Radiocarbon dating archaeobotanical remains from Island Farm, Ottery St Mary

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Excavations by Cotswold Archaeology in 2014, in advance of development at Island Farm, Ottery St Mary (Devon), revealed the remains of a structure interpreted as 'a typical later medieval house divided into three spaces' (Mudd *et al.* 2018, section 3.1). A rich assemblage of charred plant remains was recovered from within and around the building, and subjected to fully quantitative analysis by Sarah Cobain. The excavators suggest that the archaeobotanical evidence from the byre may represent 'a store of fodder, or the harvest awaiting threshing, perhaps stored in a loft' (Mudd *et al.* 2018, section 3.2).

The excavated pottery provided only a broad chronology for the construction and occupation of the house: 'the general date range of the pottery… which mostly comprises jars in glazed and unglazed fabrics typical of the region, suggests a relatively brief duration of existence *c*. AD 1250–1350' (Mudd *et al.* 2018, section 3.1).

As part of the Feeding Anglo-Saxon England project (FeedSax) at the University of Oxford, charred grains from three samples were submitted to the Oxford Radiocarbon Accelerator Unit for radiocarbon dating, with the aim of refining the dating of the archaeobotanical assemblage (and thus the likely destruction date of the building). Sample 5 derives from pit 27036 in an area interpreted as the building's eastern room (but for which no structural evidence survives). The context for sample 5 was stratigraphically above a fill containing a thirteenth- to fourteenth-century potsherd. Samples 16 and 29 represent different metre-square grid samples taken from an extensive layer of burnt material (context 27027) which partly sealed the floor surface in the western and main rooms of the building. The layer contained burnt timbers and is thought to represent a 'catastrophic conflagration' which destroyed the building. It is suggested that the charred plant remains found in this layer could represent crops stored either in the room itself, or in a loft space which collapsed in the fire (Mudd *et al.* 2018, section 2.1). The excavators suggest that the charred material in sample 5 may represent the results of this same conflagration.

The grains dated by the FeedSax project – oats in two samples (*Avena* L.), rye in one (*Secale cereale* L.) – were photographed at the University of Oxford by the author, prior to submission for dating; the photographs are included in the project's photographic archive (McKerracher *et al.* in prep.). The grains were identified and selected by the author from bagged flots during a visit to Exeter City Council's archive store.

The radiocarbon determinations obtained for these samples have been calibrated using IntCal20 (Reimer *et al.* 2020) and OxCal 4.4.2 (Bronk Ramsey 2009) as shown in the table below and figures at the end of this report.

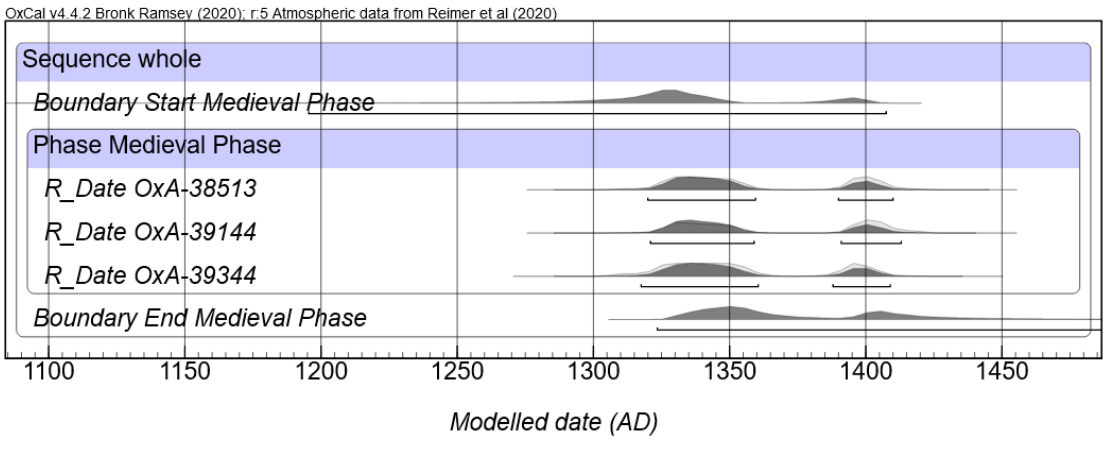
Results

context	sample	grains	laboratory no.	age BP	calibrated dates AD (confidence)
27038	5	4 x oat	OxA-38513	575±20	1316–1361 (63.6%), 1387–1415 (31.8%)
27027	16	4 x oat	OxA-39144	567±20	1321–1359 (54.6%), 1390–1421 (40.8%)
27027	29	3 x rye	OxA-39344	585±20	1310–1362 (70.9%), 1386–1409 (24.6%)

Based on the working assumption that all three samples are broadly contemporary, the following CQL2 code was run in OxCal 4.4.2, in order to determine whether a Bayesian statistical model could refine the date range for the material.

```
Plot() {
 Sequence("whole") {
  Boundary("Start Medieval Phase");
  Phase("Medieval Phase") {
   R_Date("OxA-38513", 575, 20);
   R_Date("OxA-39144", 567, 20);
   R_Date("OxA-39344", 585, 20);
  };
  Boundary("End Medieval Phase");
 };
};
```

Name Show all Show structure	Unmodelled (BC/AD)			Modelled (BC/AD)			Indices A_{model}=110.2 $A_{overall}$=109.2					Select All Visible	Page break
	from	to	%	from	to	%	A_{comb}	A	L	P	C		
Sequence whole												2	
Boundary Start Medieval Phase				1195	1407	95.4					97.3	3	
Phase Medieval Phase												4	
R_Date OxA-38513	1316	1415	95.4	1320	1410	95.4		106.3			99.3	5	
R_Date OxA-39144	1321	1421	95.4	1321	1413	95.4		102			99	6	
R_Date OxA-39344	1310	1409	95.4	1317	1409	95.4		107.4			99.1	7	
Boundary End Medieval Phase				1323	1522	95.4					96	8	



This chronometric modelling of the new radiocarbon dates suggests that the archaeobotanical assemblage as a whole most probably dates from between the early and mid-fourteenth century, with the likely date range centring on the years around *c.* AD 1340. This places it at the later end of the date range represented by the excavated pottery (*c.* AD 1250–1350). The Bayesian model also allows for an alternative chronology centred around the early fifteenth century, but this is statistically less likely, and accords less well with the ceramic evidence.

Acknowledgements

I would like to thank Thomas Cadbury for facilitating access to, and permitting analysis of, the charred grains from Ottery St Mary; and Andrew Mudd and Sarah Cobain for providing additional information about this site assemblage.

References

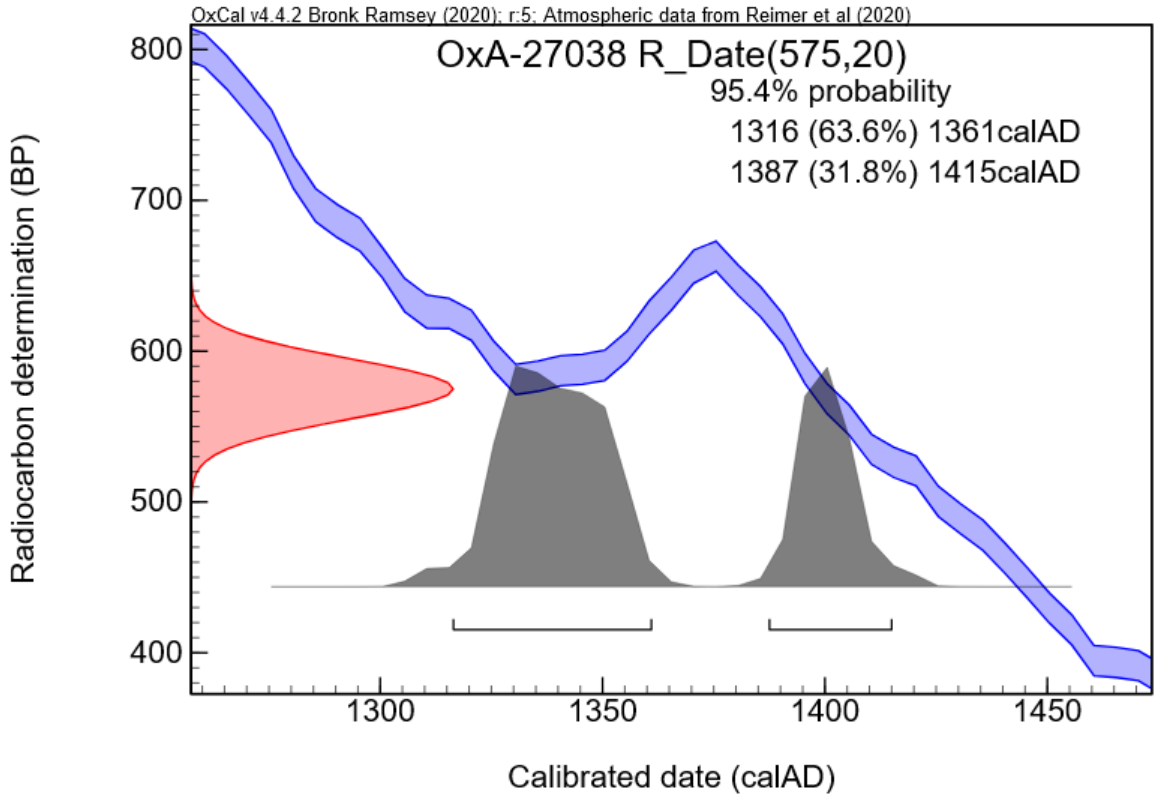
Bronk Ramsey, C. (2009). 'Bayesian analysis of radiocarbon dates', *Radiocarbon* 51(1), pp.337–360.

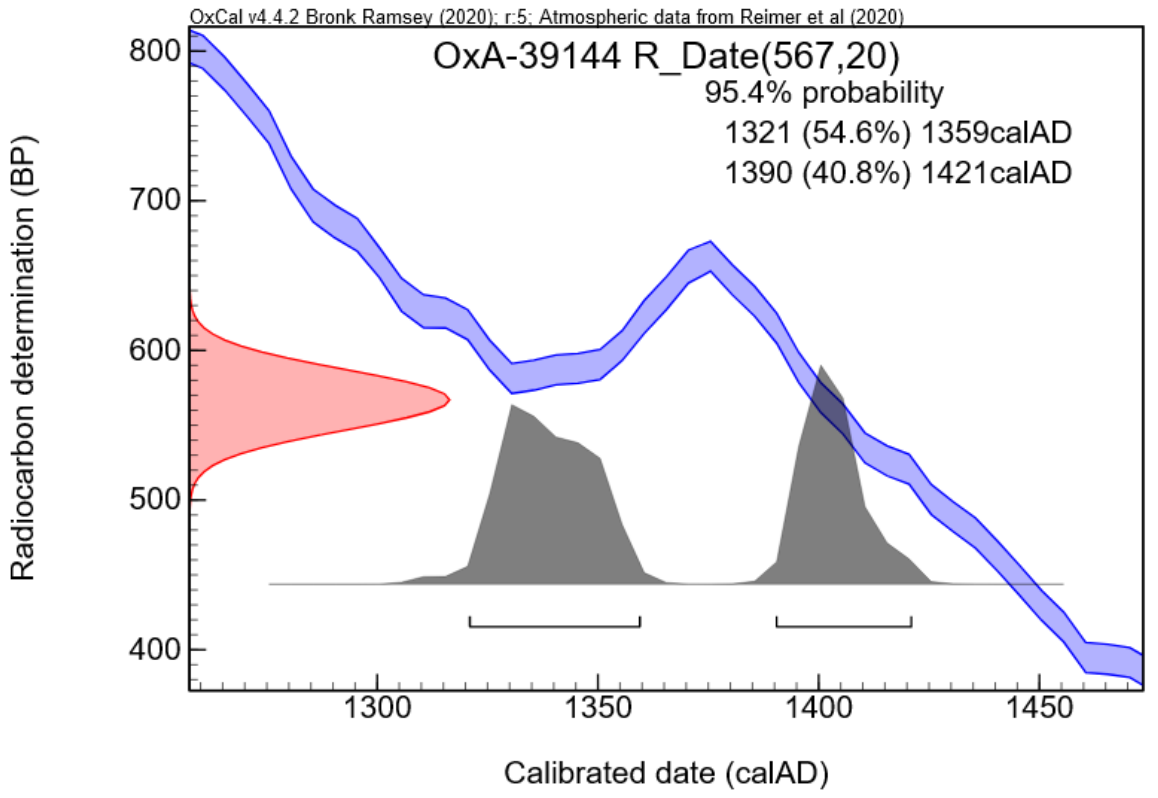
McKerracher, M., Bogaard, A., Bronk Ramsey, C., Charles, M., Forster, E., Hamerow, H., Holmes, M., Hodgson, J., Neil, S., Roushannafas, T., Stroud, E. and Thomas, R. (in prep.). 'Feeding Anglo-Saxon England (FeedSax): the Haystack bioarchaeological database and digital archives', *Internet Archaeology*.

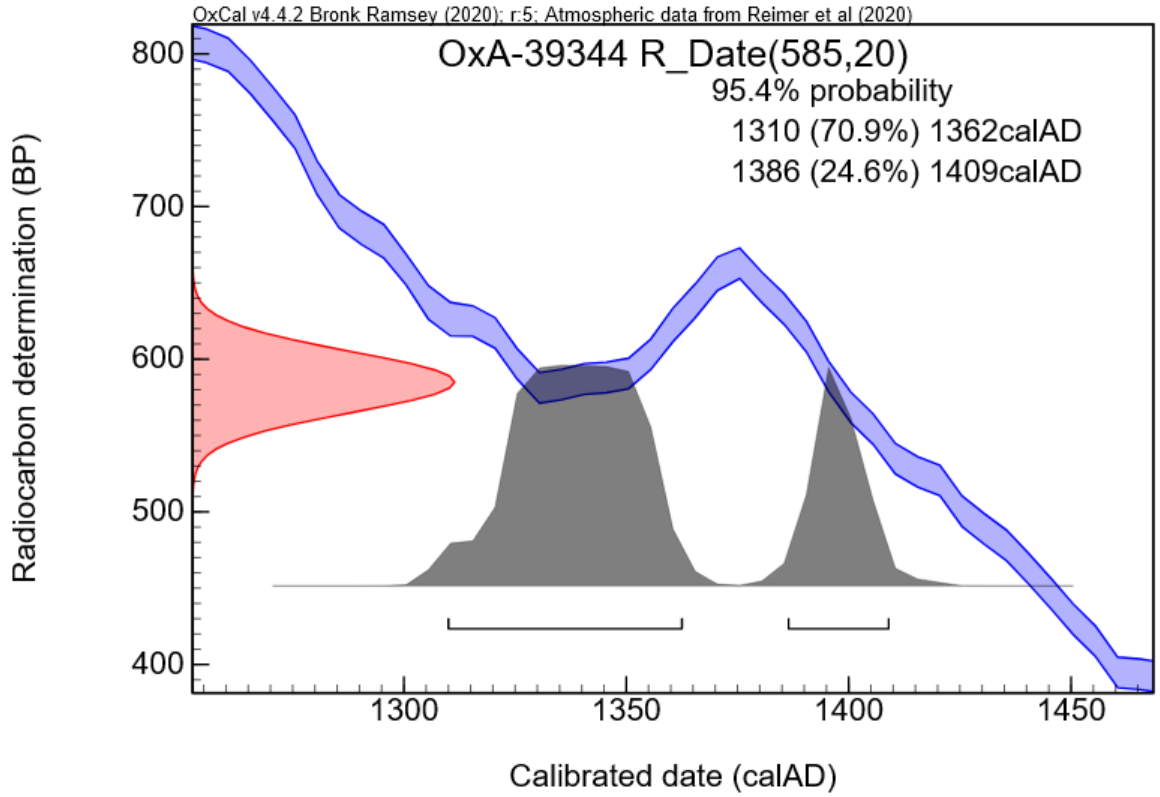
Mudd, A., Cobain, S. and Haines, C. (2018). 'A Medieval Building and its Contents at Island Farm, Ottery St Mary, East Devon: excavations in 2014', *Internet Archaeology* 47. https://doi.org/10.11141/ia.47.4

Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., ... Talamo, S. (2020). 'The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)', *Radiocarbon* 62(4), pp.725–757. doi:10.1017/RDC.2020.41

Calibration of radiocarbon determinations






OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
OxA-39344 R_Date(585,20)
95.4% probability
1310 (70.9%) 1362calAD
1386 (24.6%) 1409calAD
Radiocarbon determination (BP)
800
700
600
500
400
1300
1350
1400
1450
Calibrated date (calAD)