

Side stories: experimental hafting of composite barbed weapons

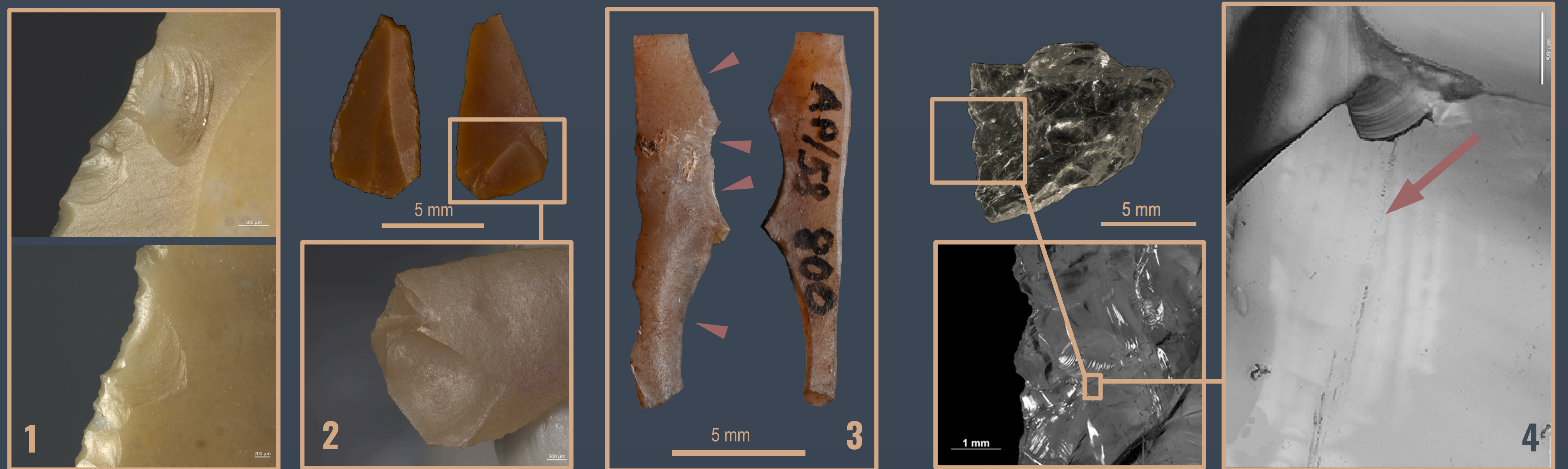
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All projectiles are not arrowheads!

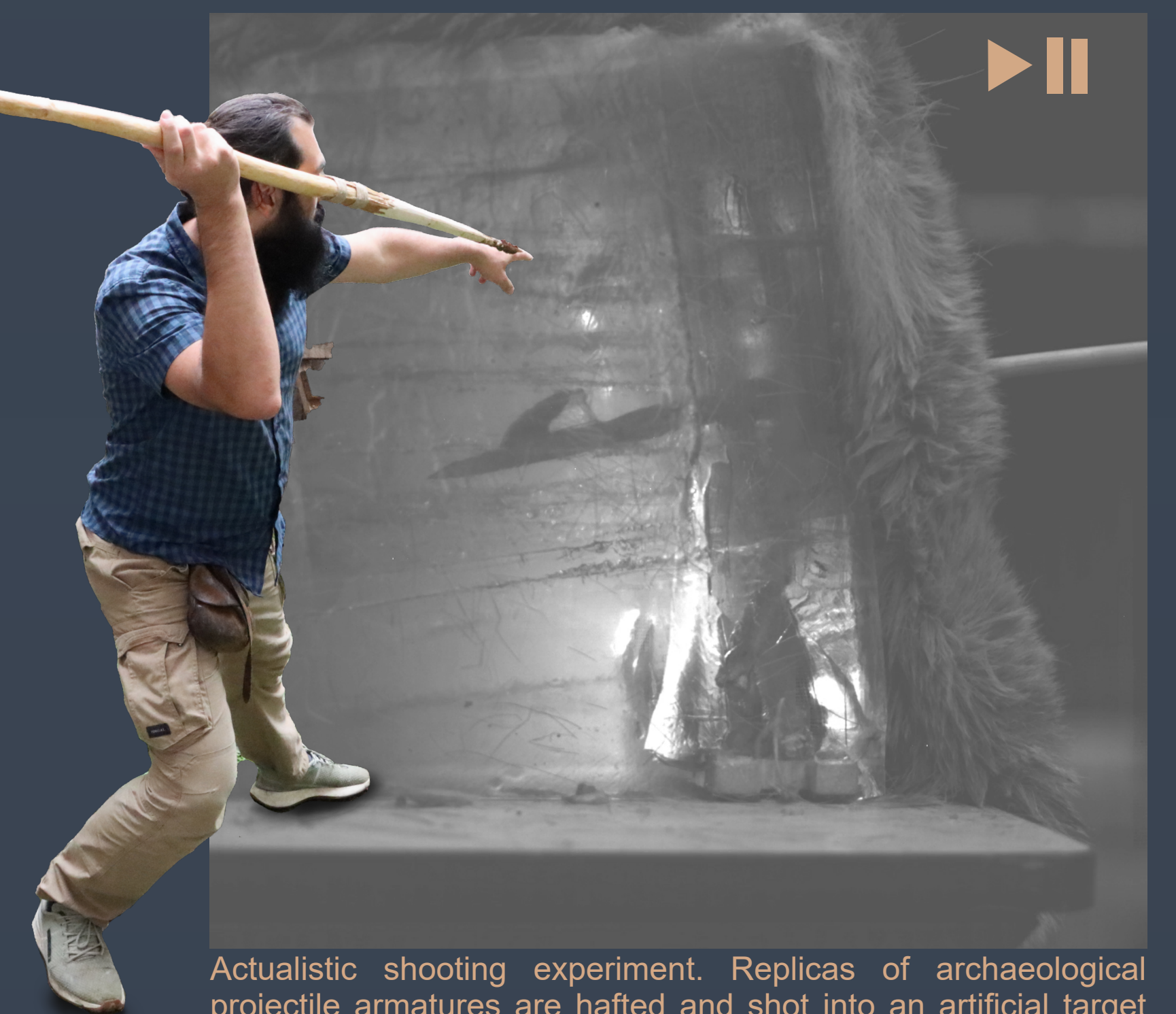
Projectiles and armatures have been intensely studied for the crucial role they played for the subsistence of hunter-gatherer societies. Many backed pieces have been interpreted as the wounding parts of a weapon and their morphology taken as suggestive of lateral hafting on composite points. To identify projectiles and to better understand weapon design and propulsion modes, use-wear analysts use reference collections to document impact wear features produced by shooting various prehistoric projectile replicas. While several reference sets exist for elements mounted as tips, reference sets focused on lateral hafting are still sparse and several challenges have been encountered in previous experiments.



Examples of wear identified on lateral insets. 1- Scarring on lateral edges of a backed bladelet, Protoaurignacian, Fumane (Italy). 2 - Invasive scarring on a distal fragment, *idem*. 3- Intensely depleted edge leaving only a retouched back on a bladelet, Final Gravettian, Abri Pataud (France). 4- Directional impact traces on a quartz armature, Howiesons Poort, Sibhudu (South Africa).

Building a reference collection

Earlier experiments have reported frequent detachment of lateral insets from the shaft upon contact with animal skin. This leads to scarce and limited wear compared to archaeological insets. **A reliable reference set thus necessitates the successful penetration of the weapon** – with its insets – into the target so that the breakage patterns on the experimental lithics have value for archaeological interpretation. **This requires a solid, reliable hafting system**, which we explored through experiments in which several variables were tested. We combined mechanical tests and actualistic shooting experiments to evaluate the performance of different glues, including resin mixtures and protein glues (F). We tested the influence of a groove (A, C) and different hafting positions (A,B,C, D), directions, and angles (C). The effect of the mode of propulsion is currently under study. The experience gained so far allows us to understand the consequences of different variables on wear traces and to determine which factors contribute to the strength of a lateral composite hafting system.



Actualistic shooting experiment. Replicas of archaeological projectile armatures are hafted and shot into an artificial target made of a deer skeleton, ballistic gelatin and deer hide. To watch a video of BARB C in flight, scan the QR code below!

What makes a strong point ?

No single tested variable is responsible for successful projectile performance by itself. Instead, a wide range of material and design choices exists, each with its own possibilities and constraints. Nevertheless, **an ever-present and crucial prerequisite for a successful shot is a smooth transition from the shaft to the insets** - abrupt or misaligned transitions (F) always hinder penetration.

We also observed that:

- **Mastics** such as resin mixtures are more easily moulded around shafts and insets and facilitate smoothing out irregularities
- **Grooves** provide support to the insets and help streamline shaft/inset transitions
- **Bindings** (B,D,E) can be used with or without mastic as long as they do not create a bump

A strong hafting system leads to more intense wear, the nature of which is dependent on the orientation and position of the inset in its shaft and additional design features, including possible serial hafting of insets.



5- Experimental composite point after a shot, with small fragments of the shattered backed pieces stuck in the groove. 6-7 - Intense lateral scarring on experimental barbs, showcasing bone residue and damage to the mastic. 8- Intense secondary damage with a twisted profile on an experimental backed bladelet.

There's more to see here !



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