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Increasing behavioral flexibility? New archaeological and ecological approaches to understanding the Howieson's Poort in Southern Africa

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The Howieson's Poort (HP) of Southern Africa peaked between 60 and 65 ka and represents a distinct phase of cultural innovation adopted by modern humans during the Middle Stone Age. While researchers generally attribute the rise and fall of the HP to social and environmental causes, neither provides a complete explanation. As patterns at the site level come into focus, large-scale trends explaining the HP expansion remain uncertain. Comparisons with earlier and later cultural phases may provide ways to view the HP phenomenon.

The most notable artifacts of the HP lithic industry are standardized, crescent-shaped, backed stone tools called segments that were mounted on wooden shafts in several orientations using mixtures of ground pigment and plant resin to create composite tools such as stone-tipped arrows and spears. The use of ocher, often faceted or striated from grinding and sometimes engraved with geometric patterns, attests to functional and possibly symbolic behavior. Other attributes of the HP include the use of laminar lithic technology to produce blades and a preference for finer grained raw materials. While rare bone tools hint at advanced hunting strategies, other organic finds include geometrically engraved and perforated ostrich eggshell containers and perhaps shell beads, artifacts that serve as markers conveying individual and group status. Analyses of faunal remains supports the possible use of snares and traps, in addition to diverse hunting strategies. Even the sediments testify to changes in behavior that involved the increasing maintenance of living areas. Micromorphological evidence for the construction of bedding layers that were regularly cleaned by burning appears towards the end of the HP. While this combination of behaviors indicates a cultural complexity that did not exist before or after the HP, the reasons for its appearance and the causes of its demise remain unclear.

To test the hypotheses of cultural and environmental causality and examine potential routes of expansion, the research center "The Role of Culture in Early Expansions of Humans" (ROCEEH) devised new ways to view diachronic datasets from Southern Africa. The research team queried the ROCEEH Out-of-Africa Database for known HP sites and compared these data with the periods directly before and after. By employing techniques from several scientific disciplines to help explain these issues, we developed a diversity index to assess variability in tool types; assessed transport distances of raw materials to examine patterns of movement across the landscape; reviewed the complexity of the cognition necessary to manufacture simple, composite and complementary tools; applied stochastic models such as boosted regression trees and statistical mechanics to explain the geographic distribution of sites in relation to specific combinations of environmental factors; and reconstructed classes of biomes and climatic constraints associated with the HP. These varied techniques allowed the ROCEEH team to integrate and process information with the surprising result that we observed little diachronic change. These results concurs with new reports and help us examine changes in the behavioral flexibility of the inhabitants of Southern Africa during the HP.