Radiocarbon dating archaeobotanical remains from Houghton

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Between 2016 and 2018, excavations by MOLA-Headland Infrastructure along the route of the A14 Cambridge to Huntingdon Improvement Scheme discovered the remains of the deserted medieval village of Houghton, and evidence of its antecedent Anglo-Saxon occupation (site TEA7C: see various assessment papers in Smith *et al.* 2021). Large numbers of environmental samples were extracted during the excavations, and the archaeobotanical assessment identified 'a remarkably high concentration of archaeobotanical remains on average, with levels of preservation ranging from good to very good' from the TEA7 sites (Walker 2019, 22). This assemblage therefore drew the attention of the Feeding Anglo-Saxon England project (FeedSax), which aimed to investigate developments in early medieval farming through the analysis of charred plant remains and other bioarchaeological evidence. From the assessment data, supplemented by first-hand rapid examination of samples by the author, six samples with especially rich and well-preserved charred crop and weed remains were selected by FeedSax for further study.

To provide a secure chronological framework for the archaeobotanical analyses, charred grains from these six samples were submitted to the Oxford Radiocarbon Accelerator Unit for radiocarbon dating. Two of these samples had been provisionally assigned by the excavator to the site's medieval phase, while the other four had not been assigned to a phase at the time of writing but were thought to be of Anglo-Saxon or medieval date because of their charred cereal content (as reported in post-excavation assessments). The grains dated by the FeedSax project were photographed prior to submission, and these photographs are included in the project's photographic archive (McKerracher *et al.* in prep.). These cereal grains – mostly those of free-threshing wheat (*Triticum* L. free-threshing), but also oat in sample 73984 (*Avena* L.) – were identified, selected and photographed at the University of Oxford by the author.

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

sample	grains	laboratory no.	original phase	age BP	calibrated dates AD (confidence)
73098	3 x wheat	OxA-38961	Unknown	1226±21	772–881 (80.0%)
76572	3 x wheat	OxA-39030	Unknown	1198±18	774–885 (95.4%)
73984	3 x oat	OxA-39031	Unknown	1047±18	980–1029 (95.4%)
73978	2 x wheat	OxA-39032	Unknown	927±18	1039–1165 (95.4%)
7225	2 x wheat	OxA-39033	Medieval	1026±18	992–1030 (95.4%)
7094	3 x wheat	OxA-39034	Medieval	1056±18	976–1027 (91.4%)

The calibrated radiocarbon dates demonstrate that at least three distinct phases of activity are represented by these six samples. First, there is a Mid Saxon phase spanning the mid-/late eighth to late ninth centuries, to which belong two samples of previously unknown phase, 76572 and 73098. Second, there is a Late Saxon phase spanning the mid-/late tenth to early eleventh century, to which

belong two samples previously assigned to a medieval phase (7094 and 7225) and one sample of previously unknown phase (73984). Finally, there is a phase spanning the early/mid-eleventh to mid-twelfth centuries, to which belongs sample 73978.

Acknowledgements

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References

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

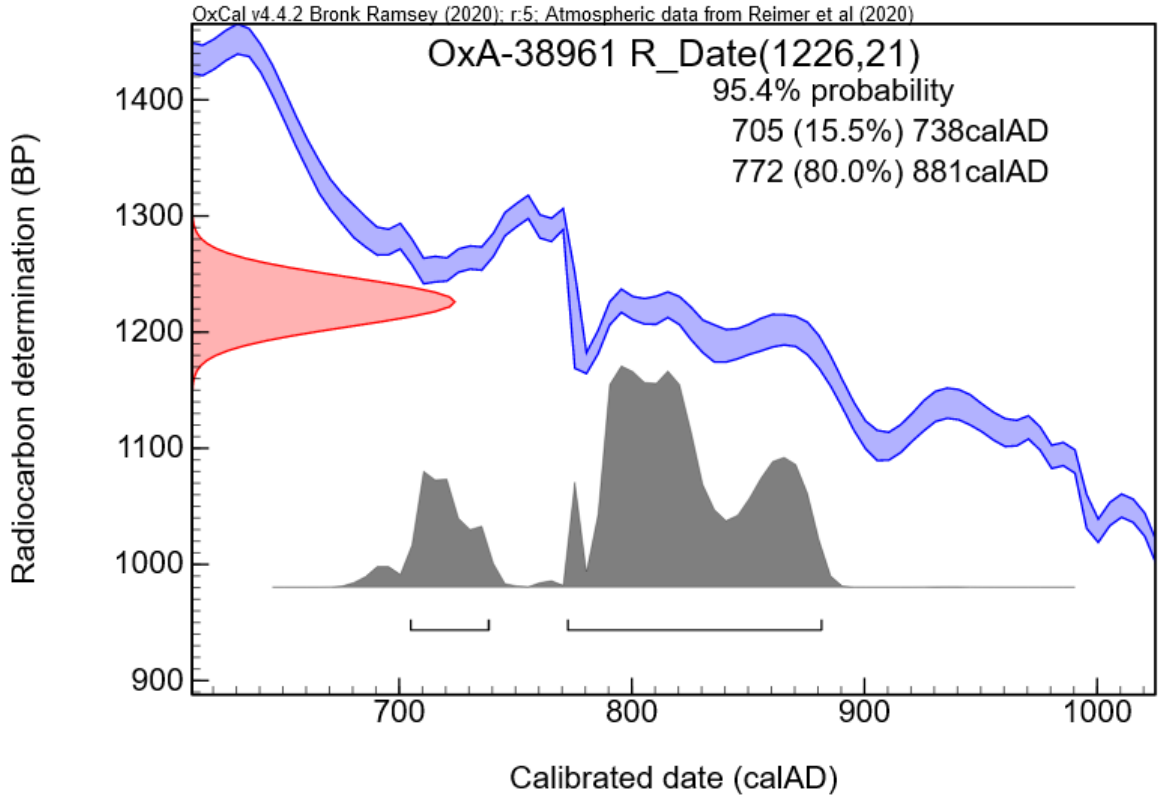
McKerracher, M., Bogaard, A., Bronk Ramsey, C., Charles, M., Forster, E., Hamerow, H., Holmes, M., Hodgson, J., Neil, S., Roushannafas, T., Stroud, E. and Thomas, R. (in prep.). 'Feeding Anglo-Saxon England (FeedSax): the Haystack bioarchaeological database and digital archives', *Internet Archaeology*.

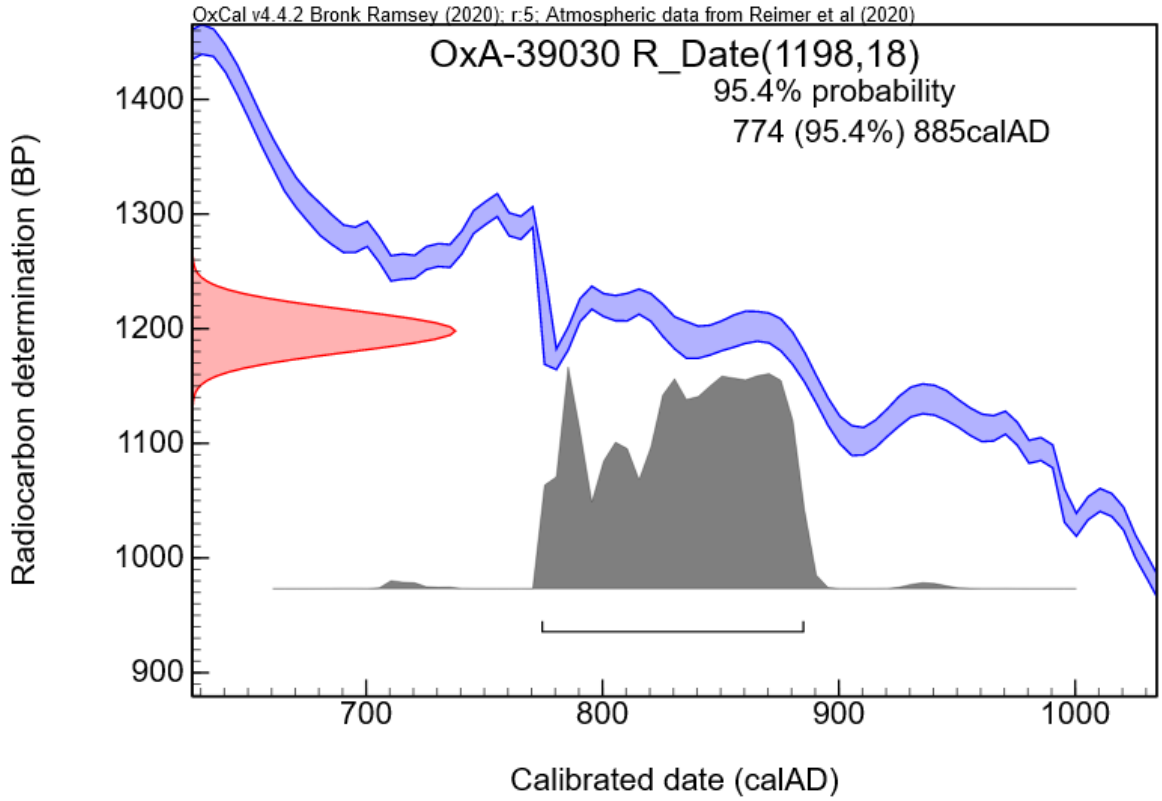
Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., . . . Talamo, S. (2020). 'The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP)', *Radiocarbon* 62(4), pp.725–757. doi:10.1017/RDC.2020.41

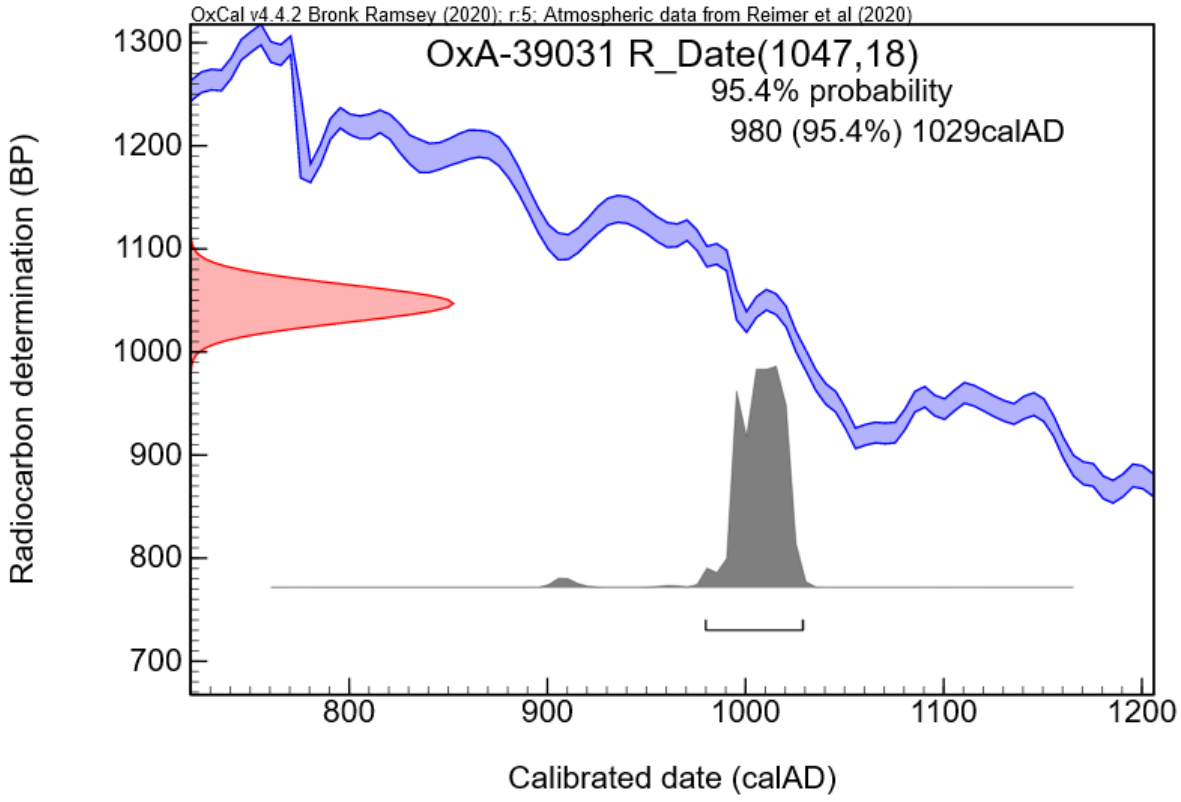
Smith, A., Bowsher, D., van Wessel, J. and West, E. (2021). *A14 Cambridge to Huntingdon, Cambridgeshire* [data-set] (York: Archaeology Data Service [distributor]). https://doi.org/10.5284/1081261

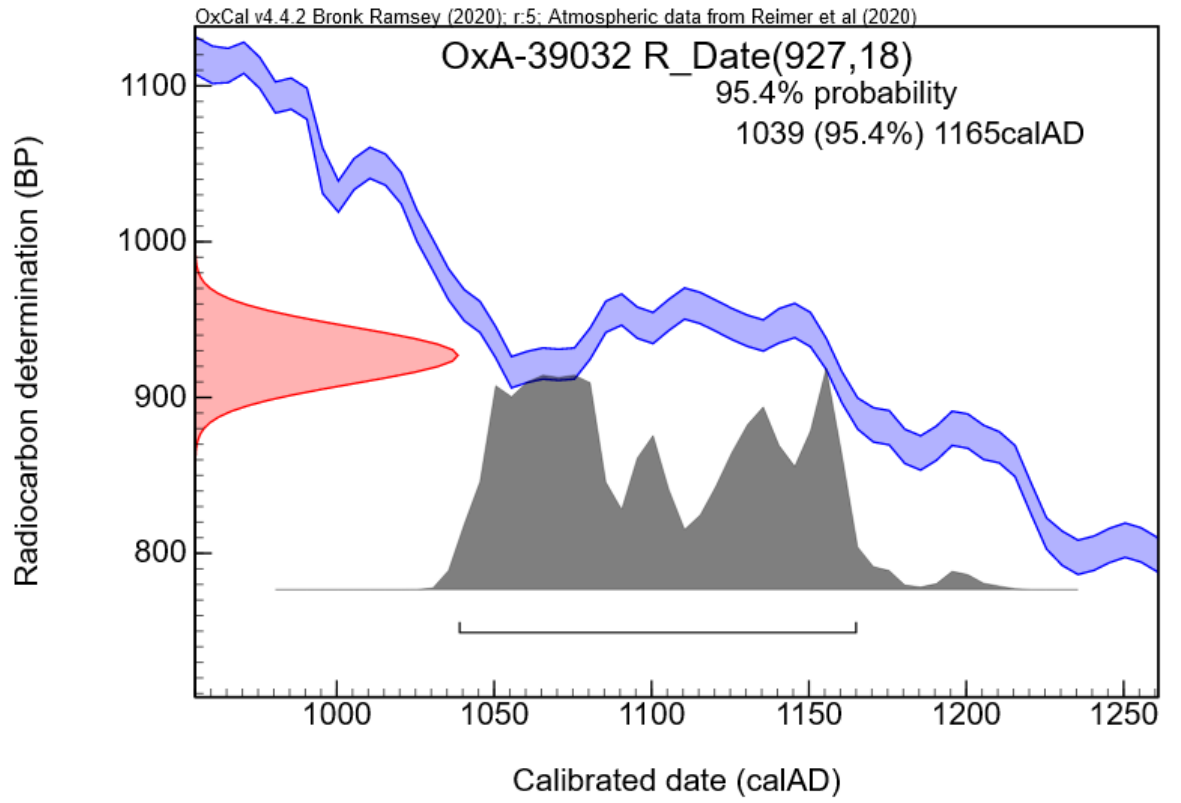
Walker, A. (2019). *A14 Cambridge to Huntingdon, Cambridgeshire, Improvement Scheme. Archaeological Investigations. Volume 3.5: Plant and Insect Remains Assessment*. Report by MOLA Headland Infrastructure (included in Smith *et al.* 2021).

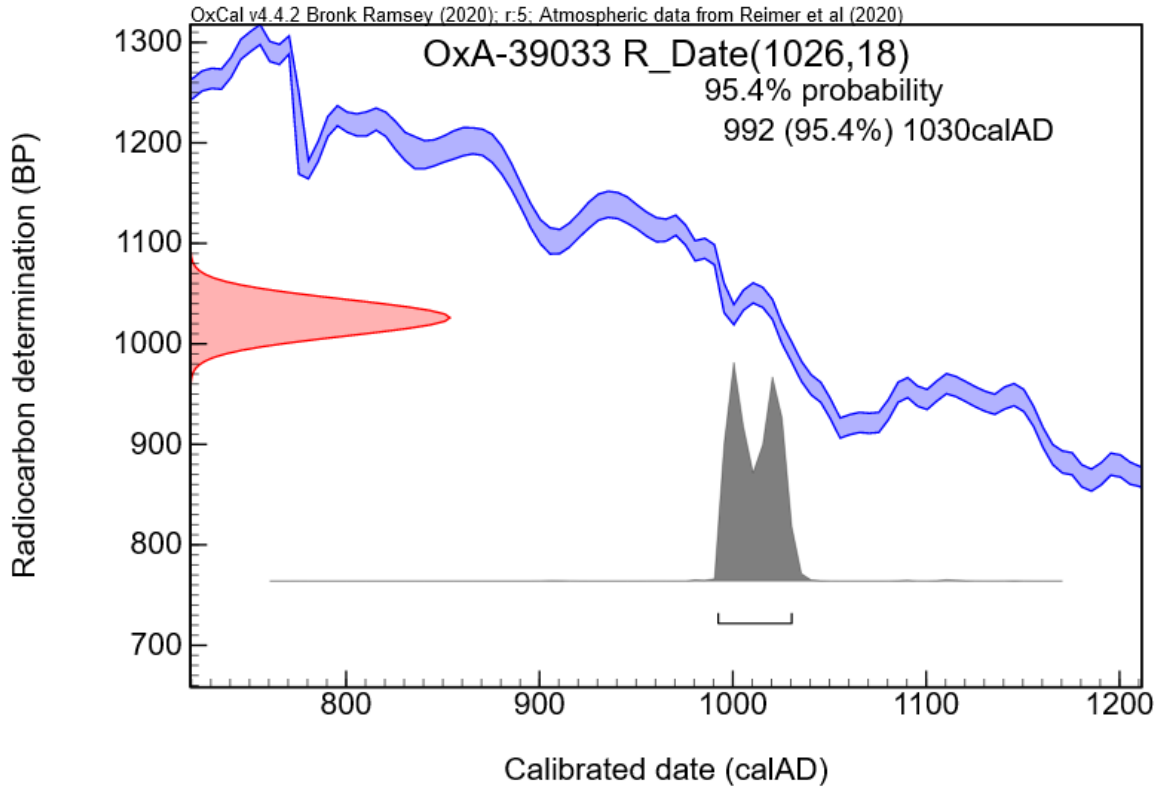
Calibration of radiocarbon determinations

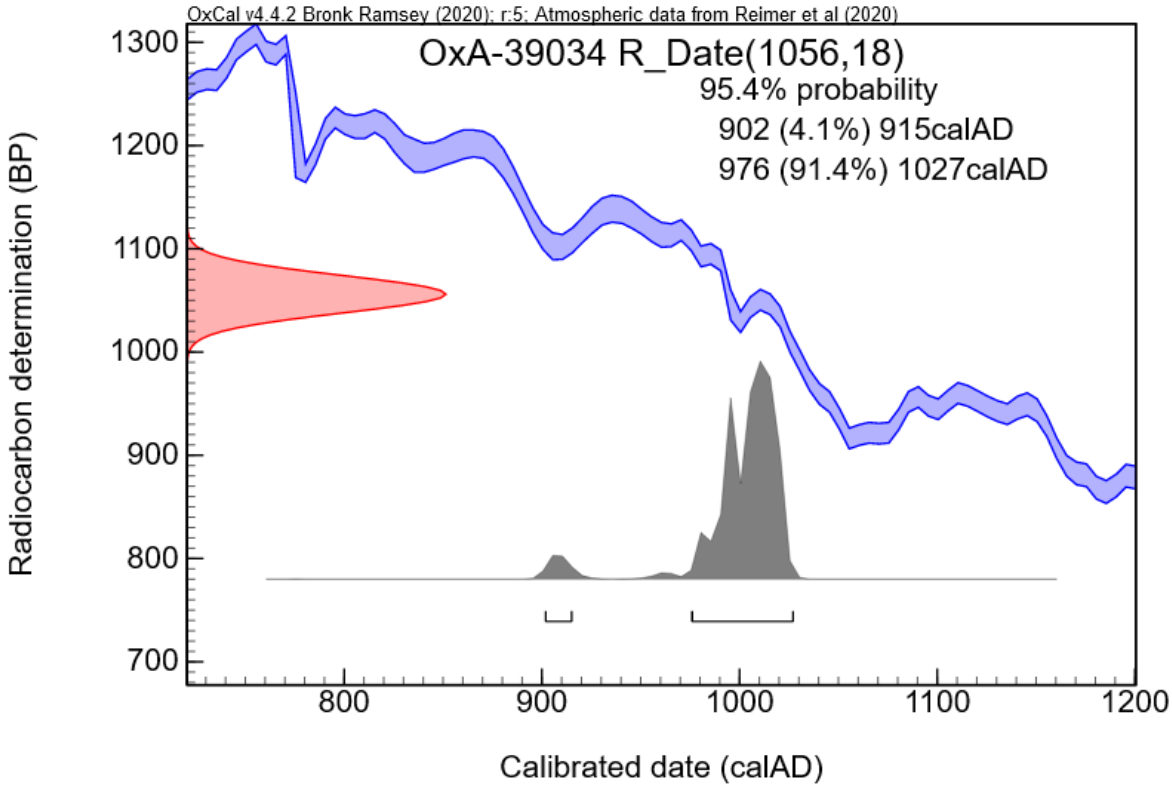





OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
OxA-39031 R_Date(1047,18)
95.4% probability
980 (95.4%) 1029calAD
Radiocarbon determination (BP)
1300
1200
1100
1000
900
800
700
800
900
1000
1100
1200
Calibrated date (calAD)


OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
OxA-39032 R_Date(927,18)
95.4% probability
1039 (95.4%) 1165calAD
Radiocarbon determination (BP)
1100
1000
900
800
1000
1050
1100
1150
1200
1250
Calibrated date (calAD)


OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
OxA-39033 R_Date(1026,18)
95.4% probability
992 (95.4%) 1030calAD
Radiocarbon determination (BP)
Calibrated date (calAD)
1300
1200
1100
1000
900
800
700
800
900
1000
1100
1200


OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
OxA-39034 R_Date(1056,18)
95.4% probability
902 (4.1%) 915calAD
976 (91.4%) 1027calAD
Radiocarbon determination (BP)
Calibrated date (calAD)
1300
1200
1100
1000
900
800
700
800
900
1000
1100
1200