RESEARCH NOTES: Puzzling Out the Past

During the height and aftermath of the last Ice Age, 10,000-20,000 years ago (Epipaleolithic Period, EPP), small bands of mobile hunter-gatherers roamed the then far more hospitable Negev. Excavation of almost 100 sites ("encampments") over the last two decades reveals a complex, evolving mosaic of many different cultural groupings (Masraqan, Mushabian, Natufian, etc.), preceding the more permanent agricultural settlements of the agriculturally oriented Neolithic Period. Most EPP sites contain several hearths, pits and a large number of chipped flint tools, suggesting their use as tool-making centers. Most tools are microliths, small bladelets of worked flint chipped off a larger stone core and commonly used as hunting projectiles (arrow, spear and harpoon heads). The blades' materials, production, shapes, methods and hafting techniques (used to attach the stone blades to their wooden shafts) cast considerable light on the identity, culture and technology of the sites' artisans.

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Dr. Nigel Goring-Morris and his Hebrew University colleagues have been using exceptionally painstaking, but productive, "refitting" methods to investigate the bladelet-making technologies of the Negev's EPP cultures based upon a sample of some 20 different sites representing different cultural groupings. They collect all the stone tools and discarded "waste" pieces of chipped flint at each site and then actually try to reassemble them onto their original cores, to reconstruct the various stages of blade production (see photo). The procedure resembles assemblying large, 3-dimensional jigsaw puzzles with many missing pieces. Despite the formidable challenges involved, considerable (albeit variable) success has been achieved. For example, at site Shunera XVI (Masraqan Culture), 20.4% of the 4459 flint pieces found, including 243 tools and bladelets, could be refit on the 35 cores found (131 pieces on one core alone). At Azariq XIII (another Masraqan site), however, less than 4% of the 1188 tools and bladelets could be refit on the 40 cores excavated.

The investigators also extract information from the spatial distribution (contour densities) of the chipped artifacts with respect to local hearths and stone sources and the locations of blades with respect to their cores. More massive tools found on-site were usually produced off-site near outcrops of suitable flint; many microliths were also produced elsewhere and discarded by their mobile owners on-site. Some artisans carefully selected (or, more rarely, imported) their raw materials, while others show surprisingly little regard for flint composition, shape, quality and (even obvious) flaws, although such cores were unlikely to produce many usable blades. There was also some experimentation with heat treatment.

The reconstructed blade-producing technologies vary through time. Middle EPP artisans, for example, often deliberately blunted sharp ridges on the sides of their cores, apparently to facilitate handling; these were removed later in the production process. Despite superficial similarities, such fragments do not appear functionally related to ridge blades and, in general, the detailed information provided by nearly complete refits often differs from, and largely supercedes, traditional classifications and inferences based solely on discarded tools or cores.