Shaping for the hunt

Harpoon point ecomorphology in Mesolithic Sweden

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Abstract

This thesis examines the relationship between humans and the paleoenvironment in the Swedish Mesolithic through the study of harpoon points. While Scandinavian Mesolithic weapon components are often investigated when broader historical narratives are constructed, few artifacts are analyzed in terms of form and function. Drawing inspiration from biological ecomorphology, this study aims to investigate morphological variation in Swedish Mesolithic harpoon points in relation to both environmental and cultural-historical factors.

This thesis employs a combination of geometric morphometrics, archaeozoological data and stable isotope analysis to explore the ecomorphology of Swedish Mesolithic harpoon points. In addition, to investigate weapon ecomorphology from a situated perspective, continuum mechanical simulations, geometric morphometrics, and experimental archaeology are employed—drawing on principles from ecological psychology and dynamic systems theory.

The thesis comprises five papers. The first paper develops a methodological approach for separating functional and spatiotemporal information inherent in harpoon point shapes. The second paper outlines analytical models for assessing hunting- and conflict-related dimensions in the hypothesized use of Stone Age hunter-gatherer weapon points. The third paper examines eastern middle Swedish harpoon point morphology in relation to broader developments in craft traditions and hunting strategies across the circum-Baltic Sea region, as well as in relation to environmental and faunal changes. The fourth paper presents an experimental study investigating how weapon use influences subsequent modification and manufacture of weapon points. The fifth paper analyzes the development of Swedish harpoon point morphology in relation to environmental and faunal change during the 8.2 ka cal BP cold event.

The thesis demonstrates how Mesolithic Swedish harpoon point morphology relates to both environmental and cultural-historical factors. Full-body and distal silhouette shape correlate with the regional presence of large terrestrial prey, while proximal width and full-body silhouette shape correlate with landscape settings. It is suggested that slim proximal parts reflect more frequent use of javelins in certain aquatic environments during the Late Mesolithic, whereas full-body silhouette shape may indicate the continued use of spearthrowers throughout the Early Mesolithic in open landscapes with abundant large terrestrial prey. The morphology of Swedish harpoon point barbs and proximal parts also changes in relation to cultural-historical developments, particularly during the transition from the Early to the Middle Mesolithic and during the 8.2 ka cal BP cold event. In addition, the thesis outlines how the ecomorphological aspects of pre-modern weapons can be examined from a situated perspective, treating weapons as components of the microenvironment through experimental archaeology. This approach allows fine-grained morphological variation to be explored across different physical settings, with cultural-historical factors conceptualized as rules or task constraints.

Keywords: *harpoon points, ecomorphology, hunter-gatherers, hunting, Mesolithic period, geometric morphometrics, continuum mechanical simulations, ecological psychology and dynamic systems theory.*

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