

## Armchair voussoirs

Two graves used fragments of tufa armchair voussoirs in their lining. Burial 237 had pieces from four and Burial 13420 had fragments of six. The rock is very soft and weathered, and the pieces are broken or battered, but where the surfaces survive well, the sawn edges are smooth. The original dimensions of the stones appear to be in the region of 440mm long and about 290mm wide. On one side is a rectangular notch 75mm wide and 40mm deep; one stone has a semi-circular notch, but this could be the result of later weathering or re-use. On the other side is a taller, tapered cut-out about 160mm tall and 45mm deep. The top end has corner notches about 50mm tall and up to 65mm deep. However, although all the pieces seem to have the same elements, the dimensions of the different features can vary considerably, especially in the profile of the stone and corner notch on the side with the tapered cut-out. The breadth of the stones also varies considerably, from 60mm thick at the base and 80mm thick at the top to 100mm thick at the base and 130mm at the top. Such variation must have made construction tricky, unless they came from different 'suites' of stones from different sections of the roof or building. Most of the fragments from Burial 13420 have remains of a mortar layer 15mm thick on at least one surface.

The voussoirs were used to form a series of solid ribs with the cut-outs and notches supporting flat slabs between them. The presence of cut-outs at both top and bottom show the ribs supported upper and lower slabs to create hollow enclosures. The use of both tapered cut-outs and notches are known from ceramic armchair voussoirs, but these are always symmetrical, with either one or the other used on both sides of the voussoir rather than each type on the same stone (Lancaster 2015, figs 101, 110; Woodfield and Woodfield 1989, fig. 48). There seems no reason to use both, unless the tapered cut-out made the laying of the flat slabs on that side of the rib easier.

In Britain the use of armchair voussoirs in bath-houses, and in particular stone ones, was generally a military practice (Woodfield and Woodfield 1989, 252). Examples in calcareous tufa are known from Chesters and Great Chesters, and in sandstone at Vindolanda and Wallsend (Lancaster 2015, 160-1; Rushworth and Croom 2016, fig. 21.6, no. 13). They appear to have been used as easy-to-construct kits for small vaults with a span of 3 - 5m, particularly during the first and second centuries (Lancaster 2015, 174).

Tufa is found in many areas of Yorkshire, including round the villa at Well about 19 km south of Catterick (Buckland 1988, 267-8). While deposits large enough to supply suitable quantities for major building work would have been less common, the military were willing to transport stones that suited their building needs some distance.

*Table 00: Armchair voussoirs from Bainesse*

	<i>L</i>	<i>W</i>	<i>B (l)</i>	<i>B (u)</i>	<i>comments</i>
1.	-	250+	65+	-	RF13708
2.	-	280+	-	90	RF13709
3.	400+	290	60	65	broken; RF11685
4.	420	290	90	100	RF11695
5.	430	270	80	100	semi-circular notch; RF11694

6.	440	250+	100	130	RF13704
7.	450	270+	100	130	RF13705
8.	450	300	75	85	has shallow groove cut across one face 160mm from the top; RF11686
9.	460	250+	55+	65+	RF13706
10.	460	270+	60	80	RF13707

Key

B (l) lower breadth, from bottom of stone

B (u) upper breadth; at top or greatest surviving breadth

### Stone roof tiles

Burial 20621 used one complete and one incomplete sandstone roofing slates at the head of the grave (RF7660 and 13701). They were rectangular in shape, with an off-centre rectangular nail hole (L: 10mm W: 8mm). The makers used the bedding planes in the sand to create a smooth upper surface, leaving the lower surface less-well worked and with a large spalling crater created by the nail hole. They are thicker than ceramic roof tiles, with the complete example weighing 19.2kg.

Stone roof slates were used through-out the Roman period on both military and civilian sites and on a range of buildings (eg Dalton Parlours villa: Clarke 1990, fig. 108; York *colonia*: Buckland 1978, fig. 18; Binchester fort: Ferris 2010, table 62). Rectangular roofing slates such as these are not as common as hexagonal slates, which are better at fitting together side by side on the roof. The complete tile from Burial 20621 is also unusually large. The size of tiles varies from site to site, but slates about 420mm long are a more typical size, while those from Birdoswald have an average weight of only 9.5kg (Astill 1997, 131). The example from Catterick must have come from a building large enough that tiles of this size would not look out of place and with a structure strong enough to support their weight; a bath-house is one such possibility.

A fragment of stone slate has previously been found at Bainesse in an unphased feature, and like the voussoirs may be re-used building material brought in from elsewhere (Bell and Thompson 2002, fig. 374, no. 11).