

# The bone industry of the Neolithic site of "La Vela" near Trento. A micromorphological analysis.

MARTA BAZZANELLA & ANTONELLA AIMAR

**ABSTRACT** - The Authors analyse the bone industry found in the Neolithic site of "La Vela" near Trento (Square Mouth Pottery culture). The aim of the study was the recognition of technological traces on bone surfaces using the Scanning Electron Microscopy (SEM).

**KEY WORDS:** "La Vela", Trento, Square Mouth Pottery, Bone industry

**PAROLE CHIAVE:** "La Vela", Trento, Vasi a Bocca Quadrata, Industria su osso

*Marta Bazzanella* - V. Parteli 5, I-38068 Rovereto (TN). E-mail: bazzanellamarta@quipo.it

*Antonella Aimar* - Dipartimento di Anatomia e Fisiologia Umana, Università di Torino, corso M.D'Azeglio 52, I-10126 Torino

## 1. INTRODUCTION

The Authors analyse the bone industry found in the Neolithic site of "La Vela" near Trento (Square Mouth Pottery culture). The aim of the study was the recognition of technological traces on bone surfaces using the Scanning Electron Microscopy (SEM).

## 2. THE MATERIALS

The bone industry found in the Neolithic site and in the Vela necropolis near Trento was recovered during subsequent excavation campaigns carried out by the Museo Tridentino di Scienze Naturali (1960, 1975, 1976, 1977) and by the Ufficio Beni Archeologici P.A.T. in collaboration with the Dipartimento di Scienze Filologiche and Storiche of Trento University (1987, 1988). It is composed of tools and ornaments mainly recovered from burials, attributed to aspects belonging to the mean-

der-spiral style of the Square Mouth Pottery Culture (BAGOLINI 1990).

The following artifacts documented in the 1975 excavations are particularly interesting:

- a bone awl made from a metapodial bone of a small ruminant (due to erosion it was impossible to obtain a more precise definition). The implement was placed near the hands and the face of the burial of tomb 2. The tomb was delimited by a circle of stones at the bottom of the grave. The buried person was probably a woman who had been placed in a crouched position on her left side.

- a small plaque with an unfinished hole, the function of which is difficult to identify, made of a wild boar's lower canine.

The following was uncovered during the 1976 excavation:

- two fragments of (arrow) heads
- a deer atrophic canine with a hole
- a plaque with an unfinished hole made of wild boar's upper canine, very similar to the one found in the 1975 excavation.

The bone industry recovered during the 1987/1988 excavation campaign includes:

- a bone spatula found at the height of the elbows of the buried female of tomb I who had been laid in the stone cist in a crouched position on the left side with the hands placed in front on the face.
- another bone spatula found inside a square mouthed bowl, placed near the right hand of the buried female who had been laid in a tight crouched position on her left side in tomb II, delimited by a circle of stones.
- a bone awl made from the distal epiphysis end of a goat/sheep's metapodial bone, placed on the breast of a child of about 4 years who is laid in a crouched position in the stone cist: tomb III. The implement would seem to be a clothes pin. Bone awls occur in four tombs, both male and female, at Arene Candide (Bernabò Brea excavation) and in a burial in the Chiozza cemetery (Degani excavations) (BERNABÒ BREA, 1946; 1956; DEGANI, 1940).
- a bone fragment with preparation traces, was found among the grave goods of a male burial, placed within the stone surround of tomb V.
- a bone awl made from the distal epiphysis end of a goat/sheep metapodial bone, found inside a small Serra d'Alto type pot placed as a grave item on the chest of the male of about eight years, laid in a crouched position within a circle of stones: Tomb VI. There was also a bone fragment with preparation traces inside the pot.

Surface micro-morphological analysis was carried out on the better preserved and most important pieces so as to identify traces left from the making and the use of these artifacts. The production of an artifact requires a sequence of actions that produce traces on the surface. In some cases it is possible to identify the techniques used by analysing these marks. It is important to remember that it is not always possible to deduce the different stages of workmanship from the finished artifact because the signs left by an action are easily obliterated by the following ones. The same goes for the finished artifact, especially if it has been used a lot. In using the scanning electron microscope it is easier to identify these surfaces, nevertheless it is not always possible to propose a technological and functional purpose for the marks analysed.

## 2. METHODOLOGY

The objects examined are ascribed to three categories: pointed implements, spatulas and or-

naments. Two awls made from metatarsal bones, a fractured point, two spatulas of a diaphysis chip and two plaques made from wild boar's lower canines were analysed. The material is generally quite well preserved apart from a few areas that underwent root chemical erosion.

The artifacts were observed through a WILD M420 stereomicroscope and a Scanning Electron Microscope (SEM) CAMBRIDGE STEREO-SCAN 120. When using a SEM the chosen area can be duplicated in silicon elastomer PROVIL L and B (Bayer) and in epoxy resin LY 554. The duplicates in resin were metallized in gold.

## 3. THE POINTED IMPLEMENTS

The awls were made from sectioned metapodial bone according to a transversal plan. Both the surfaces were polished.

The distal epiphysis of the longer awl (Fig. 1a-b) is slightly modified and the surface produced by the splitting of the metapodial bone seems to be rather rough.

This implement conserves many technological traces. Long marks can be frequently seen near the groove of the medial metapodial bone, on the surface of the section. These were produced by a stone implement, which probably caused the splitting of the bone. Traces of how the point was made are visible through the stereomicroscope and the SEM, both on the periosteum and the endosteum surfaces. These are areas of elongated and convergent marks that are particularly evident on the periosteum surface (Fig. 1c). The lower face features two types of marks in different places (Fig. 1d). It is possible to identify groups of traces on one part, made by a lithic implement, which have produced secondary characteristic marks within the main groove (Fig. 1e). On the opposite half there are short transversal abrasive rather superficial marks, that are partly erased by the longitudinal marks caused by scraping (Fig. 1f). There are no particular marks that could suggest the function of the implement.

The surface of the second awl is more compact and polished even at the proximal end (distal epiphysis of the metapodial bone) which has been retouched (Fig. 2a-b). The only marks referring to the phases of work are located on the distal end near the point. These are short transversal marks made by scraping (Fig. 2c), sometimes overlapped by stone tool working which can barely be seen.

The fractured point made from a diaphysis

chip was scarcely retouched. SEM analysis of the point shows a smooth compact surface.

#### 4. THE SPATULAS

The two spatulas made from a diaphysis chip are similar in form and dimension (Fig.3a-b). They are fine and symmetric artifacts with one pointed end and one wider end with a convex edge. In both the spatulas the periosteum face is polished and reflective. The SEM emphasizes a compact and polished surface (Fig.3c-d). Nevertheless, it is possible to identify longitudinal elongated marks, partly worn out, on the left side of both the spatulas possibly left by a lithic implement (Fig.3c). These marks correspond to a stage of manufacturing rather than to use-wear. The edges are particularly polished and on the basis of the surface micro-morphological characteristics, it is not possible to distinguish a working edge.

#### 5. ORNAMENTALS

The two plaques examined were made from the lower canines of pigs. They are thin flakes with one enamel side (Fig.4a) and another dentine one (Fig.4b). Both the objects have one end with convergent edges, cut off by an unfinished hole. The wall of the hole, seen through the SEM, have circular marks, which associated with the regularly

shaped hole, would suggest that an rounded perforator had been used (Fig.4c). The limit between the converged edges and the walls of the hole is polished and compact as though it had been retouched. A lot of marks can also be identified on the dentine face. They are elongated longitudinal marks, deeper towards the edges, attributed to a lithic implement (Fig.4d).

#### 6. CONCLUSIONS

On the basis of the results obtained by observing the micromorphologic surface, a few conclusions can be drawn regarding the manufacturing techniques of the objects examined. The projectile end of the awls is obtained by scraping the material away. It is possible that the outline of the point was carried out by means of scraping, as the few short marks identified on the endosteum surface of the implements would suggest. On the basis of the marks observed it is only possible to confirm that an implement such as a perforator had been used on the fractured point. It would seem that the polishing of the spatulas corresponds to aesthetic needs rather than to the function of the implements. It is also impossible to hypothesise the use of the plaques obtained from wild boar teeth because there is no evidence of suspension or fastening of these objects.

As these materials were personal belongings of the buried persons the objects may have been made purposely for this, and it is for this reason that there are no traces of use-wear.

**SUMMARY** - The bone artifacts found in the Neolithic site of "La Vela" near Trento were analysed using stereoscopic binocular microscopy and Scanning Electron Microscopy (SEM). The micro-marks, detected on the bone surfaces, emphasised some technical and functional peculiarities, which could integrate the typological analysis.

**RIASSUNTO** - I manufatti in materia dura animale provenienti dal sito neolitico "La Vela" di Trento sono stati sottoposti ad un'analisi di micromorfologia di superficie. Sono state effettuate. Le caratteristiche di superficie degli strumenti, analizzate allo stereomicroscopio e al microscopio a elettronico a scansione, hanno permesso di trarre delle indicazioni di tipo tecnologico-funzionale ed integrare i dati forniti dall'analisi tipologica.

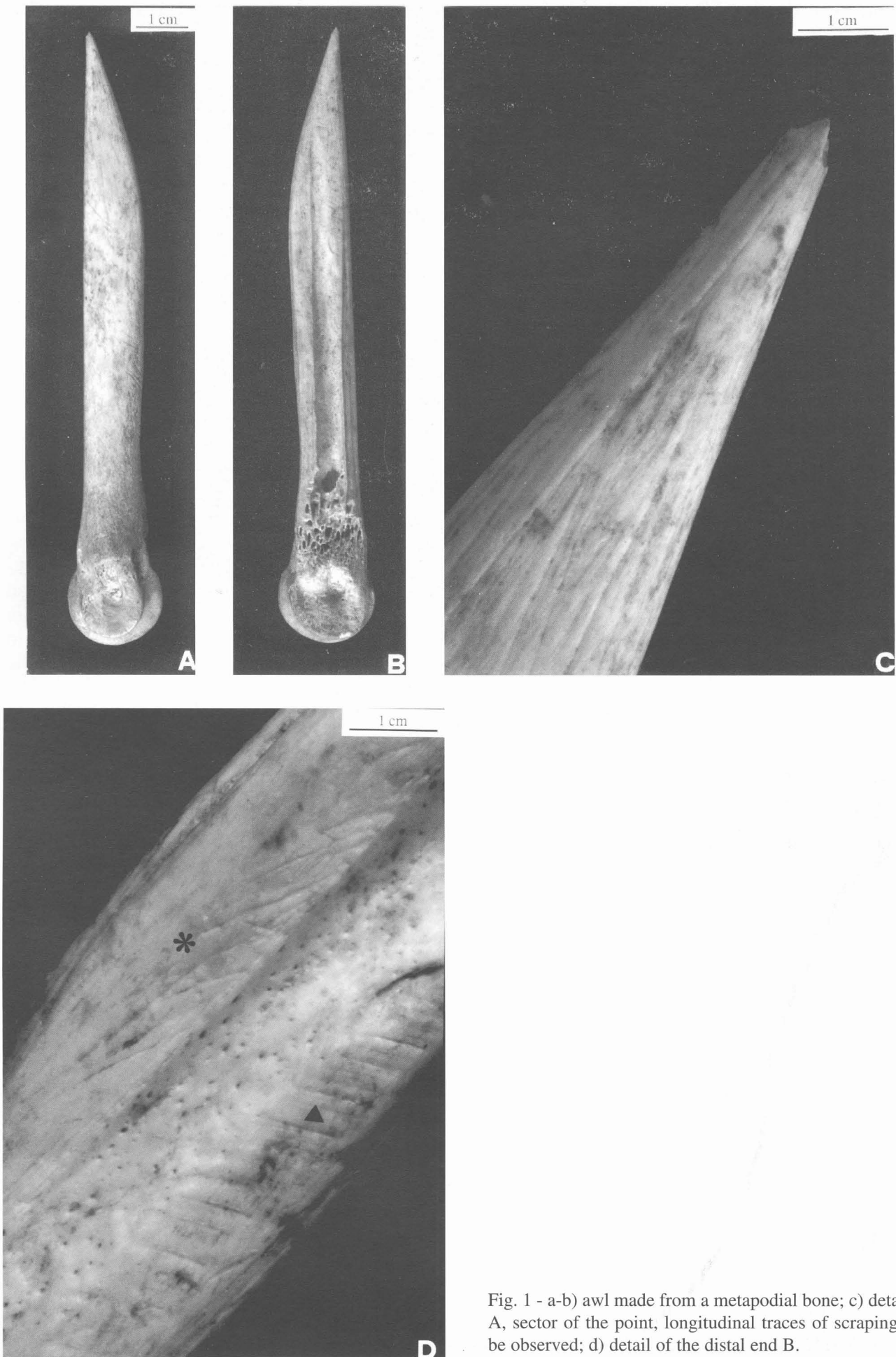


Fig. 1 - a-b) awl made from a metapodial bone; c) detail of A, sector of the point, longitudinal traces of scraping can be observed; d) detail of the distal end B.

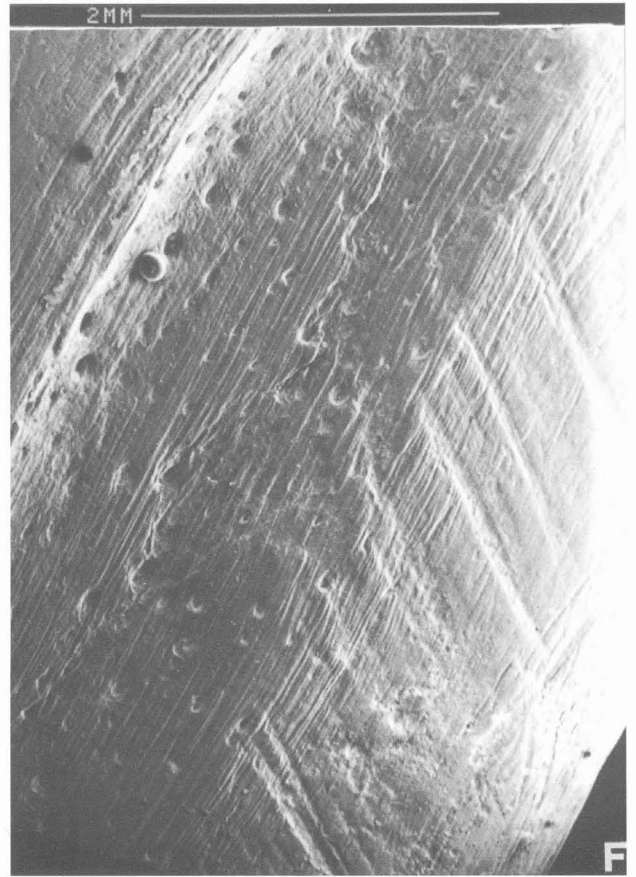


Fig. 1 - e-f) SEM resolutions of the areas indicated in D respectively by the asterisk and by the triangle.



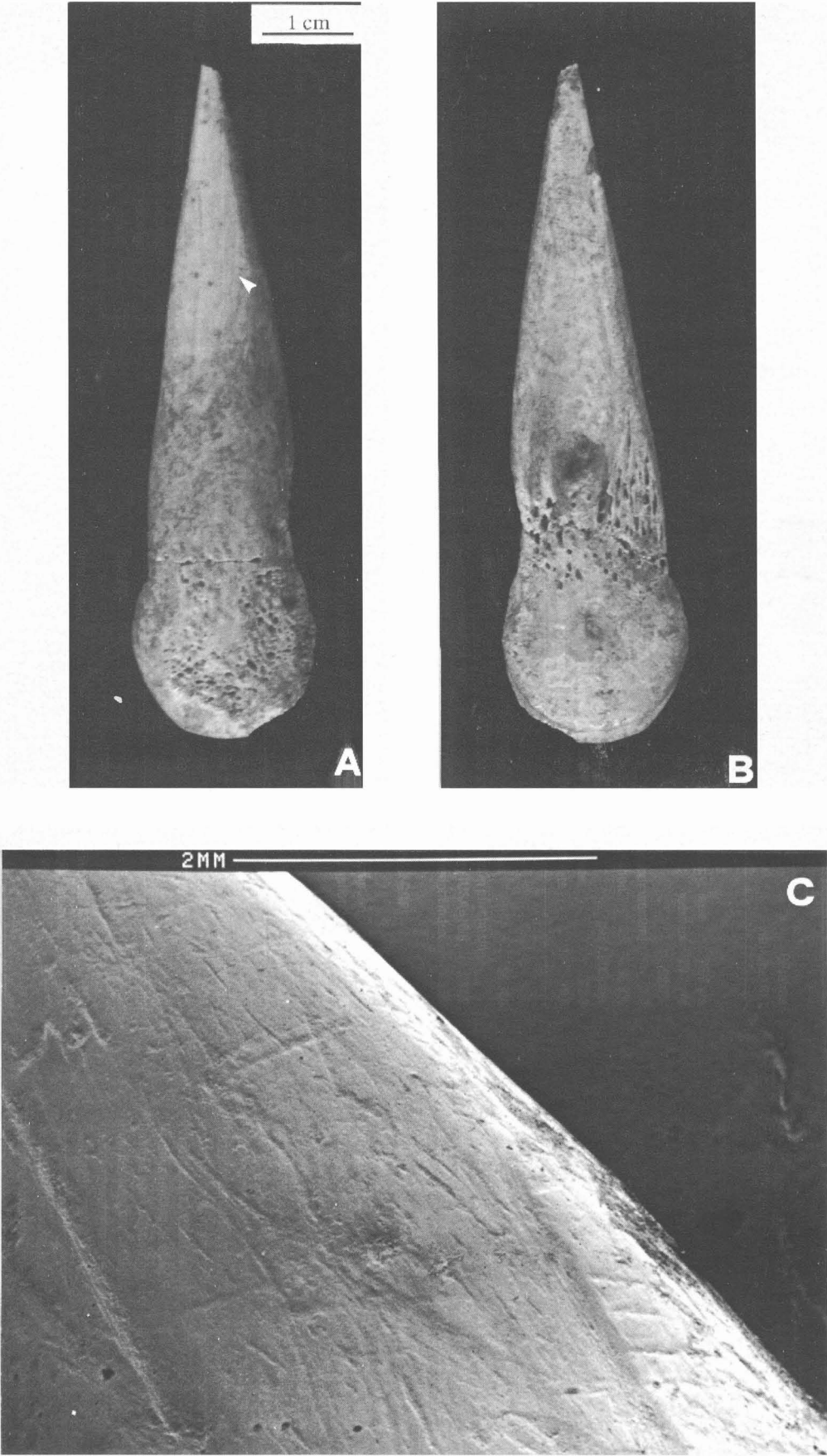


Fig. 2 - a-b) awl made from a metapodial bone; c) SEM resolution of the area indicated in A by the arrow.

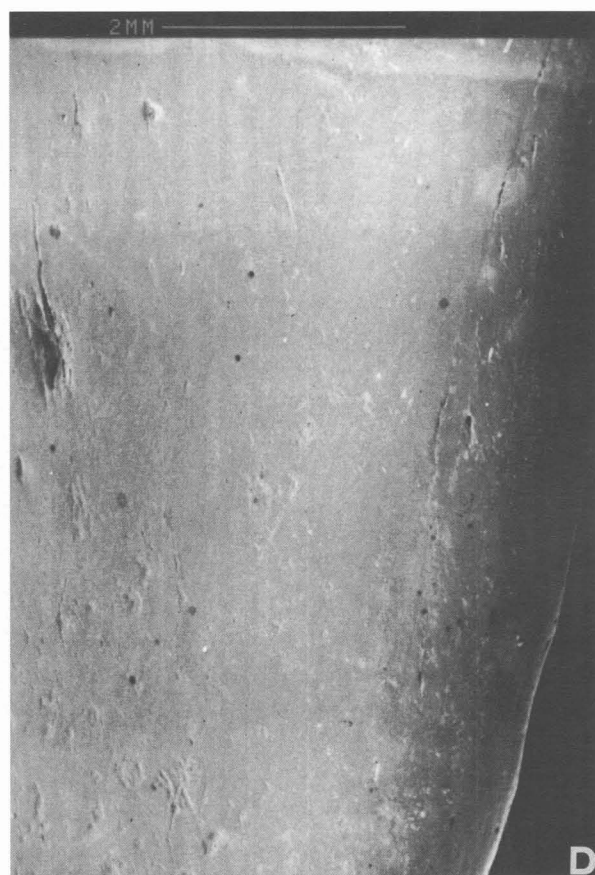
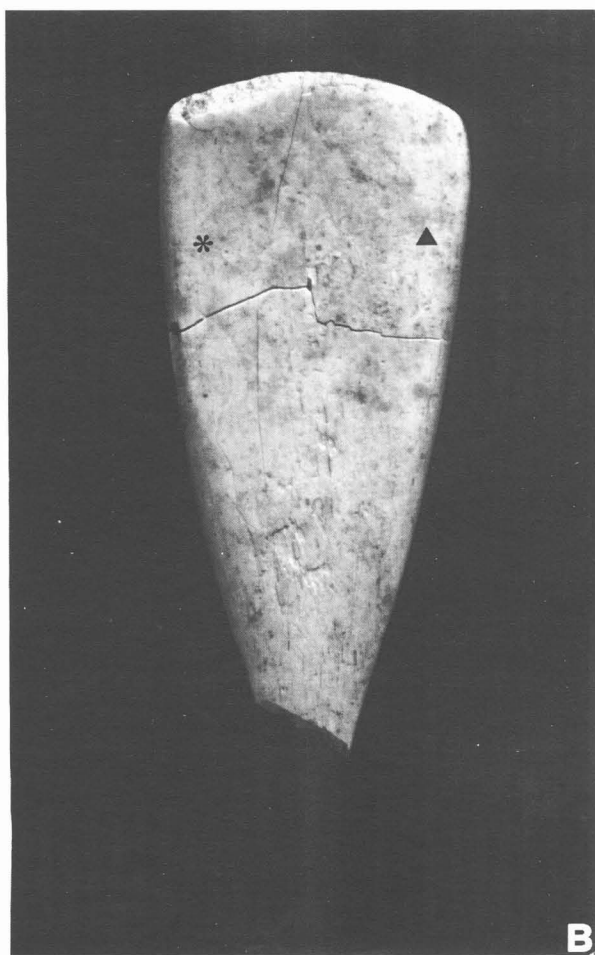


Fig. 3 - a-b) spatulas; c-d) SEM resolution of the area indicated in B by the asterisk (c) and by the triangle (d).

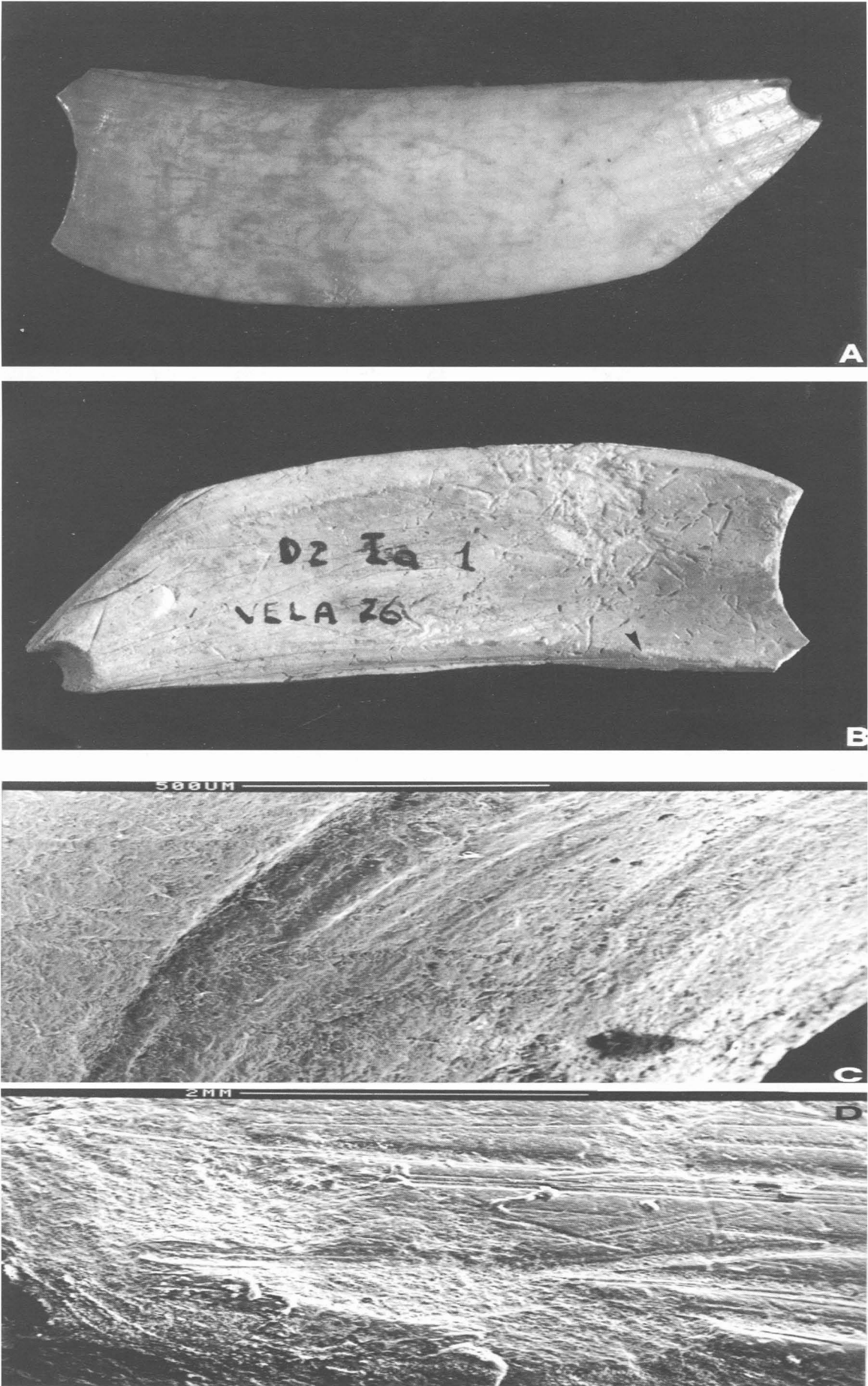


Fig.4 - a-b) plaque obtained from a wild boar canine (a: enamel; b: dentine); c) SEM resolutions of the wall of the hole; d) SEM resolution of the area indicated in B by the arrow.