

A Mammoth Comes Alive

Forschungskontor Hamburg 2019
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Introduction

Are some prehistoric paintings in caves and on bones and teeth actually a form of flipbook? A sequence of motion stills of the animals depicted?

The french archeologist **Marc Azéma** proofed his theory convincingly in animated images [1]. He distinguishes two ways to represent movements:

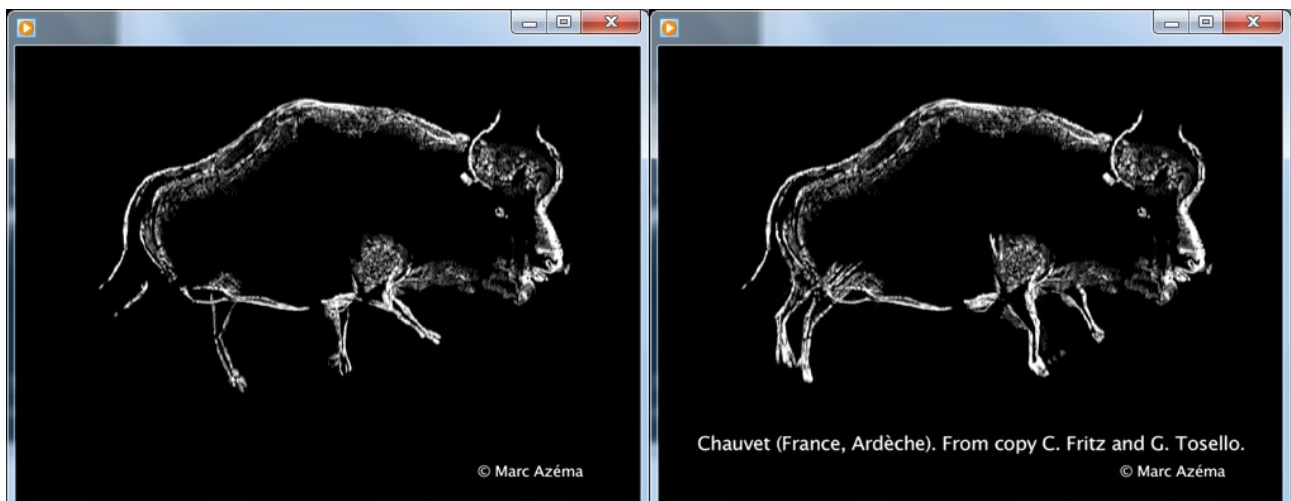
1. **Overlay**: The sequence of motions is painted in one image on top of each other.



[2]



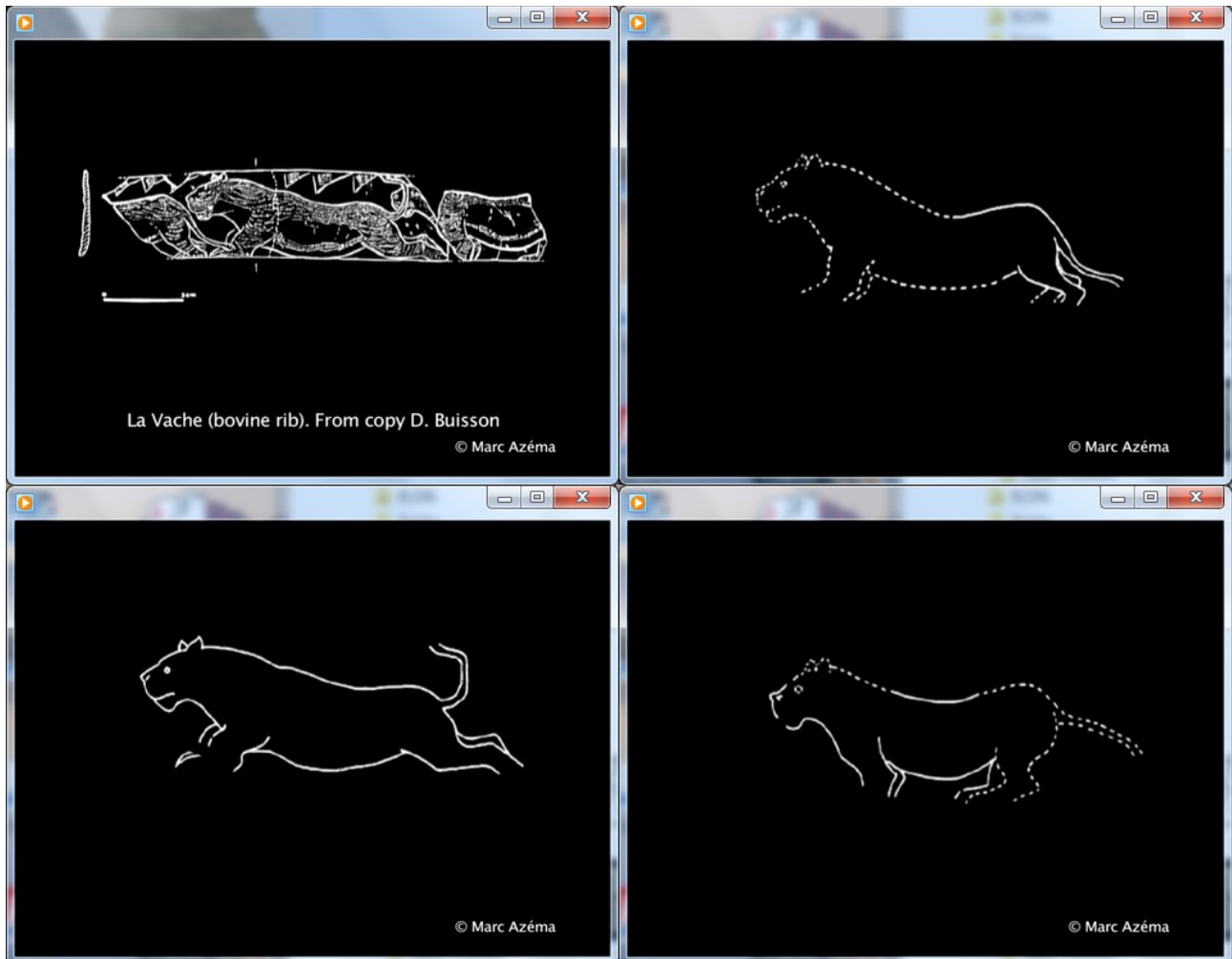
[1]



2. **Sequence:** The images of the motion are painted in a row. One after the other.



[3]



[1]

There are lots of other examples for this type of motion presentation in prehistoric art. Beside predators and bison, also horses, bears, and even humans may have been depicted in motion.

Ice Age Exhibition in Hamburg

In 2016 there was an exhibition of ice age art in Hamburg, Germany. The archeological museum and the ethnological museum of Hamburg presented original artefacts, replicas, and artists impressions of the life and art during the last ice age [4].

The exhibition lasted from 18th Oktober 2016 until 14th Mai 2017. The author paid a visit to it at the 30th Oktober 2016. The photos taken are from this date.



Description:

"Wohnen in der Eiszeit

Ein Blick zurück in eine Zeit vor 28000 Jahren. Die Nachbildung der Kleidung beruht auf den Grabfunden von Sungir in Russland. Die Rekonstruktion des Gebäudes im Hintergrund schuf der Künstler anhand ausgegrabener Hausgrundrisse auf dem Plateau Parrain in Frankreich."

"Living in the ice age

A look back in time 28000 years ago. The replica of the clothing is based on the grave finds of Sungir in Russia. The artist created the reconstruction of the building in the background using excavated house plans on the Parrain plateau in France. "

Artist: Libor Balák

The Mammoth

The picture of a mammoth could be seen on the replica of a mammoth tusk [5]. This seems to be an overlay of a motion sequence of this animal. In this document the image will be separated into a sequence of pictures.



The description of the artefact said:

"Gravur eines Mammuts (Replik). Tursac, Frankreich

... Eine der ältesten Darstellungen dieses Tieres befindet sich als Ritzung auf einem Stoßzahnfragment (2). Die Haltung des Mammuts wird als Angriffstellung interpretiert."

"Engraving of a mammoth (replica) .Tursac, France

... One of the oldest depictions of this animal is as an engraving on a tusk fragment (2). The attitude of the mammoth is interpreted as an attack position. "

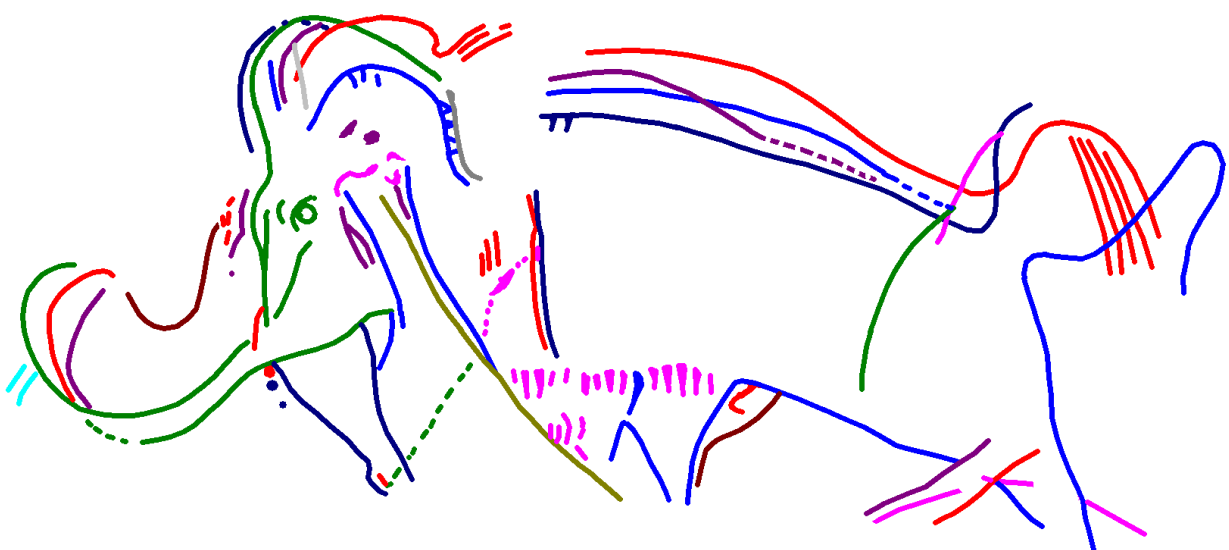
This would have been spectacular enough to scratch it onto a permanent medium like tusk ivory.

Image Processing

The lines in the photo of the tusk were first enhanced for better tracing:



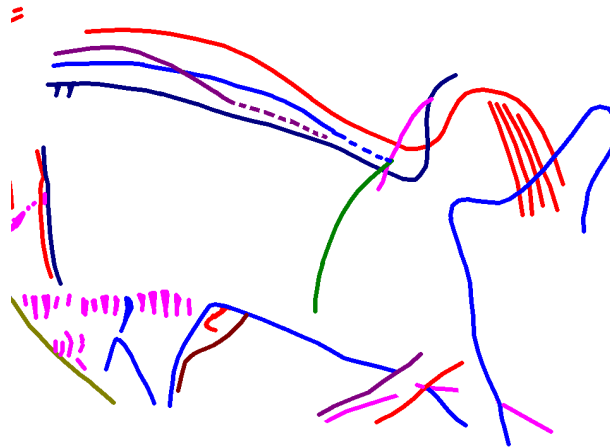
Lines that appeared to be coherent, also in accordance with the photograph, were then traced in different colors:



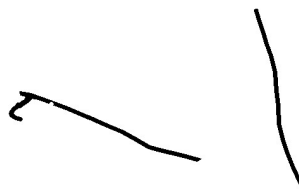
The task to separate the different pictures of the moving animal was quite difficult. The artist was familiar to the motion of the animal he wanted to depict – a knowledge we lack today, even if we may assume that the movement of a mammoth was similar to that of modern living elephants.

We separated the picture in two parts: the forward part with the head – the most difficult one to interpret - and the rear part.

We started with the easier to interpret rear part.



The number of hump lines suggests that we have an overlay of four pictures. There are some lines, that appear in every picture: the back and the belly.



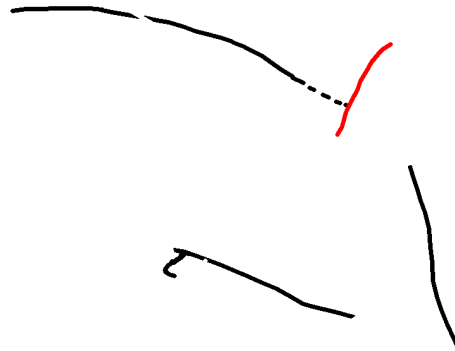
The combination of hump, back, and belly give us four images. It creates the impression of a jump from the standing. While in the stand the hump is round, it is stretched in the jump.

The same must happen to the tail which is depicted in the lines of the drawing. An obviously raised hairy tail will be stretched down in the jump and may be raised again.



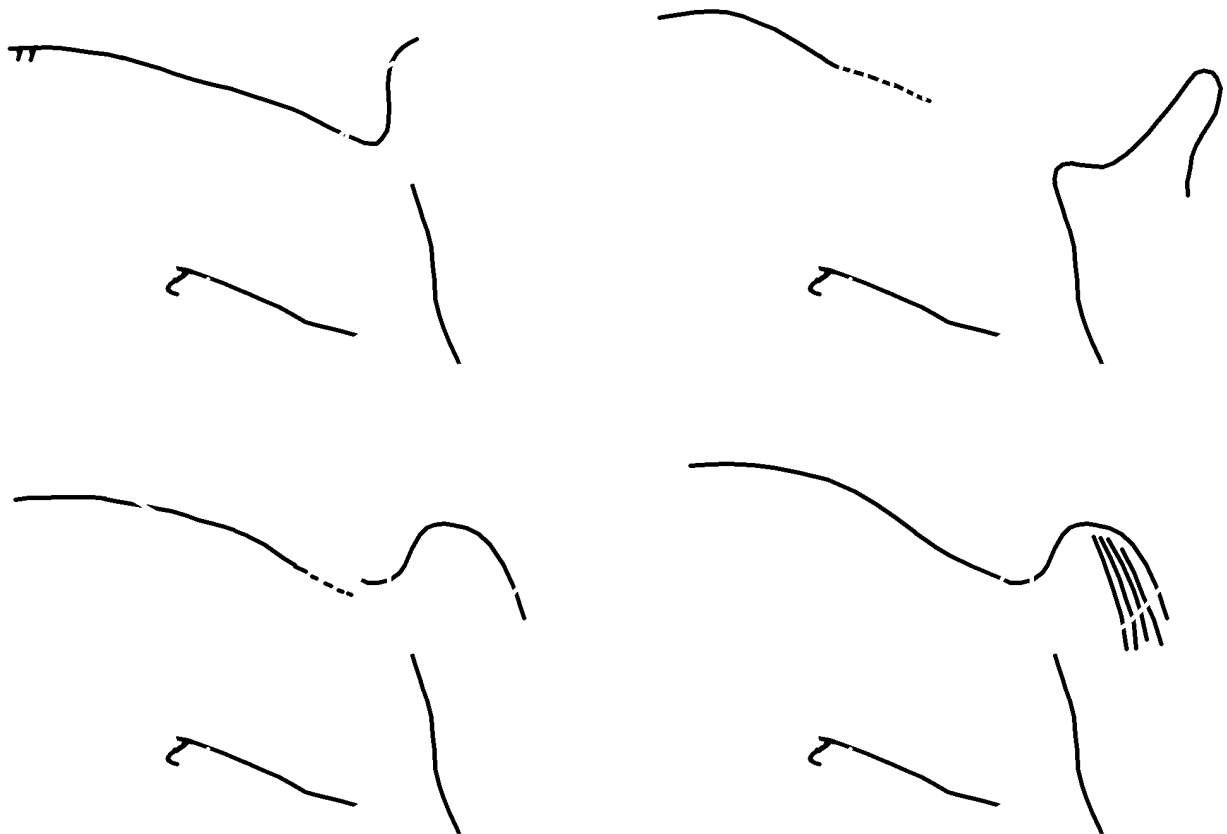
Only three tail images are present so we must interpolate the third one with an already existing one.

There is a line that could be a tail, but the wrong anatomical position denies this interpretation:



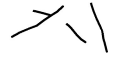
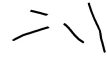
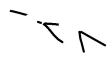
We will return to this feature later!

After some a posteriori sorting, we are now able to determine the sequence:

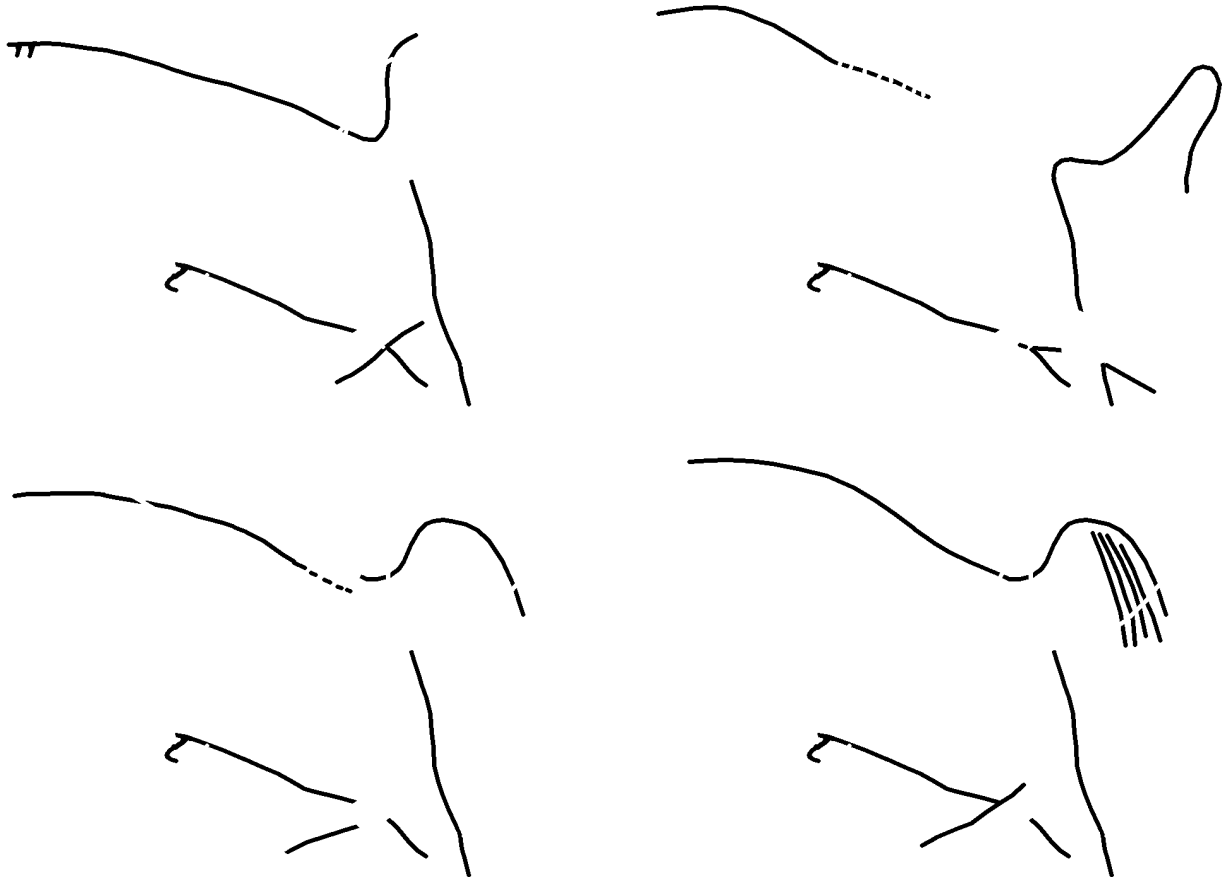


Similar reasoning can be done with the lines depicting the hind legs of the animal ...





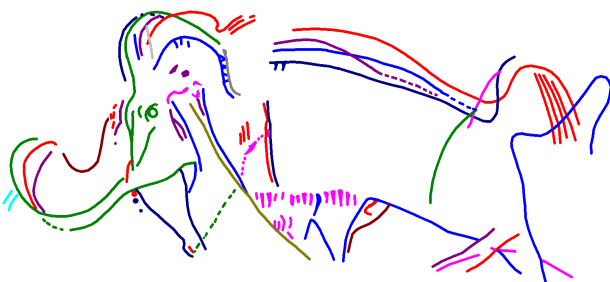
... that leads to a quite dynamic jump of the mammoth:



Now we can try to decipher the frontal part. Quite easily three head positions are detected which relate to the final phases of the jump, but the first head is either a repetition or something else:

There are strange double lines at the forward leg. Double lines could have double meaning!

They can be interpreted as the animal looking at the observer! This makes sense out of the two hooks at the hump line because they are part of the left tusk.



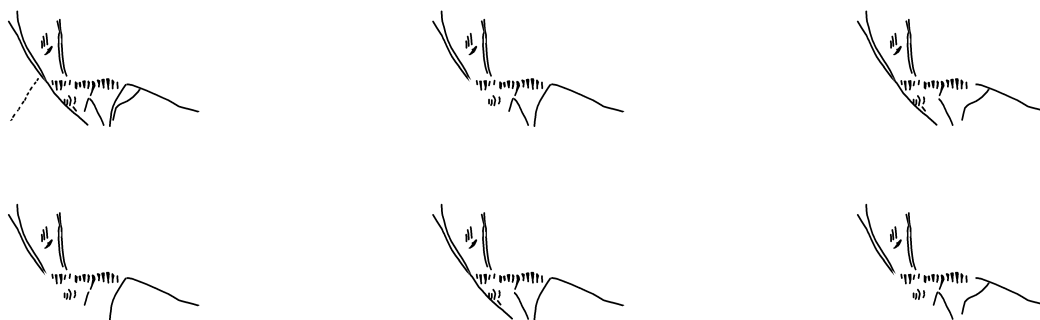
So, we have the following picture sequence:



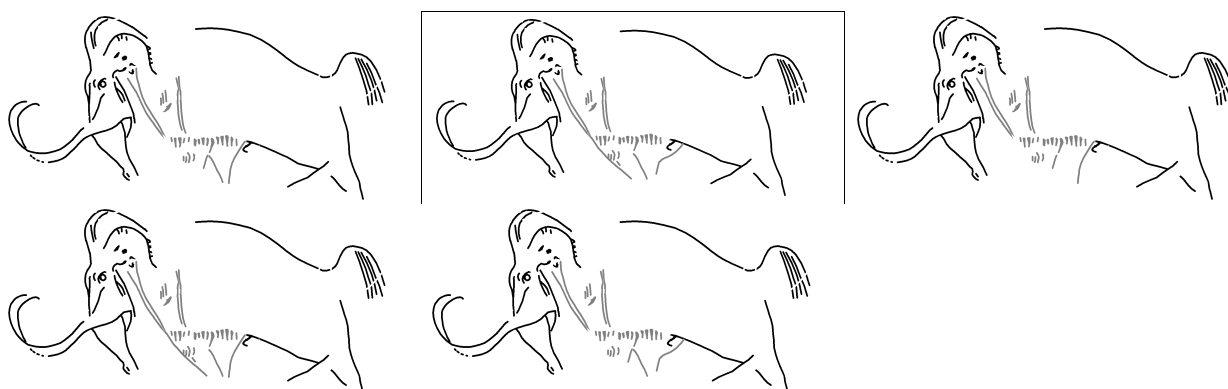
The final decision which hump belongs to which head came with the last image:



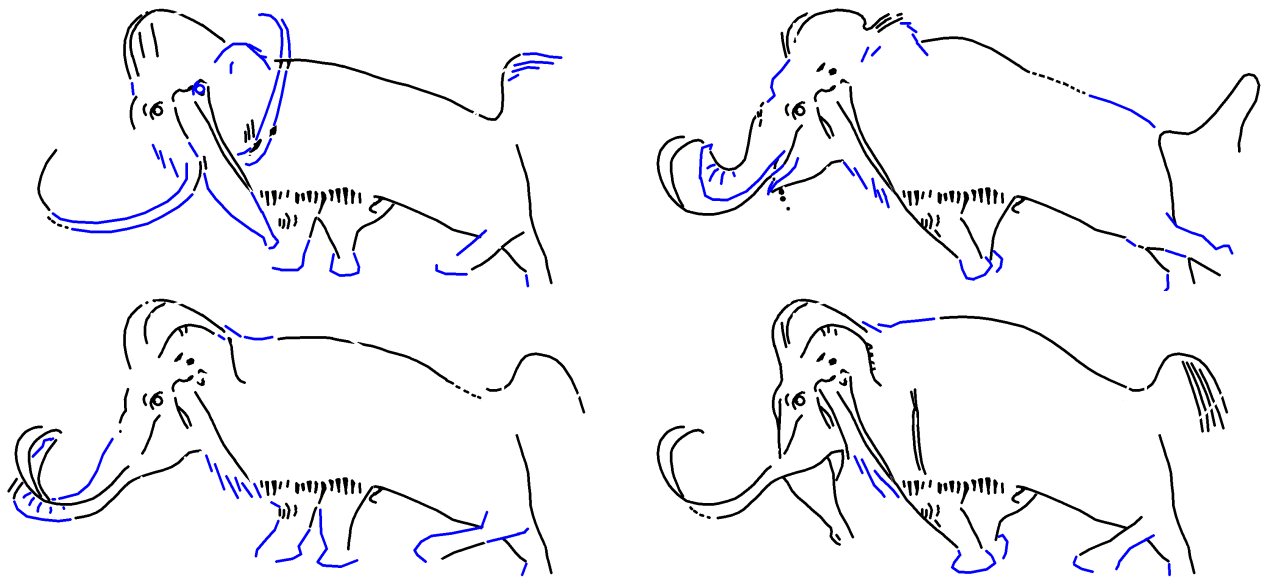
The lines depicting front legs were then combined in every combination that made sense:



A visual check of every combination of forelegs with a movement picture allowed to select the correct image:



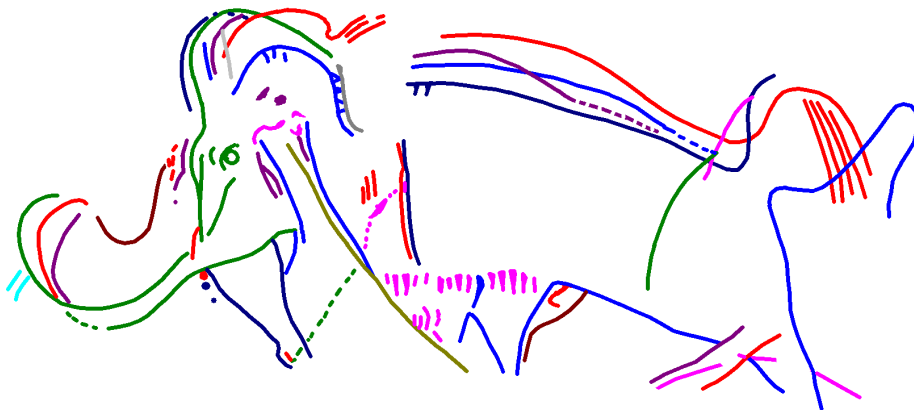
Finally, we have our sequence of pictures of the jumping mammoth. Every line has found its interpretation (**blue**: lines supplemented by the author):



If our interpretation of the lines is according to the intention of the artist, we see a massive mammoth bull jump out of the stand – a really spectacular scene, perfectly engraved on ivory! It sheds new light upon the agility of these animals, taller and heavier than a modern african elephant.

One question remains: What makes a mammoth jump? The answer is the "possible tail" line mentioned before (and some faint scratches):

It is a spear thrown into the flank of our mammoth!



This explains the evasive body movement to the right in the first picture and the following jump in the second picture. The rapid raising of the head causes also the movement of the trunk to the right side in the second picture, depicted by the talented artist in perspective shortening!

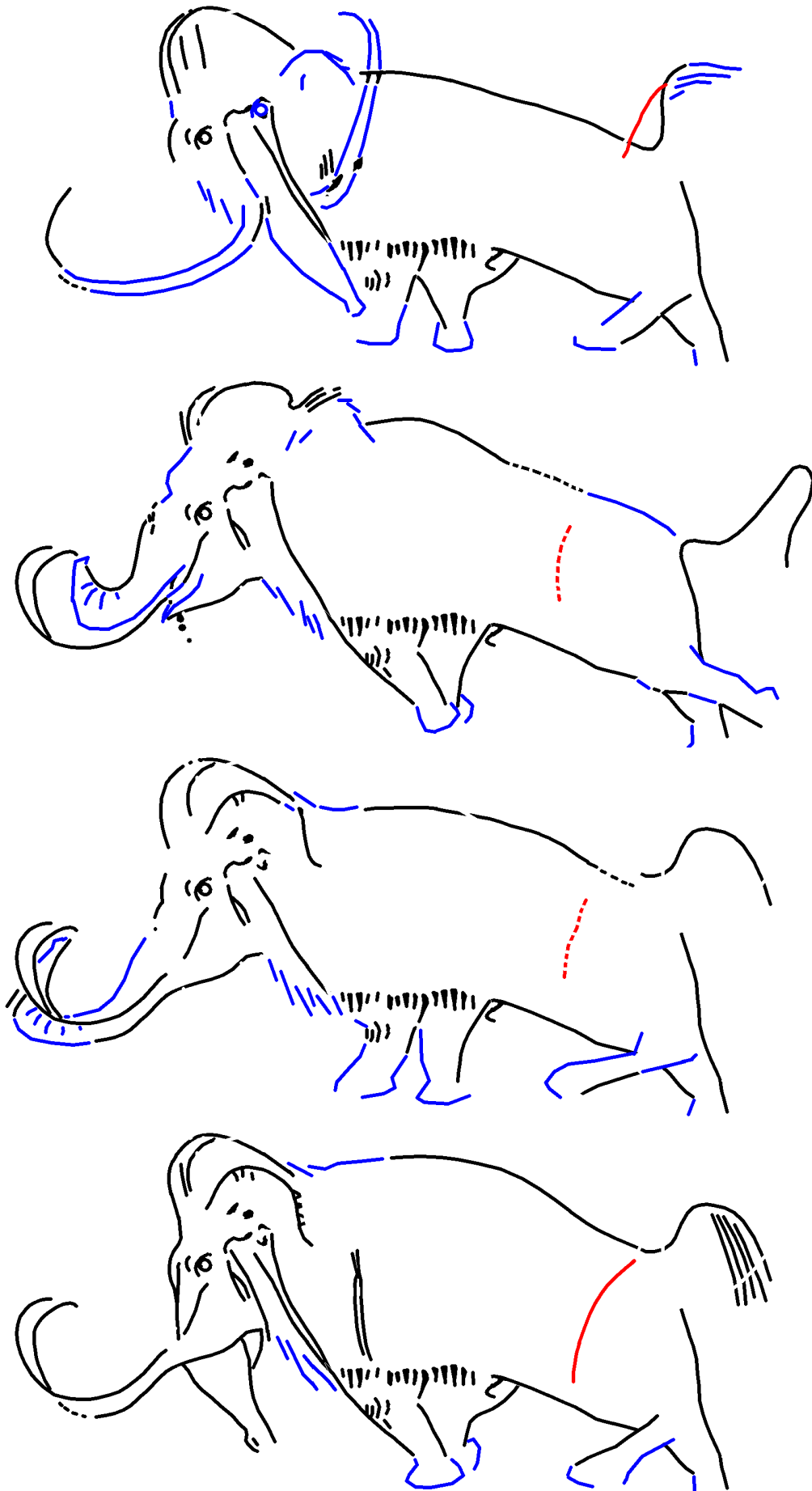
But we should never underestimate our far ancestors who were able to live and survive in the hostile surrounding of the last ice age. On top, they had time for art and fashion (see the photo above of the painting "Living in the Ice Age " by artist Libor Balák).

In the last two pictures the mammoth is landing back on four feet and starts an attack.

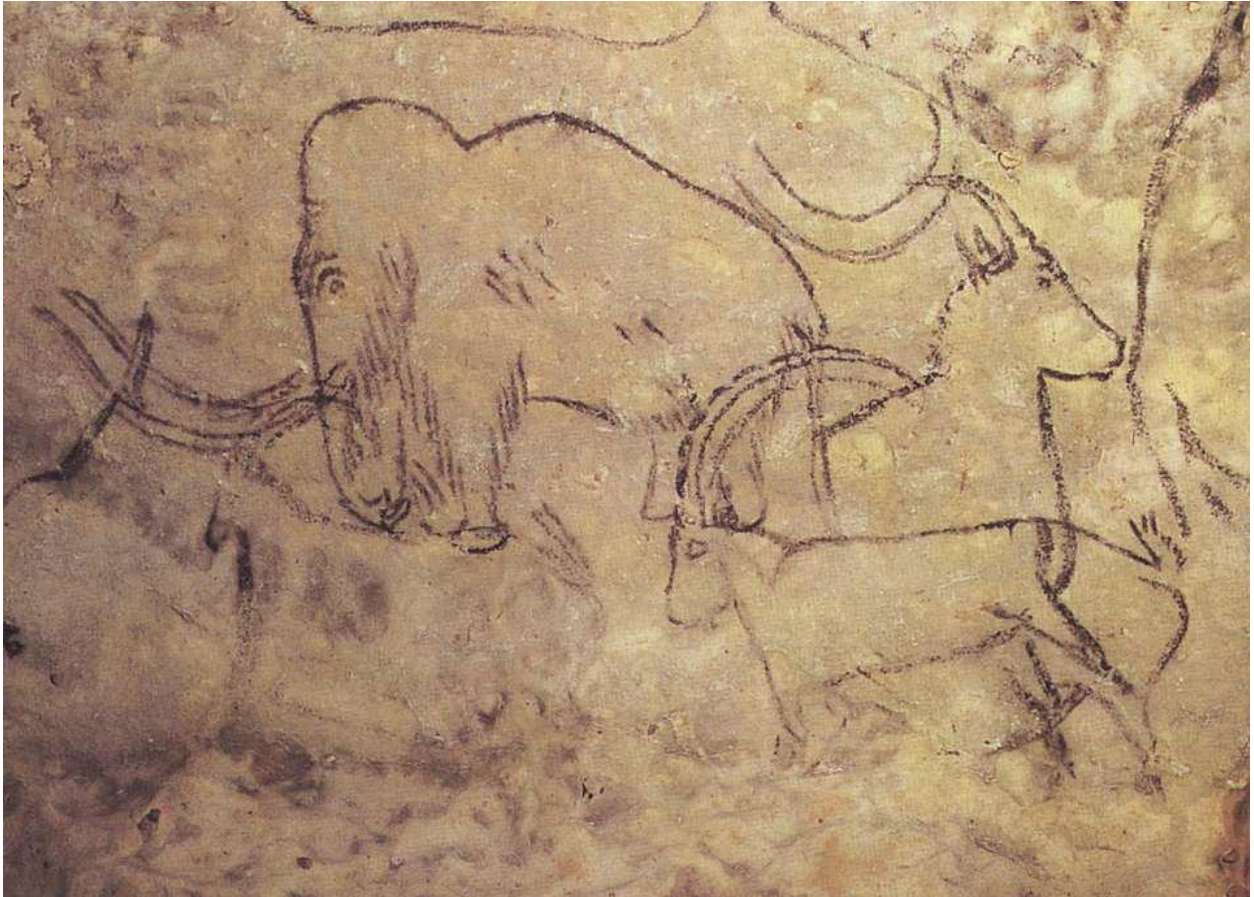
Beside the completion only lines found in the scetch are used to reconstruct the intended motion of the mammoth. But we must admit that even with multiple usage of lines still a lot of speculative fantasy was neccessary to get finally to the motion sequence.

The final picture sequence.

An animated GIF can be found on Forschungskontor.de [8].



More Pictures of Mammoths



Another prehistoric painting of a mammoth [6]...



... and a modern artists impression [7].

Sources

- [1] Photo [bison-peinture-animee-grotte-chauvet-caverne-pont-arc.jpg](#)
Image, Internet 2019
- [2] Steinzeit Daumenkino. Theorie des französischen Archäologen Marc Azéma: Die Höhlenmalereien waren eine Art steinzeitliches Kino. <https://youtu.be/TfFOJP9yKYQ>
Video, Internet 2019
- [3] Lion, Grotte de la Vache: [pal_man83347_man83643-i-21_f_piette.jpg](#)
Image, Internet 2019
- [4] Eiszeiten. Gemeinschaftsausstellung 18.Okt.2016-14.Mai.2017
Die Kunst der Mammutjäger: Archäologisches Museum Hamburg.
Die Menschen des Nordlichts: Museum für Völkerkunde Hamburg.
Ausstellungskatalog, Hamburg 2016
- [5] Photo and image processing by the author.
Hamburg 30th Oktober 2016
- [6] Photo [France-Dordogne-Rouffignac-Saint-Cernin-de-Reilhac-Grotte-de-Rouffignac-Plafond-aux-Mammouths-et-bouquetins-Ma1-960x690](#)
Image, Internet 2019
- [7] Photo [ju_paleoart_p160-161.jpg](#)
Image, Internet 2019
- [8] Animated GIF [MammothJump.gif](#) by the author
www.Forschungskontor.de
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