

# The *rennes se suivant*: A Recurrent Image Association from the Magdalenian Culture

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## ABSTRACT

What is referred to here as the *rennes se suivant* is a line of images, by far the most common type of image associations found on Magdalenian artifacts, of which at least four examples exist. Showing a reindeer male pursuing a female, this is one of the rare lines where the intention to represent a true scene is more evident due to the combination of anatomical and behavioral traits selected by their makers. While the seasonal meaning of the scene represented is unmistakable, the most prominent feature of this image association is a decoration found in all female images, which has been identified with the stylized rendition of a coat spotting pattern called Pepper's patches. This is not a seasonal character and points to a more complex symbolic meaning and use of the *rennes se suivant* than a simple seasonal marker. This work will review the evidence that this image association was meant to represent a true scene, define its seasonal meaning, and follow a trail of subtle clues pointing to its symbolic meaning and use, drawing on two related series of reindeer images and more examples previously described as representing different species for additional evidence. The resulting theory will find its place in a new framework for the interpretation of Magdalenian visual creations along with two other theories that reveal the same underlying concern for keeping track of time by means of what we call art.

## INTRODUCTION

Lines of images are by far the most common type of image associations found on Magdalenian portable objects. The French expression *rennes se suivant* is a generic description for any line of reindeer images but here it will be used to indicate a well-defined series featuring two reindeer images, male and female, engaged in a specific behavior. This series was briefly mentioned by Breuil (1907) and first documented by Nougier and Robert (1974) in a work that among other things presented two recent discoveries from La Vache, one of which will be discussed in detail here. Following the materials and methods section, we will move from a few images of reindeer bulls found on their own to the *rennes se suivant* series, focusing at first on their seasonal meaning. This will reveal a first level of meaning in these complex image associations, but a more in-depth investigation will be required to explain unexpected features of the female images that belong to the *rennes se suivant* and their remarkable decoration—which could take different forms and is shared by a related series of reindeer female images found on their own that will be introduced last. The main focus will be on the symbolic meaning and use of the images discussed, but revised descriptions addressing the species, sex, age class, and behavior of the individual represented will be introduced along the way.

## MATERIALS AND METHODS

The findings presented in this research are based on an ex-

tensive review of what is known as “art” or “decoration” found on Middle and Upper Magdalenian portable objects. Portable objects are defined here as all classes of artifacts made from organic materials, including bone, antler, and ivory, as distinct from lithic materials. Though of variable shape and size, these artifacts are always light and compact enough to be carried along without impediment, and the occurrence of closely related objects in sites far apart seems to confirm that they traveled with their makers. Engraving was by far the most common technique used on portable objects, sometimes combined with low-relief or full-round carving. The resulting visual creations, my preferred term, can be classified into figurative images, notational sequences, and what are commonly referred to as signs. It is well known that figurative images can be more or less stylized, but in my experience, they can also present a combination of stylized and purely figurative elements. Notational sequences were first described by Marshack (1964). My definition of signs is self-contained items formed by two or more marks that can be found on their own or in very short sequences. Signs are still enigmatic but could be related to either figurative images, being stylized images whose subject we have not yet been able to identify, or notational sequences. This work will only deal with figurative images. The following sections will present selected series of recurrent subjects that can be addressed by the same theory.

My review was based on photographs collected from published works and museum archives, as well as those

taken specifically for this project. The published works included illustrated books with a selection of artifacts from multiple archaeological sites, such as the works of Graziosi (1956; 1987), Zervos (1959), Leroi-Gourhan (1965; 1971), Marshack (1972; 1991), and Delporte (1990), articles or monographs covering a single site, for example Deffarge et al. (1975) for the Abri Morin, Barrière (1990) for Massat, Fritz and Roussot (in Chauchat et al. 1999) for Arancou, Airvaux (2002) for Le Chaffaud, and Delluc et al. (2008) for La Roche de Lalinde, and many articles focused on one or a few artifacts, as well as books devoted to important collections, such as Chollot (1964) for the Piette collection, Sieveking (1987) for part of the Lartet and Christy collection, and Paillet (2014) for the Vibraye collection. While featuring only low and medium resolution photos, the second volume of the work on the Robert collection from the site of La Vache edited by Clottes and Delporte (2003) and the thematic monograph by Chollot-Varagnac (1980) were an essential source of information on many artifacts not within easy reach. The photos held in museum archives were obtained from online picture libraries (Tables 1 and 2) or directly from museum representatives, as well as from printed exhibition catalogs where they are regularly featured. For selected artifacts, additional photos were taken by museum representatives or myself at the Logan Museum of Anthropology (LMA), Musée archéologique de Narbonne (MN), Musée d'art et d'archéologie du Périgord (MAAP), Musée d'Aquitaine (MA) and, for a limited time, the British Museum.

The study of these materials consisted of three different steps. The first objective was to identify the subject represented, leading to what will be referred to here as the image description. Part of this research consisted in comparing previous descriptions taking note of correspondences, differences, and conflicts. Any associated images, notations, and signs were noted but not addressed at this time, to the effect that each image was considered on its own. For frequently recurring subjects, a second step was taken, consisting in comparing all the images in the corresponding series to collect any clues left, intentionally or not, by their makers that could point to a symbolic meaning of that particular subject, assuming it remained constant over time. These clues were considered in light of previous interpretations, eventually leading to insight into the meaning of a series of images representing the same subject, a result referred to here as interpretation. Previous interpretations for individual images were considered as long as they could be applied to other examples in the same series. For images of a subject whose meaning had been addressed with a theory and that were found associated with other images, of the same or different subjects, a third step was taken, consisting of considering whether their association added a new layer of meaning to the individual subjects and what that could be.

Except where noted, all the tracings published here are original tracings from photographs based on the review materials just described. The two figures illustrating more than one artifact include several hybrid tracings, my

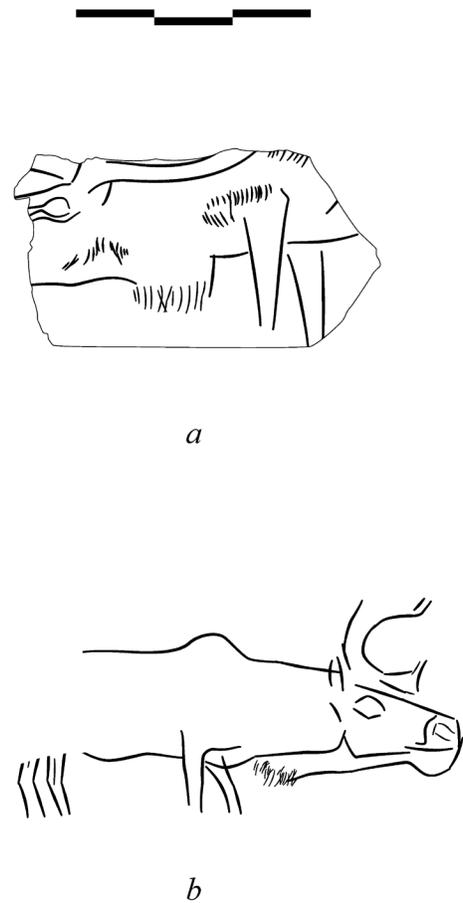


Figure 1. Low-stretching reindeer bull images: a) Laugerie Basse (MAAP Pr. A. 1901), b) Abri Morin, tube (MA 88.47.21).

term for artwork that combines manually traced lines with a photographic layer edited to match. These layers were used to faithfully reproduce areas with exceedingly fine and complex patterns that would have been too difficult or time-consuming to trace by hand. In my experience, even the most carefully executed manual tracings fail to accurately reproduce these areas. Hybrid layers were also used to render low-relief elements when present.

## SEASONAL IMAGES

Relatively few images of reindeer bulls have been preserved in the Magdalenian archaeological record but compared to other subjects they seem to show a wider range of behaviors. Two full-figure images from Laugerie Basse (Figure 1a) and the Abri Morin (Figure 1b) that reached us in fragmentary form were described as showing a low-stretch display by Rätzl (1961: 57) and Guthrie (2001: 69). The same behavior may be represented in the line from Massat (Figure 2c) although here we only see the head of the male behind a full-figure female, which in turn follows what appears to be another male. Guthrie drew attention to the stance of the female, with its hind legs stretching back and raised tail, concluding that the first two images—starting from the right—represent a communication episode in which the male is testing for estrus a fluid produced by

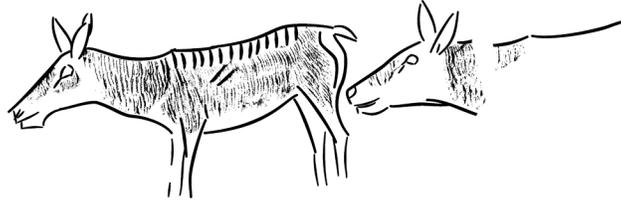
TABLE 1. LIST OF MUSEUMS.

CODE	NAME	INSTITUTION/ HISTORICAL BUILDING	CITY	DEPARTMENT/ REGION/STATE	COUNTRY	WEBSITE
AA	Musée départemental d'histoire et d'archéologie	abbaye d'Arthous	Hastings	Landes	France	<a href="http://arthous.landes.fr/">http://arthous.landes.fr/</a> [5]
BM	British Museum		London		UK	<a href="http://www.britishmuseum.org/">http://www.britishmuseum.org/</a> [5]
LMA	Logan Museum of Anthropology	Beloit College	Beloit	Wisconsin	USA	<a href="https://www.beloit.edu/logan/">https://www.beloit.edu/logan/</a>
MA	Musée d'Aquitaine	former Allerheiligen monastery	Bordeaux	Gironde	France	<a href="http://www.musee-aquitaine-bordeaux.fr/">http://www.musee-aquitaine-bordeaux.fr/</a> [5]
MAA	Museo Arqueológico de Asturias		Schaffhausen		Switzerland	<a href="https://www.aillerheiligen.ch/">https://www.aillerheiligen.ch/</a>
MAAP	Musée d'art et d'archéologie du Périgord		Oviedo	Asturias	Spain	<a href="https://www.museoarqueologicodeasturias.com/">https://www.museoarqueologicodeasturias.com/</a>
MAH	Musée d'art et d'histoire de Genève		Péregieux	Dordogne	France	<a href="http://www.perigueux-maap.fr/">http://www.perigueux-maap.fr/</a>
MAN	Musée d'archéologie nationale [1]	château de Saint-Germain-en-Laye	Genève		Switzerland	<a href="http://institutions.ville-geneve.ch/fr/mah/">http://institutions.ville-geneve.ch/fr/mah/</a>
MAN-ES	Museo Arqueológico Nacional		Saint-Germain-en-Laye	Yvelines	France	<a href="http://musee-archeologienationale.fr/">http://musee-archeologienationale.fr/</a> [6] [7] [8]
MB	Musée Bégouën	château de Pujol	Madrid		Spain	<a href="http://www.man.es/">http://www.man.es/</a> [9]
MBAC	Musée des beaux-arts de Carcassonne		Montesquieu-Avantès	Ariège	France	<a href="http://www.carcassonne.org/">http://www.carcassonne.org/</a> [3]
MC-MHNL	Musée des Confluences [2]		Carcassonne	Aude	France	<a href="http://www.museedesconfluences.fr/">http://www.museedesconfluences.fr/</a>
MCHM	Musée de Cahors Henri-Martin		Lyon		France	<a href="http://www.mairie-cahors.fr/musee/">http://www.mairie-cahors.fr/musee/</a>
MDA	Musée départemental de l'Ariège	château de Foix	Cahors	Lot	France	
MDW	Musée Despiat-Wiérck		Foix	Ariège	France	<a href="http://www.montdemarsan.fr/">http://www.montdemarsan.fr/</a> [3]
MH	Musée de l'homme	Muséum national d'Histoire naturelle	Paris	Landes	France	<a href="http://www.museedelhomme.fr/">http://www.museedelhomme.fr/</a>
ML	Musée Labenche	ancien palais des archevêques	Brive	Corrèze	France	<a href="http://labenche.brive.fr/">http://labenche.brive.fr/</a>
MN	Musée archéologique		Mont-de-Marsan	Aude	France	<a href="http://www.musees-narbonne.fr/">http://www.musees-narbonne.fr/</a> [4]
MNCIA	Museo Nacional y Centro de Investigación de Altamira		Paris	Cantabria	Spain	<a href="http://www.mecd.gob.es/maltamira/">http://www.mecd.gob.es/maltamira/</a> [9]
MNCN	Museo Nacional de Ciencias Naturales		Madrid		Spain	<a href="http://www.mncn.csic.es/">http://www.mncn.csic.es/</a> [5]
MNHN	Muséum national d'histoire naturelle		Paris		France	<a href="http://www.mnhn.fr/">http://www.mnhn.fr/</a>
MNP	Musée national de préhistoire		Les Eyzies-de-Tayac	Dordogne	France	<a href="http://musee-prehistoire-eyzies.fr/">http://musee-prehistoire-eyzies.fr/</a> [6]
MNS	Musée national suisse		Zurich		Switzerland	<a href="https://www.nationalmuseum.ch/">https://www.nationalmuseum.ch/</a> [5]
MP	Musée de la préhistoire		Le Mas-d'Azil	Ariège	France	<a href="https://www.le-mas-dazil.fr/">https://www.le-mas-dazil.fr/</a> [6]
MuPAC	Musée de Préhistoria y Arqueología de Cantabria	centre de préhistoire du Pech Merle	Santander	Cantabria	Spain	<a href="http://www.museosdecantabria.es/">http://www.museosdecantabria.es/</a> [4]
MRAL	Musée régional de préhistoire Amédée Lemozi	monastère royal de Brou	Cabrerets	Lot	France	<a href="http://www.pechmerle.com/">http://www.pechmerle.com/</a>
MRB	Musée de Brou		Bourg-en-Bresse	Ain	France	<a href="http://www.monastere-de-brou.fr/">http://www.monastere-de-brou.fr/</a>
MSC	Musée Sainte-Croix		Poitiers	Vienne	France	<a href="http://www.poitiers.fr/">http://www.poitiers.fr/</a> [3]
MVB	Musée d'histoire naturelle Victor Brun		Montauban	Tarn-et-Garonne	France	<a href="http://www.museum.montauban.com/">http://www.museum.montauban.com/</a>
PMAE	Peabody Museum of Archaeology and Ethnology	Harvard University	Cambridge	Massachusetts	USA	<a href="https://www.peabody.harvard.edu/">https://www.peabody.harvard.edu/</a> [5]
RM	Rosgartenmuseum		Konstanz	Baden-Württemberg	Germany	<a href="http://www.rosgartenmuseum.de/">http://www.rosgartenmuseum.de/</a>

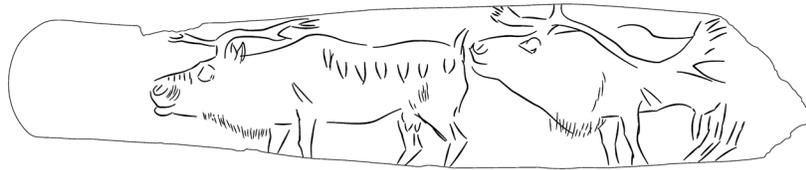
- [1] formerly Musée des antiquités nationales  
 [2] holds the collections from the Musée d'histoire naturelle  
 [3] one or more pages in the culture section  
 [4] website for two or more museums  
 [5] picture library available as a collection search feature  
 [6] external picture library (RMN)  
 [7] external picture library (Base Joconde)  
 [8] external 3D model library (Sketchfab)  
 [9] external picture library (CER.ES)

TABLE 2. ONLINE PICTURE/3D MODEL LIBRARIES.

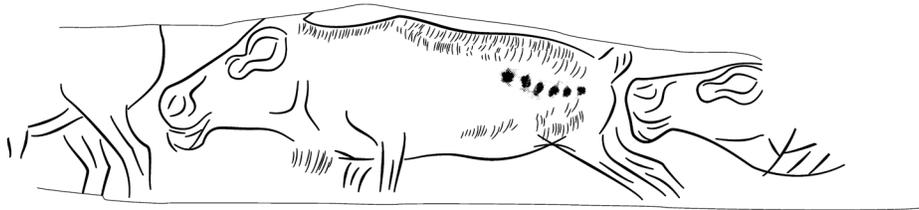
NAME	WEBSITE
Agence photographique de la Réunion des Musées Nationaux (RMN)	<a href="https://www.photo.rmn.fr">https://www.photo.rmn.fr</a>
Base Joconde	<a href="http://www2.culture.gouv.fr/documentation/joconde/fr/pres.htm">http://www2.culture.gouv.fr/documentation/joconde/fr/pres.htm</a>
Sketchfab	<a href="https://sketchfab.com/francecollections/collections">https://sketchfab.com/francecollections/collections</a>
Red Digital de Colecciones de Museos de España/Colecciones en Red (CER.ES)	<a href="http://ceres.mcu.es">http://ceres.mcu.es</a>



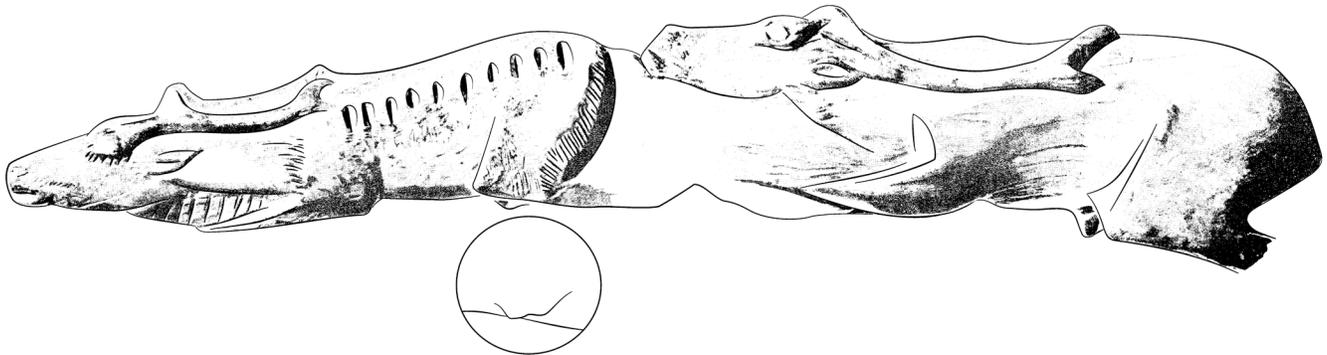
a



b



c



d

Figure 2. The rennes se suivant series: a) Le Chaffaud (MAN 30.361), b) La Vache (MAN 83.356), c) Massat (MAN 31.717), d) Abri Montastruc, large carving (BM Palart.550).

the female (2001: 69). This interpretation seems to be confirmed by the proximity of the male, whose outstretched head seem to show a curled-up nose and possibly even parted lips. Guthrie's description implies that the association between these two images was meant to represent a true scene. If so, it is also possible that the male is directly testing the scent of the female, a behavior more clearly depicted in the following example.

The line of two reindeer images from *la Vache* (Figure 2b) is one of the image associations where the intention of its maker, or makers, to represent a true scene is more evident. What we see here at first is a male with fully developed, tilted back antlers following a female. Nougier and Robert (1971: 18–19) remarked that the bull, with its head and neck raised upwards, open nostrils, and exposed genitals is not only following but also testing the scent of the cow, whose tail is raised up exposing her own genitals, in a characteristic “pre-mating” behavior. The bull is also shown with the hind legs bunched as if ready to mate (Guthrie 2001: 54) and possibly an open mouth or lip curl. The male from *La Vache* is also shown with a long mane hanging from its thick neck. These two secondary sexual characters confirm the meaning of the behavior represented, placing it firmly in the reindeer mating season. The same two characters can be seen in the images from *Laugerie Basse* and, to a lesser extent, the *Abri Morin*. Since the image from *Laugerie Basse* is fragmentary, in theory it is possible that it was originally associated with a female image of which no evidence remains.

### LES RENNES SE SUIVANT

The examples from *La Vache* and *Massat* belong to the remarkable series of image associations that I refer to as the *rennes se suivant*. Not only does this series feature a recurrent image association but it includes two of the Magdalenian associations that can be most confidently interpreted as true scenes. What is more, one of these two associations is rendered as a full-round carving, a class of portable objects that are relatively rare. Everything indicates that the scene represented in this series was essential to the Magdalenian culture, giving a new meaning to the term reindeer age, an earlier proposed name for the Magdalenian period.

Discovered at the *Abri Montastruc*, one of the four rock shelters in the *Bruniquel* area, the full-round carving in this series is the largest known artifact of its class (Figure 2d). The only comparable pieces are a few weighted spear-throwers that are only partly carved and not always in full round. What we see in this artifact is a bull with fully-developed antlers stretching its head out to test the genitals of the cow (Guthrie 2001: 54) which are “sculpted in low relief” like the corresponding parts of the male (Sieveking 1987: 64). The details of the nose are difficult to read, but the mouth of the bull appears to be open in a similar way as in the images from *Massat* and *la Vache*. The hind legs of the cow, especially on the side not shown here, seem to be stretching back as in the image from *Massat*, but all the legs are partly missing and what is left is difficult to read. Note that Sieveking described the two individuals as “swim-

ming one behind the other” (1987b: 64), which eventually led to the nickname “swimming reindeer” (Cook 2010), possibly because of what appear to be folded forelegs and hind legs. My impression is that the legs were at some point reworked, making it more difficult for us today to determine their original position, but there is no doubt that the two images as a whole were influenced by the shape of the raw material used, and this accounts for all the differences with the images from *La Vache* (Nougier and Robert 1971: 33). The outstretched head of the bull may also have given the impression of swimming, but this is no different from what we see in every other image in this series. The mating season behaviors represented are only observed on land.

Mainly due to their lack of antlers, the two images from *Le Chaffaud* (Figure 2a) have traditionally been described as hinds. Like its English translation, the original French term (*biches*) indicates females of red deer or related species. More recently, they were still described as hinds (Airvaux 2002: 43) or does (Cook 2011: 188–193) without taking into account the revised description given by Nougier and Robert. The two authors pointed out that the second image shows a larger neck, a secondary sexual character, and described the two images as a male closely following a female (1971: 26). This description is confirmed, in my view, by fine details that suggest the same behavior represented in the *rennes se suivant*. In the female image, the rump patch is emphasized and the tail raised, while in the male image the nostrils are well defined and the mouth slightly open, not unlike in the example from *Massat*. The clues are more subtle but their combination seems hardly coincidental.

This description leads to a new question that Nougier and Robert did not address. If the behavior represented belongs to the mating season, why is the male without antlers? This is a difficult question to answer, and one related to the issue of which species was depicted. The main arguments in favor of red deer is the presence of what has been described as a black lip spot (Guthrie 2001: 67), an ancestral feature retained by red deer but not reindeer (Guthrie 1971; Guthrie 2001: 64), and the rump patch outline, which could represent the dark brown hair that borders it. The position of the lip spot, also referred to as a stripe, would be correct, but the orientation is not as expected, and it seems difficult to explain why this feature is missing in the female image. This makes me wonder whether the mark so described was intentional or accidental, the result of artifact damage. There is no doubt that the antlers were omitted, intentionally or not, in the male image, but we should consider the possibility that they were also omitted in the female image, and both were meant to represent reindeer. The shape of the heads seems to be consistent with this description, which is why I tentatively included this image association in the *rennes se suivant* series.

Two images on a baton from *Laugerie Basse* were described as hinds (Breuil 1901: 20). Nougier and Robert saw them as a male following a female (1971: 27) but without offering any evidence to support this conclusion. These two images are significantly stylized and difficult to read due to what appears to be a combination of intentional signs,

accidental marks, and surface deterioration. Based on the shape of the head and body, they are more likely to be antlerless reindeer than red deer hinds (Paillet 2011: 121). The first image seems to show a raised tail, and the hind legs may be in a similar position as in the image from Massat, two signs that would indicate a female, but I found no evidence that the second image represents a male, or a subject different from the first.

Two of the female images in the *rennes se suivant* series include the udder with its two teats. Today, most pregnant caribou females develop a distended udder shortly before calving (Bergerud 1964), which occurs in late spring. The udder is no longer visible shortly after the calf is lost (Whitten 1989) or weaned. Normally, weaning takes place before or early in the mating season, allowing the female to become pregnant again, although its timing can vary significantly. Females can extend lactation into early November, and all through the winter, but when this is the case they are unlikely to become pregnant again (Gerhart et al. 1997), suggesting that their fertile period was shorter or missing.

The images showing the udder are the examples from La Vache and the Abri Montastruc (see Figures 2b and 2d). Remarks to this effect can be found in Delporte (1991: 135; in Clottes and Delporte 2001: 396) and Cook (2011: 269). Since it evokes the birth season, this anatomical feature does not seem consistent with the behavior represented, such as all the primary and secondary sexual characters indicated in the male images and the hindquarters of the females. This could be seen as a contrasting element, either a mistake or evidence against the conclusion that the two reindeer images were meant to represent a specific time of the year, but could also represent the first clue pointing to a more complex symbolic use that does rely on their seasonal meaning.

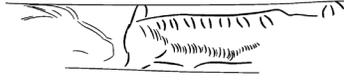
### ROUND WHITE SPOTS

There is a second clue that this image association may be something more than a scene observed at a particular time of the year. All the female images in the *rennes se suivant* have a series of large shapes, or double marks, along their side. Similar series are found in female reindeer images that are not associated with a male image (Figures 3 and 4), although five of these show a raised tail that seems to suggest the same behavioral interaction represented in the *rennes se suivant*. I include here the image from La Roche (see Figure 3a) previously described as an ibex (Delluc et al. 2001: 199) seemingly based on Breuil (1936–37: 12) who actually described the other image as ibex but was more cautious about this one. When asked if the image on the right could be that of a saiga antelope, Breuil examined the horns but found it difficult to determine whether they belonged to an ibex or a saiga (1928). My view is that what we see in this image is only the base of what could be either antlers or horns, while the details of the coat are rendered in the same way as in many reindeer images. The image on the left, which is likely to be a secondary addition, is simply too sketchy to be described with any confidence. The image from La Vache (see Figure 4a) has been described as

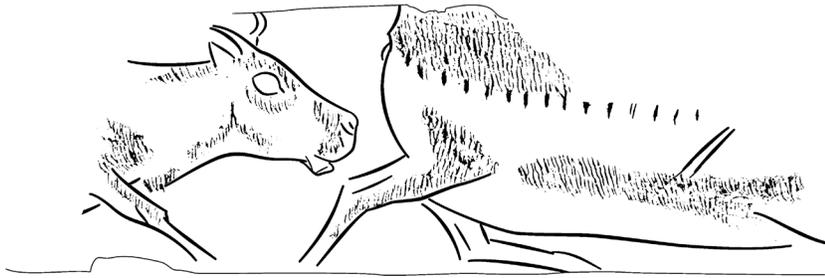
a young reindeer based on the size of the head, relatively large compared to the rest of the body (Mons in Thiault and Roy 1991: 312), but in my view the head is actually too large, and the legs too short, to support this conclusion. A more likely image of this subject is the one from the Abri Morin, following the female image (see Figure 3b), whose similarity with an image from La Madeleine described as a young reindeer was correctly pointed out, without drawing any conclusions, by Deffarge and colleagues (1971: 36–38). In my view, none of these examples is convincing enough to conclude that the Magdalenians intended to represent a young reindeer, and they are more easily explained as less convincing renditions of male or female reindeer.

Breuil may have been the first to note that this “decoration” could take different forms and to describe it as an unspecified kind of spotting (1901: 31). More recently, they have been described as a variety of coat features including the white ends of the male’s winter fur, the patches seen in the spring molt, and unspecified variations in hair color or thickness. And yet, as Guthrie reminded us (2001: 84), they were accurately matched to a specific reindeer coat feature almost thirty years ago. In a paper co-authored with artist Hubert Pepper, Pruitt (1989) identified these series with a coat pattern observed in some female—and sometimes young—reindeer that he named Pepper’s patches. These are a series of light-colored patches, well distinct from the surrounding fur, running all along the side of the body, from the rump or hip area to the lateral surface of the thorax and lumbar regions (Pruitt 1989: 227). They are similar to the familiar white spots of deer fawns, retained by adults in selected species, but slightly larger in size, all of the same rounded shape and size, and forming a single row of closely and regularly spaced, perfectly aligned spots, rather than being scattered all over (Figures 5 and 6). They consist of longer, stiffer hair and should not be confounded with the breaks in the pelage over individual ribs (Pruitt 1989: 227), visible as lighter stripes especially in males. Note that the drawing by Pepper (1989: Figure 2a) shows the patches slightly smaller and more closely spaced than they are in reality. Pruitt estimated this coat pattern to be displayed by 1 of every 5 females of Finnish forest reindeer (*Rangifer tarandus fennicus*) and less frequently by at least three subspecies of caribou (Pruitt 1989: 227–228).

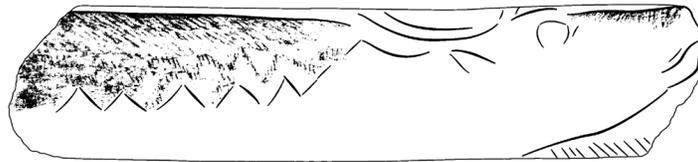
The most realistic renditions of this feature found on portable objects are the more or less rounded, hollowed out shapes seen in the images from Massat (see Figure 2c) and Laugerie Basse (see Figure 4d). These appear to be the result of careful work and an accumulation of individual marks. The images from Le Chaffaud (see Figure 2a), the Abri Montastruc (see Figure 2d), and Isturitz (see Figure 4e) use a similar technique, but one can clearly see one or more vertical mark deep within each shape. The deep vertical marks seen in the images from the Abri Morin (see Figure 3b) and Gourdan (see Figure 4b) are the result of two or more superimposed marks, while in the image from La Vache known as a young reindeer (see Figure 4a) single vertical marks were used. Two large marks were used to render each spot in the remaining examples, leading to



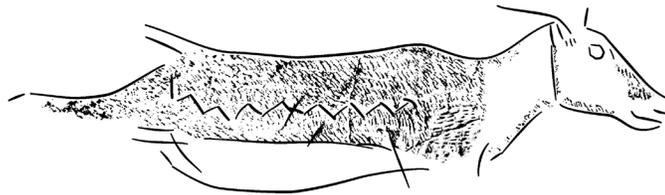
*a*



*b*

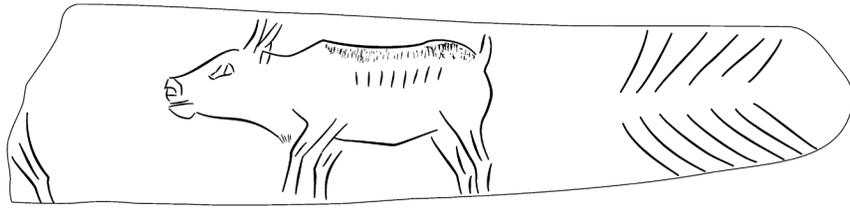


*c*

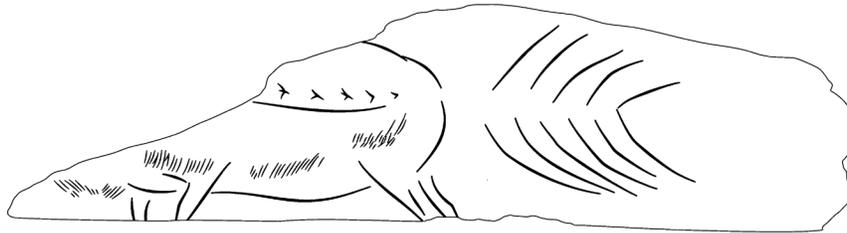


*d*

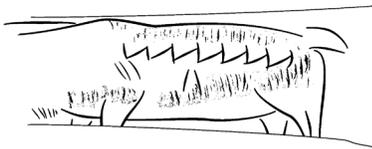
Figure 3. Reindeer images with stylized renditions of Pepper's patches: a) La Roche de Lalande, tube (MC-MHNL 80001280), b) Abri Morin (MA 88.47.51), c) Laugerie Basse, half-round rod (MH 38.189.1729), d) Laugerie Basse (MAN 53.858).



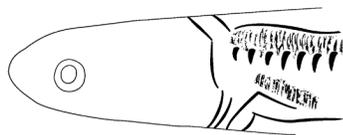
a



b



c



d



e



Figure 4. Reindeer images with stylized renditions of Pepper's patches: a) La Vache, polisher (MAN 83.350), b) Gourdan (MAN 47.307), c) La Madeleine (BM Palart.420), d) Laugerie Basse, pendant (MAAP Pr. A. 1902), e) Isturitz, large rondelle (MAN 84.753).



Figure 5. Reindeer herding in Finnmark, Norway. The female in the middle, and to some extent the yearling behind her, show the coat spotting known as Pepper's patches (photograph by Lawrence Hislop from [www.grida.no/resources/2009](http://www.grida.no/resources/2009)).

more stylized renditions of the same coat feature. In the two images from Laugerie Basse (see Figures 3c and 3d) the double marks are so closely spaced that they give the impression of a continuous line.

Regardless of the degree of stylization and the technique used, this coat feature was always made to stand out from the rest of the image, always purely figurative. This is even more evident on the baton fragment from Laugerie Haute (Figure 7). This artifact is engraved with a highly stylized image, nothing more than a quick head outline with a series of large vertical marks. The number of marks traced that will be considered in the following discussion is seven, but there is a slight chance that an additional mark was present and is now mostly erased due to what appears to be surface damage (Figure 8). Regardless of their number, these marks can only be yet another stylized rendition of Pepper's patches, which makes the subject depicted a female reindeer. With the head outline almost in the background, the emphasis on this spotting pattern could not be more evident, thus confirming that it was highly significant

to the Magdalenians. Everything indicates that this feature had a symbolic meaning and the symbolic use of the images in the same series revolved around it.

### COUNTING MOONS

Pruitt (1989) made no mention that this spotting pattern may be more pronounced or only present in either the winter or summer coat. The photos I collected showing this feature in domestic and wild reindeer of Finland, Sweden, and Norway were taken from the end of September to early June, which leads me to believe that it is displayed with the same intensity all year-long. If it is not a seasonal character, what could the significance of this feature be? Clues to their possible symbolic meaning come from the *rennes se suivant* series. We have seen that while the male image and the hindquarters of the female always represent a mating season behavior, in two examples the female image seems to evoke the birth season. In addition, the shorter, possibly incomplete series seen in the example from Massat can be taken as evidence that the shapes or double marks



Figure 6. Reindeer herd in Finnish Lapland. The female in the foreground shows the same coat feature (photograph by Heather Sunderland from <https://www.flickr.com/photos/rukakuusamo>).

representing these spots were added from right to left, beginning in the hindquarters of the female, and were likely meant to be read in the same direction. When we consider the likeness in color and shape between the reindeer female spots and a full moon, it seems possible that the Magdalenians used this coat feature as a visual device for counting moons. In this view, each shape or double mark was a symbol for a full moon observed in the time from the mating season to the birth season, while reindeer females carry their offspring. For example, the stylized image on the Laugerie Haute baton may have been meant to be read as a count of seven moons, beginning in the reindeer mating season and ending in spring. This is not to say that they attributed a magical significance to the spotting pattern, or saw a connection between the reindeer life cycle and the moon, only that they found it convenient to use it symbolically as a means to keep track of time. The likeness between each spot and a full moon would have made this symbolic use easier to commit to memory and communicate to others.

Caribou males shed their antlers at the end of the mating season, but pregnant females will retain them through winter and until around the time of giving birth (Miller in Feldhamer et al 2003). If the reindeer represented in the *rennes se suivant* followed the same antler cycle, the meaning of the male image is limited to the mating season, but the meaning of the female image may extend in time until the birth season. Looking at the *rennes se suivant* in the direction the subjects are moving, we see a series of events beginning in the mating season, when males follow and test the scent of the females, continuing through the winter, while the females carry their young and the moon follows its cycle in the night sky, and ending in the birth season, when the female is ready to nurse her calf. These events correspond to most of a year's time as seen through the reindeer life cycle.

Today, the gestation period of caribou herds falls within 7 and 8 months (see, for example, Bergerud 1975). Does the observed length match the number of decoration items in the reindeer female images discussed in this research?

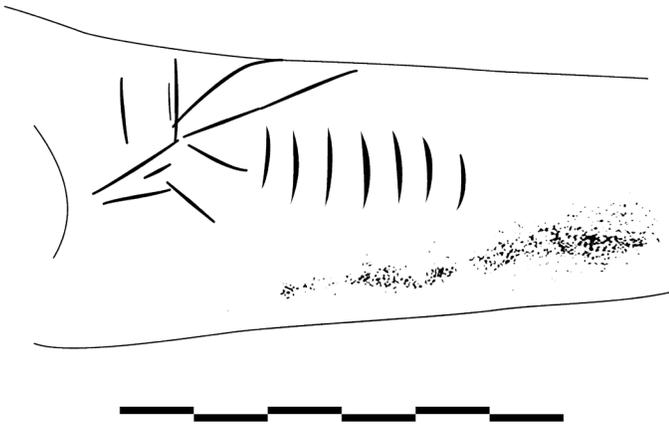


Figure 7. Fragment of a baton from Laugerie Haute (MNP 38-2-4).

This is what we would expect given that the difference between calendar months and lunar months, or moons, is negligible. Looking at our limited sample, the first thing to note is that for three of the fourteen images, the original number of items is unknown due to the fragmentary state of the artifacts. Every artifact discussed here is fragmentary, but what is of interest here is the limited surface area where the decoration was preserved and to what extent.

For these three images, marked with a plus sign not followed by a number (Table 3), we only know that the number of items was greater than the number we see, and since they are all smaller than what we see in the shortest complete series they will not be considered in this analysis. The artifact from the Abri Morin is also partly broken, but the surface area available for adding more marks is intact, and unused, so the series can be considered complete. The mean value for the eleven remaining images is 8.5. This value is slightly higher than expected but there are more things to consider. First of all, there are two clear outliers, namely the long counts from Le Chaffaud and the Abri Morin. In my view, these reveal a different use of the same images, one in which the count was intentionally extended beyond the birth season. While the reindeer life cycle provided a useful visual device to record moon counts, one that could be understood by anyone familiar with the species represented, these extended counts may be evidence that the wish or need to keep track of time was not limited to the purpose of naturalistic observation. As long as the figurative images provided a marker to read the first item as the moon of the reindeer mating season, the counts represented by the vertical marks could be extended for any length of time desired within the physical constraint of available engraving surface. A mean for the nine remaining images, without the two outliers, gives a value of 7.2, which in my



Figure 8. Close-up view of the image on the Laugerie Haute baton. Musée national de Préhistoire, Les Eyzies de Tayac, inv. no. 38-2-4 (photograph by Don Hitchcock).

TABLE 3. THE ARTIFACTS DISCUSSED IN THE TEXT AND THEIR DECORATION.

FIGURE	TRACING NO.	CONTENTS	ARTIFACT		SITE	DISCOVERY		COUNT	DECORATION		CONN.		
			MUSEUM	INV. NO.		MATERIAL	CLASS		SITE DETAILS	LEVEL		DATING	ITEM TYPE
<i>Low-stretching reindeer bulls</i>													
1a	048	artifact	MAAP	Pr.A.1901	bone	Laugerie Basse	abri classique	A IV	14000-15700 ya				
1b	087	images	MA	88.47.21	bone	abri Morin							
<i>Rennes se situant</i>													
2a	055	images	MAN	30.361	bone	Le Chaffaud	Grotte du Puits	1	14,100-14,700 ya	14	vertical marks	N	
2b	053	artifact	MAN	83.356	reindeer antler	La Vache	Salle Monique			7	pitched pairs	inverted	
2c	034	artifact	MAN	31.717	bone	Massat	Grotte du Ker			6	vertical marks	rounded shape	
2d	047	artifact	BM	Palart.550	ivory	Bruniquel	Abri Montastruc			10	vertical marks	rounded shape	
<i>Reindeer females with Pepper's patches</i>													
3a	107	artifact	MC-MHNL	80001280	bone	Lalinde	Grotte de La Roche			7	rounded pairs	open	N
3b	072	artifact	MA	88.47.51	bone	Abri Morin		A III	13900-15500 ya	15	vertical marks	multiple	Y
3c	079	artifact	MH	38.189.1729	reindeer antler *	Laugerie Basse	abri classique			5 + 5	pitched pairs		Y
3d	064	images	MAN	53.858	bone	Laugerie Basse	abri classique			8	pitched pairs		Y
3e	159	artifact	MAN	83.350	bone	La Vache	Salle Monique	2	14,200-15,800 ya	8	vertical marks		
3f	016	artifact	MAN	47.307	bone	Gourdan				5 +	vertical marks	multiple	
3g	058	artifact	BM	Palart.420	bone	La Madeleine				7	pitched pairs	asymmetric	Y
3h	113	artifact	MAAP	Pr.A.1902	bone	Laugerie Basse	abri classique			7 +	vertical marks	curved shape	
3i	114	artifact	MAN	84.753	bone	Isturitz	Grand Salle	II	14,200-15,000 ya	3 +	vertical marks		
6	138	artifact	MNP	38-2-4	reindeer antler *	Laugerie Haute	est			7	vertical marks		

NOTES: The tracing number is a production code used in the digital art workflow. Tracing 087 is unrolled. Tracings 055 and 064 are selective. An asterisk indicates that the material was inferred from artifact class and appearance. The artifact class was assumed to be undetermined or unknown, and is therefore missing here, for pieces referred to in the original sources by way of their raw material, alone or combined with other physical properties (e.g., *côte, lame osseuse, fragment d'os*). The date range for Level II of the Grand Salle at Isturitz is based on two AMS dates (Baishay-Szmidt et al. 2016). More radiocarbon dates are available for this level combined with level E on the basis of their proposed equivalence (Szmidt et al. 2009) and for level F alone but were not used here. Levels 1 to 4 of the Salle Monique at La Vache are considered artificial subdivisions of a single level rather than true stratigraphic units and more recent dates do not differentiate between them (Pailhaugue 1998) but they are still used here. The range for Level 2 is based on two dates (Pailhaugue 1998) calibrated using OxCal 4.3 and then converted from cal BC to cal BP by adding 1950 years. An early date identified as Col-336c, formerly L-336c, was not used here because it was considered unreliable early on (Leroi-Courhan 1967) and rarely used afterwards. The range for Level 1 is based on a date taken from museum records—a simple estimate inferred from the direct dates available for different levels and expressed in the same unit of time but without error margin—calibrated and converted in the same way. The date ranges for Abri Morin levels AIII and AIV are based on four and seven AMS dates, respectively (Mallye et al. 2018). All dates were calibrated using IntCal13 (Reimer et al. 2013) and rounded to the next hundred, lower limits down and upper limits up. The plus sign in decoration item counts can have two different meanings. When followed by a number, it indicates the presence of an additional series of items, when alone it indicates that the actual number must have been greater than the one reported because part of the series was not preserved. The terms used in the Item Type column are taken from a classification system for notational sequences that has not been published yet. The last column indicates if decoration items are connected (Y) or not (N) which only applies to double marks such as pitched pairs and rounded pairs.



Figure 9. View of the half-round rod from Laugerie Basse, inv. no. 38.189.1729, coll. Vibraye, Musée de l'Homme, part of the Muséum national d'Histoire naturelle, Paris (photograph by Patrick Paillet).

view is more accurate. Then there is the special case of the image from Massat. Here, the unusual spatial disposition of the items compared to the rest of the image suggests an incomplete count, as if the object was for some reason lost or abandoned. If this was the case, this should be left out for the same reason as the three fragmentary artifacts and the adjusted mean for the eight remaining images would be 7.4, which is the value that I consider the most accurate of the three given here. This analysis reveals that the average number of decoration items in our sample closely matches the length in months of the reindeer pregnancy cycle observed today.

Without the two outliers and the image from Massat, six out of eight images are either 7 or 8 items long. This is precisely what we would expect if these series were records of the reindeer life cycle observed in a given year, or representations of its known length. The other two images, however, have one shorter and one intermediate count that are more difficult to explain. The image on the half-round rod from Laugerie Basse appears to have an intentionally complete count of 5 items (Figure 9). If the artifact was broken before the series was added, or while the series was being created, then it is possible that the intention to add more items could not be fulfilled due to the missing surface. Right above the main series of items we find a long series of tiny marks arranged as pitched pairs and covering approximately the same length, like a shadow decoration, which is the single instance of an additional series of items encountered in our sample. The style is very different, but there is some chance that it was meant to continue the main series. The image from the Abri Montastruc, listed here as a single example, is a three-dimensional image with a series of items on each side, both comprising 10 items. There are

only a few Magdalenian carvings (from organic materials) of comparable size and they all are, or may have been, part of weighted spear-throwers, making this a truly unique artifact. The variety of carving and engraving techniques used for this image strongly suggests that it was reworked at different times by different hands. This is especially evident in the decoration items, which compared to the other images in the same series, are more unevenly spaced on one side (Figure 10) and slightly misaligned on both. Based on these elements, the unique number of items seen in this image may be the result of later additions to an originally



Figure 10. View of the reverse side of the large carving from the Abri Montastruc (photograph © Trustees of the British Museum).



Figure 11. View of the artifact from the Abri Morin engraved with a line of two reindeer images. Musée d'Aquitaine, Bordeaux, inv. no. 88.47.51 (photograph by Andrea Castelli).

shorter series, closer to the series average, although for reasons unclear.

Magdalenian images of reindeer typically have a few rows of fine lines that represent coat hair. These slightly curved lines are found in areas where the hairy coat tends to be thicker, longer, or changes color from light to dark. They can be seen in every image pictured here except for the reindeer bull on the tube from the Abri Morin (see Figure 1b), where they are present but could not be accurately traced from the reference material collected and were eventually omitted from the published tracing. The female image from Le Chaffaud is unusual in that these hair lines fill most of the image, although they are intentionally missing from the lower body to indicate the lighter hair color. In some of the reindeer female images discussed here, however, we see something different. In the image from Mas-sat they are unevenly distributed and tend to cluster above the decoration that represents the female spotting pattern, while in the image on the La Vache polisher they are only found in this limited area. This becomes more evident in the images from the Abri Morin (Figure 11) and on the pendant

from Laugerie Basse where they completely fill the area bounded by decoration. Finally, in the other two images from Laugerie Basse, the realistic hair lines are replaced by tiny vertical marks completely filling a well-delimited area. The first of these two examples (see Figure 9, see also Figure 3c) shows many rows of fine lines and a series of tiny marks arranged as pitched pairs all bounded by the main series of large double marks, while the second (see Figure 3d) has countless tiny marks that completely fill the area delimited by an horizontal line running below the series of double marks, too straight and high up to have been meant as a purely figurative representation of coat color change. This is the same line seen in the image from Gourdan and its function may have been to underscore the main series of marks. Being far removed from anatomical reality, the tiny marks in these two examples are more likely to be part of its symbolic decoration, as if they were meant to complete the main series of marks. If the larger items represent a series of moons, the tiny marks decoration may have been meant to evoke, as a whole, the idea of “many days” or nights, that is, all the days or nights that follow one another

through fall and winter, the length of time represented by the main series of marks they are closely related to. Whether this elaborate, carefully executed decoration evolved over time from purely figurative hair marks or was a local development that belonged to a particular time and place is a question that we will be able to address when more direct dates for the relevant artifacts become available.

Direct dates are only available for five of the sixteen artifacts discussed here (see Table 3). These dates, referring to the levels where artifacts were found, fall in the range between 13,900 to 15,800 years ago. The Abri Morin and La Vache levels listed here have yielded industries that are considered to be Upper Magdalenian. The Isturitz level from which the large *rondelle* comes has been traditionally attributed to the Middle Magdalenian (Delporte in Pétilion 2004), but recent lithic analysis indicates a Late Upper Magdalenian phase (Barshay-Szmidt et al. 2016). The stratigraphic position of the eleven remaining artifacts, all from ancient collections, is uncertain or unknown, been attributed to the Magdalenian culture based on a combination of limited or indirect information and style. The artifacts from Massat, Bruniquel, Lalinde, and Gourdan are considered to be Upper Magdalenian while the piece from Le Chaffaud is regarded as final Magdalenian (Airvaux 2002: 43). The remaining artifacts could be Upper Magdalenian or older. Based on this information, the symbolic use of reindeer images revealed by the theory presented here was likely to be an Upper Magdalenian development, although a Middle Magdalenian origin cannot be ruled out.

Four of the examples discussed in this research show a sign formed by two short, roughly parallel lines. These signs are traditionally described in the literature as arrows or spearheads, and therefore stylized figurative images, a description that fits two different general theories, namely hunting magic and hunter's art. The theory proposed here, however, suggests a different interpretation. The double sign is found right below the main decoration in the images from Le Chaffaud (see Figure 2a) and La Madeleine (see Figure 4c) and right after the last mark in the images from the Abri Morin (see Figure 3b), always within the outline of the female image. The position is slightly different in the *rennes se suivant* from La Vache (see Figure 2b), where it was added to both images. Overall, the double sign appears to be closely associated with the main series of marks as a whole, especially in its completed state. This suggests that its symbolic meaning may have been to wrap-up the symbolic use of the image and mark the end of the length of time represented by the main series of marks.

While the scope of this research is limited to portable objects from the Middle and Upper Magdalenian, reindeer images with similar decorations also are found on the rock surfaces of archaeological features and artifacts—ranging from cave and rock shelter walls to stone plaquettes and blocks—dated to the same cultural period. The subjects represented in these images are more uncertain and their decoration can rarely be described with the same accuracy. The reindeer image engraved on a large limestone slab from Limeuil shows a series of pitched pairs whose number

I could not determine. Two images engraved in the Grotte de la Forêt have a series of deep vertical marks. The first image, which can be identified as a reindeer, appears to have eight or nine marks while the second one has at least six or seven, possibly more. There are several examples engraved at Les Trois Frères, including one possibly showing a female followed by a male, but they are mostly found on heavily over-engraved surfaces that are extremely difficult to decipher. Two engraved images from La Mouthe show details painted in dark brown color and according to Breuil (in Delluc et al. 1995: 655) additional colors were originally present. The painted details that were still visible when the cave was discovered include a series of items that may have originally been rounded pairs in the first and pitched pairs in the second. Unfortunately, the first image was damaged not long after its discovery, to the effect that an early photograph has been our primary source since then. For reasons that are not clear to me, Breuil (in Delluc et al. 1995: 655) saw in this photo twelve decoration items, whereas I see eleven at most, and possibly less considering that there is a slight chance the first item was intended to represent a different coat feature, which may also be true for the last one. Rivière, who discovered the cave, reported eleven (1905: 22–23). The situation is reversed for the second image for which Rivière (1905: 23) reported fifteen and Breuil (in Delluc et al. 1995: 654) sixteen. Recent photographs clearly show sixteen items, although in my view the first four or five items have a distinct appearance, in style and alignment, from the rest, suggesting that an earlier, shorter series was at some point reworked into what we see today. For a more detailed discussion of all these images, see the comprehensive work by Dubourg (1994: 155–163) where the same decorations are referred to as *punctuations* and *lignes ondulées ou brisées*. To what extent does the theory presented here apply to these images? The meaning of the decoration may have been the same, but the way each image was used would have differed significantly from the model proposed here due to the different physical properties of rock surfaces and the local conditions of each archaeological feature.

## CONCLUSION

The theory proposed here can be placed in a wider framework for the interpretation of Magdalenian visual creations. Keeping track of time is a basic need of every human group. Several series of Magdalenian images show a strong emphasis on seasonal characters and behaviors, suggesting that their symbolic meaning was a given time of the year, a season in a general sense, and they were used as seasonal markers (Marshack 1972: 169–195; 1991: 382–386; 1995). My review of Magdalenian figurative images revealed extensive archaeological evidence that at least seven recurrent subjects (Table 4) were created and used to mark what I call biological seasons, the time of the year when a given anatomical or behavioral character is displayed (Castelli n.d.; for a preliminary overview of the seasonal meaning theory with a focus on images of Pyrenean ibex and related species see Castelli 2010: 131–138). Every example that I was

TABLE 4. MAGDALENIAN VISUAL CREATIONS.

SERIES	REFERENCE SOURCE	SYMBOLIC MEANING/USE
<i>Seasonal</i>		
Belling red deer stags	Marshack 1972	red deer mating season, early to mid-fall
Low-stretching ibex bucks	Rätzl 1965	ibex mating season, late fall to mid-winter
Pyrenean ibex bucks in winter coat (winter ibex)	Castelli 2010	cold season, fall and winter
Wild horses in winter coat (winter horses)	Schmid 1973	cold season, fall and winter
Wild horses in summer coat (summer horses)	Schmid 1973	hot season, spring and summer
Bison bulls with full display hair	Guthrie 1984	bison mating season, late summer
Reindeer male pursuing a female ( <i>rennes se suivant</i> )	Nougier and Robert 1974	reindeer mating season, early to mid-fall
<i>Non-seasonal</i>		
Reindeer females with Pepper's patches	Pruitt and Pepper 1986	counting moons
Ibex with winter rings	Castelli 2010	counting years
<i>Non-figurative</i>		
Notational sequences	Marshack 1972	counting days or nights

able to confirm as seasonal for each of these seven series comes from the Middle or Upper Magdalenian. Due to the climate instability and rapid environmental transformation witnessed by the humans inhabiting what I refer to as Atlantic refugial area in Magdalenian times, a symbolic system based on the appearance and disappearance of prominent seasonal characters and behaviors in familiar species would have been more accurate at predicting variations in seasonal climate than the system based on astronomical turning points we use today. As living species adapt to changing environmental conditions, biological seasons such as the reindeer mating season remained reliable indicators of local climate variability.

The reindeer female images discussed here, whether part of the *rennes se suivant* association or found on their own, represent the second series of non-seasonal images identified so far. The first was ibex images with horn rings, or more accurately winter rings, whose symbolic use was proposed to be counting years or winters (Castelli 2010). These two theories were developed independently of each other and of seasonal meaning theory. They complement each other by addressing different series of images or different aspects of the same images, as in the *rennes se suivant*, but what is remarkable is that taken together they all reveal the same underlying concern for keeping track of time, at different levels, and the same disposition to use figurative images as visual devices to that end. Whether this solution was the result of the need to complement or extend spoken language, overcome language barriers if any existed, create lasting records for personal or shared use, or combine

function with artistic expression are fascinating questions for future research.

While these three theories only account for selected series of Magdalenian images, the resulting framework represents an alternative to the general theories on the meaning of Paleolithic art with their wider scope. This framework is not complete but open to reassessments of the existing archaeological evidence and new discoveries that could reveal more series of seasonal images, but it is important to note that the theory of seasonal meaning could never become a general theory due to the existence of at least two series, and possibly more not yet recognized, that are not seasonal. The inclusion of notational sequences in the same framework is based on a preliminary evaluation of the relevant literature that falls within the same limitations in time, space, and archaeological record as the present research and should be seen as tentative.

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