

## Notes and News

### ANGLO-SAXON LAMINATED SHIELDS AT PETERSFINGER — A MYTH (Fig. 1; Pl. XIII)

In 1953, the publication of the Anglo-Saxon inhumation cemetery of Petersfinger, Wiltshire, established the view that curved (concave) shield-boards were built up of several layers of laminated wood, the grain of adjacent layers running at right angles to one another as in modern plywood.<sup>1</sup> This interpretation rested entirely on the evidence from part of the shield remains in grave III: the long, curved shield-grip no. 9 showed wood grain running in two directions. The inference of laminated shields gained widespread acceptance, to the extent that this construction was generally taken to have been the standard type of curved shield-board in Anglo-Saxon England.

Recent re-examination showed that the wood remains on the grip are still visible, although the object is covered with a thick layer of conservation wax. The clearest indications of wood grain directions are near the end of one of the grip extensions; here, transverse grain can be seen to overlie grain running along the length of the grip, nearest to the iron surface of the extension (Pl. XIII, A). The total length of the grip of 330 mm gives the minimum diameter of the shield-board; the actual diameter may have been slightly larger. The iron boss belonging to the same shield is low and sharply carinated with four rim (flange) rivets which attached the boss to the wooden shield-board.<sup>2</sup> One iron rivet is complete, with a lozenge-shaped bronze washer still in position (Pl. XIII, B); two more incomplete rivet shanks survive, and one is missing. The complete rivet indicates that the board was originally 6–7 mm thick; the wax cover does not allow a more precise estimate.

A close inspection revealed considerable wood remains around the shank of this complete rivet. A close-up photograph taken after careful removal of most of the wax leaves no doubt that the wood remains have one single grain direction for the entire length of the rivet shank (Pl. XIII, C), i.e. for the whole thickness of the board which the rivet passed through. Examination of the two incomplete rivets produced the same result: the wood remains cover the entire lengths of the remaining shanks (5 and 4 mm, respectively), and they show only one grain direction for their whole thickness. The direction of the grain was identical on all three rivets, and coincided perfectly with the grain of several small patches of wood preserved on the underside of the rim. The only possible conclusion from these observations is that the shield of Petersfinger grave III was made of planks, not of laminated wood layers.

But this conclusion in turn raises two further problems: the origin of the two grain directions on the grip (which led to the original misinterpretation), and the construction of a curved shield-board from planks. The answer to the first may be suggested by the fact that the shield-boss is rather low and narrow (total height, without rim-rivets: 85 mm; internal minimum diameter: 95 mm). If the grip had been set on a very thin, narrow strip (wedge) of wood to raise it just enough to clear the knuckles of the shield hand from the inside of the boss cone, the result would be a wood grain pattern exactly as preserved on the grip terminal. Such a constructional adaptation may have become necessary when the shield changed its owner. Evidence of grip adaptation seems to be present in some other pagan Anglo-Saxon shields. The second question concerning shield curvature is a complex one, and beyond the scope of this note. In principle, curved shield-boards could have been made in a number of ways; lamination is only one of them. Carving the board from a solid

block in one piece<sup>3</sup> is not impossible, but most impractical: the resulting shield would have been either too heavy, or too brittle. Other, more likely methods involve bending planks in steam or boiling oil, or wedge-shaped boards could be joined to form a low truncated cone.

This re-assessment removes the cornerstone of the whole idea of Anglo-Saxon laminated shields. Two of the other Petersfinger shields (graves XX and LVIII) were also built of planks; the remainder do not have enough wood to be evaluated. Material from other Wessex and Upper Thames cemeteries that I have examined does not contain any evidence of laminated boards. The same is true of other Anglo-Saxon cemeteries where shield remains have been subjected to technical investigation. Even the curved shield from Sutton Hoo is now seen as having been made of three solid lime-wood boards joined side by side.<sup>4</sup> Thus, we have yet to be presented with convincing evidence of laminated shield-boards in pagan Saxon England.

A feature which may be misinterpreted in terms of lamination is the presence of two different wood grains on iron shield grips, particularly where this takes the shape of two superimposed layers of wood, with their grains at right angles, around rivets fastening the grip to the board. A very clear example is provided by the ample wood remains on the grip from Winterbourne Gunner IV (Pl. xiii, d). In such cases, it should be considered that for structural reasons a minimum of three layers is required for making a composite wooden board. Triple lamination would result in two outer layers with parallel wood grain running at right angles to the grain of the inner layer sandwiched by them. This composition has been suggested for the Roman shield from Doncaster.<sup>5</sup>

But in several instances of Anglo-Saxon shields, iron grips showing two wood grain directions are associated with shield-bosses and shield-studs the rivet shanks of which hold wood remains with one single grain direction for their entire thickness. The related shield-boards must therefore have been built of planks, and the only explanation of differing grains is in terms of handle (wooden cross-bar) constructions. This is true, for example, in the case of Winterbourne Gunner IV where the evidence was correctly interpreted as a 'halved joint'.<sup>6</sup> But the brief remark in the excavation report seems to have gone largely unnoticed. Patterns of differing wood grain directions preserved on iron grips result from several constructions of grip and handle bridging the opening in the board behind the boss (Fig. 1).

#### A. *Lap joint (halved joint) of handle and board*

*Sub-type 1:* The wooden handle was fitted into rebates in the front of the board, with their grains at right angles; then the iron grip was riveted against the back, with the rivets passing through the joint; finally, the boss was fastened to the board from the front, its rim wedging the handle against the board. With a board thickness of only 6–8 mm, this is as stable a joint as possible, and it seems to have been relatively popular. It occurs with short, flat grips (e.g. Winterbourne Gunner grave IV) as well as with long, flanged grips (e.g. Finglesham grave 22). The middle of the handle may have been widening towards the front to provide a more comfortable hold for the hand.

*Sub-type 2:* The handle was fitted into rebates in the back. This is structurally not a very good solution, and I have encountered only one possible case so far (Petersfinger grave XXVII).

#### B. *'False lap joint' of handle and board*

Only the handle was rebated, and its extensions were set proud on to the front of the shield board; the grip was riveted against the back, with the rivets passing through the whole thickness of the board and the handle extensions (Pewsey grave 62). It results in a wood grain pattern similar to that of type A1, but is recognizable by the fact that the grip rivets are about 3 mm longer than the boss rivets and shield-stud shanks. This construction is the worst of all true joints possible at this point, and it requires an internal boss diameter that is somewhat larger than the middle (grip) part of the wooden cross-bar. It may have been an adaptation of a shield to meet the requirements of a new owner, or an improvisation during repair.

#### C. *Handle set flush into board opening, without joint*

*Sub-type 1:* The short iron grip was riveted against the back of the board, and the wooden handle was attached only to the grip, by leather binding, cloth wrapping, glue, or something similar (e.g.

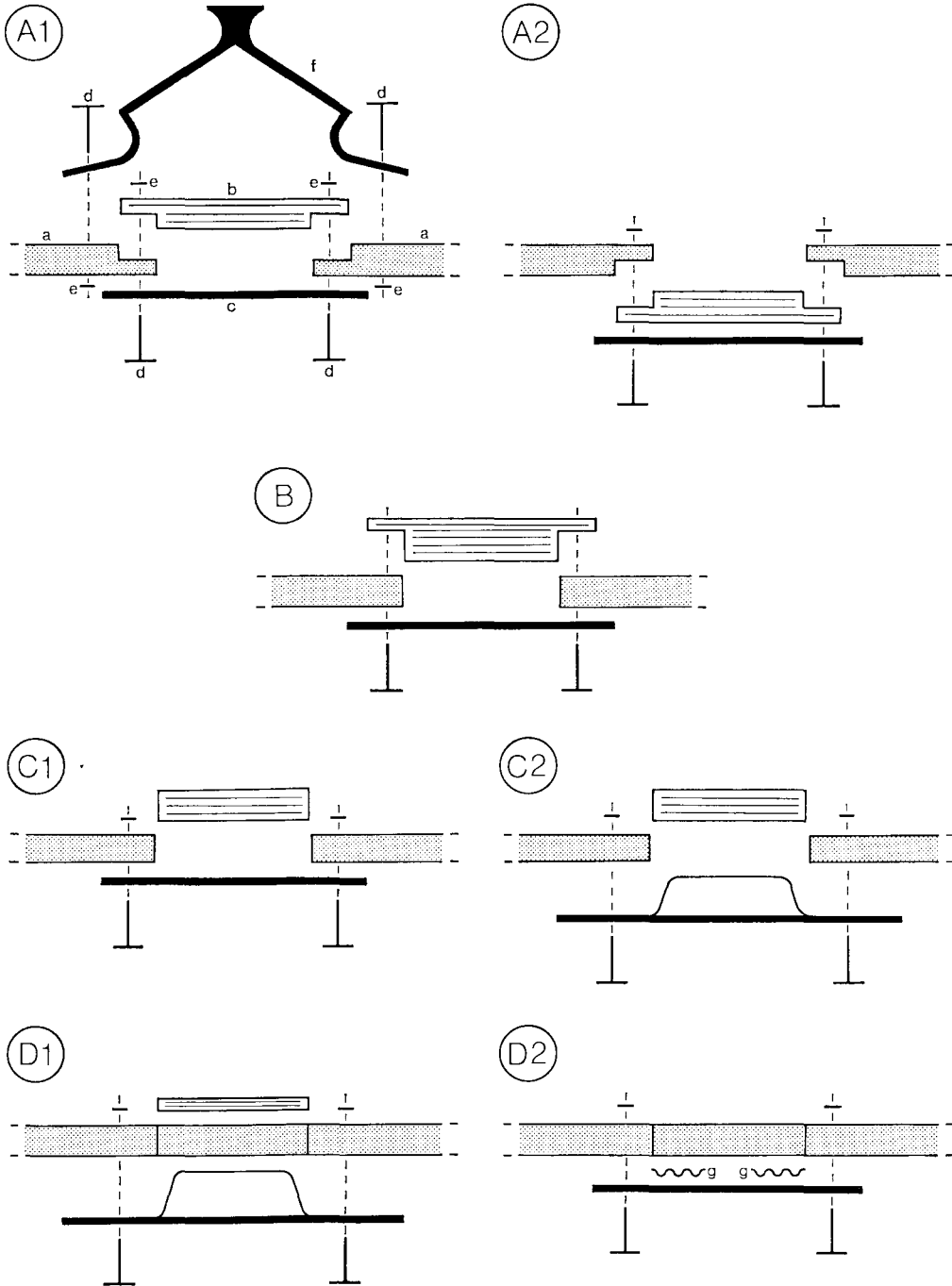


FIG. 1

Some types of handle constructions on Anglo-Saxon shields (in section; schematic, exploded drawings, not to scale)

- |                   |                 |
|-------------------|-----------------|
| a — shield-board  | e — washer      |
| b — wooden handle | f — shield-boss |
| c — iron grip     | g — leather     |
| d — rivet         |                 |

Collingbourne Ducis grave 2). The front ends and the back of the handle must have been flush with the board. Wood remains around the grip rivets of excavated examples have a single grain direction. But a pattern of two adjacent wood grains may be preserved directly on the surface of the iron grip, which could lead to misinterpretations.<sup>7</sup> This type seems to have been the most widespread construction, involving wooden handles on short grips.

*Sub-type 2:* The wooden handle was held by flanges of the iron grip which was riveted against the back of the shield-board (e.g. Petersfinger grave XX, although it is unusual for having four rivets fastening the short grip to the board). This construction can result in wood grain patterns similar to type C1, but the flanges make them more easily interpretable. It was possibly the most common type for short and long, flanged grips.

#### D. *Handle and board made out of one piece*

*Sub-type 1:* A bridge of wood was left standing between two lunate openings in the centre of the shield: a separate billet of wood was added to the bridge, their grains running at right angles; a flanged grip was set against it from the back, riveted to the board, and its flanges were hammered back to contain both layers of handle wood (e.g. Sutton Hoo).<sup>8</sup>

*Sub-type 2:* As in the previous sub-type, a bridge was left between two openings cut into the board; leather strips were laid against the back of the bridge to add to its thickness; then a flat grip was set on this and riveted to the back of the board; finally, thick cloth, or leather, was wrapped around the handle to make it sufficiently thick (e.g. Pewsey 47).

There are apparently other common types of iron grip constructions without wooden cross-bars such as short, flat grips with leather strip binding, leather padding, cloth wrapping or similar solutions. But these are of little relevance to the question of laminated shields, as are the many kinds of leather covering of shield-board and grip.

In conclusion, it should be borne in mind that organic remains on grips, and grip rivet measurements, often do not provide direct information on shield-board construction and thickness, but only on grip and handle types and on methods of attaching them to the shield-board.

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HEINRICH HÄRKE

#### NOTES

<sup>1</sup> R. J. C. Atkinson, in E. T. Leeds and H. de S. Shortt, *An Anglo-Saxon cemetery at Petersfinger, near Salisbury, Wilts.* (Salisbury, 1953), 55–56.

<sup>2</sup> Leeds and Shortt, *op. cit.* in note 1, 27, fig. 8.

<sup>3</sup> Suggested by Atkinson, in Leeds and Shortt, *op. cit.* in note 1, 56, as the only alternative to lamination for making curved shields.

<sup>4</sup> R. Bruce-Mitford, *The Sutton-Hoo ship burial*, Vol. 2 (London, 1978), 21, 24.

<sup>5</sup> P. Buckland, 'A first-century shield from Doncaster, Yorkshire', *Britannia*, 9 (1978), 251, 268–69.

<sup>6</sup> J. Musty and J. E. D. Stratton, 'A Saxon cemetery at Winterbourne Gunner, near Salisbury', *Wilts. Archaeol. Nat. Hist. Mag.*, 59 (1964), 95.

<sup>7</sup> As was the case with the grip from Collingbourne Ducis grave 2; cf. C. J. Gingell, 'The excavation of an Early Anglo-Saxon cemetery at Collingbourne Ducis', *Wilts. Archaeol. Nat. Hist. Mag.*, 70/71 (1975/76), 71.

<sup>8</sup> Bruce-Mitford, *op. cit.* in note 4, 24–25.