Defining the Limits of Raw Material Extraction in Prehistoric Bedrock Quarries: A Petrofabric Approach.

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Résumé

Unquestionably, the most steadfast and reliable principle adhered to in lithic analyses is the presence of the taxonomic flake scar, indexed by the conch shaped hertzian cone. This feature, ever present on flaked stone tools, represents the base line for all further analyses of prehistoric implements. A common prejudice in lithic analysis studies is that if a flake scar does not exist on a worked piece of raw material, then the object is not yet an artifact. Instead it is categorized as an object modified only by natural processes, such as freeze thaw. Detailed analysis of archived collections excavated at numerous prehistoric bedrock quarries, in the eastern United States, have shown worked objects at various phases of ore processing, without the characteristic flake scars. The lack of a flake scar has unfortunately caused many scientists to reject the object as meaningful archaeological remains. In addition, the lexicon of terminology ascribed to the definition of quarry debris remaining behind from extraction and refinement processes is strikingly limited, and typically descriptive of the shape of the debris at hand. The descriptions of quarry tailings includes ambiguous terms such as chunk, block, shatter, waste flake, and trim. Although these terms serve to describe the overall morphology of quarry tailings, they do little to explain the organization of the early and intermediate phases of the chain of operation. This circumstance unfortunately leaves the quarry vacant of all human behavior, due to the absence of a lively terminology that describes the early to intermediate phases of extraction (Zone 1), milling (Zone 2), beneficiation (Zone 3), processing (Zone 4) and refinement (Zone 5). We propose the adaptation of an economic geology approach to the analysis of prehistoric quarries and their associated tailings.

Our investigations suggest that there are sound geological reasons that would explain the absence of flake scars in the early to intermediate phases of ore processing at quarry sites. Initially, raw material removed from the Zone 1 is processed to remove country rock and enrich the ore block by removing waste that is not the intended production target. Processing will not produce flake scars in the raw material, but instead will result in microlithon packages

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of enriched ore, the dimensions of which are controlled by the level of tectonic deformation (number of intersecting foliations), degree of diagenetic recrystallization, and/or hardening or sealing of foliation due to incursions of chemically reactive fluids. Bipolar crushing of enriched ore at Zone 3 through Zone 5 will result in the separation of unsealed microlithon packages, reducing the ore target volumetrically until a single, flakable unit is produced. It is this flakable unit that is then capable of recording a flake scar when purposefully struck by a technician. As such, the flake scar characteristically does not make its appearance until the raw material has reached the final phases of refinement (Zone 5) at prehistoric quarries and is ready to be removed from the quarry to nearby workshops and support sites. This is significant in that entire sections of the lithic chain of operation have gone unrecognized in previous investigations. Until this is remedied, lithic analysis at quarries will begin with the appearance of diagnostic bifaces and cores.

Mots-Clés: Raw Material Extraction, Prehistoric Bedrock, Petrofabric Approach