NEW INTERPRETATION OF SHOULDERBLADE-SCRAPERS

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Experiments with fresh red deer shoulderblades strongly indicate that the shoulderblade-scrapers described by Rust (1943) are not artifacts. They are more likely to be the result of alternating moistening and drying out which distorts the thin plate of bone between the spine and posterior edge of the blade. Further distortion causes doming, fracturing and break-up of the plate, resulting in V-shaped fractures with curved facettes along the rim, typical of the fractured bones previously described as shoulderblade-scrapers.

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Late Palaeolithic shoulderblades of reindeer with characteristic V-shaped breakage were considered by Rust (1937, p. 144, pl. 57; 1943, pp. 131, 182, pls. 77–79) to be man-made implements. He called them "shoulderblade scrapers" and envisaged their use as cleaners and strengtheners of sinews. However, during an examination of subfossil bone material excavated from archaeological sites in Denmark, many shoulderblades with similar fracture characteristics were found. A further search revealed the special form of breakage to be common also in mediaeval and modern material, covering a wide time-span and independent of culture. Muskox and reindeer shoulderblades recovered from areas never inhabited by man showed the same fracture pattern. The purpose of this article is therefore to offer an alternative interpretation for the production of V-shaped shoulderblades, by purely natural processes, without the intervention of man.

Material

Rust's original material from Stellmoor, near Hamburg is housed in Gottorp Museum, Schleswig, Germany. A representative part of this has been re-examined. In addition, material from the following sources has been investigated. The Danish Mesolithic settlement Kongemosen, Sjælland, dated to early Atlantic time, Zone VI, has yielded shoulderblades of red deer (pl. 1, figs. 10a & 10b), roe deer and wild boar with the characteristic V-shaped fracture. Two red deer blades with V-shaped breakage were recorded from

the late Mesolithic settlement Præstelyngen situated in the Åmosen bog, Sjælland, Denmark. A random selection of blades from settlements dating from Palaeolithic, Mesolithic and Neolithic times showed that the characteristic fracture is widespread. The fracture was also found in blades of cattle from the Roman iron-age offering at Turup, Denmark, dated to 0–200 BC (pl. 1, figs. 6 & 9) and also in the shoulderblades of *Bos domesticus* in the early Mediaeval excavation at Store Valby, Denmark. Finally, comparable modern material was examined from Jameson Land, East Greenland, comprising muskox and reindeer bones belonging to complete skeletons from areas uninhabited by man (pl. 1, figs 1–4).

The fracture

The fracture in the shoulderblades has the general shape of a V and lies in the posterior part of the blade. The rim of the fracture carries a set of curved marks (pl. 1, figs 10a, 10b) as if resulting from several penetrations by some kind of instrument. Furthermore, most of the scars after splintering are distributed on one side of the blade only, usually the outer side. In several cases the spine of the shoulderblade is also lacking and scars on the stump of the spine show fractures as if the spine had been chipped off.

Discussion

The curved marks on the rim of the fracture were interpreted by Rust as the result of repeated chipping of the boneplate to create a sharp edge at the bottom of the V. However, during the recent reexamination of some of Rust's reindeer material, a collection of shoulderblades labelled "Schulterblattschraber" was found which showed practically no wear or polishing and, on the whole, few signs of use as implements. Moreover, an extraordinarily high proportion of the 511 shoulderblades, namely 150, were classified as scrapers (Rust 1943, 182). These two facts taken together cast doubt over the likelihood that the shoulderblades in question were really man-made tools. The shape of the fracture and the curved rim are closely similar to those of the Danish material, yet the two occurrences are widely separated in time and represent different cultures. The occurrence of identical fractures in mediaeval and modern material insists that another possible mode of origin be sought.

A more plausible explanation is that the V-shape is not an artifact but has a purely natural origin. Experiments with modern shoulderblades support this hypothesis. Repeated, alternate moistening and drying out was found to distort the blade into an arched shape or cause bulges in several places in the thin boneplate between the spine and the lower posterior edge, eventually reaching as far as the zone of growth (fig. 1) (pl. 1, figs. 7, 8). This process continues until the brittle bone begins to crack, and the base

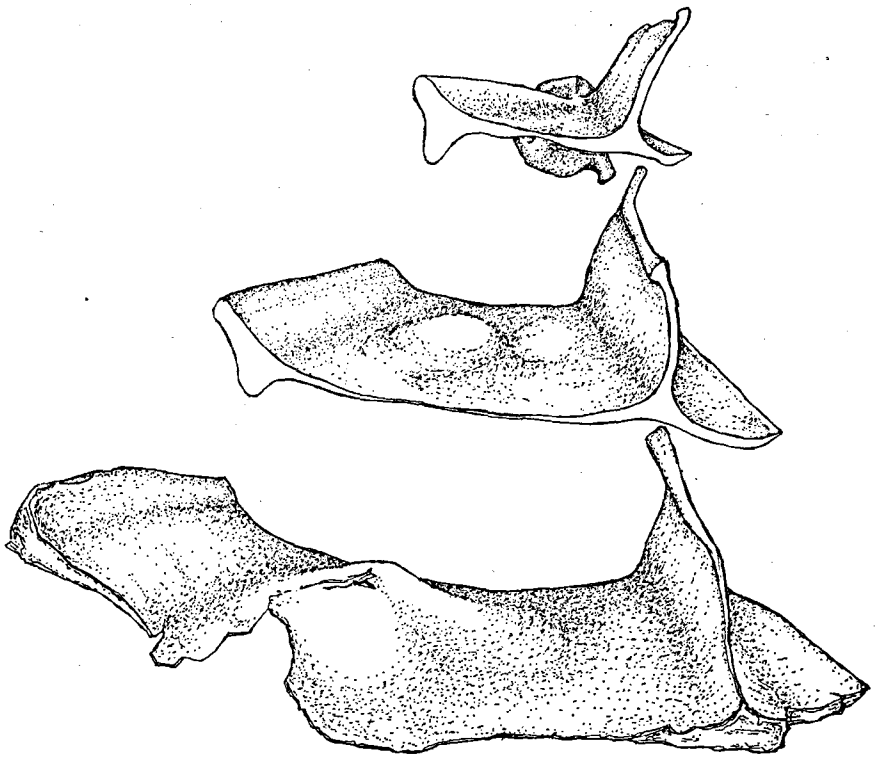

Fig. 1. Sections through a red deer shoulderblade from the Kongemose culture. The blade has recently been exposed to repeated moistening and desiccation. Note the doming of the thin boneplate between the spine and the lower edge of the blade, due to stresses caused by differences in thickness of the blade.

of the domed fractures creates the curved rim of the V-fractures.

In transmitted light a recent muskox shoulderblade demonstrates where its weaker part is situated and that the shape of this area is that of a triangle (pl. 1, fig. 1). It should be added that this appears to be the last part of the shoulderblade to become ossified (pl. 1, fig. 2). Rust (1943, pl. 78) illustrates a shoulderblade in which the dorsal edge, the growth zone, is nearly complete; this may be considered as representing a step prior to that of a final V-shape (fig. 2). This dorsal edge is slightly thicker than the blade itself, and thus, depending on the ontogenetic age of the animal, more or less resistent to fracturing. Therefore, as it is demonstrated on fig. 2, there are at least two possible ways of arriving at the V-shape: either the growth zone is very porous and vulnerable to dissolution (fig. 2, a, b, c) or the growth zone is ossified and the fracturing starts in the middle of the blade and sooner or later the dorsal rim will break off (fig. 2, d, e, f). All

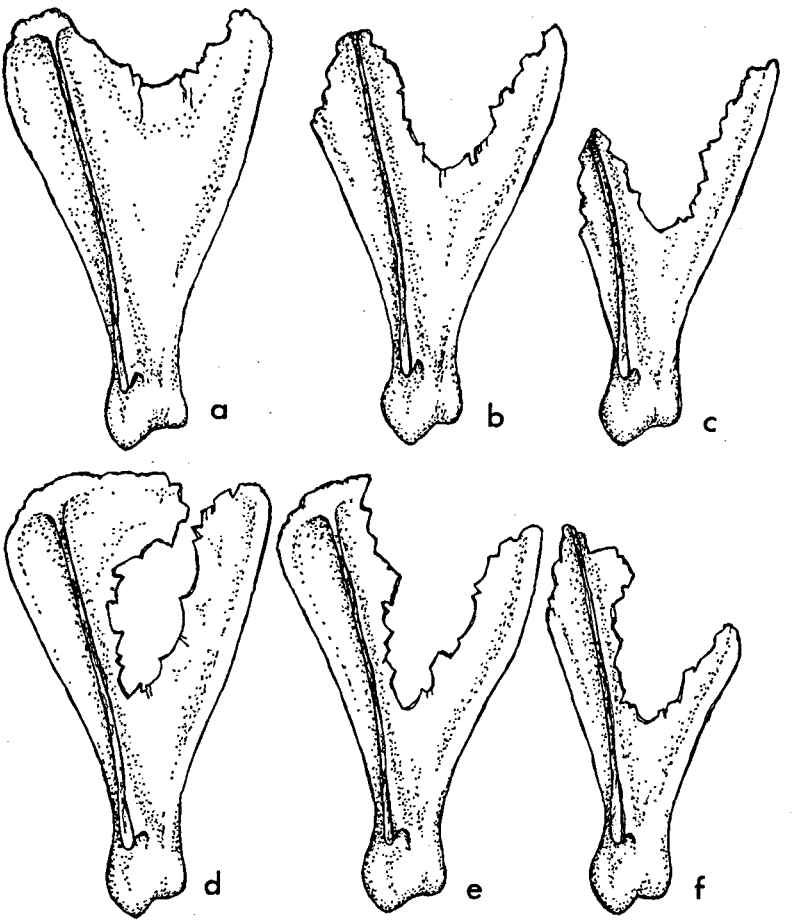

Fig. 2. Two series of blades – a, b, c and d, e, f – compiled from Danish subfossil and modern material. The series show two different ways of obtaining the V-fracturing: a, b, c may be from a young animal; d, e, f may be from an adult animal with ossified zone of growth.

the stages drawn in fig. 2 have been found in the subfossil material from Denmark.

Another mode of origin may be considered as artifacts through ritual breakage. This would appear especially likely in the case of the material from Rust's excavations where it is clear from other evidence that some rites have been performed. One could imagine the hunters penetrating a shoulderblade with their arrows with the prospect of a better hunt, or sacrificing the shoulder to the gods in thanksgiving for a good hunt. However, this use of the shoulderblades would be expected to vary with different cultures while,

on the contrary, the mode of fracturing remains the same across many cultures. The characteristically fractured blades are found in large amounts in settlements from various ages and the fact that the shoulderblades stem from elk (Rust 1943, 182), reindeer, red deer, roe deer, wild boar, cow and modern muskox indicates that few or none are of the ritual origin.

It would therefore seem likely that the "shoulderblade-scrapers" were made not by man but by nature herself, often in environments repeatedly covered by water and dried out in alternation, as for example in a peat bog with seasonal change of water level. The characteristic V-shape of the fracture is due to the fact that the thinnest and weakest parts of the shoulderblades are those most affected by the process. The same process may also have caused the loss of the spine.

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Dansk sammendrag

Eksperimenter med recente skulderblade af kronhjort viser, at v-formede frakturer, der af Rust (1937, 1943) er beskrevet som redskaber, skulderblads-skrabere, kan have en anden oprindelse. Sandsynligvis er de et resultat af skiftende fugtighedsforhold, som kan findes i moseaflejringer, hvor der er sæsonbetingede vandstands-ændringer. Knoglen bliver skiftevis opblødt og udtørret; dette får den tynde benplade mellem den nedre rand af skulderbladet og spinen til at bule op for til sidst at briste. Den tynde benplade har facon af en trekant (pl. 1, fig. 1), der, når den helt er ødelagt, giver den karakteristiske V-fraktur. Bulerne giver randen af bruddet et tunget udseende (pl. 1, figs. 10 a, 10 b).

References

Rust, A. 1937: *Das altsteinzeitliche Rentierjägerlage. Meindorf.* 144 pp. Neumünster: Wachholtz.

Rust, A. 1943: *Die alt- und mittelsteinzeitlichen Funde von Stellmoor.* 240 pp. Neumünster: Wachholtz.

Plate 1

Figs. 1–4. Modern shoulderblades

Fig. 1. Recent muskox shoulderblade (East Greenland) photographed in transmitted light to show the thinner part of the blade. The first desiccation cracks have appeared in the thinnest part. Height of blade 340 mm.

Fig. 2. A shoulderblade of a newborn muskox (Recent, Jameson Land, East Greenland) showing an incomplete stage of ossification. Height of blade 85 mm.

Fig. 3. A Recent reindeer blade from East Greenland showing an early stage in the process leading to the final V-shape. Height of blade 245 mm.

Fig. 4. A Recent reindeer blade from East Greenland showing the nearly completed V-shape. Height of blade 240 mm.

Figs. 5–10. Subfossil shoulderblades

Fig. 5. A shoulderblade of red deer from the Kongemose settlement. The V-shape is nearly complete. Note that the spine has also broken off. Height of the blade 165 mm.

Fig. 6. The shoulderblade of *Bos domesticus* from Turup, an offering from Roman iron-age; note the V-shape and the broken spine. Height of blade 210 mm.

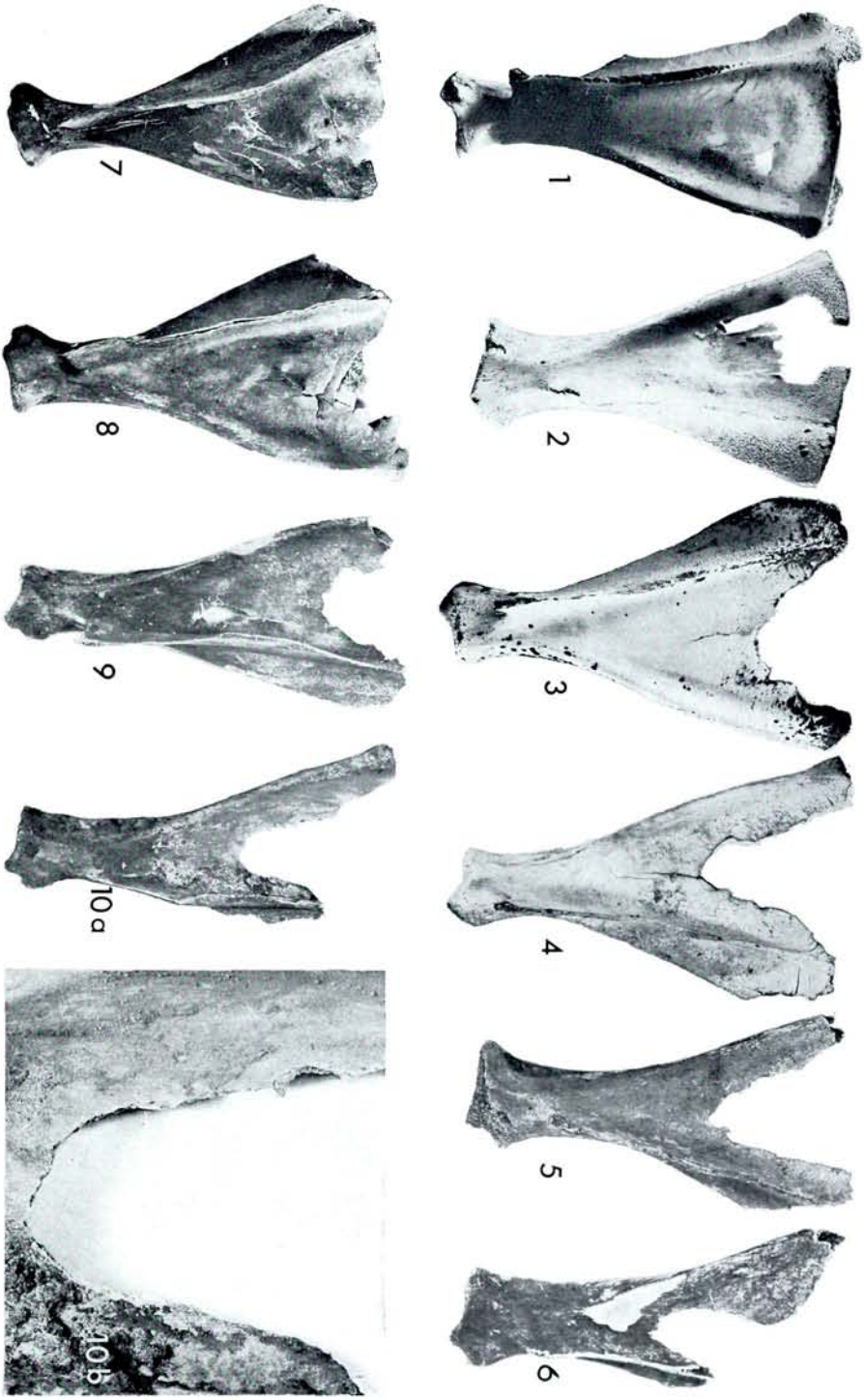
Fig. 7. A shoulderblade from red deer from the Kongemose settlement showing the doming of the thin boneplate between the spine and the lower edge of the blade. Height of blade 260 mm.

Fig. 8. A blade of a red deer from Døjringe, Denmark, c. 2300 BC, showing the doming of the blade where it is thinnest; note that the spine has also broken off. Height of blade 269 mm.

Fig. 9. Shoulderblade from *Bos domesticus* from Turup, an offering; note the fracturing in both middle and posterior parts of the blade. Height of blade 260 mm.

Fig. 10 a. A shoulderblade of a cow from the Mediaeval settlement Store Valby. Note part of the spine has been broken off, and the V-shape is nearly complete. Height of blade 300 mm.

Fig. 10 b. Part of the bottom of the V from the blade 10 a showing the curved, facetted rim of the fracture. (×0.7).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