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## The recycling of material culture today and during the Paleolithic



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### ABSTRACT

Archaeologists are being increasingly challenged to apply their methods and perspectives to address contemporary global concerns, such as material consumption and recycling. The archaeological investigation of recycling can contribute to understanding its behavioral causes and situational contexts because it can reveal systematic patterning in its temporal, spatial, and formal dimensions. In this paper, I review some of the archaeological evidence of artifact recycling and a few lessons drawn from those studies, including general patterns in lithic recycling behavior and needs to address ambiguity in the definition of recycling, compounding factors of equifinality in lithic reduction, and recognizing opportunism in recycling behavior. This evidence is also used to consider the behavioral and environmental circumstances of patterned recycling in the broader study of material culture and human behavior. It is argued that archaeological studies can offer useful contributions to such universal theories and that archaeological explanations about recycling behavior would benefit from greater integration with the larger body of historical and social science studies on this topic.

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### 1. Introduction

Media reports about “The Origins of Paleolithic Recycling” conference emphasized the substantial time depth of recycling behavior and promoted the idea that it illustrated long-term continuity in this aspect of human behavior (e.g., David, 2013; Ross, 2013). This paper offers a review of recycling behavior throughout human history in order to identify and evaluate the factors which seem to motivate it. It begins with a discussion of recycling today and during the historical past. Then it describes critical terminological distinctions involved in the processes of recycling and reclamation. Examples of prehistoric recycling and reclamation are then reviewed followed by specific discussion of how these processes can be identified among lithic artifacts. A few case studies from North America are then presented which illustrate how recycling and reclamation processes are important to increasing our understanding of the archaeological record. This paper concludes with a few comments about the challenges and opportunities artifact recycling presents to archaeology and discussion of the relevance of these long-term views for understanding the factors which condition recycling behaviors.

Material objects are often reused, recycled, and reclaimed in a variety of ways. The most robust considerations of these transformative processes are found in the work of Michael Schiffer

(1972, 1976, 2010, Schiffer et al., 1981). In particular, he has carefully distinguished several kinds of “reuse processes” based on changes in object use, object user, and the form of an artifact (Schiffer, 2010, pp. 32–34). Schiffer’s reuse processes are restricted to cases in which the object has not yet entered the archaeological record, in his terminology, the object remains in “systemic context” although its use, form, or user may have changed. He recommends that in cases where artifacts have been retrieved from the archaeological record and bought back into a living systemic context, we consider them as having been transformed by what he calls the “reclamation process” (Schiffer, 2010, p. 38).

### 2. Contemporary and historical patterns of recycling

Significant historical shifts away from the age-old tradition of artifact mending, repair, recycling, and repeated reuse began around the beginning of the 20th century (Strasser, 1999; Miller, 2000; Cooper, 2005; O’Brien, 2008). Interestingly, evidence from the field of historic archaeology commonly identifies these traditions in the archaeological record, for example, the frequent recycling of containers such as barrels (Ross, 1985) and bottles (Busch, 1987; Stuart, 1993; Wilson, 1995; Adams, 2002b). Motloch (2003, p. 228) reports that between 1850 and 1910 several dozen book-length manuals were published which offered instructions on how to recycle a wide range of household objects. Historians and environmentalists have lamented this change toward over-consumption which accelerated during the beginning of the

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industrial age of mass production. This transformation caused the shift from mending and repairing to a form of recycling that is best termed downcycling in which discarded objects are broken down to raw product and manufactured again as new objects (Grogan, 1996; Matos and Wagner, 1998). The only event that seemed to slow this trend was the conservation and recycling movement associated with the allied war effort in WWII (Cooper, 2008; Riley, 2008). This success in motivating recycling behavior among consumers in the developed countries reflects how the individual decision to recycle today is largely connected with ideological and political viewpoints (McGuire, 1984; Hornik et al., 1995; Kaiser et al., 1999; Best and Mayerl, 2013). Secondarily, the citizens of developed countries are more motivated to sort waste for recycling purposes when it is made more convenient for them (Derksen and Gartrell, 1993; Hornik et al., 1995; Schultz et al., 1995; Vining and Ebreo, 1990). These modes of contemporary recycling behavior actually refer to waste sorting rather than recovery and reclamation of discarded materials.

Today, the most common situations where individuals in the world's developed countries participate in the recovery of discarded materials are among the marginalized and within the lowest socioeconomic classes (Underwood, 1993; Gowan, 1997; Simpson-Herbert et al., 2005; Tremblay et al., 2010). In many cases, the opportunity for individuals to participate in the reclamation of waste in affluent countries has been removed because of formal recycling programs which frequent ship waste to developing countries for downcycling and product remanufacturing, usually making new products that are sold back to consumers in the developed world (Van Beukering and Curleed, 1998; Van Beukering and Bouman, 2001; Grossman, 2006). Systematic mining of landfills for desirable resources is already occurring because of resource scarcity facing certain developed nations and it is expected to increase in the future (van der Zee et al., 2004; Krook et al., 2012; Quaghebeur et al., 2013).

Examples of contemporary scavengers who reclaim, reuse and recycle a significant portion of their food and material possessions are rare and expectably represent the poorest of the poor who are living in the Third World (e.g., Abad, 1991; Keyes, 1974; Tevera, 1994; Drackner, 2005; Medina, 2007; Ocasiones et al., 2009; Wee, 2012). Such developing countries remain some of the last places to witness individuals making significant efforts to reclaim and recycle materials for reuse, and more often than not, these individuals (usually termed scavengers or waste pickers) are simply working as informal labors and selling materials to brokers who relay them on to industry for downcycling (Medina, 2007). The growing demand for materials by industries and products by consumers living in developed countries has resulted in an organized system of materials scavenging and recycling in much of the developing world where individuals and guilds participate in collecting and selling scrap to middlemen who make most of the profit (Cross, 1997; Adama, 2012; Adeyemi et al., 2001; Asmin et al., 2012; Grothues, 1988; Hayami et al., 2006; Medina, 2007; Moreno-Sanchez and Maldonado, 2006; Rockson et al., 2013; Scheinberg et al., 2011; Schenck and Blaauw, 2011; Vergara and Tchobanoglous, 2012). Currently it is estimated that around 140 million people (about 2% of the world's population) make a living by collecting, sorting, using and selling scavenged material from discarded refuse as a consequence of poverty and hardship (Medina, 2007). Many of those involved as scavengers are women and children (Gunn and Ostos, 1992; Huysman, 1994; Davies, 2008) who tend to suffer from numerous health problems associated with this hazardous work – sometimes involving toxins – and because they live near the dumpsites to reduce material transport costs (Hunt, 1996; Grossman, 2006; Ocasiones et al., 2009; Afon, 2012; Binion and Gutberlet, 2012; Kimbugwe and Ibitayo, 2013). Buyers come

directly to the settlements near the dumps to buy the salvaged materials from the scavengers. Similar systems of materials recovery from landfills by the poor were common in large cities in the U.S. during much of the 19th and early 20th centuries (e.g., Miller, 2000; Pellow, 2002).

Political economists argue that public concerns about recycling in the developed world are largely the result of desires to assuage guilt about our increased rates of consumption and waste resulting from affluence and too many products with short use-lives (Hawkins, 2006). As the archaeologist Gavin Lucas (2002, p. 15) has expressed it, “recycling can be seen to have taken on a reconciling role, resolving the dilemma of disposability: recycling permits a disposable material culture yet at the same time counteracts the apparent wastefulness in such a practice. But the ideology of recycling may be out of all proportion to its efficacy and experience in practice; surveys of attitudes to recycling show how people want to recycle more, but at the same time, do not do so – the reasons given tending to be laziness, business, forgetfulness or inconvenience.” History shows that government and industry have generally been very reluctant supporters of recycling – largely because it cuts into the profits to be gained by using virgin materials and this problem is especially true of glass and paper (Rogers, 2005; Humes, 2012; MacBride, 2011). While we would like to think that most people today are concerned about the growing overconsumption of earth's resources, resource extraction industries tend to treat them as common pool resources easily depleted unless protected by regulations on exploitation rates (Hardin, 1968; Feeney et al., 1990; Ostrom, 1999; Borgerhoff Mulder and Coppolillo, 2005).

This review of historical and contemporary recycling behavior suggests that archaeological considerations of recycling behavior tend to be focused on different concerns. For the most part, recycling to those in the developed world is simply waste sorting which is a job that governments and industry have offloaded onto the public to counteract the increased costs that dealing with materials recycling has on industry profit margins (Dean, 1995; Eckelman and Chertow, 2009). One modern business solution to this problem has been to ship recyclable materials from the developed countries to the developing countries where labor costs are lower and environmental protections are weaker (e.g., Grossman, 2006). As a result, waste and recycling today have simply become vehicles in the globalization of inequality.

### 3. Reclamation and recycling in the archaeological record

Modern examples of recycling generally do not involve reclamation over substantial amounts of time and rarely involve retrieval from archaeological context. Usually recycling today follows shortly after the use and discard of an object, but it can involve a functional change in the product and nearly always involves a change in the user. As such, it conforms best to Schiffer's (2010, pp. 32–34) description of lateral recycling (change in artifact user or social unit of use), secondary use (change in object's use but not form), or recycling (manufacturing change in an artifact's form). These analyses recommend distinguishing retrieval and recycling of an object from archaeological context as reclamation rather than recycling (Schiffer, 2010, p. 38).

Archaeologists have documented evidence of lithic reclamation for more than a century, often through the phenomenon known as “double patina” in which weathered artifacts are picked up and flaked again by later artisans (Martin, 1906). The absolute time depth of reuse, repair, and reclamation activities is uncertain, but double patina appears in a few Lower Paleolithic Mode 1 assemblages of Southern Europe and the Near East. Table 1 compiles many of the sites where lithic recycling has been reported. It is possible that sites have been inadvertently omitted from this list,

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