Environmental evidence

Evidence for tanning from plant and insect remains

By Allan Hall and Harry Kenward

It is suggested elsewhere (Hall and Kenward forthcoming) that a bioarchaeological 'indicator group' (*sensu* Kenward and Hall 1997) for tanning may be recognisable. The material giving rise to this hypothesis was discovered during assessment of samples from Anglo-Scandinavian and early post-Conquest riverside deposits at Layerthorpe Bridge, York (Carrott et al. 1997). Here, large quantities of bark fragments (and the sclereids — small clumps of lignified cells characteristic of certain trees, notably oak — left when bark decays) were recorded in many samples. These gave the suspicion that the bark was being employed for some purpose, since there was usually very little wood present with it. Much the most likely process to have required bark in bulk is tanning (taken here to represent the steeping of hides in pits or vats with tree bark). Support for this came from a somewhat surprising direction. The beetle *Trox scaber* was unusually abundant (it was found in 30 of the samples, at a frequency of 3·6 per sample when present; five samples contained 'several' individuals and one 'many', on the semi-quantitative scale used for recording). This contrasts with the evidence from Anglo-Scandinavian Coppergate, where it was present in a large proportion (242) of the samples but was never abundant. There were only eight cases where three or four individuals were noted, the rest being ones or twos, and the mean number of individuals per sample where the beetle was present was 1·2 (*AY* 14/7; Kenward, unpublished database). Thus *T. scaber* was significantly more abundant at the Layerthorpe Bridge site than at Coppergate.

A statistical test on the data from Layerthorpe Bridge strongly supported the subjectively recognised association between *Trox* and bark ($p < 0.01$ for correlations of bark and bark sclereids with *Trox*, using Spearman's rank-order correlation). By contrast, there was no correlation between records of bark and *Trox* in the 301 contexts from 16–22 Coppergate for which there were analyses of both plant and insect macrofossils ($p = 0.62$). This accords well with the broad range of biological, artefactual and structural evidence for this period at Coppergate, which gives no reason to suppose that tanning was carried out. A similar exercise for post-Conquest deposits at Coppergate cannot be carried out because analysis of insects has not progressed beyond the assessment stage (which produced no records of abundant *Trox*; Carrott et al. 1996).

Trox scaber is a scavenger now typically associated with birds' nests but sometimes found in habitats created by human activity. It is possible that it sometimes built up populations in piles of old bones or skins, and at Layerthorpe Bridge, bearing in mind the presence of large quantities of comminuted bark, it may be that tanning is indicated, though any supporting evidence from vertebrate remains was lacking (Carrott et al. 1997). The area excavated at Layerthorpe Bridge might well have been far enough away

from centres of population to be an acceptable location for such a vile-smelling activity, too.

This is the first time that such direct evidence for an area devoted to tanning has been detected in York. Five sites have yielded medieval or post-medieval assemblages of sheep limb bones which have been interpreted as waste from hide preparation: 118–126 Walmgate (*AY* 15/1), 148 Lawrence Street (Carrott et al. 1994a), North Street (Dobney and Jaques 1993), St Andrewgate (Carrott et al. 1993) and Bedern (*AY* 10/5, 617). Confirmation would represent a significant contribution to our understanding of zonation in medieval York. As an aside, it is worth mentioning that although other sites, particularly that at 6–8 Pavement (*AY* 8/3; *AY* 14/4), have provided ample evidence of leatherworking, leather production sites have not yet been located.

We would strongly warn against using abundance of either *Trox scaber* or bark alone as indicators of tanning. Bark may have accumulated from decay of timber used for any number of other purposes. *T. scaber* is occasionally abundant in general occupation deposits, for example, in a late 14th-century 'organic dump' from High Street, Hull (Carrott et al. 1994b), though no association with tanning is suspected. Some other cases are less clear: *T. scaber* was abundant in a dump of material containing much leather in a late or post-medieval deposit at Palmer Lane, York (Carrott et al. 1993), and another dump of similar date at the nearby Adams Hydraulics II site at Peasholme Green also produced unusually large numbers of *T. scaber* (Allison et al. 1991). In this latter case, too, there was much leather and it was uncertain whether the beetle may have lived in it or have been in some way associated with its production (or of course neither!). There is also a record of several tens of individuals from a sample of unknown size from the Chaucer House site, Southwark, London (Kenward 1990).

Fragments of small strips of tightly rolled birch bark (*Betula* sp.) were found in levels from Period 4A onwards at 16–22 Coppergate, although not in any concentrations. These are discussed by Morris in *AY* 17/13 (pp.2348–9) and material of this kind may have been used in the tanning of hides.

The osteological evidence

Skin and bones: correlating the osteological and artefactual evidence

By T.P. O'Connor

The aim of this text is to review the osteological evidence from Anglo-Scandinavian and medieval York for the retrieval and working of skins and hides, and to cross-correlate that evidence with the data obtained from studies of leather artefacts. Although much of the animal bone debris from excavations in York appears to have derived from the butchering of animals for meat, and from their domestic consumption, some evidence of the retrieval of useful body parts, such as hides and horns, might be apparent. The text begins by discussing the nature of such evidence, and then reviews the available data.

What are we looking for?

The first, obvious, piece of information for which to search is to see whether the pattern of relative abundance of species observed in leather artefacts matches that observed in the animal bone debris, site by site or period by period. In fact, this is not as simple as it may seem. Both bones and leather will be subject to patterns of differential preservation, and the biases that distort the animal bone data will probably be quite different from those that affect the artefact data. Not least, the hides and skins of different species might have been treated in quite different ways, rendering them more or less likely to survive prolonged burial. Another complication is that of equating numbers of bones with numbers of potentially available hides. The relative (de)merits of different bone quantification methods have been worked over at length elsewhere (e.g. see *AY* 15/1, 6–7; O'Connor 2000, 54–67), and will not be reiterated. Suffice to say that the predominance of one species in terms of identifiable bone fragments need not indicate predominance in terms of numbers of individuals, and that the predominance of one species in terms of meat-weight contribution need not be the same as predominance in terms of available hide, one being a volume measure, the other an area measure. Thus if one ox equals eight sheep in terms of meat, it might only represent four sheep in terms of hide, and even that simple calculation makes no allowance for the value placed upon their respective hides. We need to compare measures of bone and