

## Stone buildings with timber foundations: some unanswered questions

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In his reminiscences of his school-days in Dornoch in 1801–3 the Reverend Donald Sage (1789–1869) recorded a tradition concerning the foundations of the massive late medieval Bishop's Castle in the centre of the town. According to this tradition the building 'stood upon a "brander of oak"'. This meant, I suppose, that as the soil was light and sandy the castle was founded upon oaken piles driven deep into the ground' (Sage 1899, 126).

In modern times 'brander' as a building term appears to have become restricted to one particular aspect of carpentry: branders are fillets or counter-battens which are affixed to the undersides of joists and to which ceiling laths are nailed, the process of brandering thus providing a good framework and clearance for the plaster keys. The term and the technique is also applied to the framing of internal walls for plasterwork. Derived from brandiron or brandreth, the word has had a wider variety of uses, however, and has generally meant any iron or wooden framework constructed in the form of a gridiron (BS 565 1963, 48 no. 82011; Pride 1975, 26; *DOST* 1937, 332; Skinner 1969, 18). As applied to bridge foundations in Scotland, for example, a brander was a jointed timber frame laid horizontally on the river-bed as a raft foundation for a masonry superstructure, often, perhaps most commonly, without piles (Ruddock 1976; Ruddock 1979, index *sn* foundation gratings, foundation platforms; Ruddock 1984; Salzman 1967, 498). E C Ruddock has shown that there was a clear distinction between horizontally laid and framed branders and vertically driven piles; what is not clear is whether local Dornoch tradition was as precise in its usage as to make the Reverend Sage's interpretation seriously misleading.

A description of what may be the same or a cognate type of construction (also, incidentally, with an episcopal patron) relates to King's College, Aberdeen, which was founded by William Elphinstone, bishop of Aberdeen, in 1505. In his topographical account of Old and New Aberdeen written about 1647 James Gordon, parson of Rothiemay, stated that '*Totius structuræ fundamentum, solo lubrico atque udo innitens, trabibus querceis stratum magno sumptu ac labore . . .*' (Macfarlane, *Geographical Coll*, 2, 488). (The foundation of the whole structure, as it rests on yielding and wet soil, was laid on oak beams at great expense and trouble).<sup>1</sup>

Examples of this type of foundation may well abound, but in Scotland the recorded evidence is not yet sufficiently plentiful to permit any useful generalizations. Is it possible, for example, that the horizontal timber frameworks associated with the substructures of many crannogs are part of this same tradition? Some recorded beams show evidence of notching, jointing and framing, not just simple layering.<sup>2</sup> At the more recent end of the historical time-scale, exposed baulks of timber are associated with the foundation-course of one of the buildings of a 19th-century saltworks which occupies a watery site on the man-made Preston Island in the middle of the River Forth (G J Douglas, pers comm).

However, so far as standing buildings are concerned, questions of foundations cannot be answered easily. Obviously, as an expert in the history of structural design has commented, 'One does not normally dig up foundations without good reason . . . Our knowledge of [them] is based mainly on visible failures' (Cowan 1977, 110). Investigations of such a failure in the walls of no less a structure than Winchester Cathedral provided an opportunity to examine its foundations in 1906, and the findings were most instructive. The wall-footings were found not to increase appreciably in thickness, and the foundations, which were only 3 m below ground level, consisted

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of whole beech logs overlaid by weak concrete. The logs had been submerged below the level of the water-table and the subsoil contained a thick layer of peat; it was the alternate lowering and raising of the water-table and the consequent decay of the logs that appeared to be the source of the structural problem. Even so, there was still so much water about that a diver had to be employed for the works of excavation and repair (Cowan 1977, 110, 113; Fox 1908, 254–8, 271–2).

Structural investigations also confirmed traditions concerning the tower at Holy Trinity Church, Hull, which was built on clay overlaying a deep bed of silt. 'A hole was . . . made in the floor of the church, and, as expected, a timber raft of horizontal oak baulks crossing each other at right angles was discovered', albeit in an advanced state of decay. Furthermore, 'Beneath the columns of the nave vertical piles, probably of larch, were found' (Fox 1908, 260–1).<sup>3</sup>

#### NOTES

- 1 Based on the translation in Macfarlane, *Geographical Coll*, 2, 507, but with 'oak beams' preferred for 'oaken piles'. An earlier, vernacular translation reads 'The quholl fundacione of this colledge, being builded in marrish ground is underlayde with great rafters of oake, which behoved to be great coast and travell', Innes, C (ed), *Abredoniae utriusque descriptio: a description of both touns of Aberdeen by James Gordon, parson of Rothiemay* (Spalding Club, 5 (1842), 24). For documentary references to foundations on unstable ground in England see Salzman 1967, 83–7, and espec 84 where he cites William Horman *Vulgaria* (1519): 'A quavery or maris and unstable fundacion must be holpe with great pyls of alder, rammed downe, and with a frame of tymbre called a crossandre'.
- 2 Eg *Proc Soc Antiq Scot*, 6 (1865), 114–78, espec pl xi and 131–2 n; *ibid*, 44 (1909–10), 12–33, espec at 15, fig 2; *ibid*, 51 (1916–17), 48–98, espec 62–73; *ibid*, 76 (1941–2), 8–78, espec 29–38; and cf the random arrangement of the wooden substructure described in *ibid*, 87 (1952–53), 134–52 at 141–2 and figs 6–7.
- 3 For other English examples of timber foundations revealed mainly by excavation see Wilcox 1981, 21–35 (list on p 31), which was referred to after this article had gone to press.

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