

Neanderthal String Theory: Investigating the Potential Role Of Cordage through Experimental Archaeology

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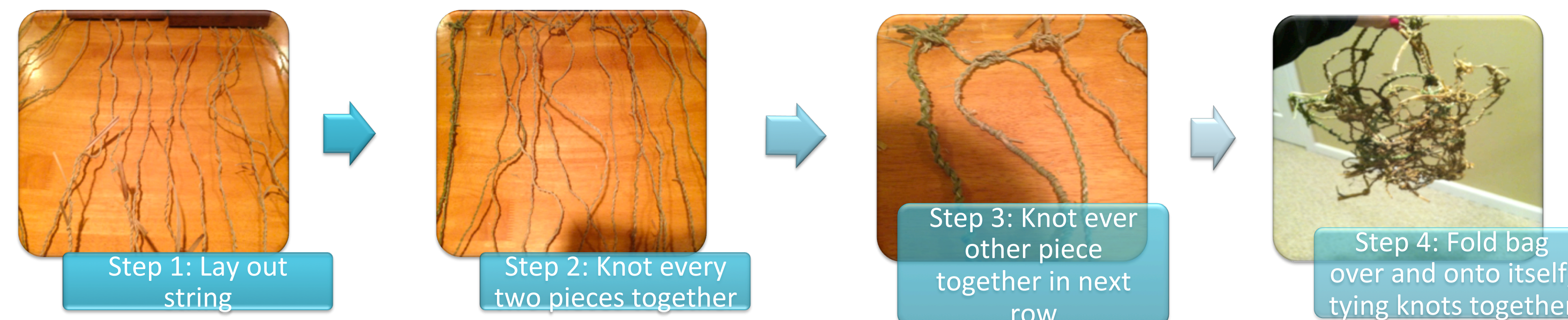
Abstract

Neanderthals have commonly been depicted as “dumb” or lacking the mental capacity to do much of anything except grunt and savagely kill large game (hunting anything smaller or using other resources would be beyond their mental capabilities). However, more evidence is starting to show that small game and plants were, in fact, used by Neanderthals. Moreover, there is some evidence suggesting that, during the Paleolithic, plants were used to create items such as clothes, ropes, and nets by twisting plant fibers to create cordage. Though plants and cordage are perishable and therefore can be hard to find in the archaeological record, it does not mean that microscopic evidence of fibers cannot still be found on stones tools by using methods of residue analysis. The goal of this research was to try to establish a signature that could help identify cordage use in the archaeological record. This was done by: 1) making string out of cattails; 2) making a bag out of that string; 3) carrying stone tools around in the bag; 4) making extra cordage and cutting it with stone tools; and 5) examining all experimental tools using reflected light microscopy. These results were then compared to published findings on Neanderthal tools from Maras, France. The comparisons suggest the plausibility of Neanderthals manually twisting fibers to make cordage.



Figure 1: Making Cordage

Figure 3: Making string bag



Introduction

Whether or not we always realize it, string plays a significant role in everyday life. String can be used for “nets, containers, packaging, baskets, carrying devices, ties, straps, harnesses, clothes, shoes, beds, bedding, mats, flooring, roofing and walling” (Hurcombe, 1994: 204). We use it for things such as clothing, household items and bags. String today is manufactured largely through industrial processes, but string can be made very simply by twisting natural plant fibers (Figure 1). Recently, twisted plant fibers were observed on 90,000 year old Neanderthal stone tools from the site of Abri du Maras, France (Hardy et al., in press) (Figure 2). The authors hypothesized that these twisted fibers came from cordage. This find is surprising since Neanderthals are commonly seen as large, savage creatures with little capability to do much other than kill large game. Many researchers assume that plants were of relatively little importance. As K. Hardy notes, “Apart from a few exceptions... plants have largely been left out of attempts to understand Paleolithic and Mesolithic life, both in terms of diet and as components of material culture even though ethnographic information has repeatedly demonstrated that indigenous knowledge of plants and their use is extensive everywhere (2007: 277).” Plants are perishable and do not often survive in the archaeological record, at least on a macroscopic scale. However, microscopic analysis of stone tools can reveal traces of plant use, even among Neanderthals (Hardy and Moncel, 2011). In order to test the hypothesis of Neanderthal string manufacture, cattails were made into cordage and cut with stone tools to see if the resulting residues matched those observed on archaeological specimens. This is not only important in telling us about Neanderthal life and our evolutionary history, but also in demonstrating how much of the organic component of archaeology is missing from the archaeological record.

Methods

Stone tools were used to cut 200-300 cattail leaves at the water line. The leaves were then twisted individually to break down fibers and two pieces were knotted together at the top. Holding the two pieces horizontally, the cattail furthest away was twisted in an outward direction. This twisted piece was pulled over the closer piece. The untwisted piece was twisted outwards, pulling that piece back over the other one. The pattern was continued for 4 feet, then it was tied off at the bottom (Figure 1). Sixteen 4 foot long pieces of cordage were used to construct a mesh bag (Figure 3). The lengths of cordage were placed about 1 inch apart from each other. Approximately 1 inch from the top, every two pieces were double knotted together. About 1 inch below the first row, the next row was double knotted across by knotting together alternate strips to construct a mesh pattern, continuing this down the length of the cordage. The bag was folded over and onto itself, matching knots at the edges. Then, the other sides were tied together with extra cattails (Cais, 2012).

The bag was soaked in a bucket of water for two nights, then 10 stone tools were carried around in it for about two hours (See Figure 4 for example). Two extra pieces of cordage were also soaked and 4 different stone tools were used to slice them (See Figure 5 for example). Lastly, the stone tools were examined using reflected light microscopy at magnifications ranging from 40x-475x.

Results

Five of 10 tools carried in the bag showed plant remains that included twisted fibers (Figures 6-8). All of the tools used to cut wet cordage had fibers along their cutting edges (Figure 9). Some residues consisted of several strands of multicellular fibers while others were single cell fibers. Twists in these fibers were very common. In contrast to the tools used to cut cordage, the flakes carried in the bag typically had fibers scattered over the surface that was in contact with the bag. These fibers were not concentrated along an edge as was the case with the cutting tools. Overall, the fibers have a close resemblance to those observed on tools from the Abri du Maras (Figure 10).

Discussion & Conclusion

The goal of this project was to try to establish a signature that could help identify cordage use in the archaeological record. We found that after carrying stone tools in a bag constructed of cordage and slicing cordage with stone tools, twisted fibers are present. Wet cordage yielded more residues on experimental tools. When dry cordage was cut, fragments of cordage were produced but they did not adhere to the tool surface. Furthermore, the differential patterning may provide a means of determining the nature of the contact between an archaeological tool and cordage. Cutting cordage leaves residues along one edge of a tool whereas artifacts carried in a bag have fibers scattered over one surface.

The cattail fibers observed in these experiments closely match the morphology of those seen on the Abri du Maras tools. This research therefore supports the hypothesis that Neanderthals were making and using cordage in southern France 90,000 years ago.

The idea that Neanderthals were using plants for crafts such as making cordage is not necessarily far-fetched, although it goes against the prevailing view of Neanderthals. In many ways, archaeologists only find what they seek. The absence of organic materials does not mean they were not being used. Hurcombe notes, “stone tools were the key to understanding activities linked to both subsistence and *craft* products” (2008: 85; emphasis added). This research suggests not only that Neanderthals possessed more intelligence than some researchers claim, but that it is plausible that they were manually twisting fibers to construct cordage. It offers us a glimpse into an otherwise invisible world of organic artifacts.

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References

- Cais, C. (2012). Savvy Summer: Carly's Beach Bag DIY. *London Times Blog*. Retrieved from: <http://www.londontimesblog.com/savvy-summer-carlys-beach-bag-diy/> Accessed August 1, 2013.
- Hardy, B.L. & Moncel, M. (2011). Neanderthal Use of Fish, Mammals, Birds, Starchy Plants and Wood 125-250,000 Years Ago. *PLoS ONE*, 6(8), 1-9.
- Hardy, B.L., Moncel, M.-H., Daujeard, C., Fernandes, P., Béarez, P., De3sclaux, E., Chacon Navarro, M.G., Puaud, S., and Galotti, R. (in press). Impossible Neanderthals? Making string, throwing projectiles and catching small game during Marine Isotope Stage 4 (Abri du Maras, France). *Quaternary Science Reviews*.
- Hardy, K. (2008). Prehistoric String Theory. How Twisted Fibres Helped to Shape the World. *Antiquity*, 82, 271-280.
- Hurcombe, L.M. (1994). From functional interpretations to cultural choices in tool use. In: Ashton, N., David, A. (Eds.), *Stories in Stone*. Lithic Studies Society, Occasional Paper 4. British Museum, London, pp. 144-155.
- Hurcombe, L. (2008). Organics From Inorganics: Using Experimental Archaeology as a Research Tool for Studying Perishable Material Culture. *World Archaeology*, 40 (1), 83-115.

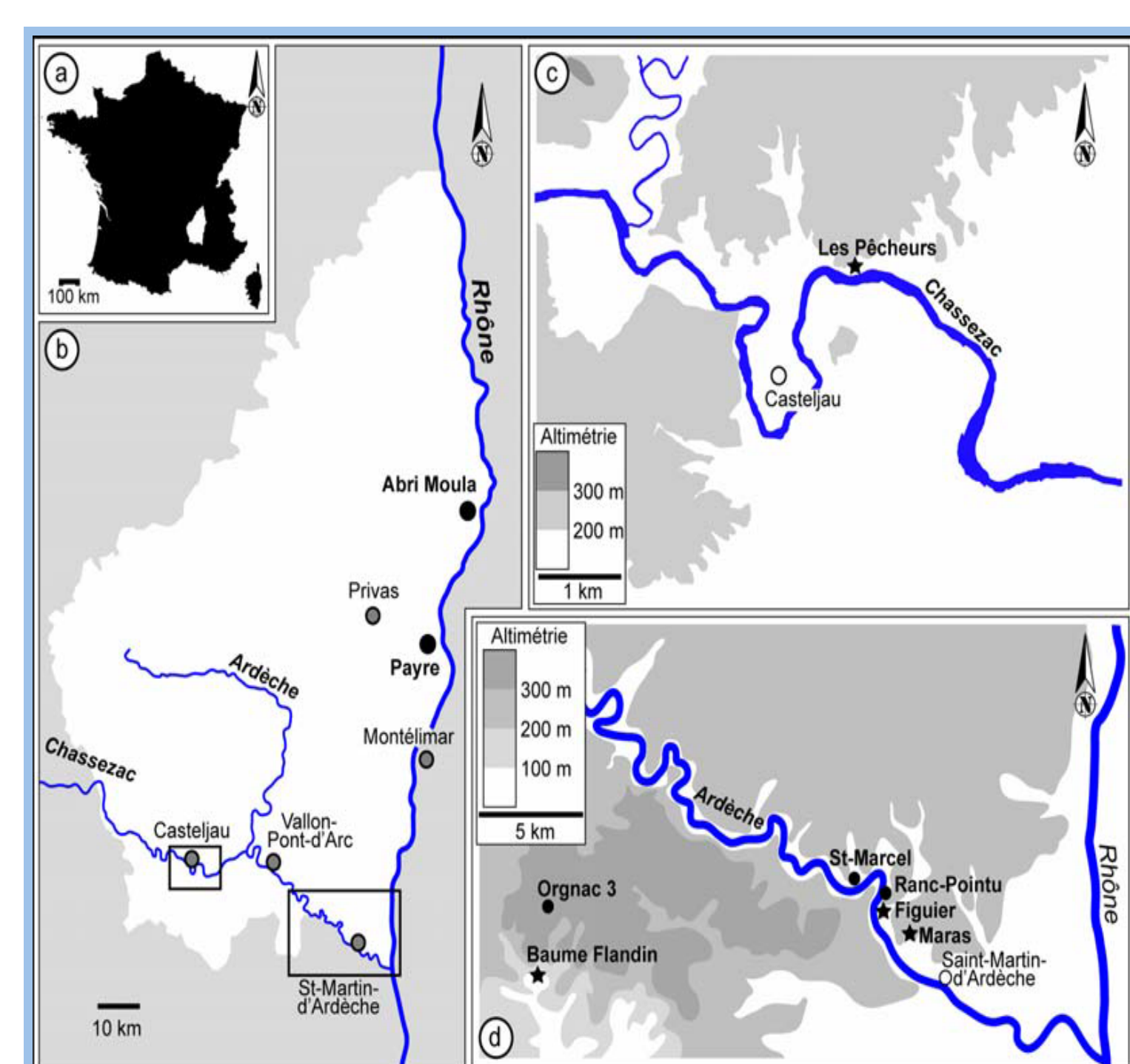


Figure 2: Location of the Neanderthal site of Abri du Maras



Figure 4: Tool carried in bag



Figure 5: Cordage cutting tool



Figure 6: Twisted fiber on tool surface, carried in string bag



Figure 7: Twisted fiber on tool surface, carried in string bag



Figure 8: Twisted fiber on tool surface, carried in string bag



Figure 9: Twisted Fiber on tool edge, cutting wet cordage

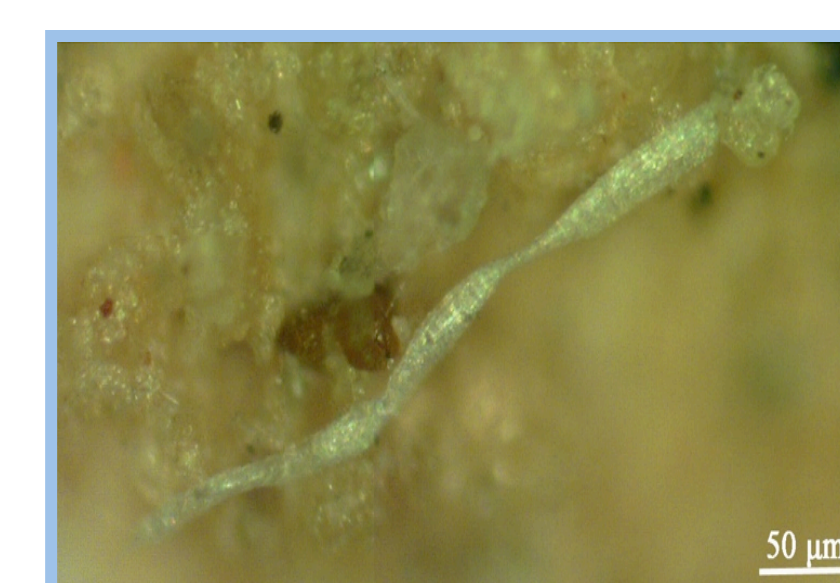


Figure 10: Twisted Fiber on archaeological tool from Abri du Maras

