REPLICAS, FAKES, AND ART: THE TWENTIETH CENTURY STONE AGE AND ITS EFFECTS ON ARCHAEOLOGY

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In addition to archaeologists who make stone tools for experimental purposes, there is a growing number of flintknappers who make lithic artifacts for fun and for profit. The scale of non-academic knapping is little known to archaeologists, and is connected to a flourishing market for antiquities, fakes, replicas, and modern lithic art. Modern stone tools are being produced in vast numbers, and are inevitably muddling the prehistoric record. Modern knappers exploit some material sources heavily, and their debitage creates new sites and contaminates old quarry areas. Modern knapping is, however, a potential source of archaeological insights, and a bridge between the professional community and the interested public. Modern knapping also is creating a “twentieth-century stone age,” and archaeologists working with lithic artifacts need to be aware of the problems and potentials.

Además de los arqueólogos que tallan implementos de piedra por razones científicas, aquellos que están haciendo artefactos líti- cos por diversión y ganancia están aumentando. La popularidad de tallar piedra sin motivos investigativos es poco conocida por arqueólogos, y en parte tiene mucho que ver con el mercado próspero de antiquedades, fraude, reproducciones, y el arte moderno lítico. Se están produciendo muchos implementos líticos modernos, un proceso que confunde el archivo prehistórico. Talladores modernos explotan muchas de las fuentes de materiales, y su debrif crea nuevos sitios y contiene canteras viejas. El tallado moderno, sin embargo, es una fuente potencial de interés arqueológico y un puente entre la comunidad profesional y el interés público. Este también está creando una Edad de Piedra del siglo veinte, y arqueólogos líticos necesitan estar concientes de sus problemas y potenciales.

When flintknapping became a common part of experimental archaeology in the 1960s, there were not very many people, archaeologists or otherwise, who were skilled knappers. Now, many archaeologists are proficient flintknappers, or at least understand the basic processes, and the number of non-academic knappers is growing. Few archaeologists realize how many flintknappers there are now, or have stopped to consider the effects of modern knapping on the archaeological record. Modern knapping has produced a body of knowledge and expertise without which we could not effectively interpret lithic artifacts. However, modern knapping, especially by the growing numbers of non-academic knappers, is producing vast numbers of stone tools and the debitage from them. These artifacts must be viewed as ultimately affecting the archaeological record. Twentieth-century stone tools can be loosely categorized as replicas, fakes, and art lithics. The first two, in particular, have a perturbing effect on the archaeological record.

Archaeological and non-academic knapping developed at the same time, often separated by different goals, standards, and social settings, but with some communication and a few individuals who crossed the boundaries. When lithic experiments became common in archaeology in the 1960s, a number of knappers like Don Crabtree, J. B. Sollberger, and Gene Titmus, who had developed their skills outside academia (Crabtree and Callahan 1979; Johnson 1978; Knudson 1982; Patterson 1988; Titmus and Callahan 1980), became involved in teaching archaeologists and performing archaeological analyses and experiments (e.g., Crabtree 1966, 1972; Sollberger 1968; Sollberger and Patterson 1976; Titmus 1985). Other non-academic knappers became more visible, and lines of communication began to open among knappers of all sorts. One of the most important factors in the growth of knapping was the “knap-in.” This label from the ‘70s was applied to events where knappers gather for a weekend to knap, exchange ideas.

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and material, and socialize. The first knap-ins (1979 and into the 1980s) were small and often organized by academic knappers, or knappers with a strong interest in archaeology. Accordingly, they usually had an archaeological flavor and often attempted to focus on particular problems of lithic analysis and experimentation. Less academically oriented knap-ins also arose, and soon became larger in both size and attendance. There are currently 30 or more knap-ins around the United States. Several are annual or biannual events with more than 10 years of history, and some knap-ins draw over 100 knappers, plus other craftsmen, hangers-on, and members of the public. Most knap-ins now emphasize the craft of knapping, the social pleasures of getting together and exchanging ideas and material, and the opportunity to buy, sell, and swap raw materials, tools, and points. Only a minority of the knappers at most knap-ins are interested in the archaeological potential of knapping.

As the knapping world expanded in the last decade, archaeologists appear to have withdrawn from it somewhat. There are more archaeologists who knap than ever before, and some important experimental work is still published, but experimental archaeology in general has lost the archaeological limelight. Moreover, as the presence of non-academic knappers became more pronounced, some of the archaeologists became less comfortable with knap-ins and their perceived connections with artifact collecting, dealing, and faking. Our experience with academic colleagues suggests that very few know much about the wider knapping world, beyond a vague general awareness that there are "a few" amateur knappers "out there."

The authors of this article are both academic archaeologists involved in lithic analysis and flintknapping. Whittaker, largely self-taught, began attending knap-ins at Fort Osage in Missouri in 1991 and has been gathering information for an ethnography of that knap-in and the knapping world in general. A student of Errett Callahan, Stafford began attending knap-ins in 1984. It seems to us that, despite some aspects we dislike, knap-ins and non-academic knappers represent a valuable resource for the academic knapper, and a potential area where archaeological bridges to the public could be built. However, in this paper we will emphasize the more negative aspects. The modern knapping world impinges seriously on the archaeological record, and archaeologists working with stone tools need to be more aware of its scope and effects.

**Replicas and Fakes**

The difference between replicas and fakes is in the intent with which they are produced and used. Both are modern artifacts intended to look like prehistoric or ethnographic specimens. Replicas are made for educational or experimental purposes, fakes for deception. Since the earliest beginnings of lithic studies, non-authentic stone tools have been recognized as a potential problem for the archaeologist. Boucher de Perthes was deceived by his workmen into buying fraudulent (and often bizarre) stone tools during his work at Abbeville and other sites in the 1840s to 1860s (Rieth 1970). In England, Edward Simpson, alias "Flint Jack," was producing stone tool forgeries by 1850 (Blacking 1953; Marsden 1983:71–76). In this country, early archaeologists like Frank Hamilton Cushing (1895) and W. H. Holmes (1891, 1919) observed native stoneworkers and taught themselves some knapping, while curious laymen also figured out some of the lost art, but left little record. A rare exception was Halvor Skavlem, a Norwegian immigrant who, like many knappers today, taught himself to make stone tools for fun and curiosity (Pond 1930). Skavlem apparently did not attempt to sell his work, but other early American knappers were already in the fake business. Thomas Wilson of the Smithsonian was complaining about fakes by 1888 (Wilson 1888). Lewis Erikson, another Norwegian in Wisconsin, produced a series of fictitious fish hooks and other odd forms chipped from old artifacts using a steel pliers, and others in the region also were faking and selling points (Jenks 1900). In Oklahoma, Mack Tussinger made and sold eccentric flints in the 1930s, complete with an elaborate story about how he had found them in a mound (Clements and Reed 1939; Ellis 1940).

After these early notices, archaeologists rarely reported on the faking of stone points. This is probably because archaeology in general became less interested in collecting unprovenienced artifacts, and thus the threat of contamination that fakes posed to archaeological knowledge of stone tools seemed less. Many early fakes also were not very good. Often they were crudely made, with bizarre forms, and could be easily detected as archaeologists became familiar with the expected types of genuine artifacts. Non-academic flintknappers increased in
numbers and skills at a time when academic archaeology was not yet very interested in replicative experiments. The collectors, who continued to be interested in unprovenienced finds, were more worried by the prospect of non-authentic stone tools than were archaeologists, and many of the older knappers we interviewed remember considerable hostility toward knappers expressed by artifact collectors (e.g. Scheiber 1992; Waldorf 1980; see also the collector literature, e.g., Russell 1957). This hostility seems to be fading now, as we will explain later. In any case, a number of knapper/fakers of the 1940s to the present (Figures 1, 2) are well-known to the knapping and collecting communities, at least by their products, although specific information on the knappers themselves is spotty and unreliable (Waldorf 1997).

Figure 1. Two “Grey Ghosts” probably made by Bryan Reinhardt. Reinhardt and several other knappers made thousands of large points by pressure flaking sawn blanks with a lever device. Reinhardt started after World War II and died in the 1970s; Grey Ghosts can still be found. They are not good replicas of any prehistoric form but Reinhardt sold to dealers who sold thousands as “antiquities.” Cranbrook Institute of Science collections.

Figure 2. A pressure flaked point by Richard Warren. Warren, who died a few years ago, made much of his living from Grey Ghost type of work, but is better known among knappers for fine pressure flaked “Yuma” points like this one. He was apparently one of the first knappers making knapped art pieces that bore no relation to prehistoric forms, which he called “teleolithics” (Warren 1978). Collection of G. Goth, drawing by Val Waldorf.

Until the last decade or so, as knap-ins arose and lines of communication became more common both among knappers and between non-academic knappers and the archaeological community, most non-academic knappers remember a feeling of intense isolation. Usually they were self-taught and often viewed themselves as the sole practitioner of a lost art. Many of the best were selling their work to collectors, either as replicas or fakes, and there were a number of knappers who made a living, or at least a serious part of their income, from stone work. Hostility from both collectors and archaeologists restrained many knappers secretive. Today, many of these knappers are more open about their occupation, and the markets for both overtly modern stone work and fakes have vastly expanded. Knapping as a hobby also is rising in popularity.
How Many Knappers, How Many Points?

As the scale of modern knapping grows, so does its impact on archaeology. A knap-in such as Fort Osage (Figure 3) draws over 100 knappers, and crowds of onlookers circulate around tables laden with stone tools and tarps covered with raw material and heaps of debitage. There is no way to provide an accurate census of knappers. Many hobby knappers are still unconnected to the informal knapping network, and some commercial knappers are still secretive. It is not even easy to count academic knappers. The main academic lithic journal in the United States, Lithic Technology, had some 300 subscribers in 1997, according to the editor, George Odell. Many of these are lithic analysts rather than knappers, but many knap, at least at some level, and many academic knappers are not subscribers. The newsletter Flinthknappers' Exchange, which ran from 1979 to 1981 and was oriented toward archaeologically involved knappers, had some 700 subscribers, according to Errett Callahan, one of the editors. Perhaps 300 to 500 is a reasonable conservative estimate of the number of academic knappers in the United States.

Non-academic knapper numbers are similarly hard to specify. Between 1991 and 1994, Jeff Behrnes edited a second flintknapping newsletter aimed at non-archaeological knappers, The Flint Knapper's Exchange, and compiled a list of over 1,300 names, mostly knappers with some related craftsmen and small businesses. The current newsletter, Chips, has around 1,000 subscribers, according to editors D.C. and Val Waldorf. The Bulletin of Primitive Technology recently reached 2,907 subscribers (Callahan 1996), and while many of them are more interested in other pursuits, Callahan feels that most of them knap. The Waldorfs, who first produced a flintknapp-
mercial knappers,” estimated to sell over 100 points or over $1,000 worth of knapping-related material a year. While some of these individuals have a substantial economic involvement in knapping, it is not their primary source of income. The rest (114, 71 percent) are essentially hobby knappers who flake primarily for fun, although 47 of these sometimes sell points, often seeing this as a way to defray costs of their hobby. Almost half of all the knappers (not counting academic knappers) in the survey (67, 42 percent) said they never sell points. We suspect that a slightly higher proportion of knappers sell points than admitted it on the survey. Many who do not actively market their work will sell it if the opportunity is presented, even though they consider themselves as “not selling points.”

Even knappers who work purely for fun may produce lots of points. Many knappers are exceedingly dedicated, not to say obsessed. When asked to estimate how many hours a month they knapped, the average response was 24.5 hours per month. This is better than half a normal work week! Ten knappers said they knapped 100 hours a month or more; five of these were hobby knappers.

The questionnaire included the question, “How many pieces do you make in a month (best guess)?” Knappers also were asked whether they sold points, and if so, to estimate how many per year. Obviously, these figures are going to be approximate, but let us run them a bit. One hundred and forty knappers (out of the 160 responses) estimated their monthly production, ranging from “don’t knap much now” (counted as 0) to “a couple” to 250 pieces; the average per knapper per month was about 25 points. Nine knappers claimed to make 100 pieces a month or more; four of these were professionals, four were considered heavy commercial knappers, and one claimed not to sell points at all. The total claimed by all 140 knappers for a month’s production was 3,448. Multiply that number by 12 months, and we can estimate that 140 knappers produced some 41,376 points in a year. If we accept our estimate of 5,000 active knappers averaging 25 points a month, some 1.5 million points are being made every year.

We think this figure is a reasonable estimate. Individual stone tools do not take long to make. Small points require 15 to 30 minutes, larger points up to a few hours. The extreme high end of the scale is represented by Danish flint daggers, which may take from 8 to over 20 hours of work (Stafford 1998). Few knappers make such complicated pieces; the overwhelming majority of knapped products at knap-ins are medium to large points, most of which can be readily made in under an hour. Comparing the hours per month to the points-per-month estimates of the knappers confirms the knappers’ estimate of 1 hour per point.

A few detailed individual records are available. Errett Callahan (1979, 1990) knaps for both commercial and scholarly purposes. He keeps records of his production, and informed us that he made 8,515 pieces from 1976 through 1996, an average of 405 per year. The “limited edition” knives that Callahan makes are exceedingly complicated. Between 1984 and 1990, he produced 352 knives, or about 59 a year (Callahan 1990:13). Another professional knapper, who also does some complex work and keeps records, estimates that he currently averages about 300 pieces a year. In 1989, during an interview with Jim Spears (another highly skilled commercial knapper), D.C. Waldorf estimated that he himself had made 10,000 pieces in some 25 years of knapping, and Spears responded that his own production was similar (Waldorf 1989:5). One full-time professional knapper who sells most of his work to a dealer told Whittaker that he regularly makes 10 to 15 points a day, or 75 to 100 a week, even more than anyone on the survey. Two knappers who do not earn all their income from knapping, but knap mostly for sale, both said they try to average 3 points per working day, or at least 30 per month. Whittaker has watched one of them make 7 to 10 points per day over several knap-in weekends.

In other words, the knappers who estimate their production in the hundreds per year are believable. Of course, most knappers are not nearly so prolific. The average of 25 points per month within the survey sample takes account of the many knappers who only make a few points, as well as the full-time workers. It is fair to point out that the voluntary survey may over-represent the dedicated knappers and underrepresent the majority who consider themselves knappers but actually knap only sporadically. However, whether we accept the estimate of 1.5 million points made per year or prefer a super-conservative figure of 750,000, the fact remains that a staggering number of new stone tools are being created each year.

**Markets for Stonework**

Many modern stone tools go directly to a flourish-
ing market for antiquities and modern replicas. The survey asked knappers to estimate the number of pieces they sold in a year. These estimates totaled precisely one-third the estimated number of points made. There are actually two overlapping but somewhat different markets for modern stone tools, which we will distinguish as the art market and the artifact market.

Although the bulk of modern lithic work imitates prehistoric points more or less closely, and circulates either as replicas or fakes in the same market as real antiquities, many knappers aim at least part of their output specifically at collectors interested in explicitly modern work. Some knappers, like Callahan, use exotic forms and materials to intentionally produce pieces that could not be mistaken for prehistoric work, and consider themselves to be elevating the art beyond the point to which it was carried in prehistory (Callahan 1990:5, 1992). Others, like Waldorf, who mainly make more traditional forms, may mark or sign their pieces, and attempt to market their name as an artist. Some of the prehistoric forms are imitated at such a level of technical skill that they appeal more to collectors of modern work than to “relic” collectors; foot-long fluted points made of heat-treated agate with parallel pressure flaking will not pass as antiquities among knowledgeable collectors or archaeologists. There also is a growing demand among knife collectors for finely flaked stone knives with fancy handles (Callahan 1990, 1992; Dickson 1992; Selbert 1996; Warner 1986). The market for art lithics is growing, and a number of knappers have found it to be an economically viable niche. It also offers an opportunity for creative experimentation and artistic expression that many knappers find appealing, and is thus one of the forces for innovation among modern knappers (Blackwell 1996).

The art market stonework is not currently confusing to the archaeological record, but much of the rest is. Part of this results from market forces. The U.S. market for antiquities of all sorts has been strong in recent years, but the strength of the demand for stone tools surprised us. Huge numbers of modern and prehistoric points are gobbled up, and the trade in both seems to be expanding. Collectors complain about some reduction in the availability of prehistoric artifacts, due to the destruction of sites and such factors as the trend away from deep plowing in agriculture. If anything, scarcity contributes to the demand and prices are rising. Overstreet’s Indian Arrowheads Identification and Price Guide is a standard collectors’ book. It is illustrated with numerous photos arranged typologically, lists some dating and distributional information, and emphasizes the joys of collecting and the monetary value of points. Price ranges for each specimen are provided based on recent sales of similar pieces. Between the second edition (Overstreet and Peake 1991) and the fourth (Overstreet 1995), the estimated prices of the same Clovis points, for example, doubled or tripled, and even point forms with a lesser demand have increased in a similar fashion.

The effects on knapping are predictable. First, there is a growing demand for honestly modern replicas, both to fill out a collection with examples of hard-to-find types, and because many collectors like nice stone tools of any origin. Second, there is a strong incentive to fake antiquities, because a well-made modern point commands only a fraction of the price of a prehistoric specimen. To be specific, a nice modern Clovis point commonly sells at a knap-in for $50-100. Dealers can retail the same point as a modern replica for somewhat more. A similar prehistoric point, if available, will bring from several hundred up to several thousand dollars.

To understand the scale of the market, it helps to know about the ethos of collectors. Many of those in our experience border on the maniacal. There is a great deal of prestige attached to accumulating a fine collection and being knowledgeable about it. This is as true among Midwestern arrowhead collectors as it is among London connoisseurs of Greek vases, or famous New York art museums. Many collectors are willing to expend vast resources of energy, time, enthusiasm, and funds to amass a large and complete collection. For many collectors of our acquaintance, a single example of a type, or of an individual artist's work, is not enough. We know collectors who have bought dozens, hundreds, or even thousands of pieces from a single knapper, just because they like his work, and because collecting defines the collector's self-worth and identity or satisfies other deeply felt psychological needs (Akin 1996; Muensterberger 1994).

We used to believe that large numbers of fakes would so debase the market for antiquities that it would reduce the mining of sites for artifacts. We no longer believe this; the market for both seems bottomless. The demand for real and faked antiquities has led to some interesting social developments among the knappers. The ethos expressed at knap-
Modern points are often difficult to distinguish from their ancient prototypes. Many of the best knappers, both commercial and hobby, are knowledgeable typologists, and use the correct materials and flaking style for particular point types. Most modern knappers use at least some copper flaking tools, which sometimes leave marks, and some “antique” points with furniture polish and other modern materials that can be detected. It also is easy to scuff a point up with a bit of dust and grit, or tumble it in sand to dull flake scars and remove obvious copper marks. On many points, there is little or no evidence of modern manufacture, and an appearance of age cannot be trusted. As a result, the evidence on the contamination of collections is non-quantified, largely anecdotal, and hard to confirm.

Among the knappers and collectors that we know, there is an undercurrent of disquiet about fakes. Arguments about ethics and marking of points are common in the newsletters and other knapper literature (e.g., letters and editorials in *Chips*; statement of ethics of the Society for Primitive Technology), as are discussions of faking and the detection of fakes in the collector literature (Berner 1984, 1997a, 1997b; Hothem 1992; Maus 1997; Miller 1997). Stories about the difficulties of authenticating points are a strong thread in the oral folklore at knap-ins. Knappers, some of whom have an ambivalent view of experts in general and the archaeological profession in particular, recount with glee how the famous So-and-So was taken in, and how Museum X displays a group of modern points as ancient. Two knappers admitted to buying or nearly buying (as antiquities) points made by their own hands a few years before. Points for which big money was paid, or which are illustrated in collector journals or price guides, may be documented as found by a particular collector at a particular site, or “authenticated” by experts, but later publicly acknowledged by a knapper as his own work. Many collectors, and knappers who collect, admit that it is often impossible to be really sure if any point is ancient.

The responses to this situation are complex. A few knapper/collectors of our acquaintance no longer buy ancient points, and collect only what they find themselves. Some collectors are interested in quality rather than pedigree and now concentrate on modern work, or acquire pieces they like regardless of origin. Older commercial knappers say that the artifact collecting organizations were once extremely hostile to knap-
pers, regarding them all as "fakers," but that seems to be changing. Several of the big artifact shows have recently invited knappers to demonstrate or to sell, and one (Texas Cache National Artifact and Flintknapper’s Show of Texas, Waco, October 1996 and 1997) divided the show in half and offered parallel prizes for prehistoric and modern pieces. A strategy of containment seems apparent: If modern knapping is in the open, it is less likely to be confused with the antiquities. The style of some individual knappers becomes known and recognizable, and therefore safer. Our opinion, however, is that the world of commercial collecting has simply abandoned the matter, admitting that even the most expert collector will be fooled sometimes but believing that experience will detect most fakes. Many points are available to be collected, the market for ancient points is stronger than ever, prices continue to climb, and business is solid. For those who want ancient points, there are still some available through new discoveries and the sale of old collections, and many undetectable fakes that sell just as well to all but the most expert buyers. All in all, the world of artifact collecting and commercial dealing has adapted easily to the increasing number of modern lithic artifacts.

Archaeological Impacts of Modern Knapping

Collections

What doesn’t worry collectors too much should worry the archaeologist more. We have described the situation because it has serious short-term and long-range effects on the archaeological record and its interpretation. The most immediate and obvious effect is that collections of artifacts are being muddled. Unsystematic collections are inadequate for many of the current, fine-grained archaeological questions, but amateur collections and old surface finds have been and still are important to regional surveys attempting to locate and date sites or establish time spans, distributions, and cultural sequences in a region (e.g., Amick 1994; Dorwin 1966; Dunbar 1991; Farnsworth 1973; Faulkner 1961; Lepper and Meltzer 1991; Tankersley 1989). Studies of the variation and distribution of particular artifact types also may depend heavily on collections (e.g. Amick 1995; Brennan 1982; Luchterhand 1970; Rolingston 1964; Tankersley 1989). Most projects which use collections rely heavily on the collectors themselves for provenance information. The term “collector” which we have used loosely in this paper, actually covers a lot of variability, from individuals who pick up what they find around them on their land or a local “territory” to enthusiasts who collect through the markets on a regional, national, or even international scale. The amount of information associated with a collection also can vary enormously. Some collectors enjoy acquiring objects, but care little about their archaeological meaning or origins. At the other end of the scale are some collectors who are extremely knowledgeable amateur archaeologists and keep detailed and useful records. Archaeologists working with collections are generally aware of all of these issues, and of the possibility of encountering fakes. However, it is our experience that few archaeologists, especially those who have never seen a knap-in, realize how numerous and plausible the fakes have become.

Based on our knowledge of the knapping world and its history, we do not consider any non-archaeological collection made after the 1930s to be surely uncontaminated. Especially in the Midwest and Texas, where large and attractive Archaic and Paleoindian points are common and desirable finds and have consequently been widely copied, we would not feel comfortable using any recent collection for archaeological interpretations without definite provenance information, preferably from the finder. Even then, humans are mortal, and memory fallible. As collectors die and collections change hands, provenance information rapidly becomes less reliable, and the chance of contamination greater.

A more insidious problem with fakes in collections is that they have perhaps already influenced our views of typology and point type distributions. There is even a sort of feedback loop. Existing typologies and collections influence the work produced today. Knappers use their knowledge of collections, published sites, and illustrations in typologies and price guides as models for their work. As a result, a desirable rare form of point may become much more common, as much because knappers like to make it as because of market demand.

Over the long term, collections will become even more unreliable. As they change hands and finders die or sell off their collections, what provenance information exists is often lost, or at least can no longer be relied on. Furthermore, although the majority of points made by the hobby knappers in the survey may not immediately enter the market,
eventually many of them will, through death or an abandonment of knapping as a hobby. The points made by archaeologists learning to knap, performing experiments, or just enjoying a craft may (or may not) be carefully labeled and uncirculated now, but in the end, they too may be disconnected from their origins and pass into the confusing archaeological record.

The Creation and Destruction of Sites

Modern knapping also is affecting the archaeological record on the ground. A few archaeologists (Dickson 1996; Tunnell 1979) have noted that the activities of modern knappers deplete some stone sources, contaminate sites with modern debitage which is often indistinguishable from old material, and create entirely new lithic sites which may confuse the archaeologist. Again, the scale of modern knapping is such that these larger are than most archaeologists realize and are bound to increase.

A vast amount of raw stone material is extracted, moved, and consumed by modern knappers. Dickson (1996) estimated that 20 pickup loads of stone were brought for sale to one Missouri knap-in; Whittaker’s estimate for another was a minimum of 6000 to 8000 kg. Hundreds of kilograms to thousands of kilograms of material are likely to be exchanged at a knap-in (Figure 4), depending on its size and location. This necessarily puts a strain on some lithic resources. Dickson’s anecdotes of depleted source areas are echoed by what we hear among the knappers.

Our ability to quantify the production of debitage is limited. We do not have the data to make accurate estimates of the amount of material used by modern knappers, but can guess at the scale of consumption. A large flake or sawn slab suitable for making a Clovis or other medium to large point weighs roughly 500 grams. Some points are much smaller, but some are larger, and producing the flakes and blanks also creates waste. If we use our estimate of 1.5 million points per year and guess that each produces an average of .5 kg waste, the total is 750,000 kg, or about 375 tons. Again, we can offer a few specifics to support this. Three prominent knappers interviewed by Callahan 20 years ago estimated that each used 500 to 2000 pounds of stone a year, consuming especially large amounts in the early years of their career when they were learning (Bonnichsen and Callahan 1978; Sollberger and Callahan 1978; Titmus and Callahan 1980). One current commercial knapper who mines and sells stone says that his knapping and slab cutting produces 150–200 lbs of waste a week that he has to send to the land fill, plus larger flakes that he does not use but sells to others. He estimates that he uses or sells 10 tons of stone a year. In 1996, the newsletter Chips advertised two large lots of imported stone for sale to knappers (as well as many smaller offers): Tom Richter in Texas was importing 50,000 pounds of chert from Belize, offered for sale at $2.50 per pound, and Eric’s Rocks and Such of Indiana was importing 45,000 pounds of British flint and asking $2.63 per pound (Waldorf 1996). These ventures illustrate the demand for high-quality material.

Much of the debitage from knap-ins and modern knappers goes into landfills or other areas where it can do no immediate harm. Some of the most productive knappers we know have huge piles in their yards or work areas, or in a convenient drainage or pit nearby. Such large deposits, which include dozens of different foreign materials, also are unlikely to confuse the modern archaeologist. It is at the source areas that knappers are likely to damage the archaeological record. Many prehistoric sources are being exploited for stone, as well as collected for artifacts, and sometimes prehistoric debitage and blanks are treated as raw material. The tendency of many knappers to at least test stone on site, and often to make “spalls” or “blanks” has undoubtedly contaminated many prehistoric quarry sites, and, as Dickson (1996) reports, begun to create entirely new lithic workshop sites.

Conclusions

We have outlined a few aspects of the modern knapping scene because we think that any archaeologist working with lithic assemblages should be aware of their possible implications. We have emphasized the
grimmer aspects, the markets in prehistoric artifacts and modern fakes, and the contamination of sites, because these have the most serious and immediate impact on the archaeological world. However, knap-ins and the modern knapping world are by no means all bad. We personally oppose faking, the whole market in antiquities, and the destruction of sites. Although some modern knappers are involved in all of these areas, the knapping community also includes many individuals who are interested in protecting archaeological resources and exchanging information with archaeologists.

As knappers who knap not just experimentally, but also for enjoyment, we must admit that academic knappers also are part of the problem. Even knappers who knap for science consume raw material and produce artifacts. From the perspective of another century or so, even archaeological replications and modern art points and knives may be confusing, and will certainly contribute to the relics of a twentieth-century stone age that in some circumstances will be hard to separate from its more ancient predecessors.

We can offer no real cure for the problems. The markets for antiquities, fakes, modern knapping, replicas, and art lithics are all strong and growing. The number of knappers also is increasing. As knappers who also participate in knap-ins, we try to encourage others to mark their points and present them proudly as modern work, conserve material, properly dispose ofdebitage, and avoid damage to prehistoric sites. Perhaps the demand of collectors, connoisseurs, and the market will shift from antiquities and their lookalikes to modern stone work as a craft in its own right. Some movement in this direction has occurred, but we doubt that it will ever best the market for antiquities and fakes. Knapping as a hobby and a profitable pursuit will continue to grow in the future. Informed awareness of the confusing “formation processes” that result from modern knapping is a necessary part of any lithic archaeologist’s analytical arsenal.

We would like to urge our colleagues to participate in knap-ins and recognize some of their positive potential. Personally, we enjoy the events, like the people, and find both intellectually stimulating. If more archaeologists attended knap-ins, they would know more about the public view of archaeology, and more members of the public would view archaeologists as pleasant people with a common interest, despite sometimes differing goals and views. The people who attend knap-ins include a wide range of personalities and backgrounds, and often command a great deal of knowledge. Some knap-ins are more archaeological than others; our experience happens to be with the less academic ones. Nevertheless, we have learned much practical information about knapping and other primitive crafts, sites, finds, and the non-academic uses of prehistory. The incredible diversity of knapping techniques and the virtuosity of some knappers was an education in itself. In turn, many knappers are interested in archaeology and would welcome friendly and reliable input from professionals. We may not convert many of the real fakers, dealers, and collectors to our view, but we can certainly encourage a better ethic and a more archaeological view of artifacts and ancient sites on the part of the majority. The exchange of information is the life-blood of professional archaeology, and would certainly benefit knappers and others interested in stone tools on both sides of the academic fence.

Acknowledgments. Much of the information herein comes from recorded and unrecorded interviews, personal communications, and participant observation, but we also have included citations from the admittedly somewhat ephemeral flintknapping newsletters and other sources to document our claims. We have chosen not to attribute information to specific knappers in most instances other than previously published references, but we thank our many friends in the knap-in community for their assistance, with special regard for those who have been helpful or at least tolerant of us despite our disagreements about the ethics of knapping and archaeology. Useful criticisms of this article were provided by Errett Callahan, Phil Geib, Kathryn Kamp, Lucy Lewis Johnson, David J. Meltzer, George Odell, Arie Tsoirk, and anonymous reviewers. Many others discussed the issues with us. Brent Metz translated the abstract, and Val Waldorf drew Figure 2.

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Notes

1 We are aware that there are different levels of care at which artifacts can be replicated, and that some prefer to reserve the term "replica" or "replication" for experiments that conform as closely as possible to the archaeological evidence of manufacturing techniques and waste products as well as the final form of the artifact. We have argued elsewhere (Whittaker 1996a, 1996b) that these distinctions are matters of degree; for our purposes here, we use "replica" in its most general sense as a copy of the form of a prehistoric specimen.

2 There is insufficient space to present the whole questionnaire, which is not all relevant to our concerns here. Other information from it can be found in Whittaker and Hedman (1996, 1997).

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