



THE ROLE  
OF CULTURE  
IN EARLY  
EXPANSIONS  
OF HUMANS

## Paleolithic use of adhesives in Africa and Europe

Composite tools represent a unique concept in tool manufacture and indicate an advanced cognitive state (Ambrose 2010). This technology dates back at least 300,000 years. Archaeological evidence points to an initial phase in which composite tool technology did not make use of adhesives. Examples include the probable wooden clamp shafts from Schöningen, Germany and the hafting of Sangoan core axes from Sai Island, Sudan. Adhesives seem to represent a later phase of innovation.

Starting in the Middle Paleolithic and Middle Stone Age, three geographic areas of adhesive use can be identified: 1) in Europe the earliest evidence for use of birch pitch comes from Campitello, Italy (ca. 200 ka), Inden-Altdorf, Germany (ca. 120 ka), Königsau, Germany (ca. 40-80 ka) and Les Vachons, France (ca. 30 ka); 2) in the Levant the use of bitumen is reported at Umm el Tlel and Hummal in Syria (ca. 40 ka), and 3) in Africa the use of multicomponent glue made of gum, ochre and fat is documented from Sibudu, South Africa (ca. 70 ka). While bitumen can be found naturally, birch pitch and gum ochre glue have to be produced in multistage processes that require complex knowledge, experience and control of several factors (Dinnis et al. 2009; Wadley et al. 2009).

### References

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