INITIAL ANALYSIS OF THE MABLE HARDING COLLECTION AS REPRESENTED BY "MABLE HARDING SITE #27"

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ABSTRACT

One of the most controversial issues in current North American archaeology is the identification of early human sites from lithic tool assemblages. This identification is even more difficult and subjective because Paleoindian lithic tools don't follow the typical patterns associated with human alteration, as seen in more recent aboriginal tools. This subjectiveness has created the "nature vs human modification of lithic tools" controversy. This paper deals with lithic material collected by Mable Harding, an amateur archaeologist, who was looking for evidence of early humans in San Diego in the 1950's. The Mable Harding Collection includes sites believed to be from the Paleoindian time period. Analysis of the lithic materials from one site in the collection was the first in depth look at the collection's lithic material by San Diego State University. The value assessment was based on analysis of the artifacts to discover whether they were naturally or humanly modified. Analysis showed that only 10% of the representative site could be considered possible artifacts.

Introduction

The focus of archaeological research on the assemblages of previously excavated sites is a growing phenomenon of archaeology today. Re-analyzing, or analyzing for the first time, previously excavated material that has been left unattended is usually cheaper and sometimes the only option available to archaeologists. This paper constitutes a preliminary analysis of the lithic material from the Mable Harding Site #27. It is an indicator of the potential research value and usefulness of the entire lithic portion of the Mable Harding Collection owned by San Diego State University. Much controversy surrounds the collection for two reasons. First, Mable Harding was not a trained archaeologist. Second, Harding corresponded with George Carter regarding his ideas on early man in North America and tended to agree with him. Specifically, the question, "How can one tell the difference between a human-made chipped stone tool and a naturally modified one?" will be addressed. The answer to this question directly relates to the potential usefulness of the Mable Harding Collection. To a lesser extent the question of whether the sites in the Mable Harding Collection are evidence for human antiquity in the New World will also be addressed. The Mable Harding Collection at San Diego State University consists of nine sites from the Mission Gorge area of San Diego County. Site #27 was chosen because it is a moderate sized assemblage that is representative of the entire collection.

Site #27 is named by Harding in her first draft report on the analysis of the material as: "The Direct Percussion Deposits of the Gorge Mouth Terraces" (Harding n.d.:1). The site is located "at the north lip of Mission Gorge, just before it widens into Mission Valley" (Harding n.d.:1). It was first located in the autumn of 1954 during a preliminary archaeological survey of the Navy Golf Course (Harding n.d.:1). Work did not commence on #27 until May of 1957 and examination went until 1965. Harding's physical description of the site is: "a felsite workshop and an apparently exhausted outcrop some 45-50 ft. above the lower terrace, at the back of the upper remnant, on the left hand side" (Harding n.d.:1). This area was covered with fragments including, "free percussion flakes, of local felsite...The workshop had apparently been used over a considerable period of time..." (Harding n.d.:1). Harding identifies two cultures at the site. The first and older of the two is called the Back Slope Culture and is identified by cobble and pebble tools altered by direct percussion techniques (Harding n.d.:146-148). The second culture Harding called the La Jolla II Culture, and it is identified by "free percussion" tools, manos and metates, and faceted hammerstones (Harding n.d:148-9).

Bulldozer activity was noted by Harding at the site, probably associated with the construction. She states: "Much of the surface of the lower Terrace and a small bit of the Upper Terrace has been bulldozed away for the building of the golf course" (Harding n.d.:7).

Methods

All lithic items from #27 were analyzed for attributes that would identify them as human-made or naturally made. Items were analyzed individually for attributes. Those items found to possess obvious characteristics of an artifact as outlined below, were placed in a "possible artifact" bag. Those items found to possess no discernable artifact characteristics, or those items in which no patterned flaking was found were placed in a "naturefact" bag. All items were labeled as to the typology originally given to each "artifact" by Harding. No attempt was made to change this typology.

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Data

Artifact Attributes

Artifact attributes used to distinguish human-made vs nature-made items are summarized by Kathy Schick and Nicholas Toth's 1993 book *Making Silent Stones Speak* (figure 1). These attributes represent the present day accepted characteristics in the identification of lithic artifacts. First is the "breaking pattern." This pattern is identified as the percussive force resulting in conchoidal fracturing. Second is the "bulb of percussion," the bulge on the flake just below the point at which the percussive force was applied. Flakes reveal this bulb as the positive end of the percussive force. Third is the bulb scar. Cores reveal this scar as the negative end of the percussive force. Fourth is the presence of ripple marks. These are "frozen" energy waves that radiate out from the bulb and the percussion point. Fissures may also be present if the material is vitreous. These are "fine cracks on the inner surface radiating out from the percussion point" (Schick and Toth 1993:94). Lastly, the outside of the flake may show cortex, the weathered outside of the rock, or flake scars where previous flakes have been removed (Schick and Toth 1993:94).

Naturefacts

Naturefacts are stone objects that are acted upon by processes in nature that flake the stones in a percussive manner that could resemble human-made, percussive style artifacts. Areas of high geologic forces where rock had the opportunity to interact percussively exist at cliffs, waterfalls, steep mountain ravines, alluvial fans and during glaciation (Schick and Toth 1993:95). Naturally rock usually fractures along internal flaw planes and lines of weakness. These features may be caused during temperature extremes, such as frost wedging and freeze/thaw which is common in desert environments and during weathering (Schick and Toth 1993:95). Schick and Toth say: "A telltale feature that signals a geologic origin is the angle of fracture. Humans need a sharp angle on the edge of the core (less than 90 degrees)...In stone that flakes conchoidally in geologic circumstances, the angle averages close to a right angle, or 90 degrees" (Schick and Toth 1993:96).

Freeze/thaw causes expansion by the freezing of water that is absorbed by the rocks (Oakley 1972:11); the water widens cracks in the rock as it freezes. Frost action flakes are commonly referred to as "pot-lids" (figure 2). Glaciation, cliff falls and subsidence of disintegrating bed rock produces "flakes that have flatter and more diffuse bulbs of percussion than those produced by purposeful blows" (Oakley 1972:11).

The above evidence then identifies percussion type flakes and cores. Who then is to say that humans can't modify a naturally occurring flake and use it as a tool? How can one decipher whether a flake has been retouched intentionally by humans or coincidentally by nature? Kenneth Oakley, in his book, *Man the Tool Maker* (1972), theorizes that once rocks are flaked by nature, the edges are thin and apt to be chipped through friction against other stone through such natural processes as soil creep, torrent action, and when rocks are caught in the bottom layer of an ice sheet (1972:11). Dr. Timothy Gross of Affinis in El Cajon, California, says that the edges of flaked rocks are the weakest and more exposed to weathering and flaking (Gross 1994). Naturally-made flakes with this type of "retouch" are often mistaken as artifacts. Archaeologists must look for patterned edge flaking with an obvious purpose to the flaking in order to accept completely an artifact as human-made (Gross 1994). George Carter, with whom Mable Harding corresponded, agrees with this statement but goes on to say, in *Pleistocene Man at San Diego*, "...random percussion results in hammering rocks into smoothness, which results in the rounding of rocks" (1957:322).

The items in the Mable Harding Collection as typified by #27 are similar to the photos of the sites in Mission Valley, namely the Texas Street Site found in Carter's *Pleistocene Man at San Diego*. This similarity should not be surprising since these sites and Mable Harding's sites were relatively close together (i.e. in the same valley) and were undoubtedly worked on by the same natural processes, such as flooding and alluvial deposition.

Results

The "artifacts" from #27 were separated by Harding into a self-designed typology. The typology list consists of cores, picks, chisels, choppers, cleavers, small sized tools, cutting edges, scrapers, possible weapon points, scraper planes, and direct percussion assemblage. The categories ground stone and hammerstones are included in the artifacts but not in the typology of Harding's report. This omission is due to the fact that her typology deals mainly with the earlier occupants of the site—the Back Slope Culture. A more current classification of the items from #27 would be: spalled items, tabular and angular chunks, broken cobbles and smoothed cobbles. Spalled items are the result of weathering and fracture, where a thin sheet of rock breaks off the surface of a rock (Gross 1994). They resemble flakes but have no bulb of percussion, and often have a small bump in the center of the flake where it popped off the main rock. The inner surface of spalls is concave because it mirrors the shape of the parent rock. Tabular and angular chunks are the result of weathering and fracturing along planes of weakness and frost wedging (Gross 1994; Schick and Toth 193:95). This weathering produces usually one or more sharp edges and may resemble a tool. Patterned flaking is absent; what edge flaking is present is non-uniform. These "flakes" are usually bifacial because of the lack of directive force in the edge flaking. Broken cobbles are similar to tabular and angular chunks in that they produce a sharp edge mistakable for a tool. Smoothed cobbles from this site have been stream rolled and may be mistaken for ground stone. Features lacking on stream rolled cobbles include ground stone polish and localized and patterned pecking.

Ground stone was not part of Harding's original typology, as she was interested in what she considered to be the older of the two cultures present at this site, and ground stone was associated with the later of the two. Two classes of ground stone were found by Harding. The first is represented by 28 manos

and 1 metate fragment; all 29 items were found to be artifacts. The second group contained 1 discoidal, 1 "old mano," gaming stones, boiling pebbles, and baking pebbles. Five items were found to be artifacts from this second group: the discoidal, the old mano and the gaming stones. The boiling and baking pebbles lacked any significant attributes to distinguish them from naturally rounded stones.

Another large class of artifacts associated with the La Jolla II Culture and therefore not included in Harding's original typology is hammerstones. Of the 59 hammerstones identified by Harding, 58 were found to be actual hammerstones.

An important point must be made before a more in-depth look at Harding's typology is undertaken. The Mable Harding site #27 is presently composed of 1714 lithic items. This number is substantially smaller than what Harding listed in her report (n.d.:17-132). Many items, as much as 1/3 of the entire Mable Harding Collection, were disposed of by a graduate student when the collection first came to San Diego State University, in an effort to cull the collection of non-artifactual material. Therefore, the collection is significantly smaller than Harding originally identified.

Harding's typology, described in her unpublished "first draft report." identifies the following categories of tools made by direct percussion:

Cores: Over 2000 cores were supposedly picked up by Harding. The extent of measurements for all the cores is 1.8–13.5 cm. The largest group of cores ranges 4.0 cm–6.0 cm (49%); the second largest group ranges 1.8 cm–4.0 cm (27%). Harding indicates that 1/4 of the cores had been stream rolled and that transport during flooding was present (Harding n.d.:17). One core, using the attributes by Schick and Toth, was found in the collection. However, Harding classified it as a hammerstone.

Picks: Harding describes picks as, "characteristically tapered from heavy butt end to an acute angular point, usually the measurements across the widest part of the butt ends are from 2/3–3/4 of the length" (Harding n.d.:21). Cross sections may be trilateral, quadrilateral or multilateral (Harding n.d.:21). Harding's measurements for picks range from 16.5 cm–3.7 cm in length (n.d.:21-22). In her report, Harding says that 43 picks were found (n.d.:46). No picks were found during the current analysis.

Chisels: Chisels closely resemble picks, but are quadrilateral in cross section. Harding's measurements for chisels range from 15.8 cm–6.6 cm (n.d.:27). No chisels were found during the current analysis.

Choppers: Choppers can be described as large hand-sized cobbles with bifacial step fractures that create a sharp mid-line ridge on the cobble edge (Harding n.d.:34). They are characterized as being 1/2 as wide as long. Harding identifies 41 choppers in #27 (Harding n.d.:34-39). Seven possible choppers were identified during this analysis.

Cleavers: Cleavers are described as "large cutting tools made on flakes that tend to be thin and flat with long and clean cutting edges;" Harding says that cleavers are used for relatively clean cutting through large unresistant material (based on the thin edges) (Harding n.d.:45). Harding's measurements for cleavers range from 18.7 cm–8.2 cm and between 2.0 cm–4.0 cm thick. Ten cleavers were originally identified by Harding (n.d.:42). Five possible artifacts classified as cleavers were found in this group during the analysis. They are characterized by unifacial or bifacial edge flaking on large flakes or pieces of stone wedges.

Small Tools: Of the approximately 3000 small tools recovered from the back slope exposure, most were less than 7.0 cm in length (n.d.:45). Harding also calls them "finger tools." They include "small picks, reamers and artifacts with cutting, scraping and planing edges" (Harding n.d.:45). No specimens of this kind were found among the artifact during the analysis.

Cutting Edges: Cutting edges are lithic fragments with edges sharp enough for cutting. Harding's measurements for cutting edges range from 6.0 cm–2.5 cm, with a few up to 10.0 cm (Harding n.d.:46). Widths range from 6.0 cm–1.3 cm, with most being elongated (Harding n.d.:46-47). No specific quantity of cutting edges was stated by Harding in her report. No artifacts from this typology were noted in the collection during the analysis.

Scrapers: Scrapers are defined as "relatively flat tools, probably in relation to the manner in which they were held with the thumb on one face and the fingers on the other." Scrapers are similar to cutting edges, but "are not sharp enough for cutting purposes" (Harding n.d.:53). Harding divided scrapers into side, end and compound categories. "Side" and "end" indicate the location of the flaked, scraping end; "compound" refers to tools that have two or more adjacent edges, plus an intervening, usable "corner" (Harding n.d.:53). Of the 2000 identified by Harding, only 1 possible scraper was found during the analysis. It constituted a thick, "core-like" item that may have been a core itself or what is commonly called a "dome scraper."

Possible Weapon Points: Thirteen items were identified by Harding as possible weapon points. Harding identifies the presence of "thinned bases to have been hafted in notched sticks or shafts" in the #27 assemblage (n.d.:101). Only 1 of the current items in #27 could be considered a possible weapon point. It is unclear where the "weapon points" category fit into her culture-line. Harding states: "Weapon points, found occasionally in La Jolla II deposits, are problematical in the Back Slope assemblage, although there are artifacts, which would otherwise be classified as apical scrapers, that, because of thinned bases, might have been hafted in notched sticks" (n.d.:148-149).

Scraper Planes: Scraper planes are described as "a type of scraper that appears to have been used with a planing motion...with finger holds on the sides;" measurements range from 2.0 cm–13.0 cm (Harding n.d.:115). No items from the assemblage could be placed in this category.

Direct Percussion Assemblage: The term "direct percussion assemblage" is used to describe the material recovered from the back half of the lower 30 ft. shelf. Harding considers

artifacts from this area as having been derived from the back slope area as a slope wash (n.d.:132). The direct percussion assemblage is defined as: "poorly defined chisels, planing tools, picks, choppers, and poorly formed scrapers" (Harding n.d.:132). The group "direct percussion assemblage" was present in the current items from #27; however, no items were found to be possible artifacts from the direct percussion assemblage group during the analysis.

Discussion

Harding makes three observations about the site that are important to the discussion of #27 in relation to the nature vs human made tool conflict. First she states that embedded artifactual material was found in two exposures of horizontal alluvium. Second, the heaviest concentration of artifacts was at the -25 ft. to -30 ft. level, "well below the shoulder of the terrace, where the gradient is highest and retention on the slope would be the least." Third, she comments that stream rolled, worked stone and tools were recovered from all levels to a height of 75 ft. above the present flood plain (Harding n.d.:147).

These three observations by Harding strongly suggest that the area was subject to periodic, sometimes massive, flooding in the valley. This flooding could account for the high occurrence of naturally flaked tools from rocks hitting each other and from foreign artifacts being carried in and deposited in that area. Of the 1,714 items in the #27 assemblage, only 6 percent or 107 items could be considered possible artifacts. Of the 107 possible artifacts the majority are large, heavy artifacts of ground stone, cleavers, choppers and hammerstones. Only 1 hafted point can be considered to be human made. It was likely brought in by flooding.

This brings us full circle to the questions asked in the beginning of the paper. How does the Mable Harding Collection measure up as a potential research resource? The answer has several components. First, we must say that based on the data of #27, the Mable Harding Collection does not have much research potential because it has very few artifacts as compared to naturally broken rock. Secondly, however, the collection does present the opportunity for other analyses concerned with the nature vs human-made ideas such as micropolish analysis. Tests on tools for micropolish have been limited to flint of Europe (Keeley 1978). It would be interesting to see if any tests have been done on New World artifacts. If an examination for evidence of microwear were undertaken on the Mable Harding Collection, perhaps more artifacts could be identified. Thirdly, while it may be easy to condemn the collection as a waste of time, one must keep in mind that if Harding hadn't been so inclusive in her field work, there would be no collection at all. Had she attempted to analyze the artifacts in the field instead of bringing them back for others to see, archaeologists would have no idea if there was anything there or not. We must appreciate her diligence, even if her conclusions were incorrect. Harding's rigorous techniques of collecting make it possible for today's archaeologists to go back and make sense of what she was doing and recreate the site based on her notes on the "artifacts" and their provenience.

An interesting side note, that Harding also noted, is the large presence of pointed naturefacts. It is reasonable to assume that the pointed areas of rock would have been broken or weathered long ago based on their having a large surface area that is open to weathering and flaking faster than solid portions of rock. That type of weathering may be true for rocks that are influenced by percussive force. However, one might claim that the rocks with dominant pointed attributes suggest human made artifacts. Another, more reasonable answer would be that what we see is just another process of natural alteration of the rock (figure 3). Some of the pointed rocks in the collection could be the result of grinding and minute chipping between two cobbles so that it forms a natural point. Further research must be done on these pointed rocks to discover the processes that formed them. Because they show no obvious human-made artifact characteristics, it is probable that they are naturefacts.

Finally, as mentioned before, very few artifacts were identified out of the 1,714 items in #27. The analysis was on the conservative side. If it was not extremely apparent that a particular item was flaked by humans, it was not labeled as such. One or two small flakes taken off the edge of the item were not considered definite proof of human alteration. If one can not identify the artifact as positively being human-made all cultural information that the artifact may have is irrelevant.

The last question to be answered is, did Harding claim this as an early man site? No direct evidence was found in Harding's report on #27. However, correspondence with such well-known archaeologists as Malcolm Rogers, Spencer Rogers, and Clem Meighan and with George Carter suggest Harding was looking for evidence regarding early man in San Diego. George Carter is well-known in San Diego and throughout California for proposing extremely early dates for human settlement of San Diego (and therefore North America) (Carter 1980). His dates of hundreds of thousands of years ago vs the traditionally accepted dates of 12,000-20,000 years ago for North American population by humans are often criticized by archaeologists (Carter 1980). However, as far as #27 goes, Harding never directly commented on the possible great antiquity of the site. She *did*, however, class the Back Slope Culture as contemporaneous to the San Dieguito Culture (8,000-12,000 years ago) (Harding n.d.; Christenson, personal communication 1993). She also hints at their evolution into the La Jollan II complex (Harding n.d.).

Conclusion

As a "hot topic" in today's archaeology, human entrance into the New World is receiving much scrutiny. As new information is continually coming to light and dates of human migration to this continent are pushed farther back in time, many sites that have been forgotten in storage are suddenly being pulled out for a "new interpretation," or sites once thought useless for various reasons (i.e. lacking provenience, or collected by non-professionals) are finally receiving attention. The Mable Harding Collection is no exception. By analyzing

the lithic material in the Harding Collection, this archaeologist is taking the first step in identifying the place the Harding Collection has in answering the "early humans in North America" question. It is likely that the time line for human entrance into the New World is older than archaeologists can currently prove. It is just a matter of time before sites are found that will continue to push the time line farther and farther back. In the case of the Mable Harding Collection, however, this analysis has shown that this particular collection is not the "smoking gun" needed to prove earlier dates for the human entrance into North America.

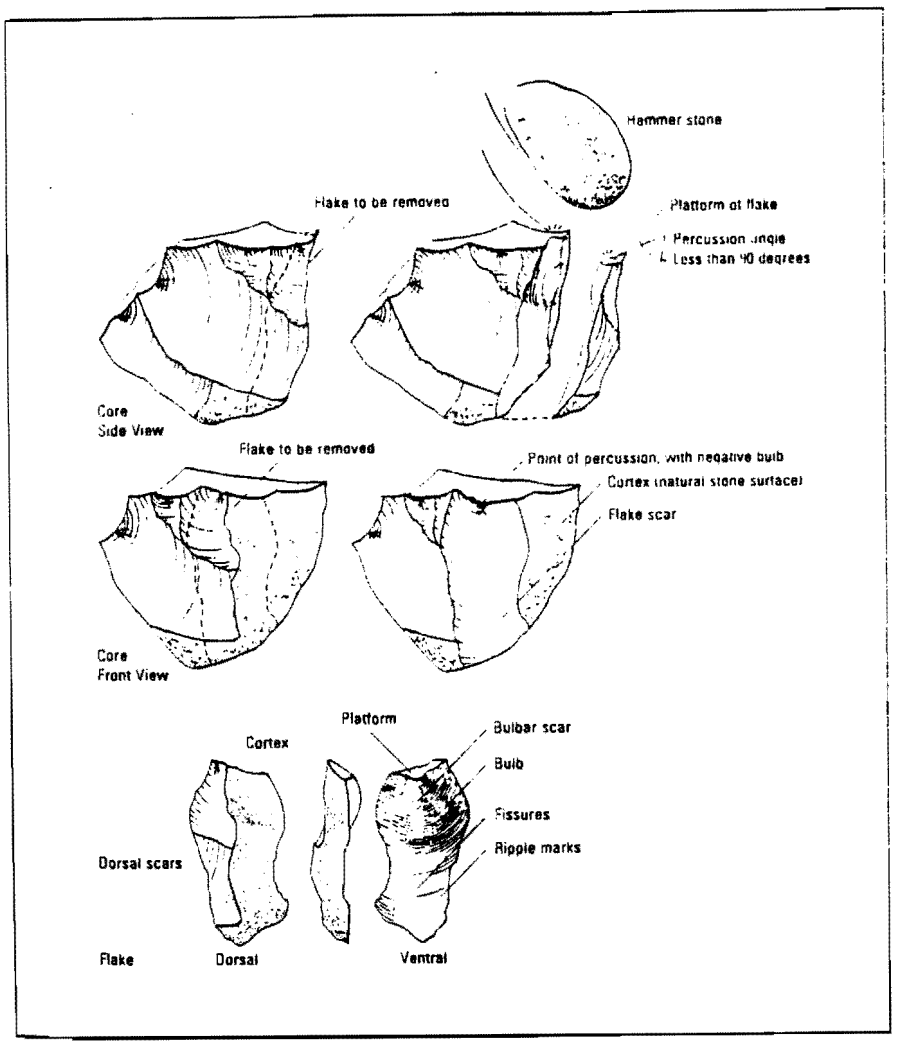

Figure 1. The Characteristics of Conchoidal Fracture. Evidence of human-made artifacts. (From Schick and Toth 1993:93.)

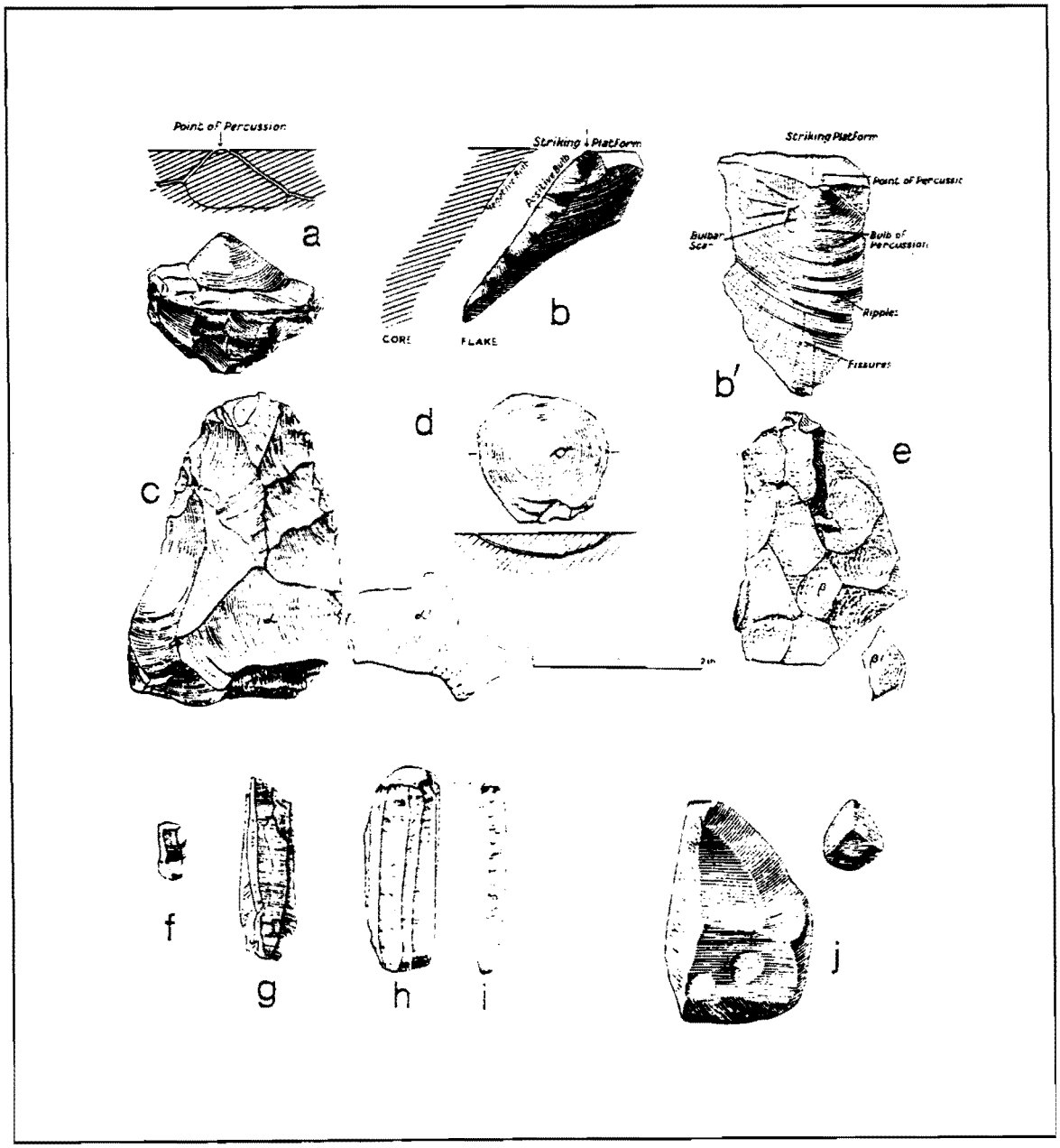

Figure 2. Characteristics of Humanly Worked Flint, and Naturally Flaked Flint MistaKenly Called Artifacts. a) Complete cone of percussion. b) Flint flake struck by man. c) Flint hand-axe. d) Rounded spall of flint called a "pot-lid." Split from the rock by frost action. e) Lump of flint pitted by intersection scars of frost spalls. f) Shrinkage-prism of starch. g) Flint showing prismatic-, or starch fracture. h) Prismatic core of volcanic glass from which blades have been struck. i) Blades from example 'h' from Chalcolithic, Crete. j) Ventifacts of dreikanter type: pebbles of jasper faceted by windblown sand; Carnak, Brittany. From Oakley (1972:9).

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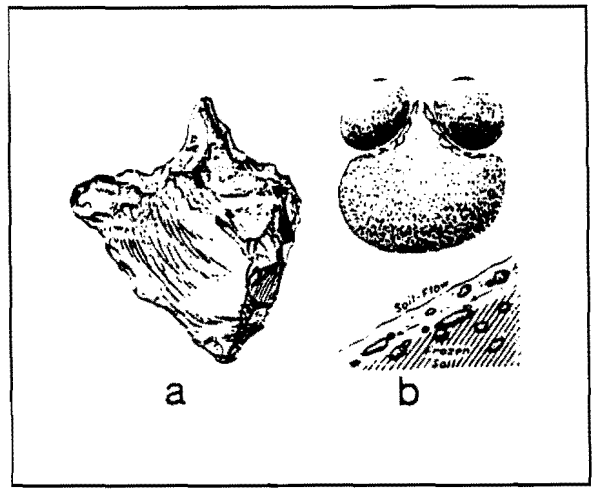

Figure 3. Naturally Made Chipped Stone. a) An "eolith" from river gravel at Pilthdown, Sussex. b) An illustration of how an "eolith" could be made (by soil creep). From Oakley (1972:8).