

6 RADIOCARBON DATING

Dating samples were identified by Mike Cressey (charcoal) and Kathleen McSweeney (human bone). Radiocarbon assays of human bone were carried out at the Centre for Isotope Research, University of

Groningen, and charcoal assays were carried out at Poznań Radiocarbon Laboratory, Poland. Dates were calibrated using OxCal Version 3.10 (Bronk Ramsey 1995 and 2001, with atmospheric data from Reimer

Table 6 Radiocarbon dates obtained from un-urned cremations cremated human bone (GrA) and charcoal (Poz). Calibrated using OxCal version 3.10.

Context	Description	Material	Lab Code	Uncal BP	Calibrated 1-sigma	Calibrated 2-sigma
001/2	Primary fill	Cranium	GrA-24029	3455 ± 40	1880–1690 BC	1890–1660 BC
002/1	Main fill	Tibia	GrA-24030	3450 ± 40	1880–1690 BC	1890–1660 BC
004/5	Primary fill	?Humerus	GrA-24031	3445 ± 40	1880–1690 BC	1890–1660 BC
004/4	Upper fill	<i>Betula</i> sp.	Poz-7688	3540 ± 30	1930–1780 BC	1960–1750 BC
004/4	Upper fill	<i>Betula</i> sp.	Poz-7689	3555 ± 30	1950–1820 BC	2020–1770 BC
006/4	Primary fill	Femur	GrA-24019	3460 ± 40	1880–1690 BC	1890–1680 BC
006/4	Primary fill	<i>Corylus avellana</i>	Poz-7685	3330 ± 35	1670–1530 BC	1730–1510 BC
006/4	Primary fill	<i>Quercus</i> sp.	Poz-7686	3305 ± 35	1620–1525 BC	1690–1500 BC
010/3	Primary fill	Petrous temporal	GrA-24020	3495 ± 40	1880–1760 BC	1930–1690 BC
012/1	Upper fill	Femur	GrA-24021	3395 ± 45	1750–1630 BC	1880–1530 BC
017/1	Primary fill	?Femur/humerus	GrA-24024	3470 ± 40	1880–1740 BC	1890–1680 BC
020/2	Primary fill	?Femur	GrA-24025	3385 ± 40	1740–1620 BC	1770–1530 BC
022/1	Primary fill	?Frontal bone	GrA-24026	3415 ± 40	1770–1640 BC	1880–1610 BC
025/1	Upper fill	?Femur	GrA-24027	3560 ± 45	1980–1780 BC	2030–1760 BC
025/2	Primary fill	<i>Quercus</i> sp.	Poz-7683	3410 ± 35	1750–1640 BC	1880–1610 BC
025/2	Primary fill	<i>Quercus</i> sp.	Poz-7684	3455 ± 35	1880–1690 BC	1880–1680 BC
026/2	Middle fill	Scapula	GrA-24039	3485 ± 40	1880–1750 BC	1920–1690 BC
027/1	Single fill	?Femur	GrA-24040	3545 ± 40	1950–1770 BC	2010–1750 BC
029/2	Primary fill	?Femur	GrA-24041	3510 ± 45	1900–1760 BC	1950–1690 BC
029/1	Upper fill	<i>Quercus</i> sp.	Poz-7692	3520 ± 35	1900–1770 BC	1940–1740 BC
029/1	Upper fill	<i>Quercus</i> sp.	Poz-7694	3505 ± 30	1890–1770 BC	1910–1740 BC
031/2	Single fill	?Humerus	GrA-24043	3430 ± 40	1870–1680 BC	1880–1630 BC
033/1	Main fill	?Humerus	GrA-24045	3455 ± 40	1880–1690 BC	1890–1660 BC
033/1	Main fill	<i>Quercus</i> sp.	Poz-7695	3430 ± 35	1870–1680 BC	1880–1630 BC
033/1	Main fill	<i>Quercus</i> sp.	Poz-7696	3395 ± 35	1740–1630 BC	1870–1600 BC
035/3	Middle fill	?Humerus	GrA-24046	3485 ± 40	1880–1750 BC	1920–1690 BC
038/3	Primary fill	<i>Quercus</i> sp.	Poz-7704	3495 ± 35	1880–1760 BC	1920–1690 BC
038/3	Primary fill	<i>Quercus</i> sp.	Poz-7705	3590 ± 35	2010–1890 BC	2040–1820 BC
039/1	Upper fill	?Tibia	GrA-24047	3380 ± 45	1740–1620 BC	1870–1520 BC
039/1	Upper fill	<i>Quercus</i> sp.	Poz-7676	3415 ± 35	1760–1640 BC	1880–1620 BC
039/1	Upper fill	<i>Quercus</i> sp.	Poz-7677	3695 ± 35	2140–2030 BC	2200–1970 BC
042/1	Upper fill	Femur	GrA-24034	3365 ± 40	1740–1610 BC	1750–1530 BC
043/2	Primary fill	?Humerus	GrA-24035	3390 ± 40	1740–1630 BC	1870–1530 BC

Table 7 Radiocarbon dates obtained from urned cremations cremated human bone (GrA) and charcoal (Poz). All samples recovered from within the urns. Calibrated using OxCal version 3.10.

Context	Material	Lab Code	Uncal BP	Calibrated 1-sigma	Calibrated 2-sigma
003/1	Long bone shaft	GrA-26519	3400 ± 40	1750–1630 BC	1880–1530 BC
005/1	?Tibia	GrA-26520	3375 ± 40	1740–1620 BC	1760–1530 BC
007/4	Humerus	GrA-26521	3390 ± 40	1740–1630 BC	1870–1530 BC
013/3	?Ulna	GrA-26523	3320 ± 40	1660–1520 BC	1690–1500 BC
021/4	?Humerus	GrA-26524	3455 ± 40	1880–1690 BC	1890–1660 BC
021/4	<i>Quercus</i> sp.	Poz-7690	3505 ± 30	1890–1770 BC	1910–1740 BC
021/4	<i>Quercus</i> sp.	Poz-7691	3540 ± 35	1940–1770 BC	1970–1750 BC
024/5	Femur	GrA-26525	3360 ± 40	1740–1600 BC	1750–1530 BC
030/2	?Tibia	GrA-26528	3490 ± 40	1880–1750 BC	1920–1690 BC
034/3	Humerus	GrA-26529	3490 ± 40	1880–1750 BC	1920–1690 BC
034/3	<i>Quercus</i> sp.	Poz-7679	3465 ± 35	1880–1730 BC	1890–1690 BC
034/3	<i>Quercus</i> sp.	Poz-7680	3515 ± 35	1900–1770 BC	1940–1740 BC
040/3	Femur	GrA-26530	3480 ± 40	1880–1740 BC	1900–1690 BC
040/3	<i>Quercus</i> sp.	Poz-7681	3445 ± 35	1870–1690 BC	1890–1660 BC
040/3	<i>Quercus</i> sp.	Poz-7682	3480 ± 35	1880–1740 BC	1900–1690 BC
044/6	Fibula	GrA-26531	3470 ± 40	1880–1740 BC	1890–1680 BC
044/6	<i>Quercus</i> sp.	Poz-7706	4090 ± 35	2850–2570 BC	2870–2490 BC
044/6	<i>Quercus</i> sp.	Poz-7708	3505 ± 35	1890–1770 BC	1930–1740 BC

et al 2004). Single samples of bone were dated from each context while pairs of samples of charcoal were dated from each context.

In total, 57 radiocarbon dates have been obtained. Thirty-three dates, nineteen of these from cremated bone and fourteen from charcoal, were obtained from the un-urned cremations (Table 6). Eighteen dates, ten of these from cremated bone and eight from charcoal, were obtained from the urned cremations (Table 7). Six charcoal dates were obtained from Pit 036 (Table 8). The dates are presented in date order, and the cremated bone and charcoal dates are combined on the same illustration (illus 21). In 2003 (Sheridan 2003) there were just 13 dates from Scottish Collared Urns and 13 from Cordoned Urns and so the Skilmafilly dating programme is a significant boost to this particular radiocarbon corpus.

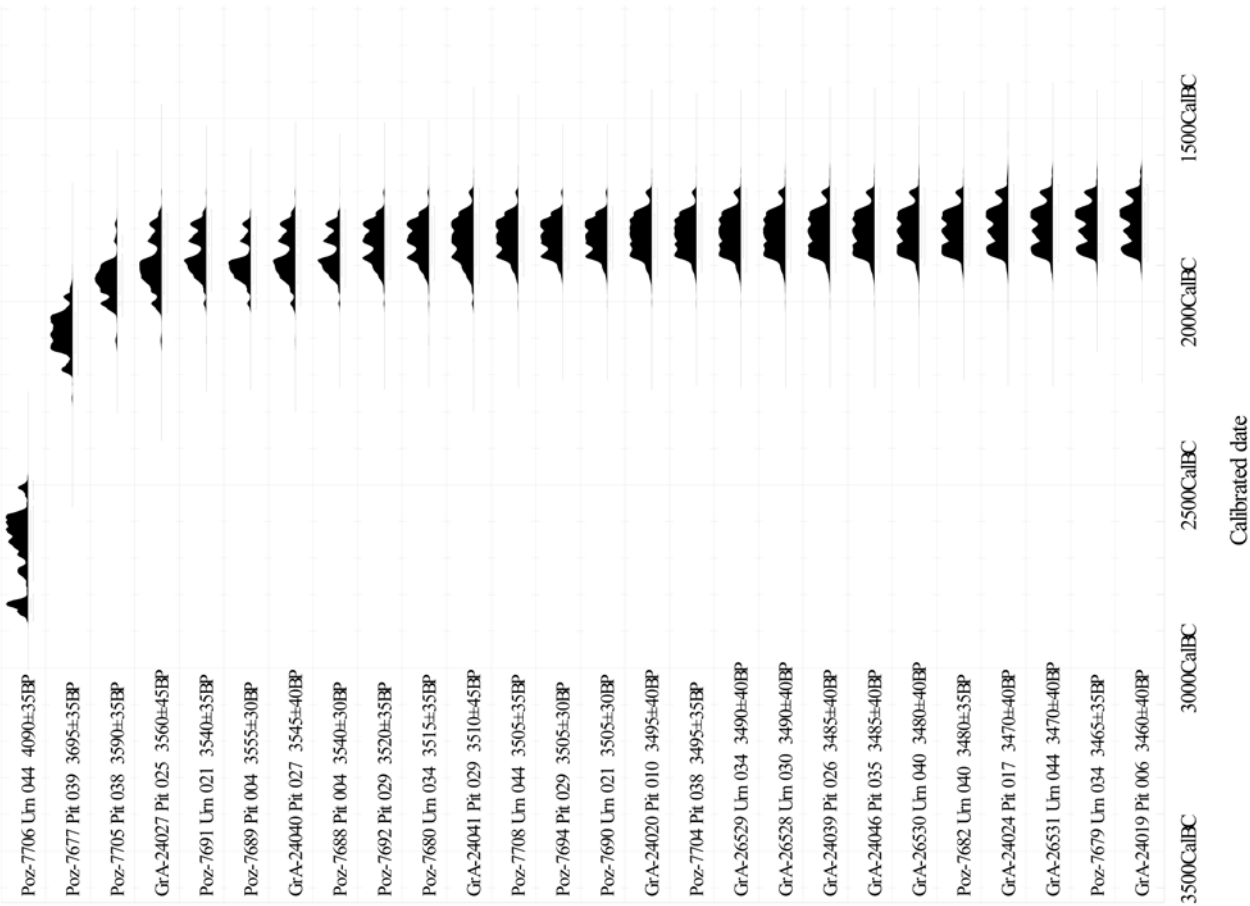
With the exception of Poz-7677 and Poz-7706, the dates range from 2040 BC to 1500 BC. This supports an Early Bronze Age date for the cemetery. The two earliest dates, Poz-7677 (2200–1970 BC; context 039) and Poz-7706 (2870–2490 BC; context 044) are both from charcoal and as such may relate to old wood, although Poz-7677 does overlap with the rest of the dates and corresponds to the earliest date obtained for Collared Urns in Scotland, from Grandtully,

dated to 2130–1740 BC (GrA-21743; Sheridan 2003, 207).

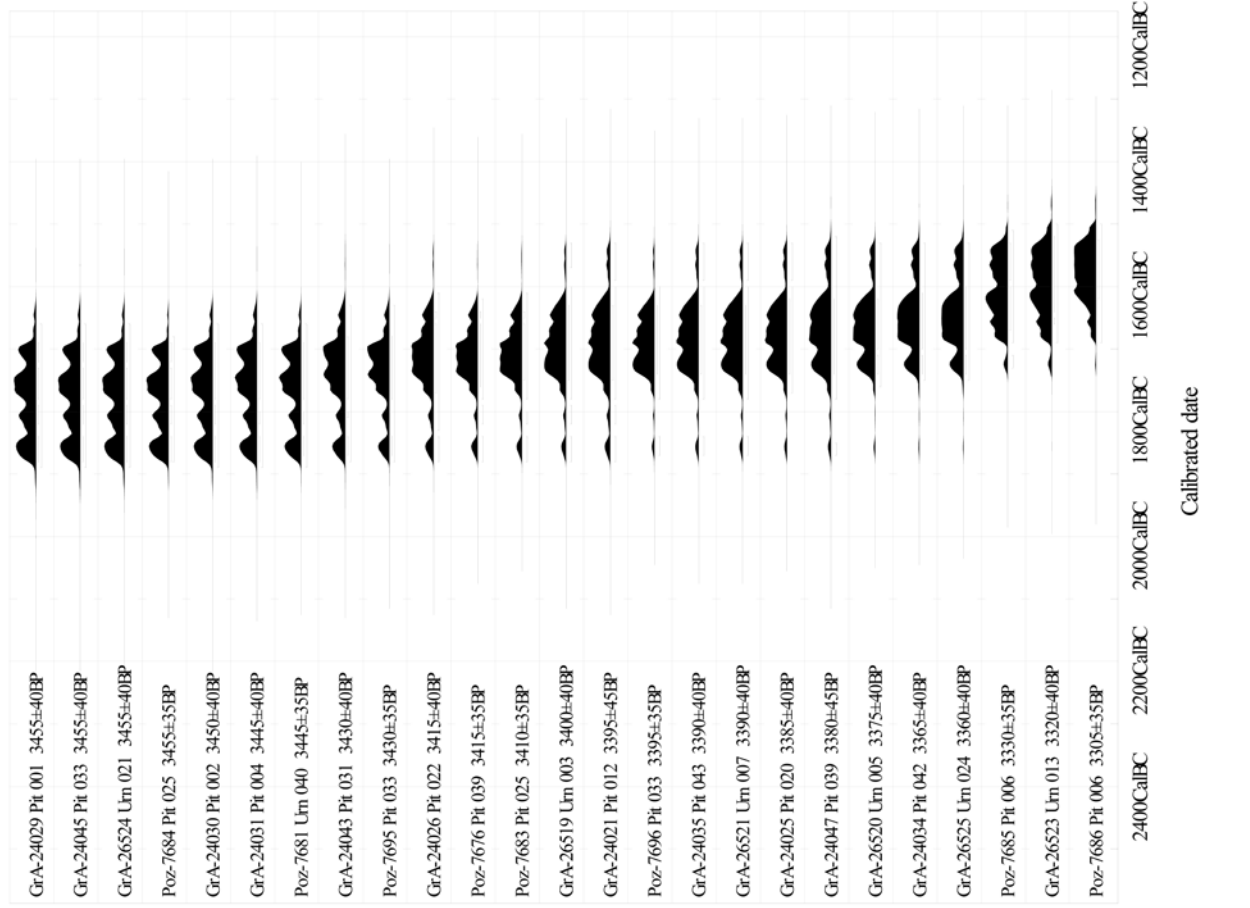
The Skilmafilly dates are largely statistically indistinguishable, so it is not possible easily to identify any earlier or later burials or a sequence of burial apart from between the very earliest dates (eg Poz-7706, Poz-7677, Poz-7705) and the very latest dates (eg Poz-7685, Poz-7686). However, these dates are from charcoal samples and may be considered to be more susceptible to error than the human bone dates. The human bone dates, when considered in isolation, are not statistically distinguishable between the oldest and youngest dates. No attempt has been made to tighten the individual dates as there was no *a priori* information (eg layout of cemetery, ordering within burials) upon which to base a Bayesian analysis of the dates (Buck et al 1996).

The dates obtained for Pit 036 (Table 8; illus 22) indicate a date range of 4510–3970 BC and appear to tie in with the pit's internal stratification; the oldest dates are from a context lower in the pit, the youngest dates from an upper fill. This range indicates a *terminus post quem* in the Late Mesolithic, possibly just stretching into the Early Neolithic. It remains possible that the pit was filled later than the Late Mesolithic and that earlier material has simply been incorporated into its fill.

Atmospheric data from Reimer et al. (2004) OXCal v3.10 Bronk Ramsey (2005), cub r5 sd:1.2 prob usp[chron]



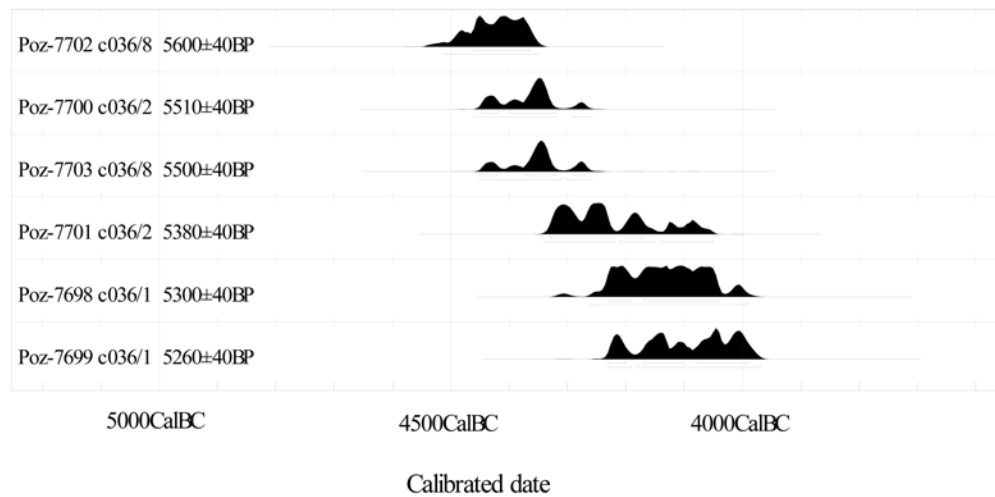
Atmospheric data from Reimer et al. (2004) OXCal v3.10 Bronk Ramsey (2005), cub r5 sd:1.2 prob usp[chron]



Illus 21 Radiocarbon determinations for the urned and un-urned cremations in date order: cremated human bone (GrA) and charcoal (Poz)

Table 8 Radiocarbon dates obtained from charcoal, Pit 036. Calibrated using OxCal version 3.10.

Context	Material	Description	Lab Code	Uncal BP	Calibrated 1-sigma	Calibrated 2-sigma
036/1	<i>Corylus avellana</i>	Lower fill	Poz-7698	5300 ± 40	4230–4040 BC	4260–3990 BC
036/1	<i>Corylus avellana</i>	Lower fill	Poz-7699	5260 ± 40	4230–3990 BC	4230–3970 BC
036/2	<i>Quercus</i> sp.	Lower fill	Poz-7700	5510 ± 40	4450–4320 BC	4460–4260 BC
036/2	<i>Quercus</i> sp.	Lower fill	Poz-7701	5380 ± 40	4330–4170 BC	4340–4050 BC
036/8	<i>Betula</i>	Upper fill	Poz-7702	5600 ± 40	4460–4365 BC	4510–4350 BC
036/8	<i>Quercus</i> sp.	Upper fill	Poz-7703	5500 ± 40	4450–4270 BC	4450–4260 BC



Illus 22 Radiocarbon determinations for Pit 036