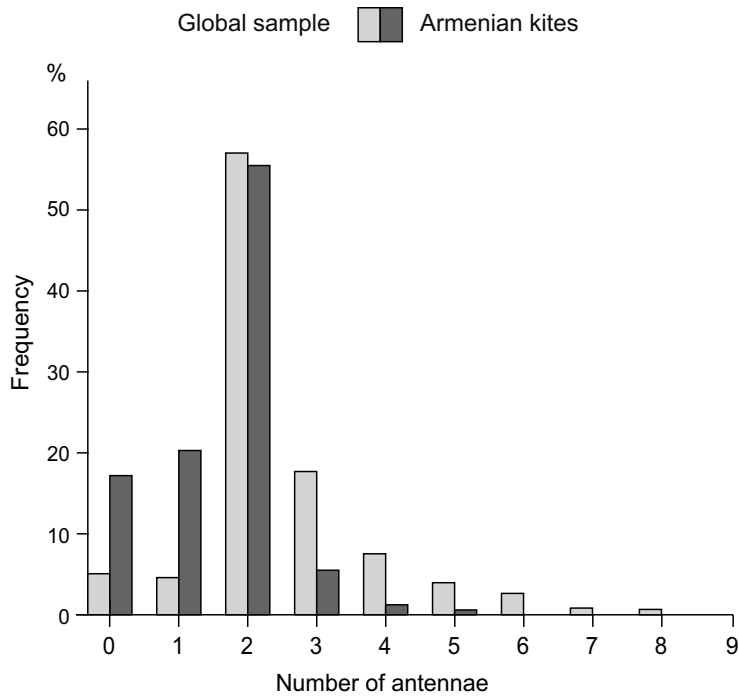


Figure 4.4a. Comparison of morphological variables for the Aragats kites ($n = 162$), and those of a sample covering the area of extension in a homogenous way ($n = 600$). Number of drivelines.

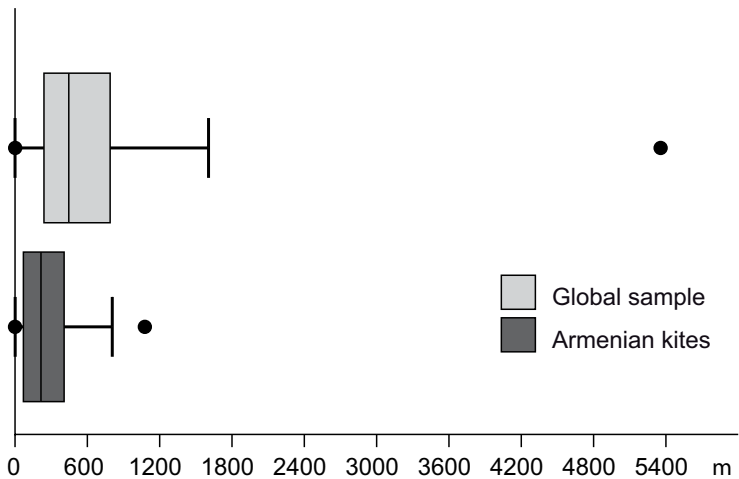


Figure 4.4b. Comparison of morphological variables for the Aragats kites ($n = 162$), and those of a sample covering the area of extension in a homogenous way ($n = 600$). Length of drivelines (Tukey box plot, outliers omitted, max-min shown as dot).

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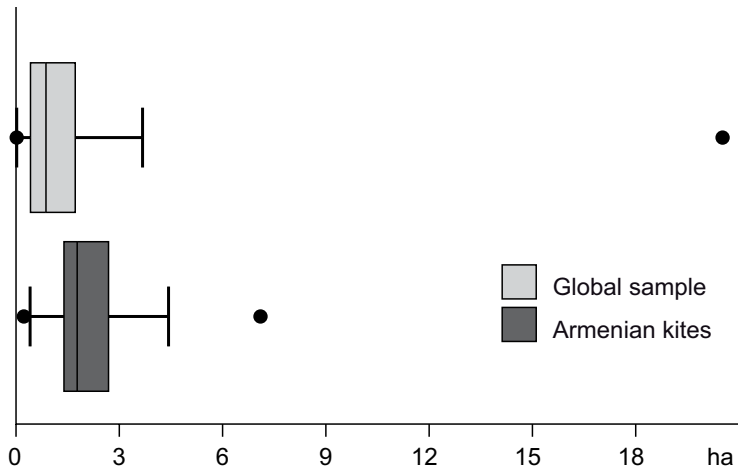


Figure 4.4c. Comparison of morphological variables for the Aragats kites (n = 162), and those of a sample covering the area of extension in a homogenous way (n = 600). Enclosure surface area (Tukey box plot, outliers omitted, max-min shown as dot).

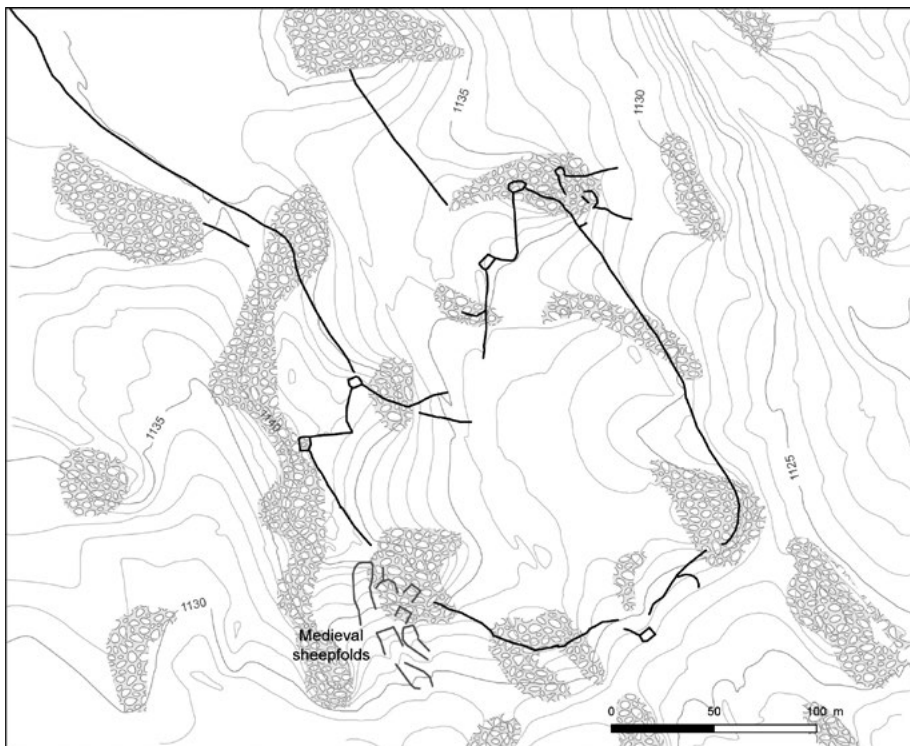


Figure 4.5. Plan of kite AM67.

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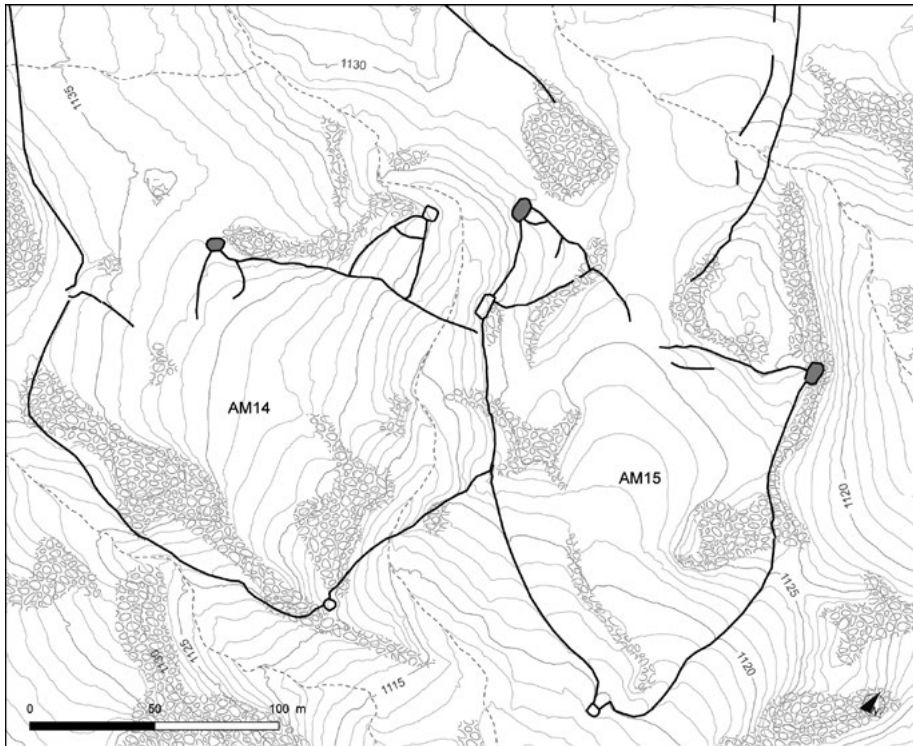


Figure 4.6. Plan of kites AM14 and AM15. Excavated cells are highlighted in blue.

with a cell at the terminal end (so-called pointed cells) are especially frequent. In most cases, enclosures have a pointed cell on one or two sides of the entrance (cases AM14 and AM15). Sometimes enclosures have a double pointed cell at this location (cases AM64 and AM4).

The surface areas of Aragats enclosures tend to be greater than those of enclosures in the broader data set (Figure 4.4c), often exceeding a hectare. Median surface areas are slightly over two hectares. On average the enclosures contain 3.1 cells, which is quite small in relation to the kites of the broader data set, which have more than twice that number. Pointed cells are the most numerous, making up 40 per cent of the cells in the broader data set, and 77 per cent in the case of the Armenian data set.

In sum, whatever variable is taken into account in the comparisons, the Aragats kites are distinctive in combining few and short drivelines with a large-sized enclosure containing a small quantity of cells, most of which are of a pointed type.

CELLS, THE REAL FEATURES FOR TRAPPING ANIMALS

The Aragats kites have two types of large cells: circular, with a mean surface area of 16 square metres, and quadrilateral, with a much greater mean surface area of 31 square metres. Cell walls are usually faced on both sides and have several

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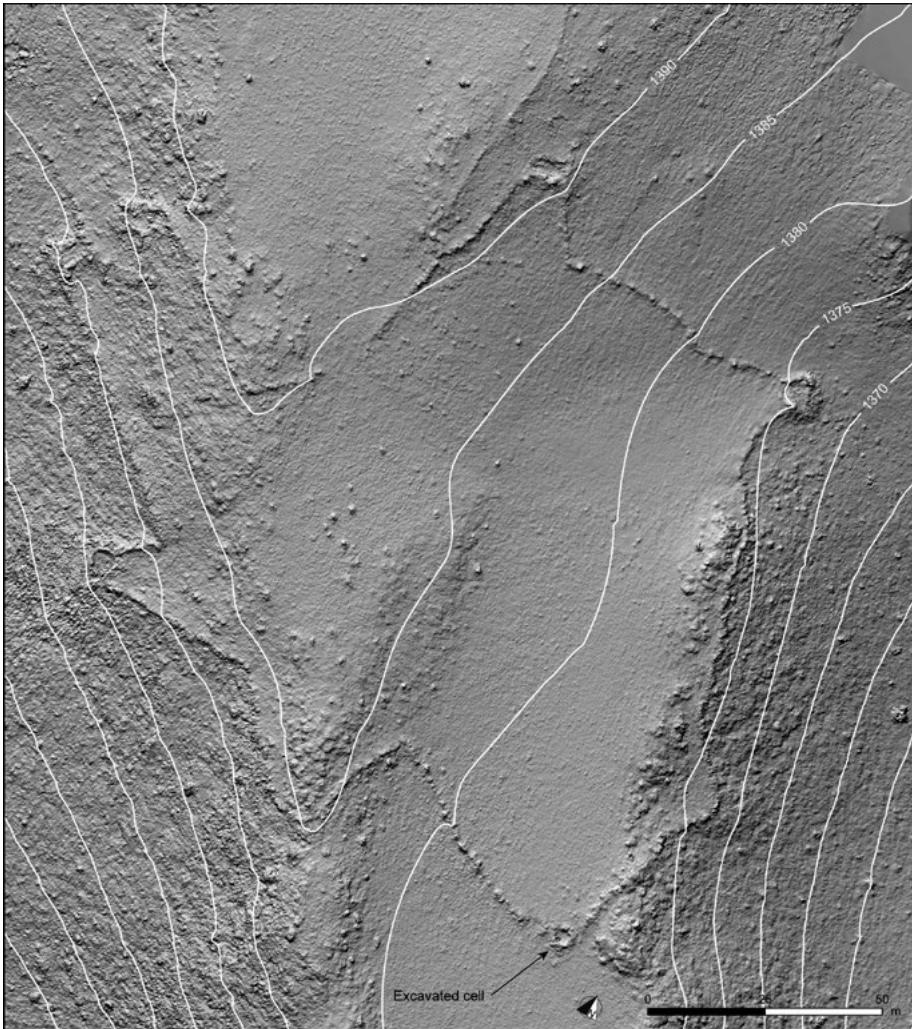


Figure 4.7. Hill-shade of kite AM4 from a Digital Surface Model obtained with aerial photogrammetry. Note the presence of two different types of cells: cells dug into the substratum and slope break cells.

courses preserved. Their height can reach two metres or more. In their upper part, the walls always have continuous peripheral corbelling that forms a slight overhang towards the interior. It was not possible to distinguish an opening in any of the cells observed. It appears that they were completely closed off towards both the interior of the enclosure and the exterior (Figure 4.8).

While kites have sometimes been considered enclosures meant to gather domesticated animals, or those well on the way towards husbandry (Échallier and Braemer 1995), the function of cells has not been explored in detail. Most initial interpretations considered them to be hunters' hideouts, but excavation

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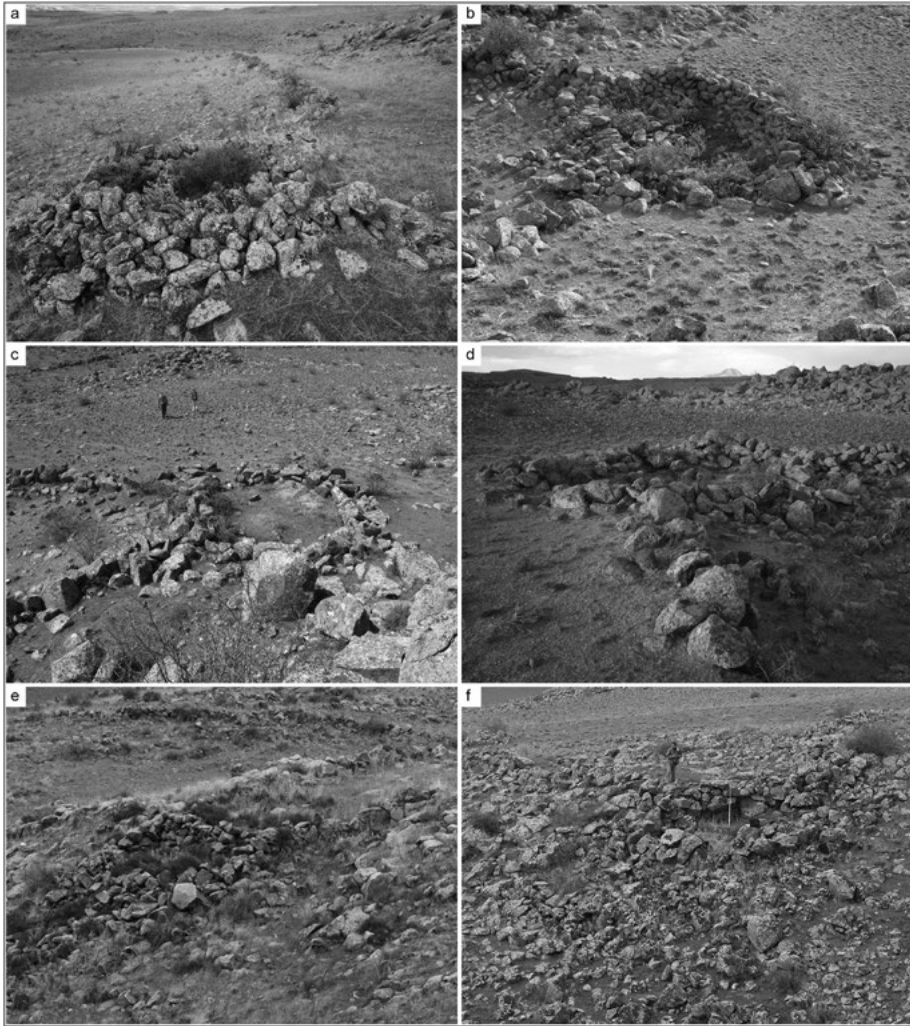


Figure 4.8. Examples of cells: A. circular cell from AM7 kite; B. rectangular cell from AM10 kite; C. cell AM14-L01, dug into the substratum; D. cell AM67-L01, dug into the substratum; E. cell from AM5 kite, built using a slope break; F. cell from AM1 kite, built using a slope break. (Photographs by Olivier Barge and Jacques Élie Brochier)

has since shown that many cells are deep, pit-like constructions. The care given to the internal facing of these pits is particularly remarkable, and is a constant feature across the various regions explored by the Globalkites team, be it Armenia, Jordan, Kazakhstan, or Saudi Arabia. Excavations have shown that the floors of cells are *always* located below the enclosure floor. The difference in elevation between the two can exceed four metres in Armenia, making them functional trapping pits.

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Two techniques were employed in cell construction. The first consisted of digging a pit into the substratum until the desired depth was reached, and lining the sides of the pit with a facing of fieldstones. Above floor level, a much lower second facing of stone was subsequently built around the edge of the pit (AM14-L01 cell: Figures 4.9 and 4.10). The second technique took advantage of the topography and inserted the cell just below a slope break. In this example a low wall was built on the side of the enclosure at the slope break, with the depth of the cell being obtained by making use of the slope's natural gradient. An external wall was then added with a double facing. This wall was often of considerable height and width, but is rarely entirely preserved (cell AM15-L03: Figures 4.9 and 4.10).

Cells are most often located at the terminal ends of enclosure protrusions, sometimes constructed along slope breaks. Their general shape is identical to the cells in 'V-shaped' or 'killing kites' in the Negev (Holzer et al. 2010; Nadel et al. 2010, 2013). The Armenian kites described by Nadel et al. (2015) at the eastern end of the distribution of Armenian kites are plausibly only pointed cells that have had their associated enclosures destroyed. Kites in the east of the Mount Aragats group have been heavily disturbed by multiple later destructions or refurbishments. Many of these alterations and destructions seem to be modern, although some are evidently older, a feature confirmed in the field. To us, the resemblance of these structures, which are otherwise unique in the large Armenian sample, to isolated structures in the distant Negev and Sinai, is coincidental, and the result of degradation rather than conscious planning.

ESTIMATING DATES OF CONSTRUCTION

The chronology of the Aragats kites, and desert kites generally, is poorly understood and represents a serious challenge to archaeologists. Desert kites commonly lack occupation layers with diagnostic archaeological remains, such as pottery fragments and other artefacts, which makes it difficult to determine who was responsible for their construction and use. However, in the last decades, thanks to advancements in radiocarbon-dating techniques, such as the widespread use of measurements in accelerators (AMS) on very small quantities of organic material, some absolute chronological benchmarks have been obtained. Despite great investment in the field, we were only able to obtain radiocarbon dates for six out of 192 Aragats kites (that is, little more than three per cent of the total corpus).

The dates presented in this chapter stem from residual radiocarbon found inside the cell fills, most often at low elevations. These dates only provide a *terminus ante quem* (TAQ) for the date of construction (Table 4.1). The materials used in most cases were tiny bird-eggshell fragments, extracted from the sandy fraction of the detritic sediment using a binocular microscope. Bone splinters, *Boraginaceae* calcitic nutlets (*Buglossoides arvensis* L.), and charcoal were also analysed when available. Eggshell fragments are a common (albeit scarce) datable biological carbonate in cell fills in Armenia and elsewhere. It is as if in these open landscapes, the inner dry-stone cell walls were used by small birds for nesting. Frequency counts indicate they do not occur in samples pre-dating construction; they are thus salient biomarkers of the beginning of cell infilling in a context marked by sedimentary homogeneity. Measured radiocarbon ages were validated by

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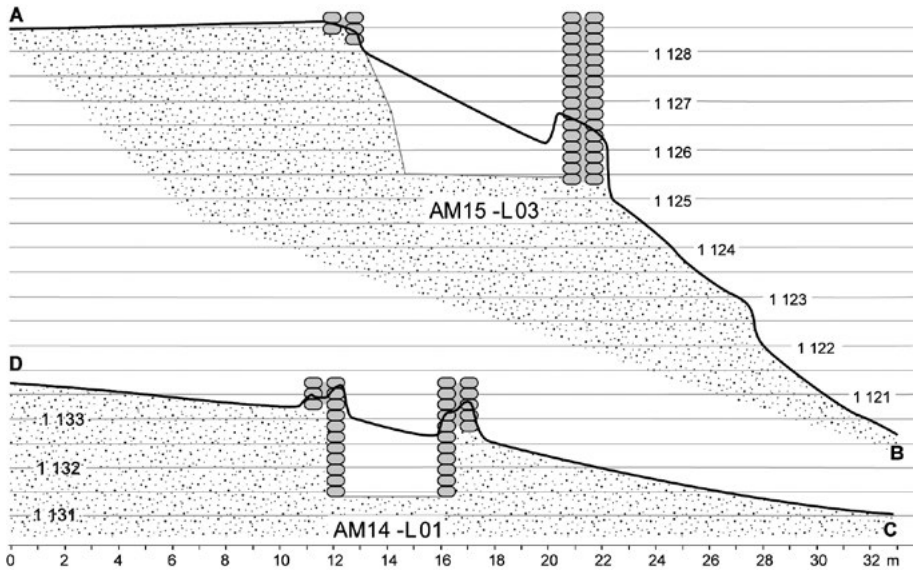


Figure 4.9. Cells AM14-L01 and AM15-L03 in section. The current topographical profile is indicated in black. The reconstruction of the walls is theoretical and does not take the corbelling into account.

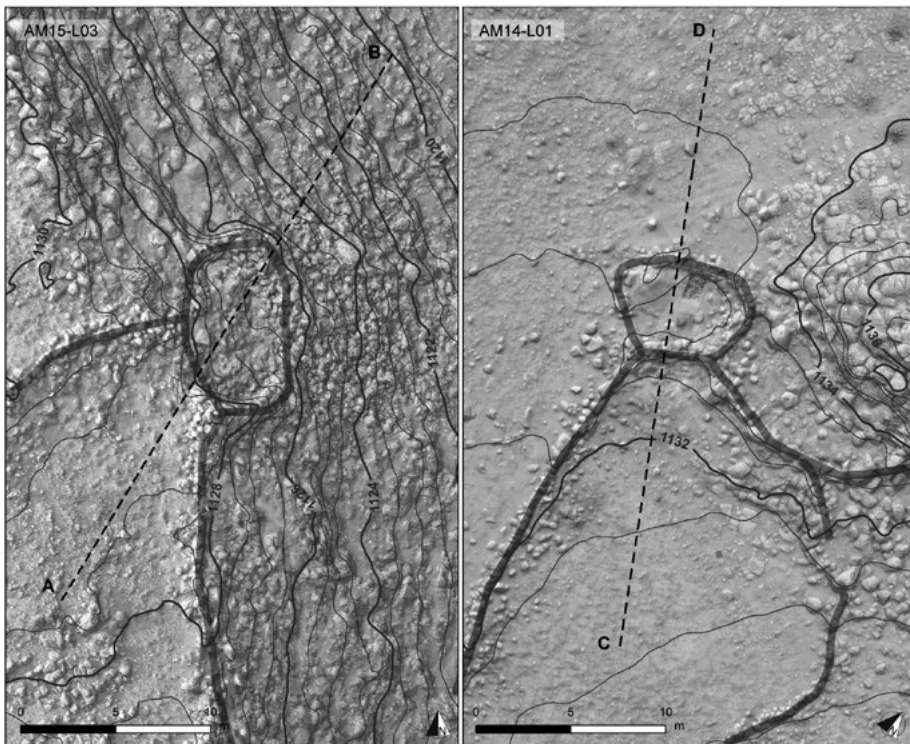


Figure 4.10. Plan of cells AM14-L01 and AM15-L03. The location of the sections depicted in Fig. 10 is indicated by a dashed line.

Table 4.1. Radiocarbon (and OSL) data and calibration results. AMxx refers to the Globalkites database number. CRA and s.e. stand for Conventional Radiocarbon Age and standard error respectively; individual calibration of radiocarbon determination (HPD 95%, IntCal13 curve) and MAP (Maximum A Posteriori of the density distributions); MAP of the terminus ante quem of construction events (TAQ), modeled construction events HPDs (95%) and MAP of the density distributions. All the calculations were made using Chronomodel 2.0 (Lanos and Dufresne 2019) and the latest radiocarbon calibration curve IntCal13 (Reimer et al. 2013).

kite ID	material	Labo ID	CRA	s.e.	HPD 95% cal. BCE ; MAP	TAQ (MAP BCE) of construction events	modeled construction events HPD 95% ; MAP
AM4	charcoal	Poz 78059	2005	30	[90-75], [55-70] ; 2		
AM4	eggshell	Poz 78506	2220	30	[370-200] ; 215	215	[1230-230] ; 710
AM4	charcoal	Poz 78482	2955	35	[1260 -1050] ; 1140		
AM10	eggshell	Poz 51369	2100	35	[340-330], [200-40], [5-5] ; 115	115	[3420-170] ; 2170
AM14	eggshell/ <i>Buglossoides</i>	Poz 56320	2940	70	[1380-1340], [1310-970], [960-930] ; 1150	1150	[3100-950] ; 1480
AM15	bone	Poz 56324	2430	30	[750-680], [670 -640], [590-405] ; 495		
AM15	eggshell	Poz 56322	2510	30	[790-730], [720-700], [690-540] ; 675	790	[3550-1560] ; 3270
AM15	eggshell	Poz 56321	2565	35	[810-740], [690-660], [640-550] ; 790		
AM59	bone	Poz 51370	895	30	[1040-1110], [1120-1210] ; 1160 CE		
AM59	eggshell	Poz 51372	995	30	[990-1050], [1080-1150] ; 1020 CE	655 CE	[3410 BCE-570 CE] ; 1850
AM59	eggshell	Poz 78505	1380	30	[610-680] ; 655 CE		
AM106	OSL	ARM10	3200	200	[1580-790] ; 1190	-	[2060-310] ; 1200

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the geoarchaeological correlation of the different sequences according to the taphonomically complex – but uniform across Aragats’ slopes – evolution of two groups of siliceous algae, aerophylous diatoms (*Hantzschia amphioxys* [Ehrenberg] Grunow), and chrysophytes (statospores), both linked to long-term changes of intensity in pastoralism (Brochier et al. 2014).

Construction event TAQ are provided in Figure 4.11 and Table 4.1. They are rough estimations based on the contentious initial postulate that the ongoing infilling was never removed during use of the cells. Furthermore, the estimated mean sedimentation rate in these sediment traps (seven to 10 centimetres per century) means that in some cases the TAQ dates underestimate construction and use dates.

We therefore used all available prior knowledge to construct chronological models and estimate, through Bayesian modelling (Buck et al. 1991, 1996), the main parameter of interest: the event of construction. These (unknown) events are introduced in the chronological models – one for each construction – as a uniform distribution defined on the whole study period. It is on these uninformative data that prior knowledge is entered into the Bayesian framework. The prior knowledge used falls into two types: 1) cell stratigraphy and stratigraphic relations between kites (for example, AM14 was constructed later than AM15), and 2) the first common use of the double-faced wall construction technique – used in all the Aragats kites – in Early Bronze Age Armenia, as modelled from 88 Chalcolithic and Early Bronze Age radiocarbon dates.

These results are more plausible, even if they may appear less accurate. One must bear in mind that, due to the common lack of on-site *terminus post quem* (TPQ) dates, the modelled construction dates have a likely bias toward older dates. Regardless, one can observe that the construction of these five radiocarbon-dated kites could not have occurred later than the beginning of the Common Era (the end of Iron Age IV), nor before the Chalcolithic–Early Bronze Age transition – this is *a priori* information used in the model. In the only case (AM4) that yielded, by chance, an on-site TPQ, the construction event took place in the Iron Age. As regards a potentially too old double-wall construction technique TPQ, one solution would be tentatively to place the construction and use of these structures between the Middle Bronze Age and Iron Age IV. This estimate would fit the AM106 OSL date obtained by Naomi Porat (in Nadel et al. 2015) in a challenging environment.

It is difficult to determine if these radiocarbon dates can be projected onto the entire Aragats group. However, three clues support a relatively short period of use, being: the morphological uniformity of the Aragats kites, the unique way in which they adapt to landscape morphology, and the lack of modifications to initial designs.

Function: kites were hunting traps

On a functional level, most scholars have favoured the hypothesis that desert kites were used for hunting purposes. The idea that they were for pastoral use (Échallier and Braemer 1995) has been strongly dismissed (Rosen and Perevolotsky 1998). Nevertheless, both hypotheses deserve further examination. Our multi-proxy

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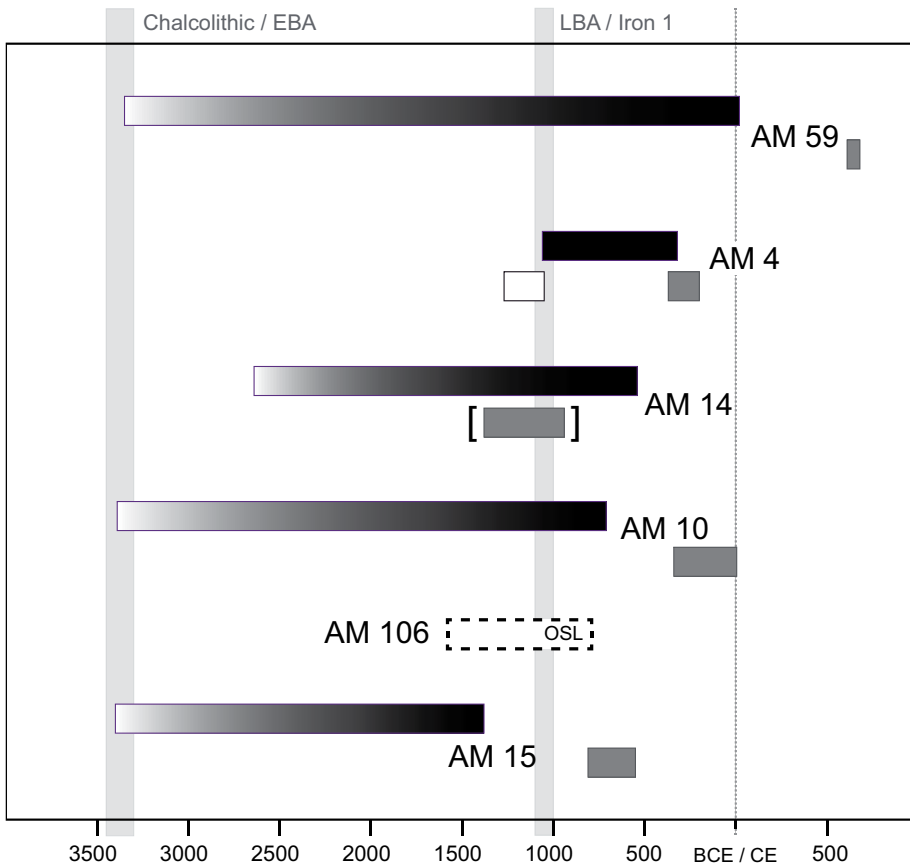


Figure 4.11. Modelled calendar date ranges (95% probability) of construction dates. AMxx refers to the Globalkites database number. Grey boxes provide terminus ante quem (TAQ) dates, bracketed grey boxes show outlier TAQ dates, and the white box shows the only available terminus post quem date. Shade gradients (from unlikely [white] to likely [black]) are based upon the archaeological interpretation of Bayesian statistics. AM106 OSL (95% probability) is from Nadel et al. 2015.

approach is to a large extent an attempt to understand the function and workings of these vast structures (Crassard et al. 2015). Kites are easily recognised and now known to have been extremely numerous. However, the aims of their builders and methods of use are still relatively little understood. Two strands of analysis shed further light on these matters. The first revolves around a study of the location, morphology, and architecture of the kites. The second is connected with the systematic excavation of cells.

The regular placement of Aragats kites seems to support the hunting hypothesis. The construction of drivelines oriented upwards on a slight slope, with the enclosure below being separated by an edge or threshold, is a salient characteristic of the Aragats kites. The presence of an edge or threshold is common,

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both in Syria (Morandi Bonacossi and Iamoni 2012) and in Jordan (Helms and Betts 1987). This configuration is more appropriate for use as a *demi-piège* (a 'semi-trap', meaning a passive structure that needs to be 'activated' by human presence, Testart 1984) than for pastoral purposes. The vast size of the enclosure also points in this direction.

The interpretation of the orientation of the kite entrance is more difficult. Their location seems to be largely determined by the orientations of local slopes; and probably, on a smaller scale, by those of the volcano. The Aragats kites could thus have been constructed to intercept herds running downhill. Nevertheless, it has to be conceded that many kites open towards the west and the north-east, and would be well oriented to intercept seasonal migrations of large herbivores that still take place in the area (Chahoud et al. 2015).

Cells are the most elaborately constructed elements of the Aragats kites, which suggests they must have played an important role in the functioning of the structures. This observation is valid not only for Armenia but also for kites elsewhere. The use of deep pits with high and corbelled walls suggests that they were used as trapping pits. The walls would have prevented animals from jumping out of the pits. The common enclosure protrusions almost surely served to drive animals towards the trapping pits.

These aforementioned observations all point to the kites being used for hunting and do not fit a pastoral interpretation. Nevertheless, there are still many uncertainties about how Armenian kites would have functioned. Enclosures often contain rocky outcrops, but the purpose of these is unknown. Perhaps they added a certain complexity to the terrain, making the interior and exterior of the enclosure seem identical, thereby masking the kite. Likewise, it is difficult to find a functional interpretation for the partition walls that are frequently observed within kite enclosures. Sometimes these block off pointed protrusions with cells at their terminal ends. Close scrutiny of these walls suggests that they were not later additions but built at the same time as the enclosure. Their presence seems to contradict the use of pointed cells for hunting.

In sum, even if the hunting function of the kites seems beyond reasonable doubt, many details of their inner workings are still poorly understood. This remark holds true not only for the Armenian desert kites but for all desert kites in the Middle East and Central Asia.

Prey species

It is difficult to determine what species were hunted with the use of desert kites (Chahoud et al. 2015). The rare bone remains found during excavation of the cells were in the upper horizons of the stratigraphic sequence and provide little information. A recent zooarchaeological analysis of prey species in Armenia during the Holocene (Chahoud et al. 2016) suggests that wild species were rare from the Early Bronze to the Iron Ages. However, among them, four types of ungulates were present, all of which were potentially hunted with the use of kites: Bezoar goat (*Capra aegagrus*), mouflon or wild mountain goat (*Ovis orientalis*), red deer (*Cervus elaphus*), and, more specifically during the Iron Age, goitered gazelle

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(*Gazella subgutturosa*). According to historical and contemporary observations, kites are found along the migration routes of these animals and may have been used to intercept migrating game (Chahoud et al. 2016). Nevertheless, it is only through the discovery of zooarchaeological remains in the deepest layers of cells or associated features that direct evidence for prey species can be obtained.

Conclusion

The Aragats group consists of a dense and relatively uniform group of kites. A small number of radiocarbon dates suggests that at least some of the structures were constructed between the Armenian Bronze Age and the start of the Common Era. However, it is still unclear to what extent these dates can be projected onto other kites in the group. Despite initial fieldwork, many details about the inner workings of desert kites remain poorly understood. There are also a lot of unknowns when it comes to potential prey species, although the number of potential candidates appears to be limited, based on indirect evidence. We are hopeful many of these facets will be elucidated soon through further fieldwork.

More difficult, and perhaps more fundamental for researchers interested in past societies, is the study of the social, economic, and symbolic importance of the Aragats kites. A broad archaeological outline has been established for the region (Badalyan and Avetisyan 2007; Badalyan et al. 2008), and this should help us to better understand the cultural dimension of the kite phenomenon.

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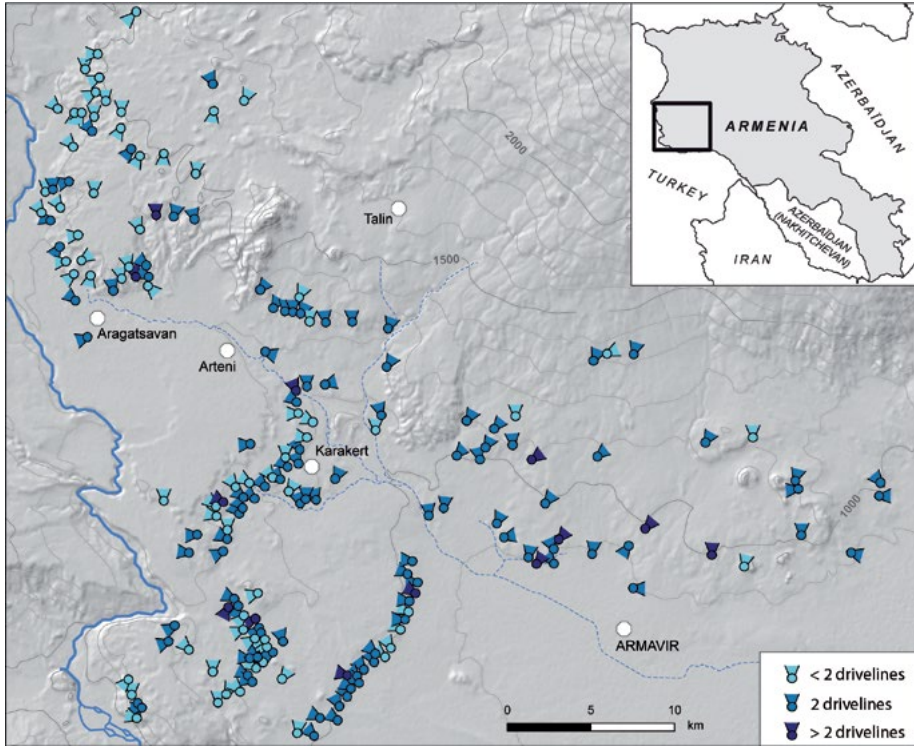


Plate 4.1. Location and orientation of the Aragats kites.