**Supplemental Text 2**

**Lithic Microwear Analysis**

Conducted By: Heather Rockwell

Microwear analysis is a method which records a constellation of traits (polish, edge scarring, and striations) on the edge of stone tools in order to identify the specific uses of those tools. The study of microwear has often suffered from a lack of consistency in method and terminology, and therefore is considered controversial despite a half century of work. While this method has been in practice for nearly sixty years, most studies still rely upon techniques developed by its earliest practitioners (Keeley 1974; Keller 1966; Odell 1975; Semenov 1964; Tringham et al. 1974; Wilmsen 1968). Recent developments in the field have attempted to rely upon quantitative characterizations of use traces and the use scanning electron microscopes as a way address the inconsistency (Evans et al. 2014; Linton, et al. 2016; Mansur-Franchomme 1983; Ollé, et al. 2016; Stemp 2018). However, these studies have not maintained the early methods of experimentation and blind testing, calling into question their validity (Evans 2014; Van Gijn, et al. 2006; Van Gijn 2014). The author would argue that though promising, these methods remain untested and that reliance on experienced analyst interpretation using classic methodology such as experimentation and blind tests yields the most reliable results.

While contentious, microwear studies can still offer considerable interpretive power for archaeologists, particularly when applied to sites of considerable antiquity which may contain only stone tools. The Paleoindian period in North America has received particular attention from analysts (Bamforth 2002; Dillehay 2000; Lambert and Loebel 2015; Loebel 2013; Maika 2012; Miller 2013; Shoberg 2005; Smallwood 2006, 2015; Waters et al. 2011). Early sites often contain only stone tools, many of which do not conform to an established formal tool type. The author’s work (Rockwell 2010, 2017) and numerous other studies have shown that form is often a poor proxy measure for function (Jeske and Sterner-Miller 2015; Knutsson et al. 2015; Odell 1981b).

Microwear analysis was conducted on the materials from the La Prele Mammoth site in the fall of 2016 and 2018. Artifacts were examined using a Nikon SMZ800 stereoscopic microscope, utilizing raking light to emphasize scarring patterns. The low-power microwear approach was utilized for the entirety of this analysis; artifacts were examined between 10-120x magnification. Any tool for which wear was noted was identified by the number of locations, or functional units, where use was observed and where on the tool this was seen using the polar coordinate (PC) recording system (Supplemental Figure 2; Cahen et al. 1979; Odell 1979, 1980; Tringham et al. 1974). Activities and contact materials were primarily identified based on scarring patterns. When present and identifiable, polish and striations were described and were used primarily to more specifically identify contact materials. Polish was descried using standard terminology developed by Lawrence Keeley (1977). A “greasy” or “greasy/grainy” polish forms when microtopography on the surface of tools is slightly worn down giving the surface a slightly lustrous appearance (Keeley and Newcomer 1977: 42). Experimental work identified this polish type as diagnostic of animal processing activities. Beyond the active uses of tools, hafting, prehension, and “pouch” polish were also noted when possible. Prehension is when a tool is held in the hand, as opposed to fitted within haft element, which leaves different wear traces on the tools (Dinnis 2009; Keeley 1982; Lombard 2004; Odell 1994; Odell and Cowan 1986; Weedman 2002). Pouch polish or transport polish is an abrasive polish sometimes including striations which develops across the surface of the tool as a result of being transported long distances (Bebber et. al 2017; Hill et. al 2014; Kilby 2008). This wear tends to take the form of bright flat areas along tool edges and arrises (Bebber et. al 2017: 546).

To assure confidence in the results, the archaeological collection was compared to a large reference collection of nearly 150 experimental tools throughout analysis. The majority of experimental tools were made of fine-grained cherts, with small numbers of tools made from rhyolites, quartzites, and obsidian. Tools were used for a wide variety of activities including scraping, chopping, drilling, cutting, and butchery. Contact materials included, wood, bone, antler, plant materials, animals, leather, hides, and shell. There has been some debate regarding the structure of use-wear experiments as to the degree of naturalism that is desired, specifically regarding the environment of experiments, contact materials, and strokes (Keeley 1980; Odell and Odell-Vereecken 1980). Naturalism is defined here as the degree to which an experiment resembles the conditions present in the past. It is difficult, if not impossible, to attain the same conditions and contact materials available in the past, particularly during the Paleoindian period. This collection, while by no means representative of the complete range of possible activities, does cover the most likely activities represented within a Paleoindian assemblage. In addition to utilized tools, the experimental collection contained a mixture of retouched and unmodified flake tools. Considerable attention has been paid in recent literature as to whether retouch can be distinguished from utilization with the majority of scholars agreeing that retouch can accurately be distinguished from use due to the present of clear percussion features (Supplemenal Figure 3; Byrne et al. 2006; Ibáñez et al. 1990; Mansur-Franchomme 1986; Odell 1981a; Rots and Williamson 2004). The experimental microwear collections housed at the University of Wyoming and University of Tulsa were used both for training purposes and to administer blind tests.

Blind tests are used to assess an analyst’s preparedness for conducting work upon archaeological assemblages. Blind tests are conducted using experimental artifacts for whose use is known. Generally, ten to twenty experimental pieces are chosen by an outside party for the analyst to examine. Analysts must identify location of utilization, relative action, relative hardness of contact material, exact action and exact contact material and is awarded one point for each correct answer. One of the major difficulties with blind tests is that no answer may be left blank. When examining archaeological assemblages, any tool for which information is indeterminate analysts do not propose a guess, however when conducting a blind test, analysts must put a precise answer to all questions, any blanks or indeterminate information is simply marked incorrect. While this ensures that analysts cannot artificially inflate their scores by leaving sections blank, it means that blind tests often significantly underestimate the skill of the analyst. If blind test scores are viewed without this knowledge, serious skepticism as to the validity of the technique can become a problem (Keeley 1974; Keeley and Newcomer 1977; Odell 1975, 1980). The author has submitted to a series of blind tests with the most recent test resulting the correct identification of microwear location, relative and exact action, and relative and exact materials 84% of the time. This exceeds the previous adequate blind test scores achieved by Rockwell (60.63%) and Odell (71.3%) on the same artifact collection in 2009.

In preparation for analysis all artifacts were lightly cleaned to remove any hand-oils or debris from storage. Microwear analysis was conducted after residue analysis to ensure that the artifacts would not be contaminated, or residues removed during the cleaning process. The author was not told the results of the residue analysis until after she had completed her analysis to ensure the independence of the results. The materials from LPM conformed to a narrow range of uses, mostly related to animal processing (Supplemental Table 3; Supplemental Figure 2). The three dominate activities were butchery, hide processing, and projectile damage. Butchery was identified based on the presence of striations parallel to the working edge, invasive polish, small bifacial feather scars, and edge rounding. Hide processing was characterized by unifacial small scalar scars, feature terminations, defined edge rounding, and occasional shallow striations. Finally, projectile damage was noted through the presence of bifacial hinge, stepped terminations, or bending fractures and possible striations or polish running parallel to the edge of the mid body of the artifact. Projectile damage may also be indicated with a variety of impact fractures including burin negatives.

Not all artifacts examined produced positive results. A selection of unmodified flakes were examined as possible expedient tools. None of these artifacts exhibited any evidence of utilization (n=19; field specimen numbers 1968, 1629, 1192, 1108, 2131, 1954, 1993, 1218, 1758, 1474, 6093, 6143, 6173, 6227, 6232, 6287, 6336, 7010, 7102). In addition, a small number of unmodified flakes were examined for wear traces but could not be identified as either unutilized or utilized due to the coarseness of the raw material (n=6; field specimen numbers 1633, 1727, 1744, 1729, 1780, 975). The results of this analysis suggest intensive butchery activity at the site. The flake tools which exhibited butchery use were often heavily worn and had evidence of edge rounding and obvious polish, even at low magnification (Supplemental Figure 2).

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