Radiocarbon dating archaeobotanical remains from Eckweek

Mark McKerracher

Between 1988 and 1989, excavations were undertaken in advance of development at farmland on Eckweek Lane, Peasedown St John (near Bath), under the auspices of Avon County Council (Young 2020). The excavations sought to investigate the remains of a medieval rural settlement indicated above ground by extant earthworks. A stratified occupation sequence was discovered, spanning the late tenth to late fourteenth centuries: from Late Saxon timber dwellings to a later medieval farmhouse which was eventually deserted. The Late Saxon to medieval chronology rested in large part upon a series of ceramic phases defined as follows (Young 2020, 132):

- CP1: *c.* AD 950–1000
- CP2: *c.* AD 1000–1050
- CP3: *c.* AD 1050–1100
- CP4: *c.* AD 1100–1250
- CP5: *c.* AD 1250–1300
- CP6: *c.* AD 1300–1400
- CP7: *c.* AD 1400–1500

Good preservation and extensive environmental sampling produced a rich assemblage of charred plant remains at this site (Carruthers 1995; 2020). The abundance and chronological spread of the environmental samples drew the attention of the Feeding Anglo-Saxon England project (FeedSax), which sought to apply crop stable isotope and functional weed ecological analyses to charred plant remains from Anglo-Saxon and medieval deposits as a means of investigating developments in arable farming. Since the aims of FeedSax hinged on the discernment of diachronic changes, accurate and direct dating of the environmental samples was considered essential.

FeedSax therefore submitted charred grains from eight samples, representing ceramic phases 2–5, to the Oxford Radiocarbon Accelerator Unit for radiocarbon dating. The archaeobotanical remains had originally been analysed by Wendy Carruthers, who kindly provided advice and additional information about the assemblage (Carruthers 1995; 2020). The cereal grains to be radiocarbon-dated – all identifiable as free-threshing wheat (*Triticum* L. free-threshing type) – were selected from the archive and photographed at the University of Oxford by the author; the photographs are included in the project's photographic archive (McKerracher *et al.* in prep.).

The new radiocarbon determinations, along with those from the original post-excavation programme, have been calibrated using IntCal20 (Reimer *et al.* 2020) and OxCal 4.4.2 (Bronk Ramsey 2009) as shown in the tables below and figures at the end of this report.

Results

Assembled below are the 14 radiocarbon dates now obtained from Eckweek's charred plant remains: five from the original project (Young 2010, 237–238), and nine from FeedSax, as detailed in the following tables. Two samples, 2539 and 2511, have now been dated both by the original project and by FeedSax; technological advances over the intervening three decades mean that the FeedSax dates can now offer greater chronological precision for these contexts.

FeedSax radiocarbon dates

sample	grains	laboratory no.	original phase	age BP	calibrated dates AD (confidence)
2544	3 x wheat	OxA-38510	CP2: 1000–1050	928±20	1037–1166 (95.4%)
2525	3 x wheat	OxA-39039	CP3: 1050–1100	947±18	1061–1158 (80.5%)
2545	3 x wheat	OxA-39044	CP3: 1050–1100	935±18	1039–1160 (95.4%)
2539	3 x wheat	OxA-39038	CP3/4: 1050–1100	926±18	1039–1165 (95.4%)
2511	3 x wheat	OxA-39042 OxA-39043	CP4: 1100–1250	855±18 874±18	1161–1228 (94.9%) 1157–1222 (95.4%)
2520	3 x wheat	OxA-39040	CP4: 1100–1250	965±18	1077–1156 (72.2%)
2518	3 x wheat	OxA-39041	CP5: 1250–1300	948±18	1061–1158 (80.1%)
2550	3 x wheat	OxA-38511	CP5: 1250–1300	862±20	1157–1227 (95.4%)

Original radiocarbon dates

sample	material	laboratory no.	ceramic phase	age BP	calibrated dates AD (confidence)
2537	various charred plant remains	UB-3203	CP4: 1100–1250	1019±58	892–1162 (95.4%)
2539	various charred plant remains	UB-3204	CP3/4: 1050–1100	891±42	1035–1227 (95.4%)
2539	various charred plant remains	UB-3205	CP3/4: 1050–1100	962±53	993–1180 (91.9%)
2511	various charred plant remains	UB-3206	CP4: 1100–1250	830±41	1156–1278 (93.3%)
2523	various charred plant remains	UB-3298	CP4: 1100–1250	990±64	956–1213 (92.6%)

The published chronology relies not only upon ceramic seriation and radiocarbon dates but also upon stratigraphy. Stratigraphic relationships between the contexts discussed here are not readily discernible from the publication, however, so this report considers only the relationships between ceramic phases and radiocarbon dates.

Sample 2544 has returned a date range rather later than might be expected, given its *c.* 1000–1050 ceramic phase: cal. AD 1037–1166 (with 95.4% confidence), although this does overlap with the later part of the ceramic phase. The two samples assigned to the subsequent ceramic phase (*c.* 1050–1100) have returned radiocarbon dates compatible with this phasing, or possibly later, into the first half of the twelfth century. The same is true of sample 2539, whose new calibrated date range is much tighter than those originally obtained, and allows that this sample may belong to phase CP3 or the earlier part of CP4. The new calibrated date ranges of two further samples, 2520 (original CP4) and 2518 (original CP5), are very similar to those of the CP3 samples. Sample 2518 is therefore definitely earlier than its original *c.* 1250–1300 phasing, instead belonging to CP3 or CP4.

Sample 2511 was originally assigned to CP4 (*c.* 1100–1250), but the new calibrated date ranges, along with the original radiocarbon date, indicate that it is unlikely to date from any earlier than 1150s or any later than the 1220s. The same is true of sample 2550, originally assigned to CP5 (*c.* 1250–1300) but now returning a date range of cal. AD 1157–1227 (with 95.4% confidence).

The set of new radiocarbon dates therefore prompt some revisions to the original phasing of these samples, and also suggest a modification to the definitions of ceramic phases 3–5, as follows (with the prefix NP to indicate ‘new phase’):

- NP3: 1050–1150
- NP4: 1150–1225
- NP5: 1225–1300

It remains possible that sample 2544 belongs to CP2, as proposed by the excavator, but the new radiocarbon date suggests that is more likely to belong to NP3.

Finally, it should be noted that the revisions suggested in this report do not undermine or substantially modify the overall site chronology outlined by the excavator (Young 2020, 53), neither do they necessitate any revisions to the phasing of other environmental samples which have not been radiocarbon-dated.

Acknowledgements

I would like to thank Susan Fox for facilitating access to the excavation archive and permitting these analyses; and Andrew Young and Wendy Carruthers for providing helpful advice and information about the assemblage.

References

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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*.

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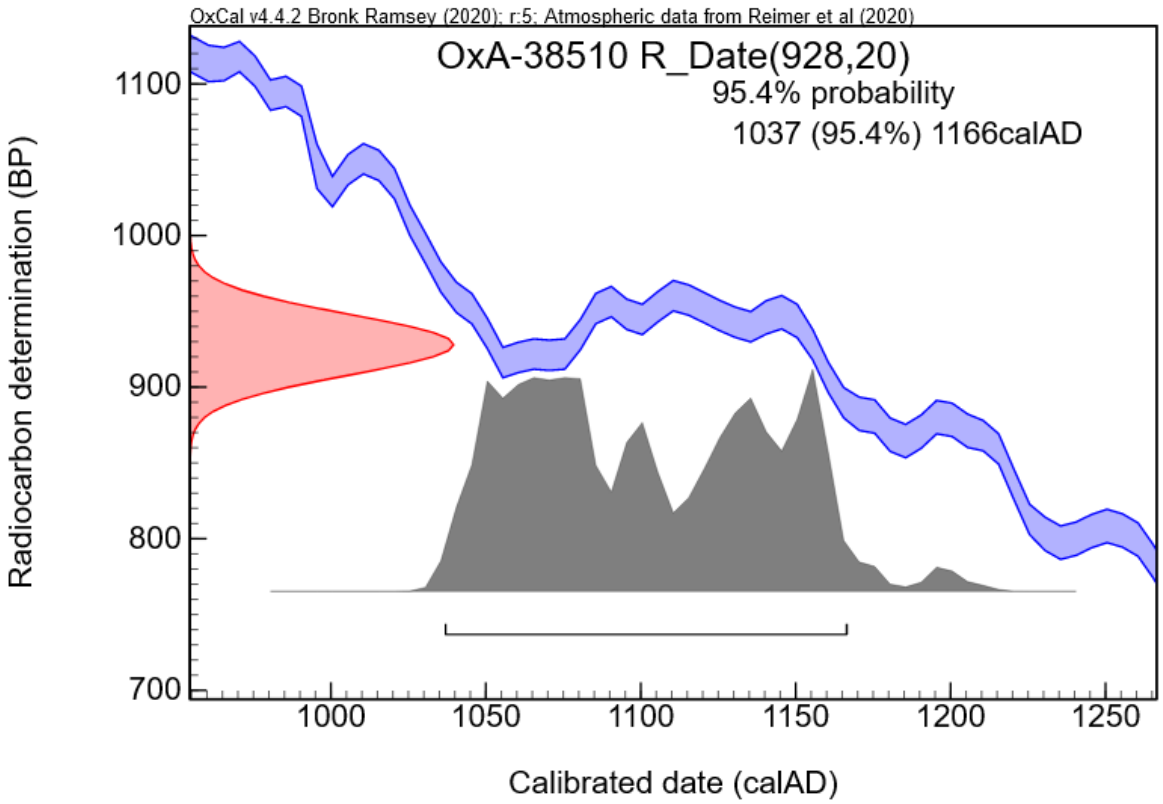
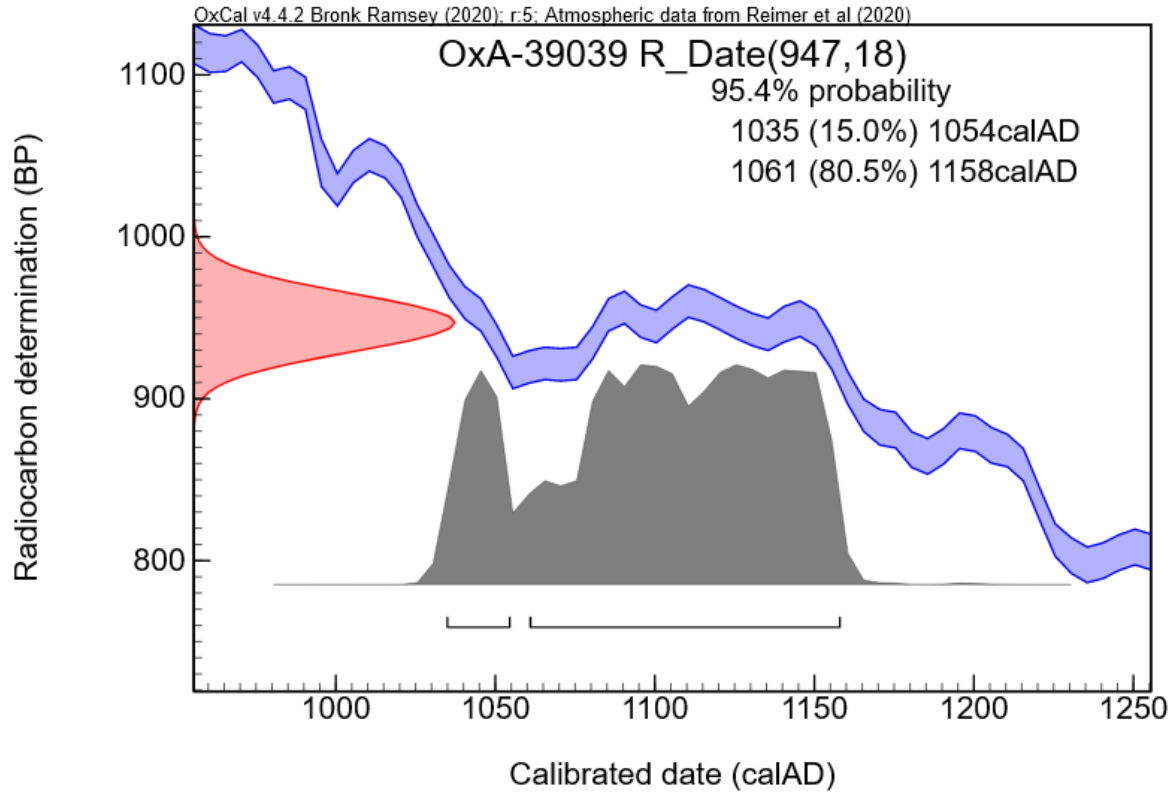
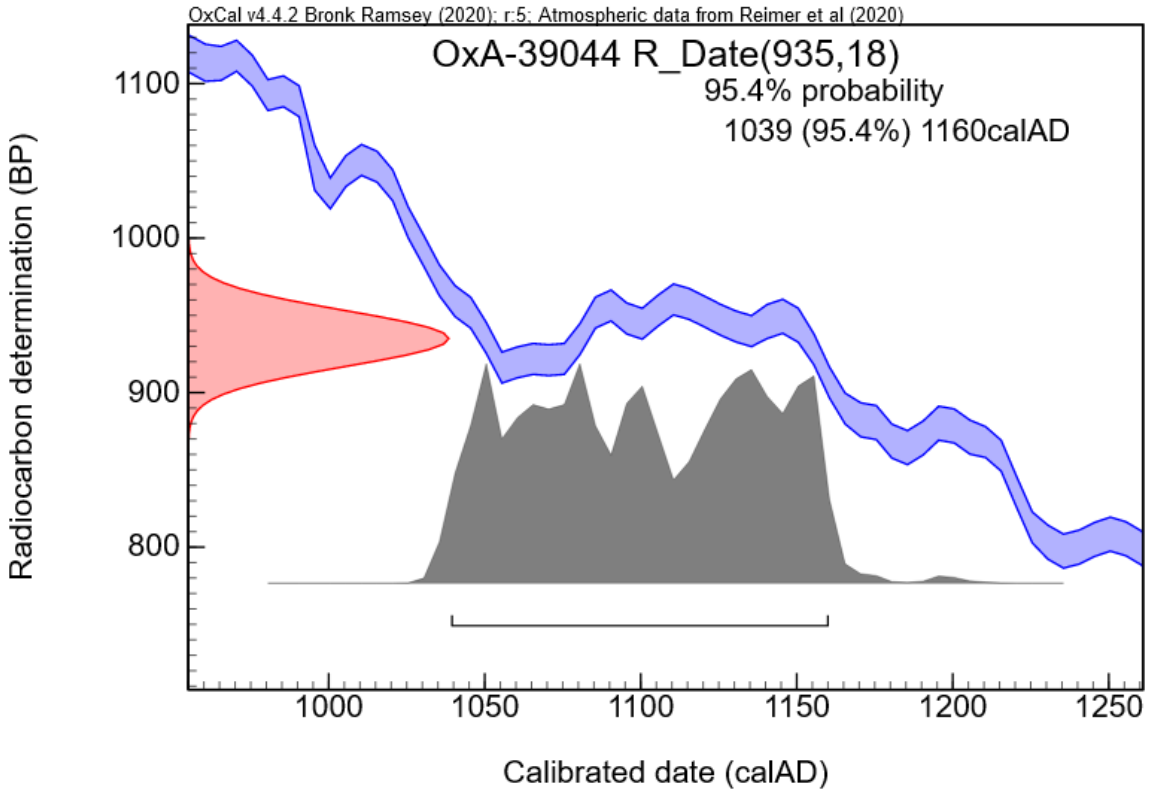
Young, A. (2020). *Eckweek, Peasedown St John, Somerset. Survey and Excavations at a Shrunken Medieval Hamlet 1988-90*. The Society for Medieval Archaeology Monograph 40 (Abingdon: Routledge).

Calibration of radiocarbon determinations



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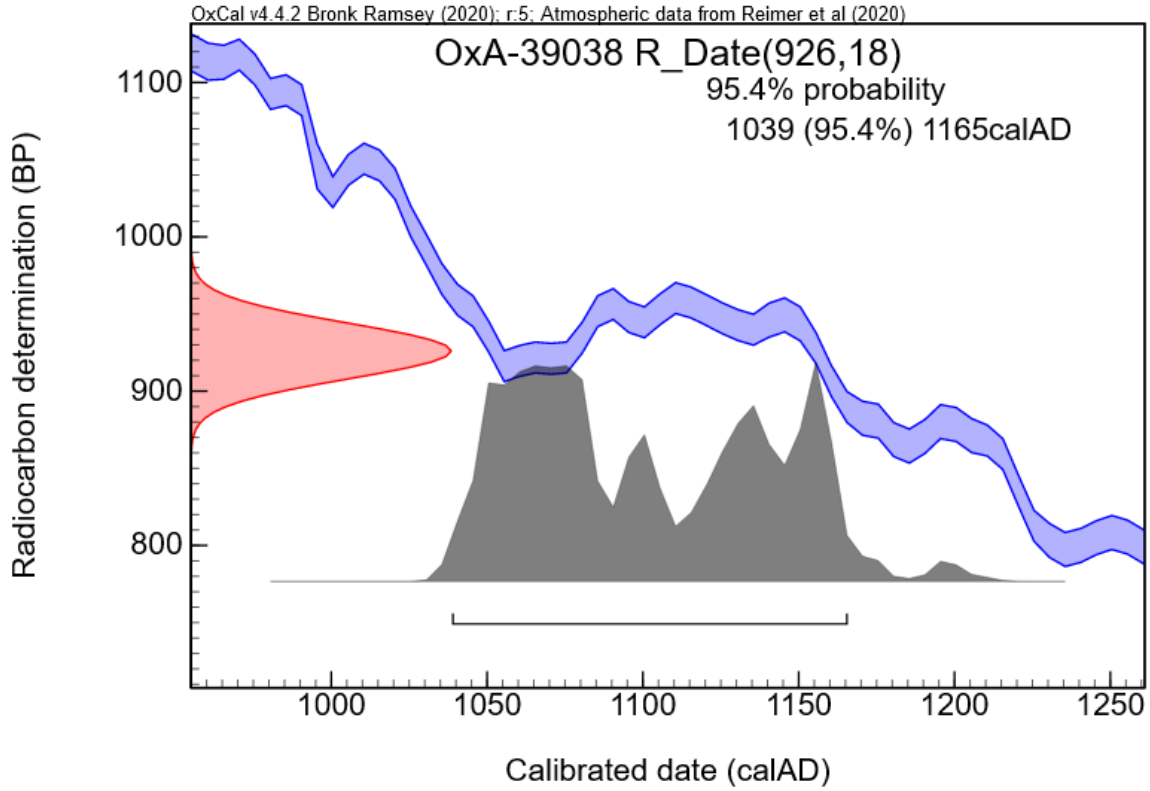
OxA-39044 R_Date(935,18)
95.4% probability
1039 (95.4%) 1160calAD
Radiocarbon determination (BP)
1100
1000
900
800
1000
1050
1100
1150
1200
1250
Calibrated date (calAD)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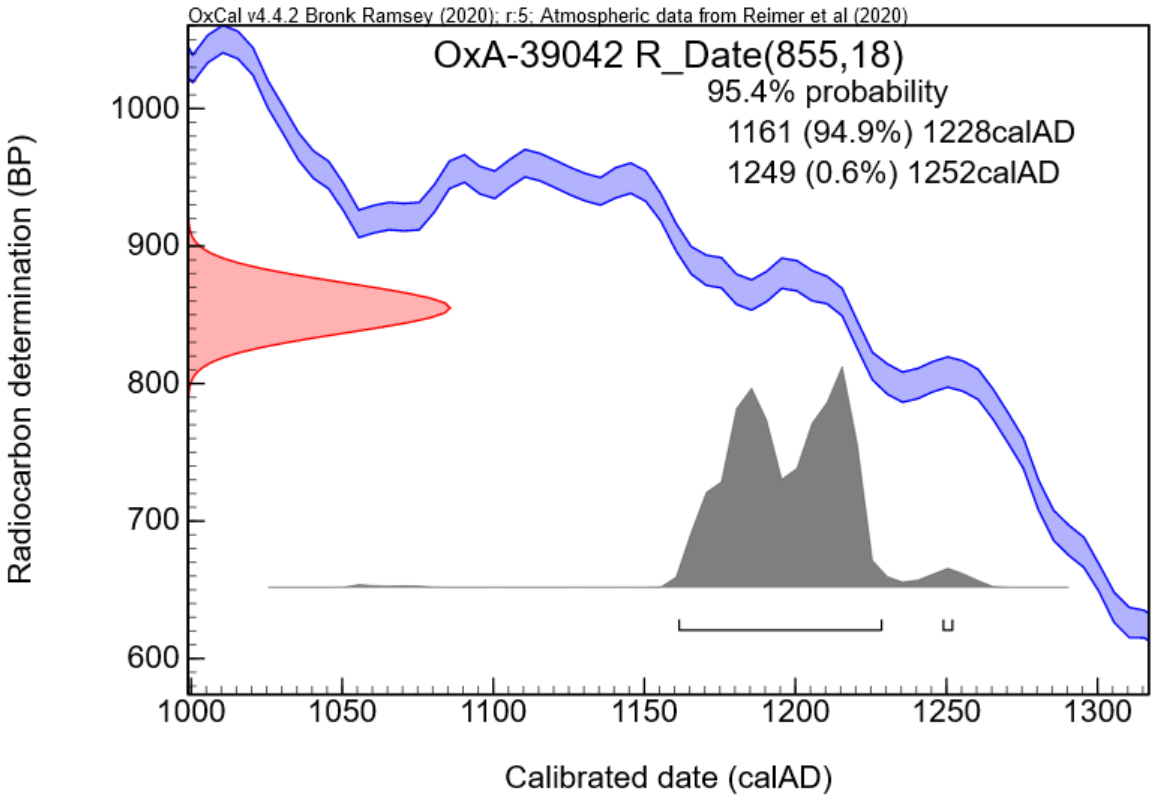
95.4% probability
1039 (95.4%) 1165calAD
Radiocarbon determination (BP)
1100
1000
900
800
1000
1050
1100
1150
1200
1250
Calibrated date (calAD)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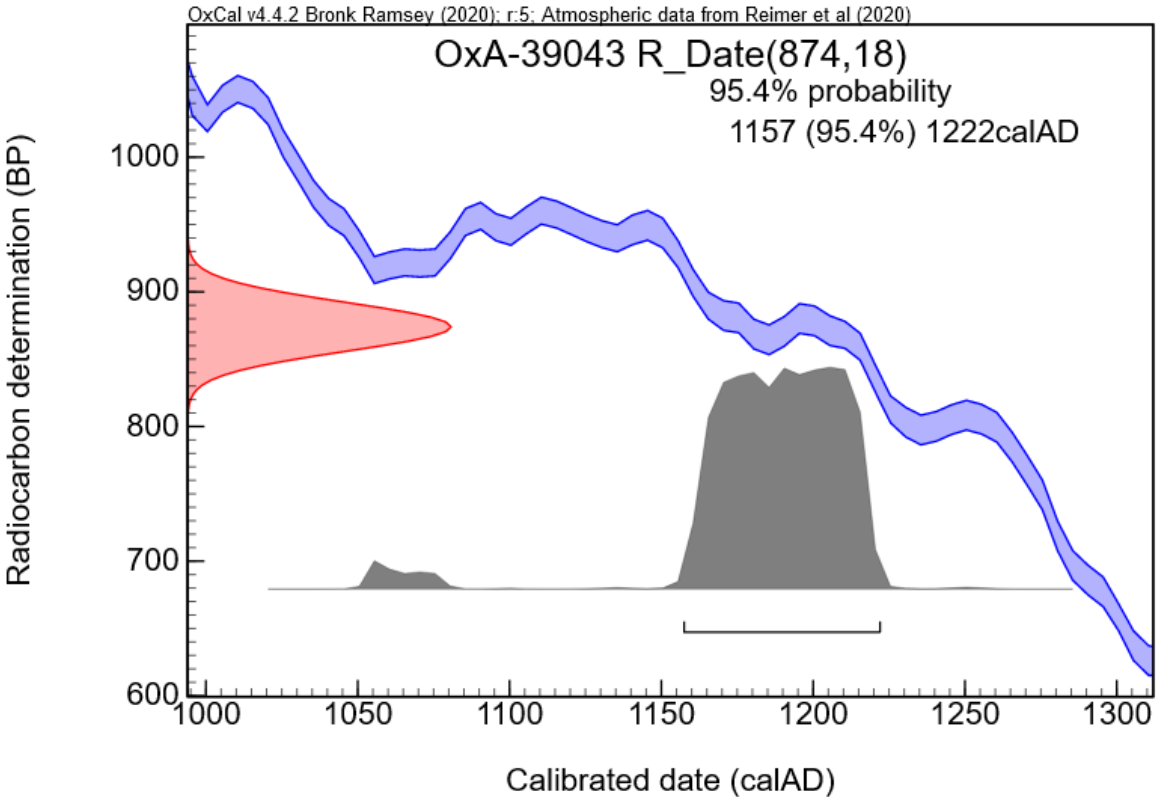
OxA-39042 R_Date(855,18)
95.4% probability
1161 (94.9%) 1228calAD
1249 (0.6%) 1252calAD
Radiocarbon determination (BP)
1000
900
800
700
600
1000
1050
1100
1150
1200
1250
1300
Calibrated date (calAD)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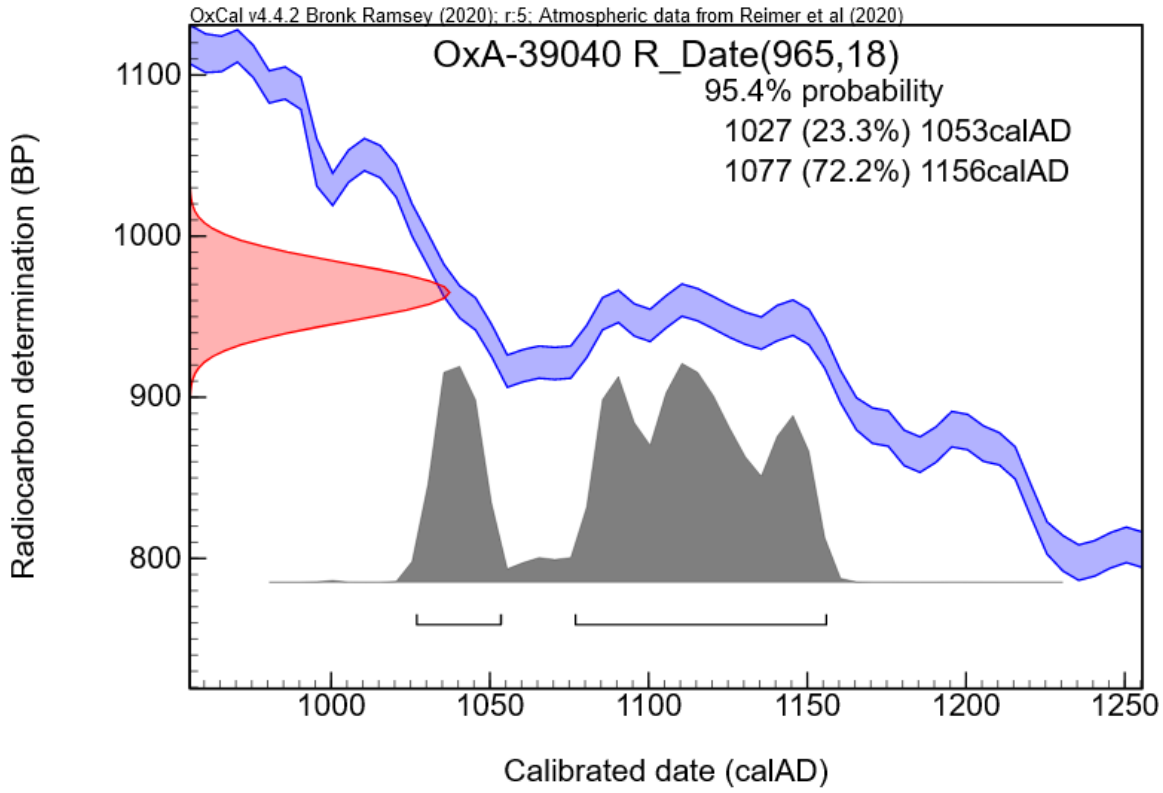
OxA-39043 R_Date(874,18)
95.4% probability
1157 (95.4%) 1222calAD
Radiocarbon determination (BP)
1000
900
800
700
600
1000
1050
1100
1150
1200
1250
1300
Calibrated date (calAD)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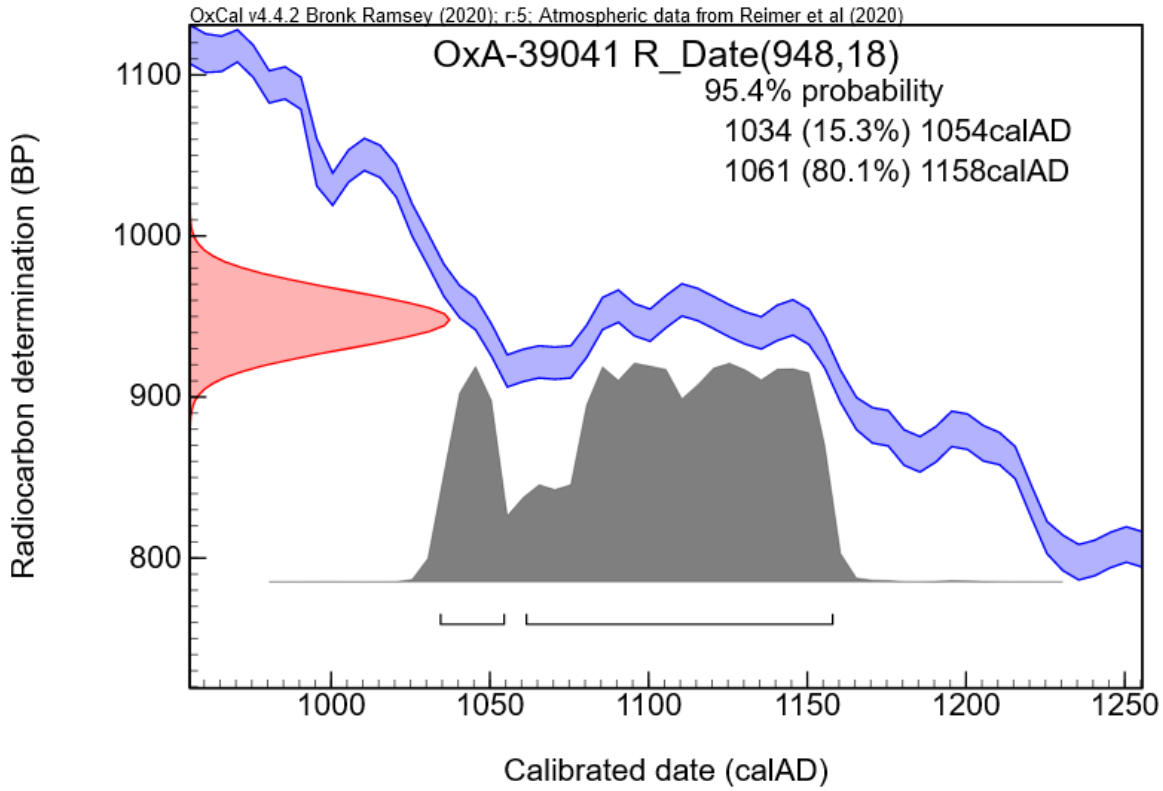
95.4% probability
1027 (23.3%) 1053calAD
1077 (72.2%) 1156calAD
Radiocarbon determination (BP)
1100
1000
900
800
1000
1050
1100
1150
1200
1250
Calibrated date (calAD)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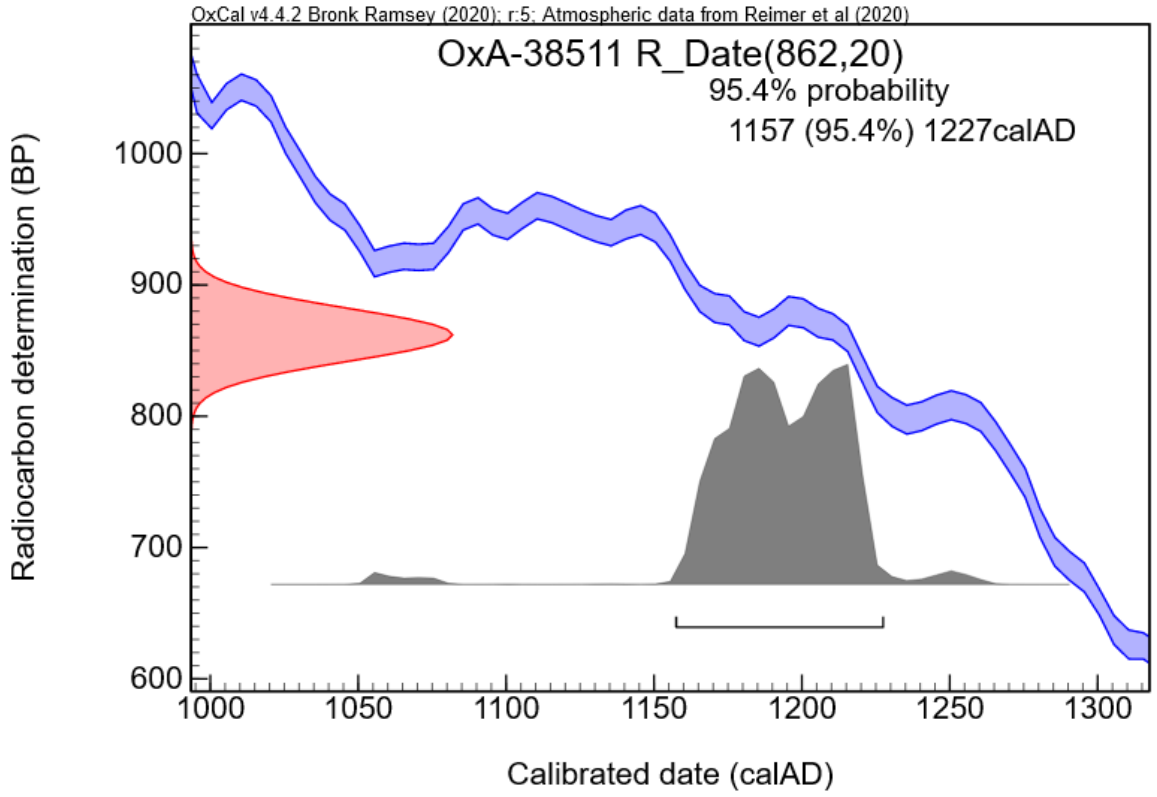
95.4% probability
1034 (15.3%) 1054calAD
1061 (80.1%) 1158calAD
Radiocarbon determination (BP)
1100
1000
900
800
1000
1050
1100
1150
1200
1250
Calibrated date (calAD)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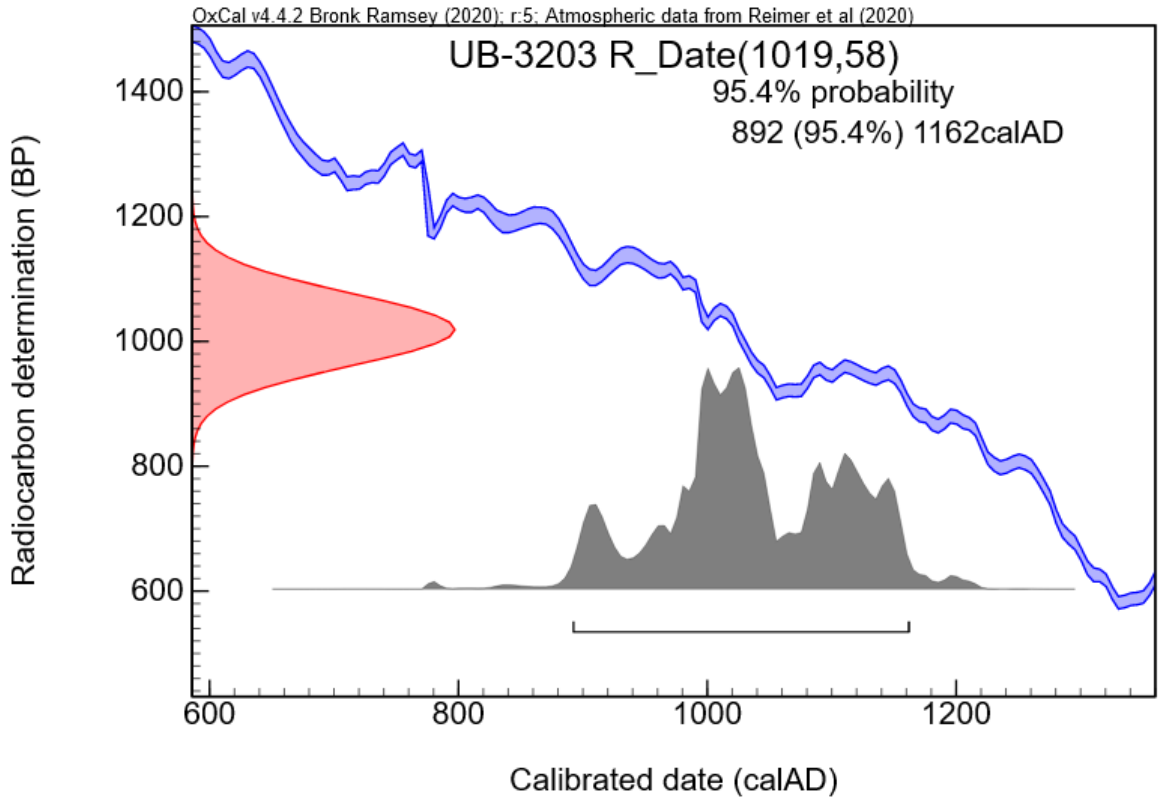
OxA-38511 R_Date(862,20)
95.4% probability
1157 (95.4%) 1227calAD
Radiocarbon determination (BP)
1000
900
800
700
600
1000
1050
1100
1150
1200
1250
1300
Calibrated date (calAD)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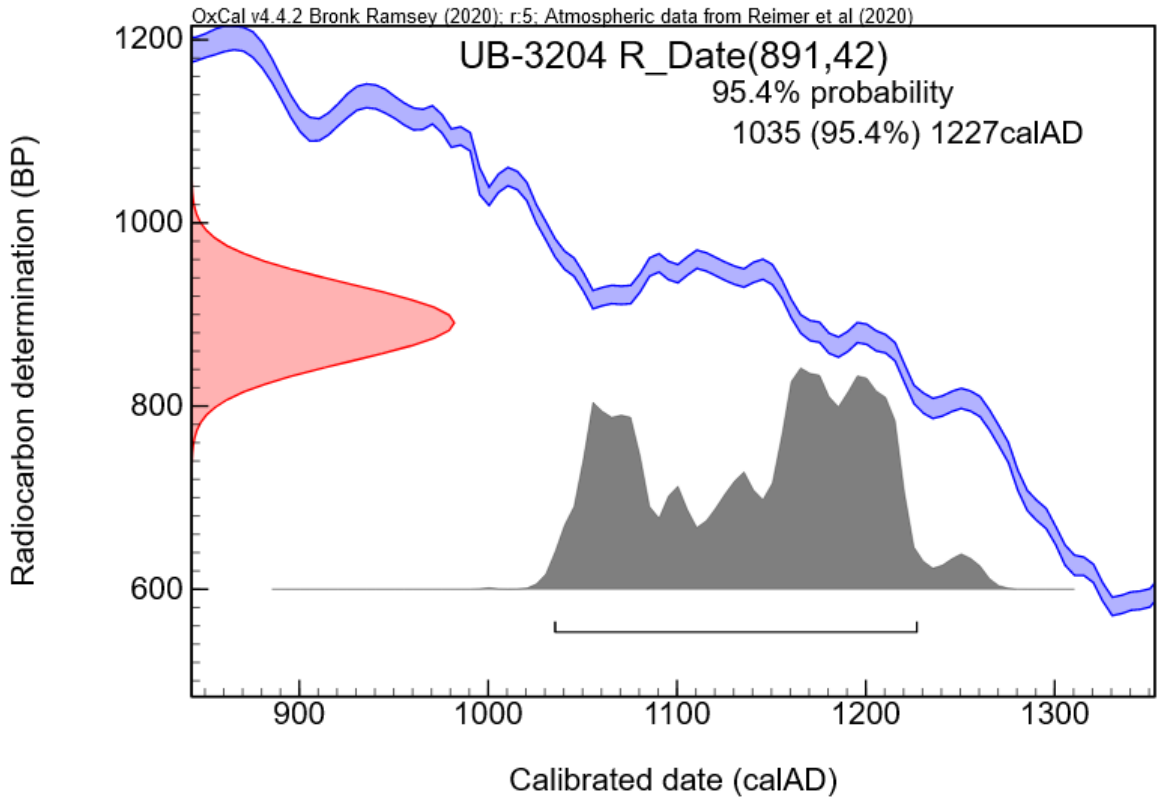
UB-3203 R_Date(1019,58)
95.4% probability
892 (95.4%) 1162calAD
Radiocarbon determination (BP)
1400
1200
1000
800
600
600
800
1000
1200
Calibrated date (calAD)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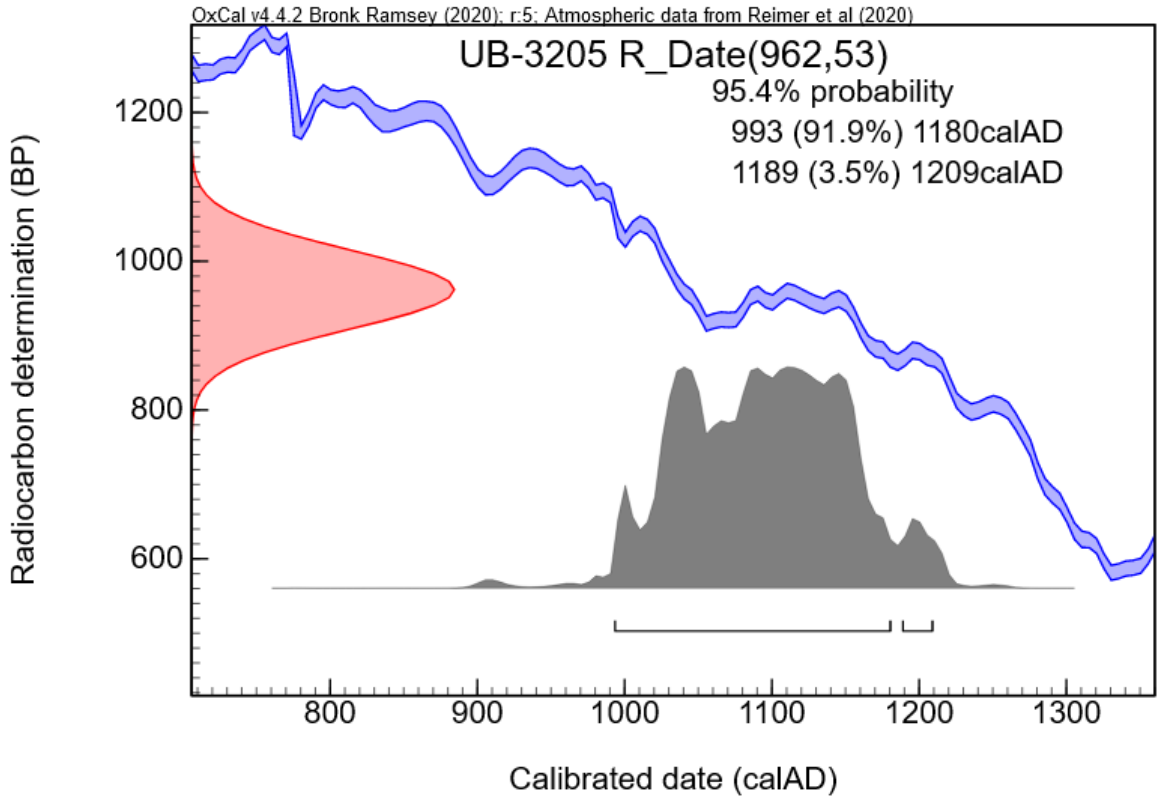
UB-3204 R_Date(891,42)
95.4% probability
1035 (95.4%) 1227calAD
Radiocarbon determination (BP)
1200
1000
800
600
900
1000
1100
1200
1300
Calibrated date (calAD)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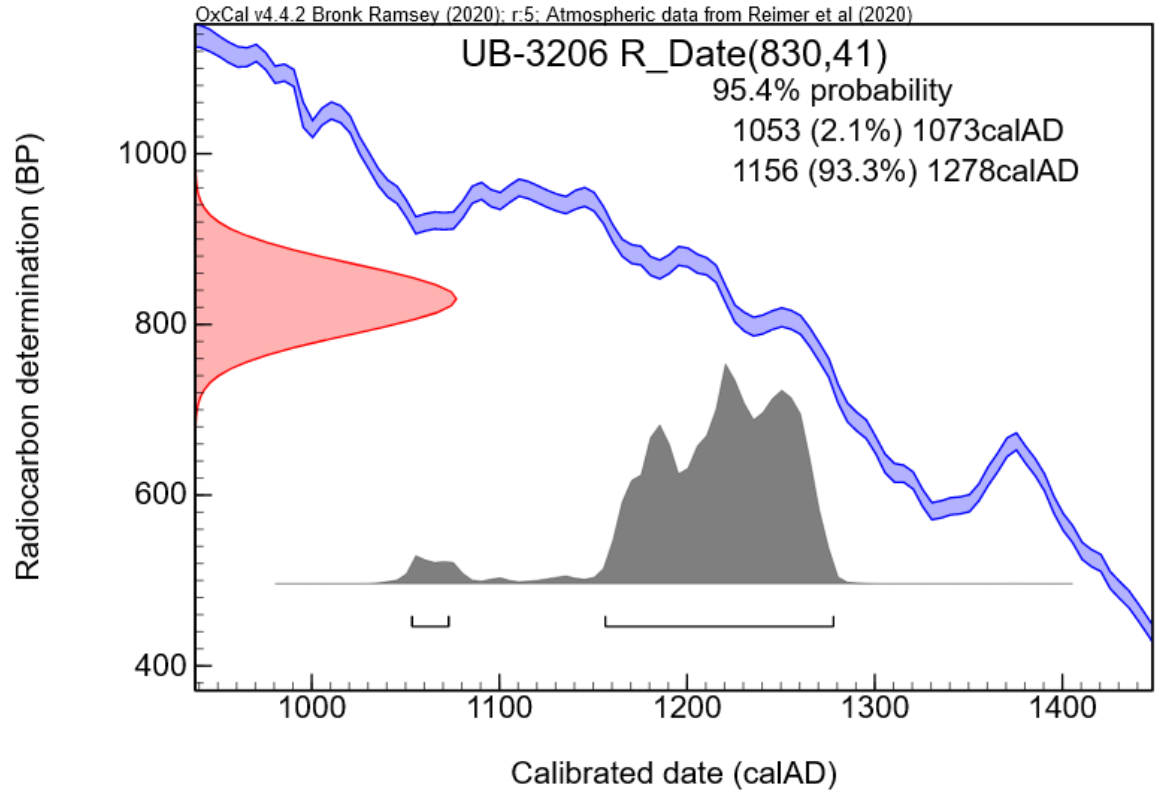
UB-3205 R_Date(962,53)
95.4% probability
993 (91.9%) 1180calAD
1189 (3.5%) 1209calAD
Radiocarbon determination (BP)
1200
1000
800
600
800
900
1000
1100
1200
1300
Calibrated date (calAD)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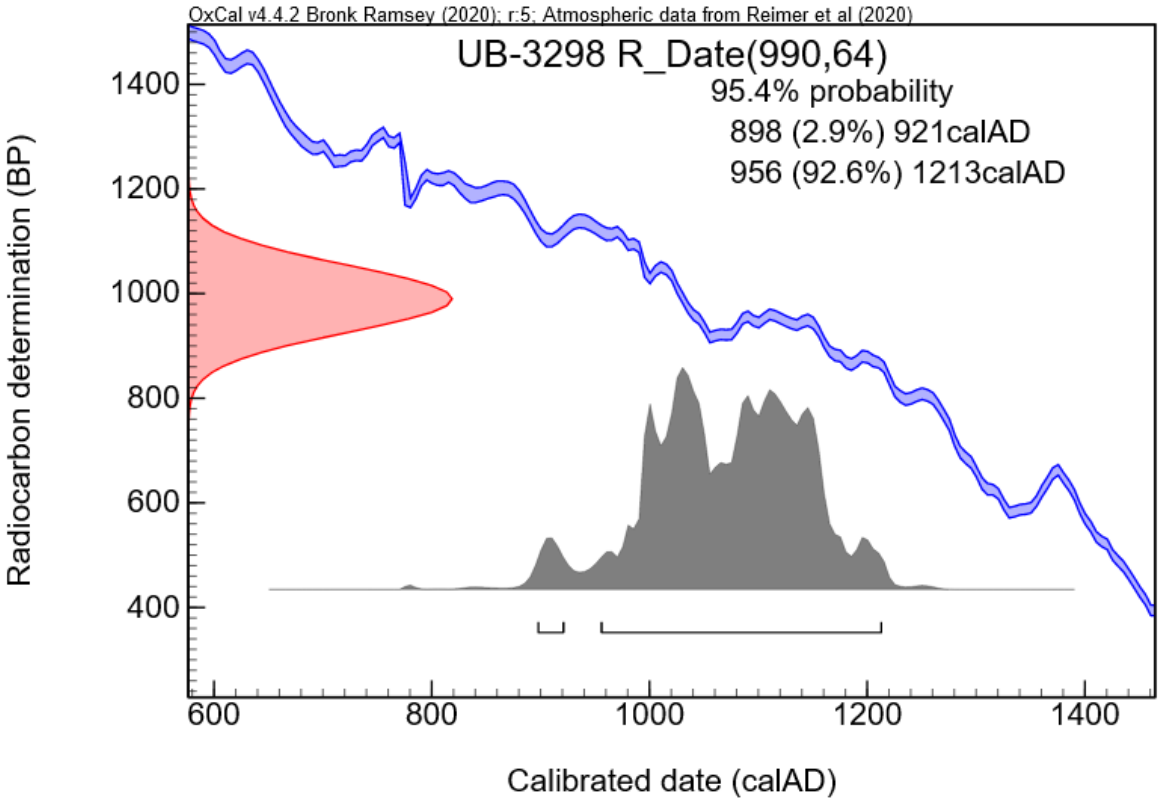
UB-3206 R_Date(830,41)
95.4% probability
1053 (2.1%) 1073calAD
1156 (93.3%) 1278calAD
Radiocarbon determination (BP)
1000
800
600
400
1000
1100
1200
1300
1400
Calibrated date (calAD)


OxCal v4.4.2 Bronk Ramsey (2020); r:5; Atmospheric data from Reimer et al (2020)
UB-3298 R_Date(990,64)
95.4% probability
898 (2.9%) 921calAD
956 (92.6%) 1213calAD
Radiocarbon determination (BP)
1400
1200
1000
800
600
400
600
800
1000
1200
1400
Calibrated date (calAD)