APPENDIX: SUPPLEMENTARY MATERIAL

Castle Camus, Isle of Skye: buildings, materials and radiocarbon analysis in the borderlands of medieval Sleat

Mark Thacker[1]

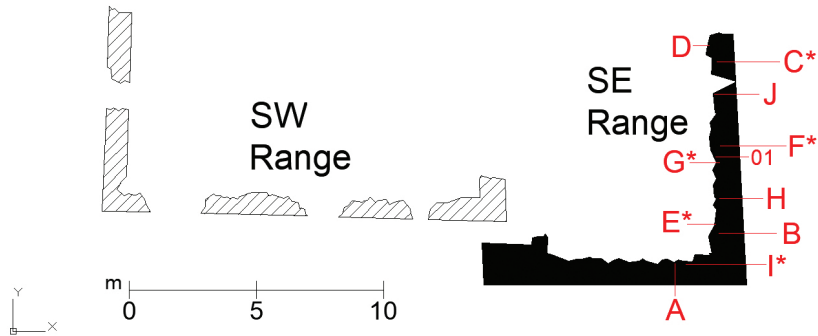**1.0   SAMPLE CONTEXTS, SOUTH-EAST RANGE, CASTLE CAMUS**

TABLE S1
Sample contexts from south-east range of Castle Camus. The datum level was set at 600mm above the bottom bed of the surviving ground floor window mid-lintel in the south-east wall. Aggregate sample CCS.B1 was collected from the nearby foreshore at NGR: NG 6736 0867 (measured by hand-held GPS)

Sample code	SE range feature	Lateral/mm (from face of adjacent wall)	Height/mm (from datum)	Depth/mm (from internal wall face)	Masonry context
MERLF					
CCS.A	SW Wall	1350 from SE	460 above	350	Core
CCS.B	SE Wall	830 from SW	615 below	410	Core
CCS.C	SE Wall	7560 from SW	360 below	680	Core
CCS.D	SE Wall	8200 from SW	410 below	390	Core
CCS.E	SE Wall	1200 from SW	720 above	290	Core
CCS.F	SE Wall	4250 from SW	530 below	630	Core
CCS.G	SE Wall	3610 from SW	360 above	580	Core
CCS.H	SE Wall	2210 from SW	490 above	500	Core
CCS.I	SW Wall	920 from SE	330 above	380	Core
CCS.J	SE Wall	6300 from SW	840 above	490	Core
MORTAR					
CCS.01	SE Wall	3840 from SW	450 below	450	Core

[1] University of Stirling, 27 Upper Carloway, Isle of Lewis

Castle Camus

Upstanding masonry at south-west of castle summit

ILLUS S1 Annotated plan of south-west of the Castle Camus summit, with hatched phasing interpretations and sample locations plotted. Primary south-east range is blocked in black and the secondary south-west range is hatched with diagonal lines. (DP148155 © Crown Copyright: Historic Environment Scotland)

2.0 CASTLE CAMUS STANDALONE MODEL 1a

2.1 MODEL 1a SCRIPT

```
Options()
{
 Resolution=1 year;
 kIterations=20000;
};
Plot()
{
 Outlier_Model("General 1a",T(5),U(0,4),"t");
 Sequence("Camus SE Range Standalone Sequence 1a")
 {
  Tau_Boundary("Camus SE Range Woodland Growth 1a");
  Phase("Camus SE Range MERLF Assemblage 1a")
  {
   R_Date("SUERC-62537", 712, 34)
   {
    Outlier("General 1a", 0.05);
   };
   R_Date("SUERC-62541", 672, 34)
   {
    Outlier("General 1a", 0.05);
   };
   R_Date("SUERC-62542", 698, 34)
   {
    Outlier("General 1a", 0.05);
   };
   R_Date("SUERC-62543", 664, 34)
   {
```

```
   Outlier("General 1a", 0.05);
  };
  R_Date("SUERC-62544", 637, 34)
  {
   Outlier("General 1a", 0.05);
  };
  Span("Camus SE Range Assemblage Growth 1a");
 };
 Boundary("Camus SE Range Construction Completed 1a");
};
Order("Willaim MacLeod Probability")
{
 Date("=Camus SE Range Construction Completed 1a");
 C_Date("William MacLeod Death", 1402, 0.05);
};
Order("Tormod MacLeod Probability")
{
 Date("=Camus SE Range Construction Completed 1a");
 C_Date("Tormod MacLeod Death", 1320, 0.05);
};
Order("Pre Battle of Inverlochy probability")
{
 Date("=Camus SE Range Construction Completed 1a");
 C_Date("Battle of Inverlochy", 1431, 0.05);
};
};
```
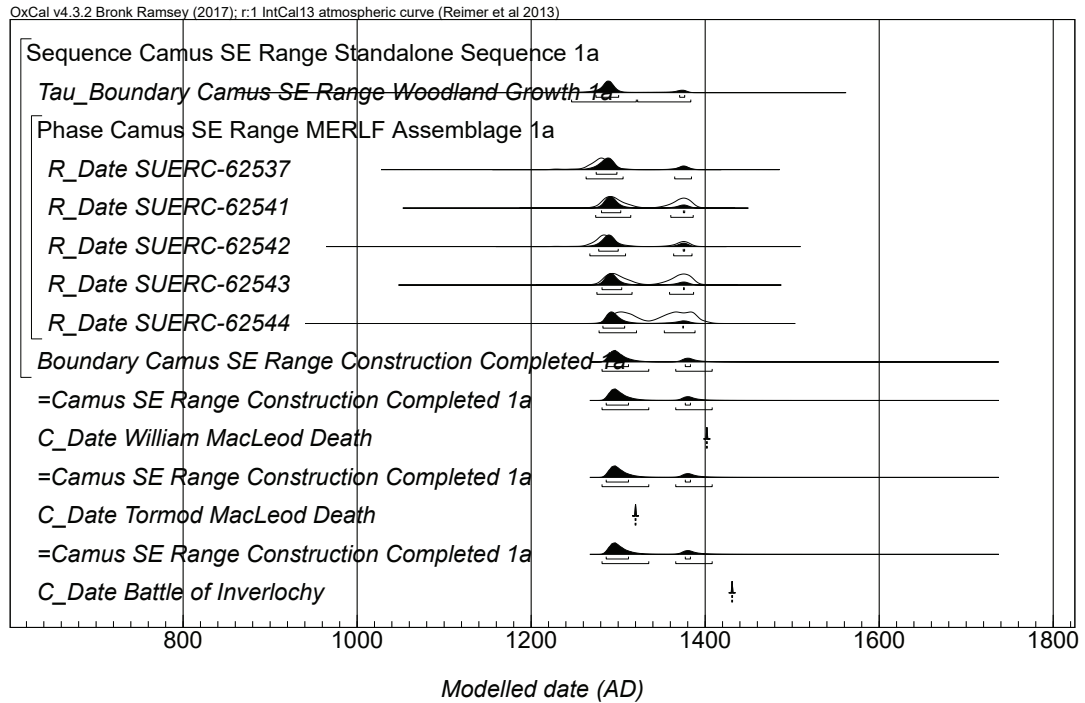
2.2 MODEL 1a TABLE OF DISTRIBUTIONS

TABLE S2

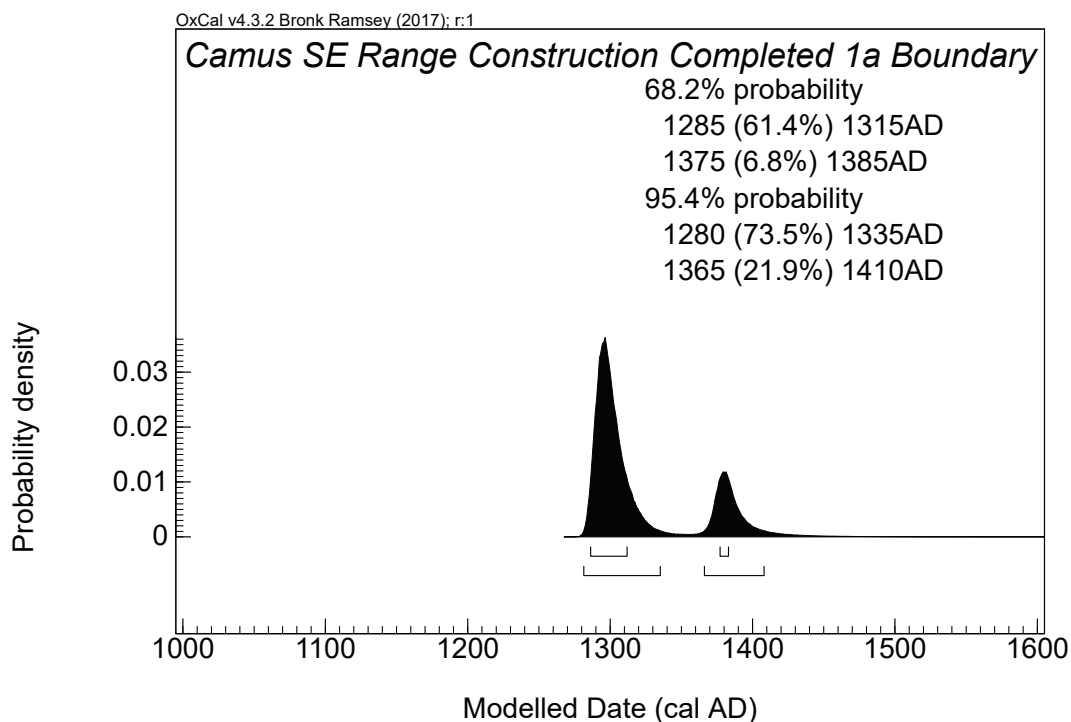Main distributions generated by Castle Camus Model 1a. Rounded out to five years

R-Date Lab Code	Unmodelled Distributions (cal AD)		1a Modelled Distributions (cal AD)	
	68.2% probability	95.4% probability	*68.2% probability*	*95.4% probability*
SUERC-62537	1260–1295	1225–1390	*1270–1300*	*1260–1385*
SUERC-62541	1275–1385	1270–1395	*1280–1380*	*1270–1390*
SUERC-62542	1270–1380	1255–1390	*1275–1380*	*1265–1385*
SUERC-62543	1280–1390	1270–1395	*1280–1380*	*1275–1390*
SUERC-62544	1290–1390	1280–1400	*1280–1380*	*1275–1390*
Generated dist.				
End Boundary			***1285–1385***	***1280–1410***
Span			*0–25 years*	*0–115 years*

2.3 MODEL 1a MULTIPLE PLOT

Sequence Camus SE Range Standalone Sequence 1a
Tau_Boundary Camus SE Range Woodland Growth 1a
Phase Camus SE Range MERLF Assemblage 1a
R_Date SUERC-62537
R_Date SUERC-62541
R_Date SUERC-62542
R_Date SUERC-62543
R_Date SUERC-62544
Boundary Camus SE Range Construction Completed 1a
=Camus SE Range Construction Completed 1a
C_Date William MacLeod Death
=Camus SE Range Construction Completed 1a
C_Date Tormod MacLeod Death
=Camus SE Range Construction Completed 1a
C_Date Battle of Inverlochy

800   1000   1200   1400   1600   1800

Modelled date (AD)

ILLUS S2   Probability distributions of dates from Castle Camus standalone Model 1a, including phasing interpretations and radiocarbon data. Plotted in Oxcal v4.3.2 (Bronk Ramsey 2017) and calibrated using IntCal13 atmospheric curve (Reimer et al 2013), this model was set at one-year resolution and run with 20,000 kIterations. All five radiocarbon dates have been situated within a single phase and all five tagged with a 5% outlier probability within the 'General' outlier model (Bronk Ramsey 2009). The Boundary distribution '*Camus SE Range Construction Completed 1a*' situated at the end of this phase is an estimate of the date when construction of the south-east range building was completed, with squared brackets beneath each distribution representing the highest probability distributions at 68.2% and 95.4% probability. In Model 1a, this End Boundary distribution is compared to calendar dates of 1402, 1320 and 1431 using the Order function. A Span distribution was also generated by this model but is not included in these plots

2.4 MODEL 1a END BOUNDARY DISTRIBUTION PLOT

OxCal v4.3.2 Bronk Ramsey (2017); r:1

Camus SE Range Construction Completed 1a Boundary
68.2% probability
1285 (61.4%) 1315AD
1375 (6.8%) 1385AD
95.4% probability
1280 (73.5%) 1335AD
1365 (21.9%) 1410AD

ILLUS S3   End boundary probability distribution 'Camus SE Range Construction Completed 1a', generated by standalone Model 1a. See Supplementary Material Illus S2 for model specification. Probability Distributions have been rounded out to five years

2.5 MODEL 1a WILLIAM MACLEOD PROBABILITY

TABLE S3
Probability that the constructional estimate generated by Model 1a precedes the death of William MacLeod in 1402, reported by MacLeod History. See Supplementary Material 2.1 for model script

Probability $t_1 < t_2$	t_2	
	Camus SE Range 1a	William MacLeod 1402
t_1		
Camus SE Range 1a	0	0.9667
William MacLeod 1402	0.03328	0

2.6 MODEL 1a TORMOD MACLEOD PROBABILITY

Table S4

Probability that the constructional estimate generated by Model 1a precedes the death of Tormod MacLeod in 1320, reported by MacLeod History. See Supplementary Material 2.1 for model script

Probability $t_1 < t_2$	t_2	
	Camus SE Range 1a	Tormod MacLeod 1320
t_1		
Camus SE Range 1a	0	0.6992
Tormod MacLeod 1320	0.30084	0

2.7 MODEL 1a PRE BATTLE OF INVERLOCHY PROBABILITY

TABLE S5

Probability that the constructional estimate generated by Model 1a precedes the Battle of Inverlochy in 1431 and reported Crown takeover of Castle Camus

Probability $t_1 < t_2$	t_2	
	Camus SE Range 1a	Battle of Inverochy 1431
t_1		
Camus SE Range 1a	0	0.9893
Battle of Inverlochy 1431	0.010686	0

3.0 CASTLE CAMUS MULTIDISCIPLINARY MODEL 1b

3.1 MODEL 1b SCRIPT

```
Options()
{
 Resolution=1 year;
 kIterations=20000;
};
Plot()
{
 Outlier_Model("General 1b",T(5),U(0,4),"t");
 Sequence("Castle Camus Standalone Sequence 1b")
 {
 Tau_Boundary("Camus SE Range Woodland Growth 1b");
 Phase("Camus SE Range MERLF Assemblage 1b")
 {
 R_Date("SUERC-62537", 712, 34)
 {
  Outlier("General 1b", 0.05);
 };
 R_Date("SUERC-62541", 672, 34)
 {
  Outlier("General 1b", 0.05);
 };
 R_Date("SUERC-62542", 698, 34)
```

```
      {
       Outlier("General 1b", 0.05);
      };
      R_Date("SUERC-62543", 664, 34)
      {
       Outlier("General 1b", 0.05);
      };
      R_Date("SUERC-62544", 637, 34)
      {
       Outlier("General 1b", 0.05);
      };
      Span("Camus SE Range Assemblage Growth 1b");
     };
     Boundary("Camus SE Range Construction Completed 1b");
    };
    Sequence("Camus SE Range Multidisciplinary Sequence 1b")
    {
     Date("=Camus SE Range Construction Completed 1b");
     C_Date("William Macleod Tradition", 1402, 0.05);
    };
    Order("Tormod MacLeod Probability")
    {
     Date("=Camus SE Range Construction Completed 1b");
     C_Date("Tormod MacLeod Death", 1320, 0.05);
    };
    Order("Malcolm MacLeod Probability")
    {
     C_Date("Glenelg Charter", 1343, 0.05);
     Date("=Camus SE Range Construction Completed 1b");
    };
   };
```
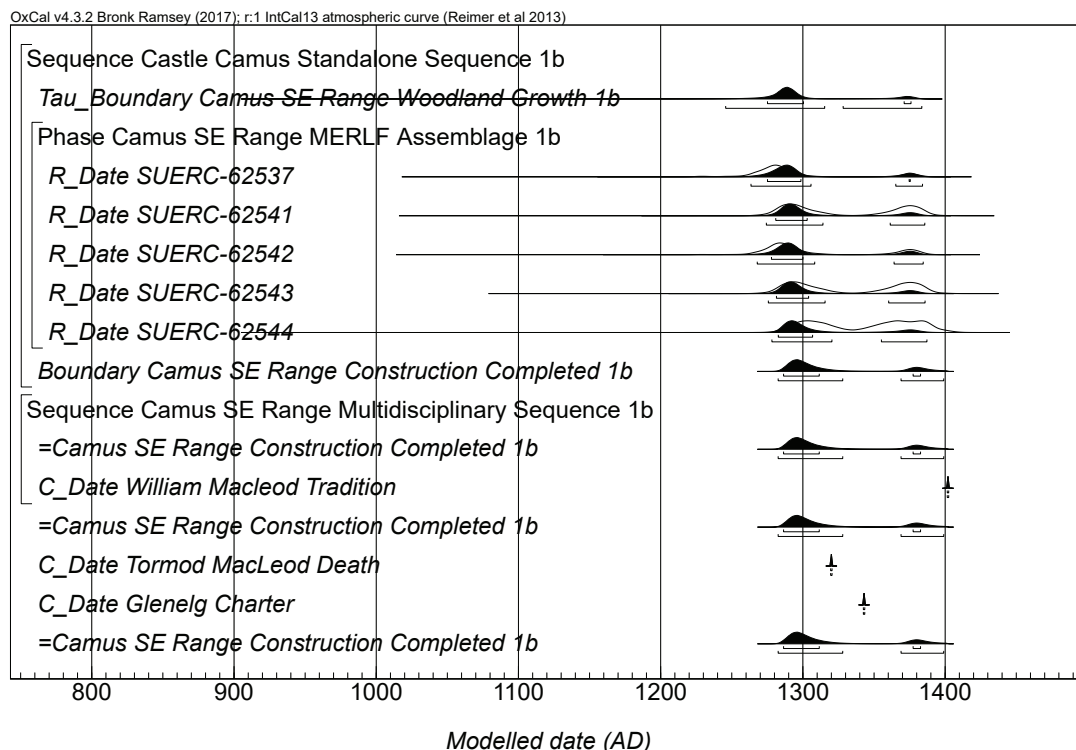
3.2 MODEL 1b TABLE OF DISTRIBUTIONS

TABLE S6
Main distributions generated by Castle Camus Model 1b. All distributions have been rounded out to five years
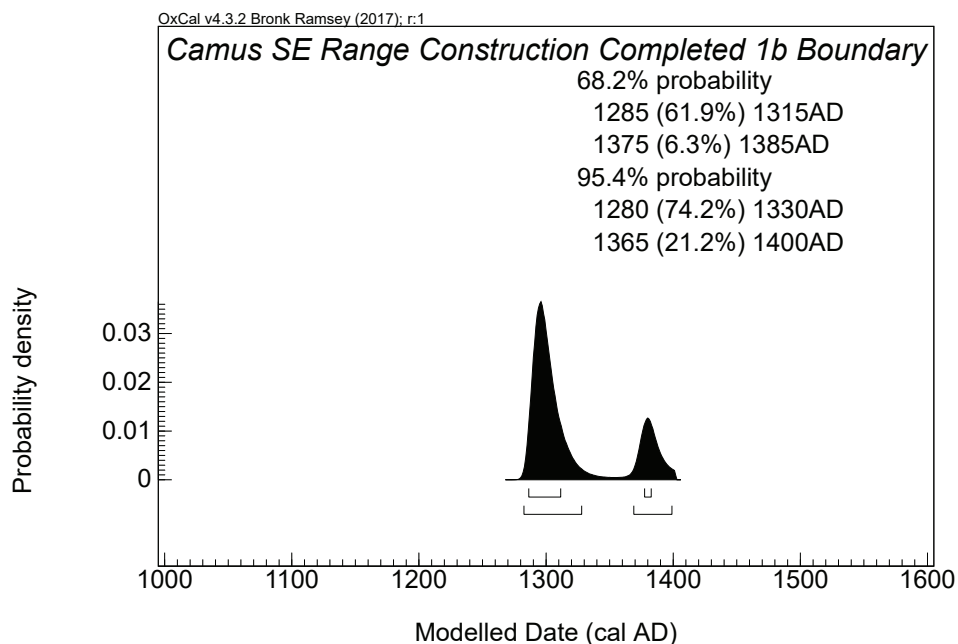
R-Date Lab Code	Unmodelled Distributions (cal AD)		1b Modelled Distributions (cal AD)	
	68.2% probability	95.4% probability	*68.2% probability*	*95.4% probability*
SUERC-62537	1260–1295	1225–1390	*1270–1375*	*1260–1385*
SUERC-62541	1275–1385	1270–1395	*1280–1305*	*1270–1390*
SUERC-62542	1270–1380	1255–1390	*1275–1300*	*1265–1385*
SUERC-62543	1280–1390	1270–1395	*1280–1305*	*1275–1390*
SUERC-62544	1290–1390	1280–1400	*1280–1310*	*1275–1390*
Generated dist.				
End Boundary			***1285–1385***	***1280–1400***
Span			*0–25*	*0–110*

3.3 MODEL 1b MULTIPLE PLOT

Sequence Castle Camus Standalone Sequence 1b
Tau_Boundary Camus SE Range Woodland Growth 1b
Phase Camus SE Range MERLF Assemblage 1b
  R_Date SUERC-62537
  R_Date SUERC-62541
  R_Date SUERC-62542
  R_Date SUERC-62543
  R_Date SUERC-62544
  Boundary Camus SE Range Construction Completed 1b
Sequence Camus SE Range Multidisciplinary Sequence 1b
  =Camus SE Range Construction Completed 1b
  C_Date William Macleod Tradition
  =Camus SE Range Construction Completed 1b
  C_Date Tormod MacLeod Death
  C_Date Glenelg Charter
  =Camus SE Range Construction Completed 1b

800   900   1000   1100   1200   1300   1400

Modelled date (AD)

ILLUS S4 Probability distributions of dates from Castle Camus multidisciplinary Model 1b, including phasing interpretations, radiocarbon data and the earliest available historical evidence. Plotted in Oxcal v4.3.2 (Bronk Ramsey 2017) and calibrated using IntCal13 atmospheric curve (Reimer et al 2013), this model was set at one-year resolution and run with 20,000 kIterations. All five radiocarbon dates have been situated within a single phase and all five tagged with a 5% outlier probability within the 'General' outlier model (Bronk Ramsey 2009). The Boundary distribution '*Camus SE Range Construction Completed 1b*' situated at the end of this phase is an estimate of the date when construction of the south-east range at Castle Camus was completed, and a second sequence defines that this distribution pre-dates a calendar date of 1402 (predicated on a historical reference to William Macleod's death at the castle site). This End Boundary is compared to the calendar dates 1320 and 1343 using the Order function. A Span distribution was also generated within the phase, but is not shown in these plots

3.4 MODEL 1b END BOUNDARY DISTRIBUTION PLOT

Camus SE Range Construction Completed 1b Boundary
68.2% probability
1285 (61.9%) 1315AD
1375 (6.3%) 1385AD
95.4% probability
1280 (74.2%) 1330AD
1365 (21.2%) 1400AD

ILLUS S5   End boundary probability distribution '*Camus SE Range Construction Completed 1b*', generated by multidisciplinary Model 1b. See Supplementary Material Illus S4 for model specification. This probability distribution has been rounded out to five years

3.5 MODEL 1b TORMOD MACLEOD PROBABILITY

TABLE S7   Probability that the constructional estimate generated by Model 1b precedes the death of Tormod MacLeod in 1320, reported by MacLeod History. See Supplementary Material 3.1 for model script

Probability $t_1 < t_2$	t_2	
	Camus SE Range 1b	Tormod MacLeod 1320
t_1		
Camus SE Range 1b	0	0.719
Tormod MacLeod 1320	0.281	0

3.6 MODEL 1b MALCOLM MACLEOD PROBABILITY (LATER ADDITION TO THE MODEL SCRIPT)

TABLE S8
Probability that the constructional estimate generated by Model 1b postdates the Grant of Glenelg to Malcolm MacLeod in 1343

Probability $t_1 < t_2$	t_2	
	Glenelg Charter 1343	Camus SE Range 1b
t_1		
Glenelg Charter 1343	0	0.23584
Camus SE Range 1b	0.7642	0

4.0 CASTLE CAMUS STANDALONE MODEL 2a

4.1 MODEL 2a SCRIPT

```
Options()
{
 Resolution=1 year;
 kIterations=20000;
};
Plot()
{
 Sequence("Camus SE Range Standalone Sequence 2a")
 {
 Boundary("Castle Camus Woodland Growth 2a");
 Phase("Camus SE Range MERLF Assemblage 2a")
 {
  R_Date("SUERC-62537", 712, 34)
  {
  };
  R_Date("SUERC-62541", 672, 34)
  {
  };
  R_Date("SUERC-62542", 698, 34)
  {
  };
  R_Date("SUERC-62543", 664, 34)
  {
  };
  R_Date("SUERC-62544", 637, 34)
  {
  };
  Span("Camus SE Range Assemblage Growth 2a");
 };
 Boundary("Camus SE Range Construction Completed 2a");
 };
 Order("William MacLeod Probability")
 {
 Date("=Camus SE Range Construction Completed 2a");
 C_Date("William MacLeod Death", 1402, 0.05);
 };
 Order("Tormod MacLeod Probability")
 {
 Date("=Camus SE Range Construction Completed 2a");
 C_Date("Tormod MacLeod", 1320, 0.05);
 };
};
```

4.2 MODEL 2a TABLE OF DISTRIBUTIONS

TABLE S9

Main distributions generated by Castle Camus Model 2a. All distributions have been rounded out to five years
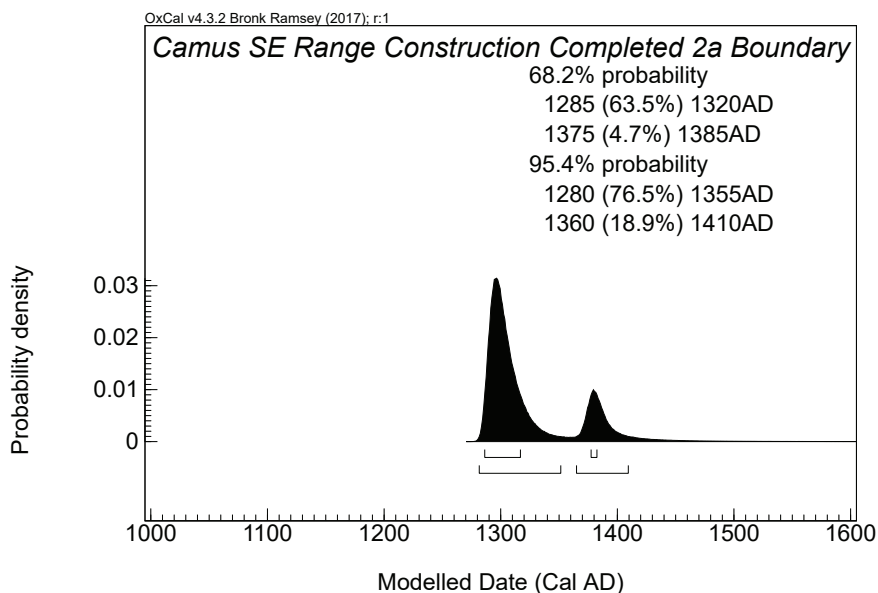
R-Date Lab Code	Unmodelled Distributions (cal AD)		2a Modelled Distributions (cal AD)	
	68.2% probability	95.4% probability	*68.2% probability*	*95.4% probability*
SUERC-62537	1260–1295	1225–1390	*1275–1300*	*1265–1385*
SUERC-62541	1275–1385	1270–1395	*1280–1305*	*1270–1385*
SUERC-62542	1270–1380	1255–1390	*1275–1300*	*1265–1385*
SUERC-62543	1280–1390	1270–1395	*1280–1305*	*1275–1390*
SUERC-62544	1290–1390	1280–1400	*1280–1310*	*1275–1390*
Generated dist.				
End Boundary			***1285–1385***	***1280–1410***
Span			*0–20 years*	*0–105 years*

4.3 MODEL 2a MULTIPLE PLOT
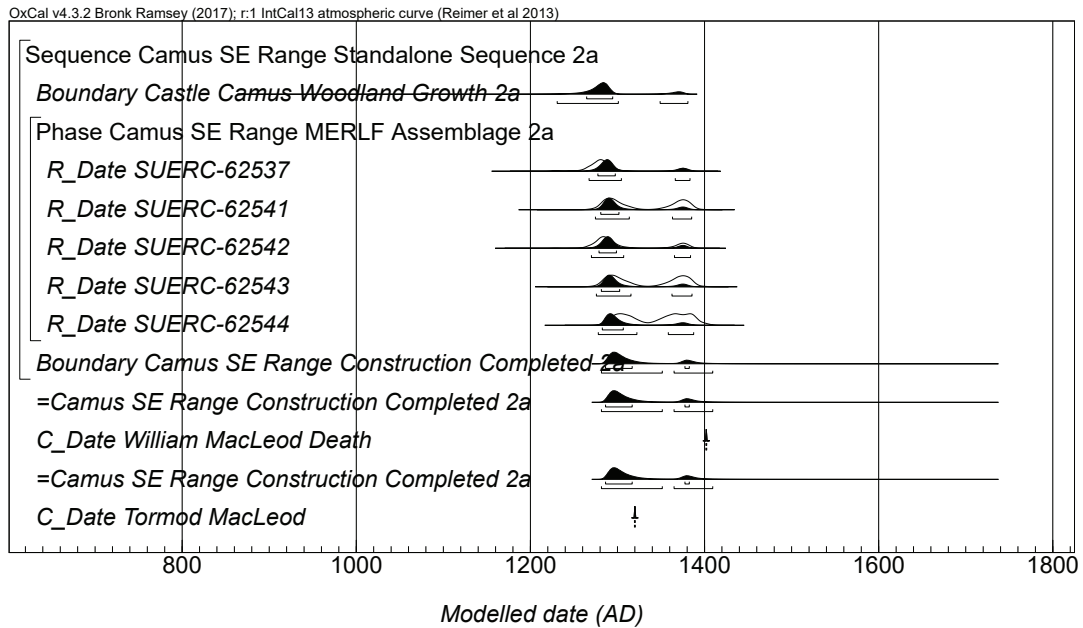
ILLUS S6 Probability distributions of dates from Castle Camus standalone Model 2a, including phasing interpretations and radiocarbon data. Plotted in Oxcal v4.3.2 (Bronk Ramsey 2017) and calibrated using IntCal13 atmospheric curve (Reimer et al 2013), this model was set at one-year resolution and run with 20,000 kIterations. All five radiocarbon dates have been situated within a single phase between uniform Boundaries. The End Boundary distribution 'Camus SE Range Construction Completed 2a' situated at the end of this phase is an estimate of the date when construction of Castle Camus was completed, and this is compared to 1402 and 1320 calendar dates using the Order function. A Span distribution was also generated by this model but is not included in these plots

4.4 MODEL 2a END BOUNDARY DISTRIBTUION PLOT

OxCal v4.3.2 Bronk Ramsey (2017); r:1

Camus SE Range Construction Completed 2a Boundary
68.2% probability
1285 (63.5%) 1320AD
1375 (4.7%) 1385AD
95.4% probability
1280 (76.5%) 1355AD
1360 (18.9%) 1410AD

ILLUS S7   End boundary probability distribution 'Camus SE Range Construction Completed 2a', generated by standalone Model 2a. See Supplementary Material Illus S6 for model specification. This probability distribution has been rounded out to five years

4.5 MODEL 2a WILLIAM MACLEOD PROBABILITY

TABLE S10
Probability that the constructional estimate generated by Model 2a precedes the death of William MacLeod in 1402, reported by MacLeod History

Probability $t_1 < t_2$	t_2	
	Camus SE Range 2a	William MacLeod 1402
t_1		
Camus SE Range 2a	0	0.9597
William MacLeod 1402	0.04029	0

4.6 MODEL 2a TORMOD MACLEOD PROBABILITY

TABLE S11
Probability that the constructional estimate generated by Model 2a precedes the death of Tormod MacLeod in 1320, reported by MacLeod History

Probability $t_1 < t_2$	t_2	
	Camus SE Range 2a	Tormod MacLeod 1320
t_1		
Camus SE Range 2a	0	0.6824
Tormod MacLeod 1320	0.3176	0

5.0   CASTLE CAMUS STANDALONE MODEL 3a

5.1 MODEL 3a SCRIPT

```
Options()
{
 Resolution=1 year;
 kIterations=20000;
};
Plot()
{
 Sequence("Camus SE Range Standalone Sequence 3a")
 {
  Tau_Boundary("Camus SE Range Woodland Growth 3a");
  Phase("Camus SE Range MERLF Assemblage 3a")
  {
   R_Date("SUERC-62537", 712, 34)
   {
   };
   R_Date("SUERC-62541", 672, 34)
   {
   };
   R_Date("SUERC-62542", 698, 34)
   {
   };
   R_Date("SUERC-62543", 664, 34)
   {
   };
   R_Date("SUERC-62544", 637, 34)
   {
   };
   Span("Camus SE Range Assemblage Growth 3a");
  };
  Boundary("Camus SE Range Construction Completed 3a");
 };
 Order("William MacLeod Probability")
 {
  Date("=Camus SE Range Construction Completed 3a");
  C_Date("William MacLeod Death", 1402, 0.05);
 };
 Order("Tormod MacLeod Probability")
 {
  Date("=Camus SE Range Construction Completed 3a");
  C_Date("Tormod MacLeod", 1320, 0.05);
 };
};
```
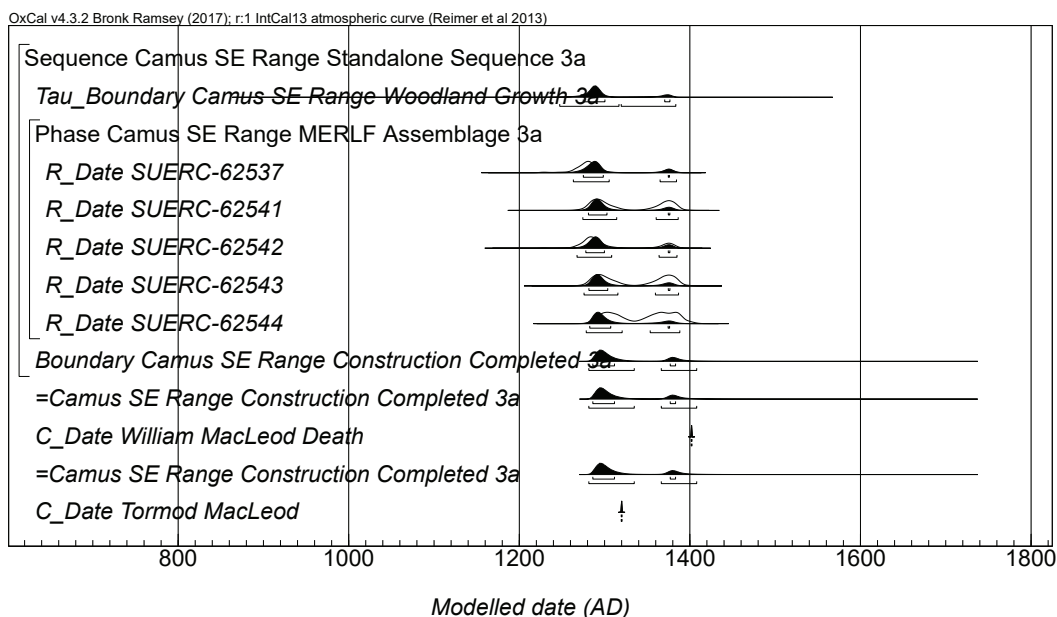
5.2 MODEL 3a TABLE OF DISTRIBUTIONS

TABLE S12

Main distributions generated by Castle Camus Model 3a. All probability distributions have been rounded out to five years
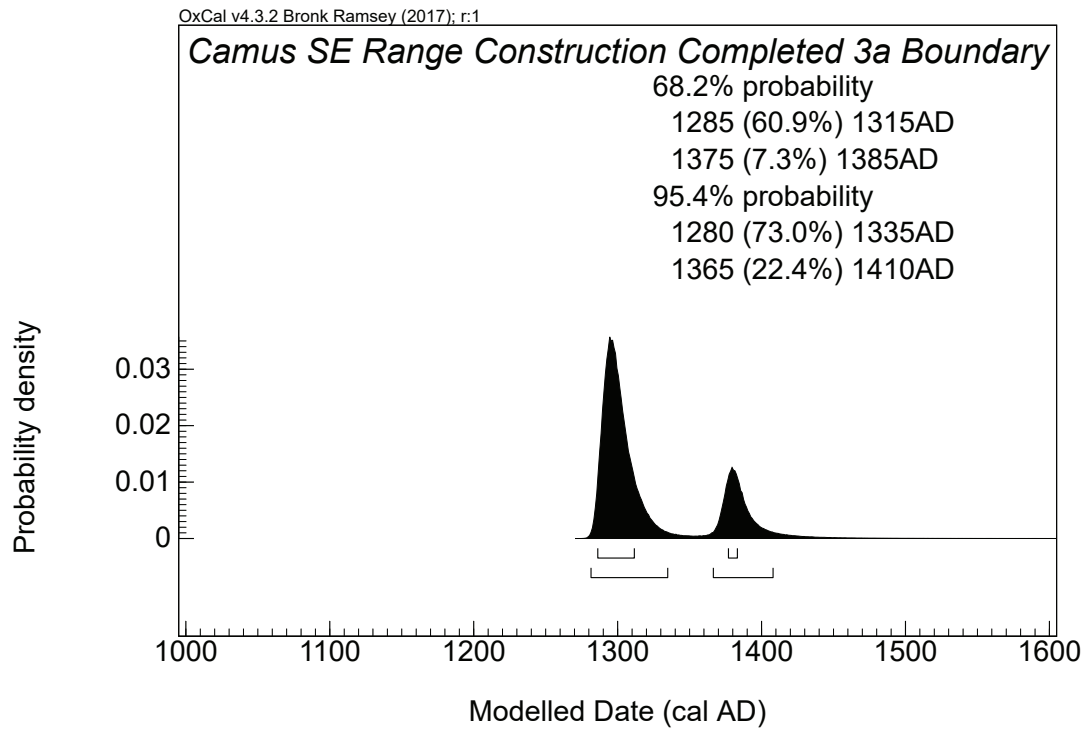
R-Date Lab Code	Unmodelled Distributions (cal AD)		3a Modelled Distributions (cal AD)	
	68.2% probability	95.4% probability	*68.2% probability*	*95.4% probability*
SUERC-62537	1260–1295	1225–1390	*1270–1380*	*1260–1385*
SUERC-62541	1275–1385	1270–1395	*1280–1380*	*1270–1390*
SUERC-62542	1270–1380	1255–1390	*1275–1380*	*1265–1385*
SUERC-62543	1280–1390	1270–1395	*1280–1380*	*1275–1390*
SUERC-62544	1290–1390	1280–1400	*1280–1380*	*1275–1390*
Generated dist.				
End Boundary			***1285–1385***	***1280–1410***
Span			*0–25 years*	*0–115 years*

5.3 MODEL 3a MULTIPLE PLOT

OxCal v4.3.2 Bronk Ramsey (2017); r:1 IntCal13 atmospheric curve (Reimer et al 2013)

Sequence Camus SE Range Standalone Sequence 3a
Tau_Boundary Camus SE Range Woodland Growth 3a
Phase Camus SE Range MERLF Assemblage 3a
R_Date SUERC-62537
R_Date SUERC-62541
R_Date SUERC-62542
R_Date SUERC-62543
R_Date SUERC-62544
Boundary Camus SE Range Construction Completed 3a
=Camus SE Range Construction Completed 3a
C_Date William MacLeod Death
=Camus SE Range Construction Completed 3a
C_Date Tormod MacLeod

Modelled date (AD)

ILLUS S8   Probability distributions of dates from Castle Camus standalone Model 3a, including phasing interpretations and radiocarbon data. Plotted in Oxcal v4.3.2 (Bronk Ramsey 2017) and calibrated using IntCal13 atmospheric curve (Reimer et al 2013), this model was set at one-year resolution and run with 20,000 kIterations. All five radiocarbon dates have been situated within a single phase with an exponential (Tau) Start Boundary. The End Boundary distribution '*Camus SE Range Construction Completed 3a*' situated at the end of this phase, is an estimate of the date when construction of the south-east range building was completed, and this distribution is compared to calendar dates of 1402 and 1320 using the Order function. A Span distribution was also generated by this model but is not included in these plots

5.4 MODEL 3a END BOUNDARY DISTRIBUTION PLOT

OxCal v4.3.2 Bronk Ramsey (2017); r:1

Camus SE Range Construction Completed 3a Boundary

68.2% probability
1285 (60.9%) 1315AD
1375 (7.3%) 1385AD
95.4% probability
1280 (73.0%) 1335AD
1365 (22.4%) 1410AD

ILLUS S9   End boundary probability distribution 'Camus SE Range Construction Completed 3a', generated by standalone Model 3a. See Supplementary Material Illus S8 for model specification. This probability distribution has been rounded out to five years

5.5 MODEL 3a WILLIAM MACLEOD PROBABILITY

TABLE S13
Probability that the constructional estimate generated by Model 3a precedes the death of William MacLeod in 1402, reported by MacLeod History

Probability $t_1 < t_2$	t_2	
	Camus SE Range 3a	William MacLeod 1402
t_1		
Camus SE Range 3a	0	0.9676
William MacLeod 1402	0.03244	0

5.6 MODEL 3a TORMOD MACLEOD PROBABILITY

TABLE S14

Probability that the constructional estimate generated by Model 3a precedes the death of Tormod MacLeod in 1320, reported by MacLeod History

Probability $t_1 < t_2$	t_2	
	Camus SE Range 3a	Tormod MacLeod 1320
t_1		
Camus SE Range 3a	0	0.6965
Tormod MacLeod 1320	0.30347	0