

The Tyrolean Iceman and Questions of Taphonomy and Tissue Identification

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Abstract

Although the Iceman and some Egyptian mummies are described as well preserved, they can nevertheless display damage or decay from a microscopic to a gross macro level. During research on aspects of these bodies, it became clear that we still need to define levels of preservation in more detail, and perhaps even down to specific tissues. The reason for this is that poor observation is likely to obscure aspects of taphonomic reconstruction. It may also prevent correct forensic interpretation. The examples will provide some variable evidence for discussion.

The late Neolithic body from the Alps has been well described (Spindler, 1994; Egg et al., 1993) and studies continue to be published. Indeed, there are still interesting questions which can be asked. As a part of my own intended research programme, I asked Professor Werner Platzer of the Anatomy Institute in Innsbruck, if I might obtain a sample of dental calculus. Trapped microscopic food debris had been previously found in various ancient calculus samples, and it seemed potentially very worthwhile to investigate such a deposit from the Iceman. As a result of my request, Platzer kindly attempted to find this calcified material in the mouth of the frozen body. Very thin deposits are to be seen on the external surface of the upper incisors, but the exploration of the lingual aspects of the posterior teeth was difficult because the mouth of the man was nearly closed and could not be opened. Nevertheless, the inside of the mouth was illuminated and it was noted that a small piece of what seemed to be calculus could be removed from the back of the mouth. This fragment (OI T. 20.10.95: Zahnstein) was handed to me for further study. Unfortunately, a preliminary microscopic examination back

in York caused me to doubt that it was calculus. It did not have the typical granular appearance of calculus, but rather suggested true dental tissue. As a result, I did not attempt decalcification prior to a search for food debris, but mounted the fragment for study under the scanning electron microscope.

As Figure 1 shows, in one broken surface, there are typical prismatic columns indicative of enamel. A contrasting surface, as shown in Figure 2, displays prism patterns on

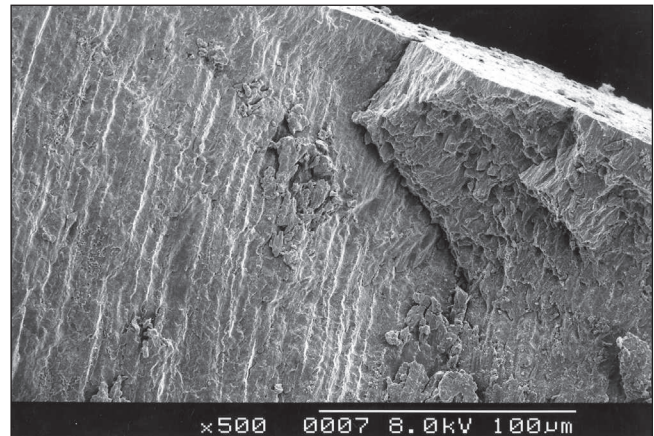


Fig. 1 - Broken surface of Iceman enamel, showing columnar structure.

what must have originally been the tooth surface. Figure 3 appears to show both the exposed prism pattern on the enamel surface, but also some irregularity. It is not clear if

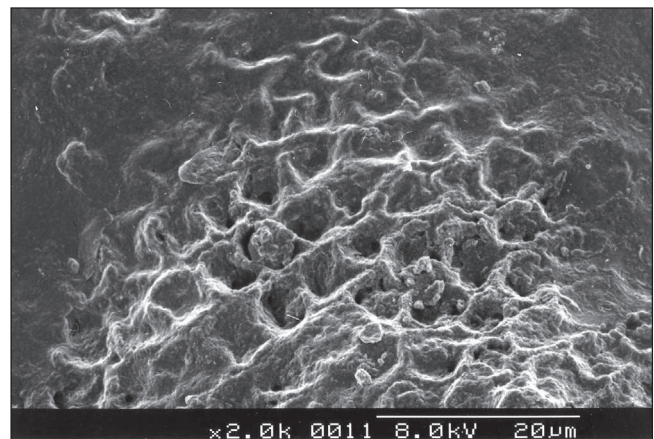


Fig. 2 - Outer surface of Iceman enamel, displaying prism surfaces.

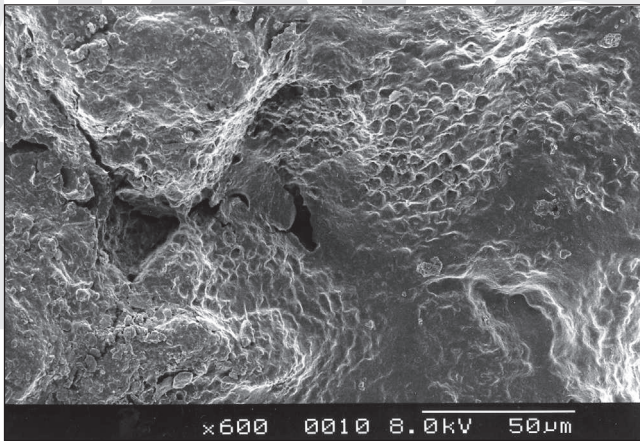


Fig. 3 - Irregularity of one enamel surface area in the Iceman.

this irregular surface is very early caries or some form of post-depositional erosion. What is clear is that the teeth are not as intact as a superficial inspection of the anterior labial surfaces might suggest. The fact that a splinter of enamel could be removed, suggests that frost action may be causing some fracturing of the dental layers. In view of the long-term conservation measures in place to keep the body very cold, periodic checking of the condition of the teeth may be advisable. I should mention that hair specimens were also made available to me for study, and while some hairs of both human and red deer origin were in excellent condition, there were certain specimens in a poor state of preservation. Figure 4 displays human hair with considerable longitudinal splitting and well preserved red deer hair. On the evidence of their preservation we need to ask if the fragmented hair has been trapped in clothing for a long period, or perhaps is from another individual? In either case, the hairs as a whole suggest that there have been variable levels of 'weathering' before or after death.

Conclusions

What appears at first sight to be a Neolithic body of remarkable preservation shows by the microscopy study of certain tissue to have changes which would be associated with long term frosting.

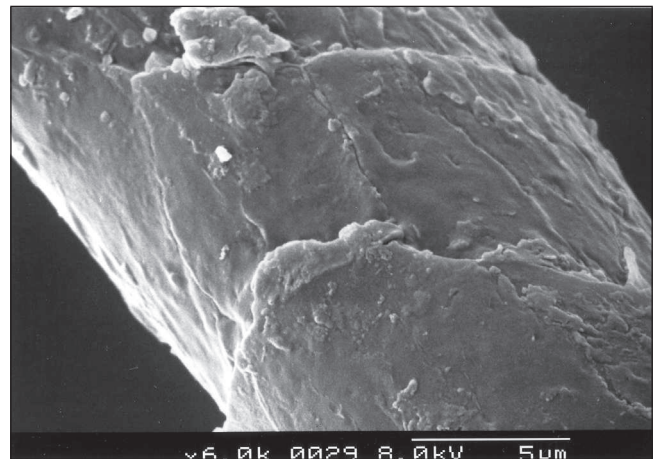
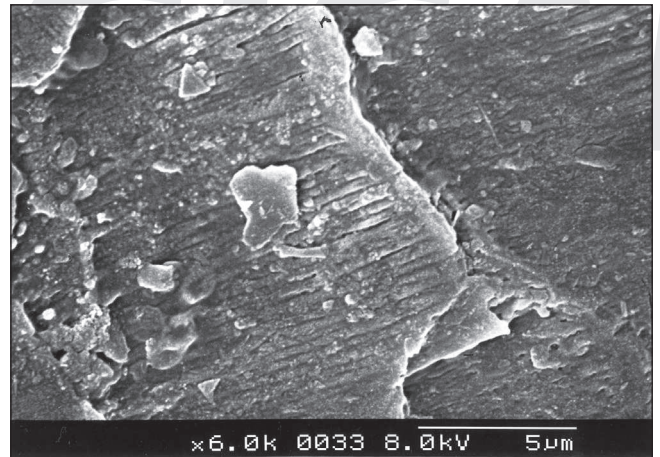


Fig. 4 - a) Human hair displaying 'weathering' and splitting. Iceman.
b) Well preserved red deer hair. From the Ötztaler site.

Literature Cited

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