Summer 2016

Invisible Clothing? Complex Clothing Manufacture in the Middle Paleolithic

Clay Whiteheart
Kenyon College

Bruce Hardy
Kenyon College

Invisible Clothing?

Complex Clothing Manufacture in the Middle Paleolithic

Clay Whiteheart ‘18, Bruce Hardy, PhD.

Abstract

In our efforts to distance ourselves from our closest hominin relatives, Neanderthals, many paleoanthropoogists have constructed a suite of behaviors purportedly only possessed by modern humans: the production of complex clothing is one of these. Arguments against Neanderthals use of complex, or tailored, clothing range from Neanderthal biological cold adaptation to a lack of archeological evidence of tools purportedly associated with *Homo sapiens* clothing production. However, based on energy use estimates and the variety of environments in which Neanderthals lived, it seems unlikely that they could have survived without the protection afforded by complex clothing. In an attempt to refute the assertion that bone needles, awls and lithic blades are the technological prerequisites for clothing manufacture (Gilligan 2007), I looked to the ethnographic record for historical peoples who have used needles made of wood, thorns and other non-durable materials to construct clothing. I produced seams in leather and sinew using needles produced via these methods to satisfactory effect. Though this does not by demonstrate that Neanderthals did produce complex clothing via these methods, it reinforces the fact that we cannot make arguments based solely on the absence of evidence.

Introduction

The question of whether or not Neanderthals needed clothing for survival is a question of climate and thermal regulation. Many studies (Steegman et al. 2002) have been carried out to properly estimate Neanderthals’ Basal Metabolic Rates (BMR) which due to morphological differences would differ slightly from anatomically modern humans. Sorensen (2009) calculated that with no additional insulation neanderthals would have needed to consume a surplus of 5000 calories a day just to survive, let alone attend to other energetic tasks like reproduction or growth and development. These caloric returns for hunter gatherers are nearly unattainable especially when many paleoanthropologists hypothesize that Neanderthals were incapable of doing simple tasks like throwing spears (Rhodes and Churchill 2009). Gilligan and others maintain that Neanderthals were incapable of producing any clothing beyond a simple hide draped over the body, citing the lack of bone needles, awls and lithic blades at sites preceding Upper Paleolithic habitation by modern humans. Aiello and Wheeler (2003) calculated high and low temperatures for a large number of Middle Paleolithic sites and found that even with the insulation provided by simple clothing a very large amount of energy would need to be expended just to maintain critical body temperatures. We hypothesized that complex clothing would have been essential to Neanderthal survival but that direct evidence is missing. Partially based on evidence of advanced wooden material culture amongst Neanderthals (Thieme 1997, Carbonell and Castro-Curel 1992) and ethnographic examples of historical peoples using wooden and thorn-based needles (Elmore 1944, Dobrizhoffer 1822), I demonstrate that complex clothing could have been produced using needles made from these perishable materials.

Acknowledgements

Thanks first and foremost to the Summer Science program at Kenyon College for the opportunity to conduct this research project.

Special thanks to advisor Professor Bruce Hardy, PhD, for research topic, assisting with methods, and all other help and mentorship along the way.

Thanks to the EHRAF datatbase at Yale for our ethnographic research

Figure 1

Methods

- Species of hardwoods indigenous to Eurasia were identified and wood blanks were procured
- Thorns of deciduous thorny trees were procured from the environs surrounding Kenyon. Honey Locust (*Gleditsia triacanthos*) serves as a reasonable analog for Eurasian *Cretagus* species and Osage Orange (*Maclura pomifera*) for other temperate citrus trees.
- Thorns were fashioned into needles by the cutting of eyes and needles were carved with stone flakes from hardwood blanks (Figures 2 and 3)
- All stone tools were knapped by the author in flint and several large cow bones were shattered to create the unmodified bone splinters occasionally used as punches (Fig. 7)
- Leather sheets were procured and cut to size using a stone flake
- Lengths of sinew or leather thongs were cut to the appropriate length for each seam and threaded through the needle
- Leather pieces were lined up and holes for the needles were punched through with either a bone or stone punch and the antler hammer (Center Fig. 1)
- The needle and sinew was passed through these holes and the seam was completed using a simple blanket stitch
- A testing rig was built with a fan of known speed on one side of the seams and an anemometer behind
- Each seam was tested for its ability to block wind vis-a-vis two strips of leather laid across the opening to mimic the protection provided by simple clothing

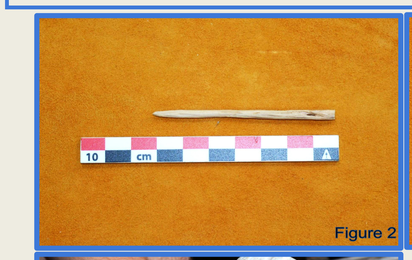

Figure 2

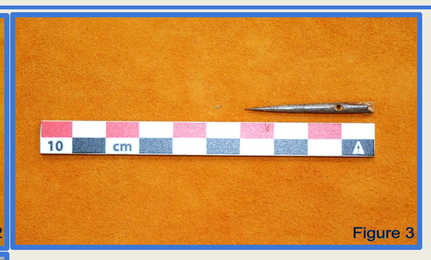

Figure 3

Figure 4

Fig. 2: Needle carved from Red Oak, eye cut laterally in from either side using flake.
Fig. 3: Needle made from honey Locust thorn, eye drilled in from either side using small flake.
Fig. 4:The author punching holes in leather pieces in preparation for sewing. One of the unmodified bone splinters is being used as a punch.

Results

All of the seams tested were able to block wind during our tests. More precise data collection is necessary to tell how effective the sewing methods are vis a vis one another. All of the wood needles proved effective with the aid of a stone punch as well as the thorn-based needles. Tailored clothing can be manufactured using the methods outlined in this study.

Figure 7

Figure 7:Unmodified bone splinters

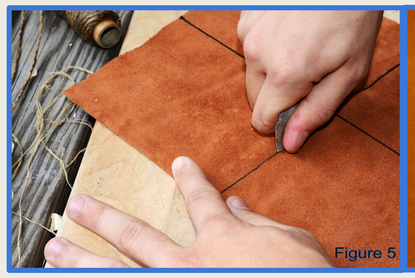

Figure 5

Figure 6

Fig. 5: Cutting leather into sample-sized pieces using a simple flake, no blade necessary. Fig. 6: One of the test seams in finished form, this one made by punching holes and feeding a thin piece of waxed leather through the holes, no needles necessary.

Discussion

All of the seams produced held up well against the basic wind tests we put them through, and each method tested could have been used to produce complex fitted clothing. These experimental seams alongside a wealth of ethnographic use of wooden and thorn needles shows that these are viable means of clothing production. Paired with Neanderthals knowledge in woodworking, clothing production by this method could have reduced the caloric load needed for basic survival to a manageable size. Hardwoods and deciduous thorny trees would have both been available throughout the Neanderthal range and there is evidence they utilized a wide variety of resources within their individual environments (Salazar-Garcia et al. 2013).

This paper does not prove that Neanderthals were producing complex clothing by this method, or at all, but shows that a greater burden of proof must be presented if we are to believe no clothing was manufactured at all based on a lack of evidence.

References

Aiello, L. C., & Wheeler, P. (2003). Neanderthal thermoregulation and the glacial climate.

Carbonell, E., & Castro-Curel, Z. (1992). Palaeolithic wooden artefacts from the abric Romani (Capellades, Barcelona, Spain). *Journal of Archaeological Science*, *19*(6), 707-719.

Dobrizhoffer, M. (1822). *An account of the Abipones: an equestrian people of Paraguay* (Vol. 1). J. Murray.

Elmore, F. H. (1944). Ethnobotany of the Navajo. In *Monographs of the School of American Research* (pp. 9-15). University of New Mexico. School of American Research.

Gilligan, I. (2007). Neanderthal extinction and modern human behaviour: the role of climate change and clothing. *World Archaeology*, *39*(4), 499-514.

Salazar-García, D. C., Power, R. C., Serra, A. S., Villaverde, V., Walker, M. J., & Henry, A. G. (2013). Neanderthal diets in central and southeastern Mediterranean Iberia. *Quaternary international*, *318*, 3-18.

Sørensen, B. (2009). Energy use by Eem Neanderthals. *Journal of Archaeological Science*, *36*(10), 2201-2205.

Rhodes, J. A., & Churchill, S. E. (2009). Throwing in the Middle and Upper Paleolithic: inferences from an analysis of humeral retroversion. *Journal of Human Evolution*, *56*(1), 1-10.

Steegmann, A. T., Cerny, F. J., & Holliday, T. W. (2002). Neandertal cold adaptation: physiological and energetic factors. *American Journal of Human Biology*, *14*(5), 566-583.

Thieme, H. (1997). Lower Palaeolithic hunting spears from Germany. *Nature*,*385*(6619), 807-810.