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Ivory points in the Lower Paleolithic of Europe

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SUMMARY: In 1983 Howell & Freeman published 34 ivory tusk fragments, described as points with a stem for hafting, from the Lower Paleolithic sites of Torralba and Ambrona (Spain). They viewed these pieces as evidence that the Acheulian hunters possessed techniques normally thought to be an Upper Paleolithic innovation. These pieces were later considered natural by Gary Haynes because their general morphology was similar to that of naturally broken tusk tips. Howell & Freeman have argued that various traces of human manufacture and utilization, not just the shape of the points, prove that these were artifacts. We have re-examined all the specimens of previous excavations and 27 new specimens from the recent Ambrona excavations. We use morphometric, optical and SEM microscope analysis and combine these observations with taphonomic, sedimentary and actualistic data. We conclude that all the Torralba and Ambrona pieces are natural and not evidence that mid-Pleistocene hominids made or used ivory points.

1. Introduction

The Lower Paleolithic sites of Torralba and Ambrona were first excavated at the beginning of the last century by Cerralbo. More systematic and extensive excavations at both sites were carried out by Clark Howell and Leslie Freeman between 1961 and 1963 and at Ambrona between 1980 and 1983 (Howell *et al.* 1991). In 1983 Howell & Freeman published thirty-seven ivory tusk fragments of which 34 were described as points with a stem for hafting. Cerralbo had found eight of these points in Torralba; he thought that humans had used these tusk tips. Howell & Freeman suggested that the Acheulian hunters deliberately fractured *Elephas antiquus* tusk tips by flexion producing a repetitive shape, in some cases modified by grinding and polishing and/or marginal retouch. These objects were thus considered as evidence that Lower Paleolithic people possessed techniques to produce patterned bone implements, normally thought to be an Upper Paleolithic innovation.

These pieces were later considered natural by Gary Haynes (Haynes 1991) because their general morphology was similar to that of tusk tips and medial segments found by him in various game preserves of southern Africa around dry-season water holes. Haynes suggested that breakage results from intra-specific fights or when elephants use their tusks in feeding activities or in pushing and lifting heavy objects. In a recent paper Howell *et al.* (1991) defend their interpretation of most of these points as artifacts. According to them, various traces of human manufacture and utilization (striations, grooves, polish on tip or stem, flaking, chipping and facetting) not just the shape of the points, prove that these were artifacts. They also say that some morphologies are different from those documented by Haynes.

To assess the validity of Howell and colleagues' renewed interpretation of these traces, we have re-examined all the specimens of Cerralbo and Howell & Freeman's excavations kept in Soria and in Madrid. A second reason for re-examining these ivory points is that 19

new tusk tips with a stem, 3 medial segments, 3 ivory flakes and 2 points without a stem (Fig. 1) have been found in the new excavations at Ambrona directed by Manuel Santonja and Alfredo Pérez-González. The excavations have also produced several more or less complete tusks and many annular tusk fragments that are the result of postdepositional breakage.

2. Analytical Procedures

To assess the nature of modifications under study we have used three different kinds of reference materials: 1) A modern sample of eleven complete tusks of African elephants killed by poachers and illegally exported subsequently confiscated by French customs officers. The sample is stored in the Museum d'Histoire Naturelle of Bordeaux; 2) Experimental reproduction of stone tools marks on ivory using retouched and unretouched blanks; 3) Comparative data derived from observations of unbroken archaeological tusks from Ambrona, which are clearly not artifacts.

Taphonomic and sedimentary context data were available from the recent Ambrona excavations and have thrown light on questions of mechanical abrasion.

Recorded morphometric data include length, breath and thickness of points and stems. We noted the presence, location and mode of occurrence of striations, and features such as polish, degree of abrasion, micro-pitting, root marks and preparators' marks. When applicable, the same variables were recorded on the modern and archeological reference material. Each specimen was examined with a reflected light microscope; selected areas were replicated with Vinyl Polysiloxane impression material. Positive casts, made in araldite, were observed with a SEM Jeol. 840A. Transparent replicas were also observed and photographed in transmitted light with a Wild M3C stereomicroscope.

3. Results

To investigate the life history of these objects we examined in sequence their breakage morphology, their dimensional variability, and various putative traces of manufacture, use and resharpening.

3.1 Breakage morphology

Contrary to Howell *et al.*'s (1991) statement that some archaeological point morphologies are different from those documented by Haynes, our analysis of the old and new points indicates that all shapes found at Torralba and Ambrona are present in Haynes' modern series, i.e. pieces with long and short stems, pieces without a stem, pieces with a dihedral end, medial tusk segments and different types of ivory flakes.

As indicated by Haynes (1991) breakage of tusk tips occurs during the animal's life. In our modern reference collection an adult tusk shows the trace of an elongated tip fracture with smoothed edges. The resulting ivory point must have been like many Torralba and Ambrona specimens, possessing a short tip and a rather long and flat stem. The rounded edges of the fracture show that the animal continued to use its tusk, smoothing out the broken surface.

3.2. Size variation

The frequency distributions of total, stem and apical length show very dispersed values. The length of intact ivory points ranges between 1.8 and 23.2 cm. Some of the smaller pieces have extremely short points (the smallest is 0.4 mm long) of no plausible functional value yet they have exactly the same general morphology as the much larger pieces. The recent excavations have added to the impression of a great dimensional variability through the recovery of several points smaller than 4 cm, missing from the older series. Thus, we agree with Haynes' suggestion that the morphology of these pieces is natural and accidental; their length and breadth variability makes them weak candidates for being hafted artifacts.

3.3 Traces of manufacture and utilization

Howell & Freeman (1983; Howell *et al.* 1991) have suggested that, although the pro-

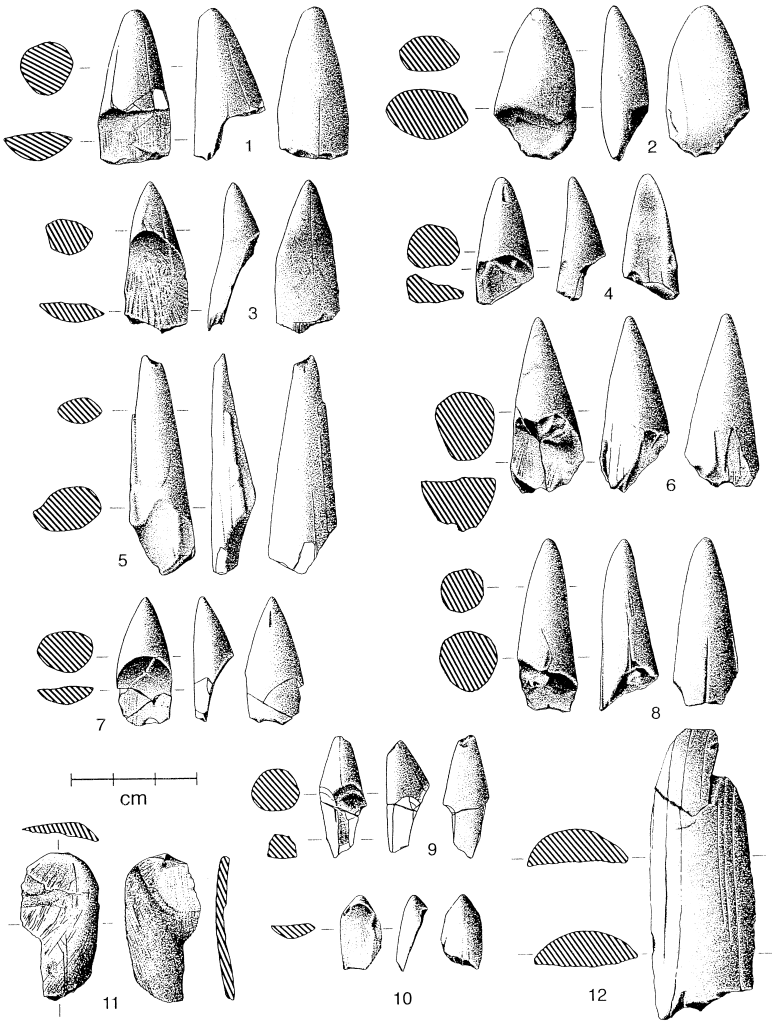

Fig.1 - Ivory points and ivory flakes from the 1993-1999 Santonja and Pérez-González' excavations.

duction of some of these pieces may be a natural phenomenon, humans have used and modified them, stressing the presence of manufacturing and utilization traces, such as striations, polish, grooves and tool marks, and marginal flaking. These traces were not discussed by Haynes. In their analysis, however, Howell and colleagues do not address the problem of the state of preservation of the surfaces. To assess the anthropic origin of these traces it is necessary to evaluate the taphonomic processes, which may have produced them. The new excavations and assemblage analysis provide data on the sedimentary context and the degree of preservation of the bone, ivory and lithic remains.

Points from the new excavations derive from four stratigraphic units: unit AS1 (alluvial fan deposits), AS1/2 (fluvial sands), AS3 (lacustrine marls with some gravels) and AS4 (channel and overbank deposits). Although the degree of abrasion of all archaeological materials varies from one unit to another, 70 to 90% of all bones, stone artifacts and ivory points show some degree of abrasion. On a total of 40 points from the old and new excavations, only

6 are fresh; 34 (i.e. 85%) are either slightly or very abraded. In some cases points are so rolled that they have almost completely lost their original shape. Frequency distributions of degrees of abrasion for different materials indicate that ivory points and bones have comparable values. Microscopic analysis of bone and ivory surfaces confirms that some at least of the surface modifications noted on these pieces are due to taphonomic processes. According to Howell & Freeman, 24 points carry striations of human origin. Our analysis of new and old points shows that all of them carry striations. In most cases points are covered with randomly oriented or intersecting sets of striations of variable width and depth. That these striations have a non-anthropic origin is strongly suggested by the fact that similar patterns of striations occur on unworked tusks from Ambrona, including on the internal face of annular tusk fragments, on the surfaces of many bones from the same site and on modern tusks. Thus, some of these striations are due to sedimentary abrasion, in particular those on the internal face of tusk annuli which are unexposed during the animal's life. Others were produced by the elephants themselves while using their tusks in a variety of activities, such as digging for tubers and water, scraping soil for salt or stripping bark from trees, as suggested by our modern sample.

Polish on tip or stem, interpreted as due to use or rubbing against the haft, was observed by Howell & Freeman on 18 pieces. Our SEM analysis of surfaces described as polished shows that they are covered by intersecting striations comparable to those present on other points with varying degree of surface and edge abrasion, indicating that areas considered as polished do not differ microscopically from naturally abraded surfaces.

Several stems present small flake scars on the sides or at the proximal end described as traces of intentional retouch or chipping by use. In fact such scars occur also on naturally broken tips collected by Haynes who considers them as damage occurring at the time of breakage. Facets described as an indication of deliberate shaping should also be considered a result of natural processes. In fact, during the elephant life the tusk tip can be broken creating flattened surfaces which are gradually smoothed and worn down forming facets with rounded edges and tips with spatulate ends.

4. Conclusions

We conclude that all the Torralba and Ambrona pieces are natural and not evidence that mid-Pleistocene hominids made or used ivory points.

The ivory point from the site of Castel di Guido (Radmilli & Boschian 1996) is very similar to those from Torralba and Ambrona. At Castel di Guido elephant remains are the most abundant after those of *Bos primigenius*. All skeletal elements are represented including 81 tusk fragments. The ivory piece is listed among the bone tools. Although the processes of accumulation of the faunal assemblage are still to be elucidated and a microscopic analysis of the object remains to be done, a natural origin of the fragment is suggested to us, as at Torralba and Ambrona, by the available data and the absence of clear anthropic modifications.

5. References

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