Recycling

Tony Baker

2/12/07

Figure 1

Figure 1 depicts a late archaic side notch projectile that was recycled from a Folsom preform. I use the term "recycled" instead of "curated" because there was no intent by the Folsom knapper to save this preform for the Archaic kanpper or anyone else. It was of no value to the Folsom knapper and he had tossed it. This is different from curated where there is intent to save an artifact for future use by oneself or other members of one's group. In this paper I define recycling as the convenient return of an abandoned artifact to service.[1]

In the archaeological record, recycling and curating are very difficult to separate. For example, if one abandons an artifact on one day and chooses to recycle it the next, how is the archaeologist going to recognize the difference? Only when a vast amount of time elapses between the abandonment and recycling events is it possible to state with certainty that recycling has occurred. One way to know that considerable time has passed is diagnostically, or being able to identify the technological efforts of two different groups that are hundreds of years apart in time. This is the method employed with Figure 1. Folsom and Late Archaic are thousands of years apart. Unfortunately, diagnostically identified recycling is extremely rare. In the Baker Collection this type of recycling represents about 1 out of every 650, or 0.15% of the cataloged artifacts.[2]

Note 1—I considered using intentional and unintentional recycling instead of curate and recycle because of the vague and various definitions associated with curate. However, to ease readability I chose the second. In this paper curate means use—save—use. Recycle means use--discard--use.

Note2--Cataloged artifacts have an artifact number and are in a database. They represent all artifacts that are more than flakes. A flake with use-wear or retouch is an artifact.

The presence of visually different flake surfaces is another way to identify recycling. Figure 2 depicts an archaeological biface fragment with two different surfaces; the more recent marked with the red line. They are easy to see without the aid of expensive equipment. In addition, different surfaces can occur on all artifacts, diagnostic and non-diagnostic, so this type of recycling is more frequent in the archaeological record. Recycling identified by different surfaces is the focus of this paper.

Figure 2

It Takes Time

Cortex is the unmodified outer surface of a rock, similar to the rind on an orange. Break a rock and compare the cortex to the newly created inner surface. The two surfaces are visually different. See Figure 3. Break the rock a second time and compare the surface of the second break to the surface of the first break. Are they different? Of course they're not. So, why is the outer surface different from the two, newly created inner surfaces? The answer is the outer surface has experienced chemical alteration and/or mechanical abrasion. So, why are the two inner surfaces not different from each other? Again, the obvious answer is there was not enough time between the creation of the first and the second inner surfaces for the agents of chemical and mechanical to affect a visual change in the two. The basic assumption of this paper is that it takes time for the chemical and/or mechanical agents to affect changes to the surfaces of the rock. In this case, time is not measured in days or years, but in hundreds of years and more likely thousands of years. I suspect the time difference between the cortex surface and the new surfaces in Figure 2 is millions of years.

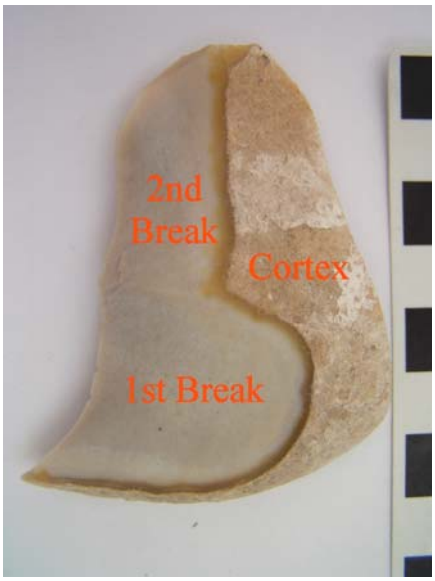

Figure 3

Returning to artifacts from the archaeological record, if a modern chip is removed from an old artifact, there is often a visual difference between the new and old surfaces. Figure 4 is a base of a Belen projectile (maybe 10,000 BP) made of opaque obsidian. After it was collected, it was inadvertently dropped and suffered damage from impact. The red lines mark the newly created surfaces that occurred as a result of being dropped. If the projectile had been made by a modern knapper, then there would be no difference in surfaces. The differences in Figure 4 are the result of 10,000 years of chemical and mechanical alteration.


Figure 4

Modern knappers are aware of this "old look" that is visible in Figure 4. A few, who want to pass their creations off as authentic, will purposely tumble them in an abrasive environment to create the "old look." This method reduces the time required to create an older looking surface from thousands of years to hours or days. But even this takes time. Again, the basic assumption of this paper is that it takes time for chemical and/or mechanical agents to visually alter a newly created surface.

Figure 5 is another archaeological specimen. Again, there are two distinctively different surfaces on this biface. These are represented by the light and dark colored scars. The darker scars, at the top in the figure, cut into the lighter ones and, therefore, are the more recent. However, it is impossible to know how much "more recent" they might be. Based on my personal experience, I believe the time difference between the two is at a minimum, greater than a human's lifetime. Hence I will argue this is evidence of recycling. Most likely, the two surfaces are separated by a hundred, a thousand, or even ten thousand years.

Figure 5

More Examples

On the remainder of this page and the next are six more archaeological examples of recycling as identified by different surfaces. These are offered to give the reader a better feel for how these different surfaces are manifested in the archaeological record.

Figure 6

Figure 7

Figure 6 is an old chip that was later recycled into a graver. Figure 7 is a long narrow uniface that was later recycled into a graver.

Figure 8

Figure 9

Figure 10

Figure 11

Figure 8 is an old side scraper that was recycled on both ends. The upper end became a highly utilized end scraper, while less usage occurred on the lower end. Figure 9 is the reverse of Figure 8 in that it is a old end scraper recycled into a side scraper. The left edge was intensively used. Figure 10 was a thin biface, most likely a projectile that was recycled into a corner notch projectile. Note the islands of old patination from the original biface on the surface. Figure 11 is an end scraper, from which a few flakes were removed from the right edge in a recycling event. Most likely these scars are the result of flakes being popped off during further use as a scraper.

Recycling in Lithic-Rich and Lithic-Poor Regions

All the artifacts in Figures 1-11 are from the Baker Collection. All are archaeological except Figure 3, which was created by Bob Patten in 2003. With these numerous examples, it is possible that I have created the impression that different-surfaced artifacts are abundant in the archaeological record. They are not. The Baker Collection contains only 110 of them, which represent only 0.75% of all the artifacts. Of more interest is how the frequency of these different-surfaced artifacts varies between lithic-poor and lithic-rich regions. In the Baker collection, different-surfaced artifacts are almost exactly twice as abundant in lithic-rich regions as compared to lithic-poor regions. And, this difference is statistically significant. See Table 1.

Table 1

	Total Artifacts	Diff.-Surfaced Artifacts	Percentage
Lithic-Poor	14,182	102	0.72%
Lithic-Rich	559	8	1.43%
Total	14,741	110	0.75%

If the reader is familiar with some of my other writings, such as "Contrasting the Lithic Technologies of Mesa and Folsom" (Baker and Kunz 2003), then he/she is most likely questioning the results in Table 1. In these other writings I have argued that curating, rework, reuse, or whatever name we use, is much greater in lithic-poor regions. Here, in Table 1, I state that recycling as determined by different surfaces is greater in lithic-rich regions. So why the apparent contradiction?

There is no contradiction. It is a comparison of apples and oranges. As stated earlier, short-term curating and recycling looks identical in the archaeological record and are usually classified as only curation. They are performed over the period of a lifetime or less, and they are definitely greater in lithic-poor regions. See Figure 12, which depicts two qualitative circular diagrams.

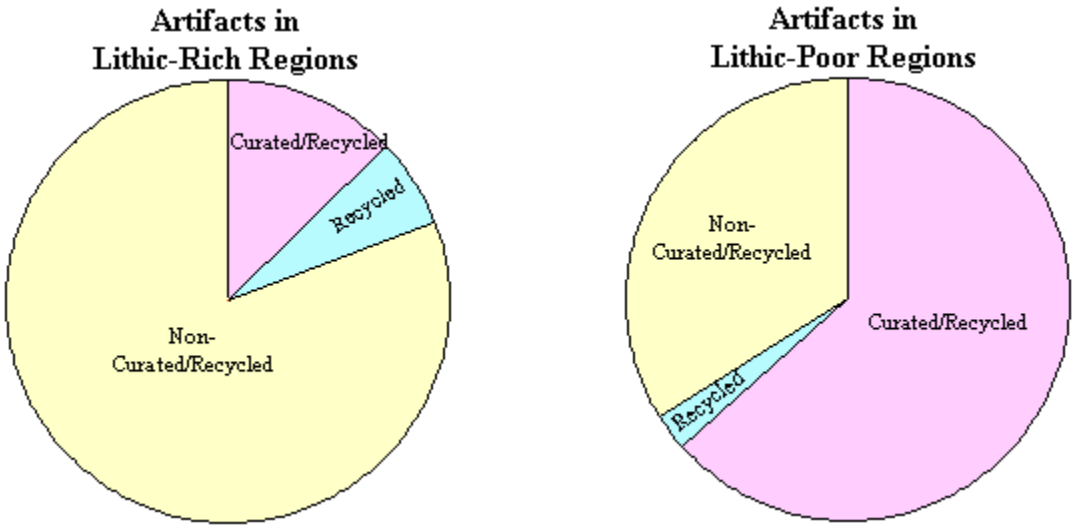

Figure 12

Because the curating/recycling is so intense in lithic-poor regions, which is the natural outcome of an effort to conserve lithic material, the artifacts are literally chewed up into little pieces. As a result, there is nothing left that is big enough for peoples of later generations to recycle. In contrast, the artifacts discarded in lithic-rich regions are larger and, therefore, more amenable to recycling by later peoples. Therefore, recycling (long-term) is more abundant in lithic rich regions. Again, see Figure 12.

The Communal Tool Box

Table 1 documents a pitifully small number of recycled artifacts. However, the reader must remember that the numbers in Table 1 represent recycling over long spans of time; spans that are long enough to alter the rock surfaces, and produce differences that are visible to the archaeologist. How much recycling, not curating, a single individual did during his/her lifetime cannot be known. That said, I am going to step out in deep water and suggest it depended on their location. I suspect in a lithic-rich region, recycling was far greater than curating. There was no reason to save a tool after it had accomplished its design task. It was just discarded. When a new tool was needed, it was easily created from a new nodule or a discarded artifact was recycled back into use. Because of transportation costs, the logic for curating or owning a tool is weak. I think most readers are going to disagree with this statement and I suspect the reason stems from the modern concept of private property. Each of us has **our** screwdriver, in **our** toolbox, in **our** house. Granted we didn't manufacture the screwdriver, but we bought it with **our** money that we earned from **our** hard work. Suppose we move our toolbox out to the street and let everyone share the tools? If someone breaks the screwdriver, then the next person who needs a screwdriver buys one, uses it, and then adds it to the communal tool box. In a lithic-rich region, the communal toolbox was the landscape. No one owns the landscape, but all can use it.

In lithic-poor regions curating was most likely the strategy of choice. Lithic material was too scarce for a tool to be discarded at the completion of a task. However, it was not the tool that was curated, it was the lithic material. I am going to suggest the curated lithic material did not belong to an individual, but instead was communal property that could be used by anyone who needed it. In a sense, there was a portable, communal toolbox.

The communal toolbox minimizes the transportation of lithic material. Each individual does not need his or her own scraper, spokeshave, blade core, or Acheulean handaxe. Our modern concept of private property would have greatly altered the behavior of a band of hunter and gatherers.

Concluding Remarks

I have been aware of diagnostic recycling since the 1960's when I found the projectile in Figure 1. Also, I have been aware of different-surfaces and non-diagnostic recycling at least since 1993 when I began to create the Baker collection database. This was one of my original variables. However, the ideas and concepts presented in this paper did not coalesce until January of this year. The catalyst for the coalescence was another chance to view some Boxgrove handaxes at the British Museum. Guess what? I saw different surfaces.

This was not the first time I had noticed these surfaces, as demonstrated by the following statement in my Acheulean Handaxe paper:

> "One could argue that the handaxe had a very long use life or many use lives. This idea of discard and later reuse came from my observations of the handaxes from Boxgrove. Some had differential patination on the flake scars." (Baker 2006)

I recognized the implications of this, but at the time I had not developed the model that I present here. Basically, the diagram in Figure 13 depicts this model. As defined in the beginning, curation is separated from recycling by intent to save. It is use—save—use. Recycling is use—discard—use. Short-term recycling occurs within an individual lifetime and most likely by that individual or a member of his/her group. It is impossible to separate it from curation in the archaeological record and, therefore, the two are colored the same in the diagram. Some readers may even argue it doesn't exist. But, I strongly suggest it does because if there is long-term recycling, why not short-term. Long-term recycling occurs over a number of life times and is detected by different diagnostic traits or different surfaces on the same artifact. Long-term recycling is also evidence for the concept of the communal toolbox.

Curation/Recycling Model

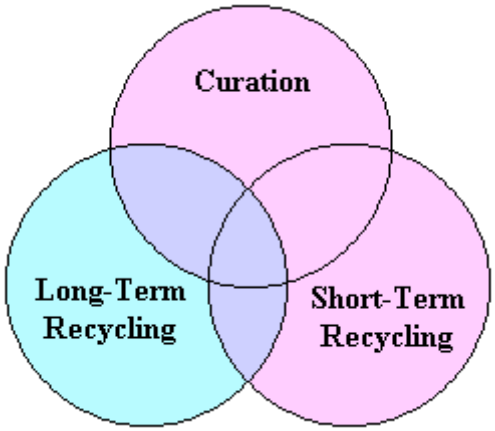

Figure 13

To close, I will ask the question, where would a person look to find evidence of long-term recycling as depicted by different surfaces? One would look at artifacts that are from lithic rich regions. Also, big artifacts are important because this characteristic is an incentive to recycle. So what is big and from a lithic rich region? The Acheulean Handaxe is a perfect fit.

For what it is worth, in the short time I randomly viewed the handaxes from Boxgrove in January of this year, I counted 2 out of 16 with different surfaces, which is definitely not a valid statistical sample. Yet, it is 12.5% and, therefore, intriguing in that it is nine times greater than the value I have in Table 1. I suggest there is behavioral information about Homo erectus available from a study of different surfaces on the handaxe. In fact, this is true for all lithic artifacts from anywhere in the World.

Acknowledgement

I want to thank Nick Ashton and Alan Slade of the British Museum for the access to the Boxgrove material. I want to thank Connie Adkins of the BLM, Fairbanks Alaska, for her editing help. Additionally, I want to thank all three of them for their true friendship.

References

Baker, Tony

2006 The Acheulean Handaxe. Electronic document, http://www.ele.net/acheulean/handaxe.htm, accessed February 1, 2007.

Baker, Tony and Michael Kunz

2003 Contrasting the Lithic Technologies of Mesa and Folsom. Electronic document, http://www.ele.net/mesa_folsom/mesa_fol.htm, accessed February 1, 2007.