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Ancient Monuments Laboratory
Report 94/89

TREE-RING ANALYSIS OF BRONZE AGE WOOD FROM THE HULLBRIDGE SURVEY, ESSEX.

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Summary

The examination of twelve oak samples from context 68 is described. All were small pieces of wood from the outside of larger tree trunks and usually containing less than 50 annual rings. No relative or absolute dating was achieved.

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Tree-ring analysis of Bronze Age wood from the Hullbridge Survey, Essex:

River Crouch Site 29

Introduction and methods

Twelve oak samples were collected by Peter Murphy from context 68 of the River Crouch Site 29. The wood was part of a Bronze Age structure which had been dated by radiocarbon to 3250±90bp (Murphy pers comm). Although the samples were small, it was hoped that some of them would contain sufficient rings for dating purposes.

At present there are few dated chronologies for the prehistoric period from the British Isles (Hillam 1987). Prehistoric tree-ring samples therefore are being examined in the hope of building up chronologies which can eventually be dated by comparison with long chronologies from Ireland and Germany (eg Brown *et al* 1986).

The samples were prepared and measured following the method described by Hillam (1985). The ring widths of any sample with more than 20 rings were measured. Generally only samples with more than 50 rings are measured but there are exceptions (Hillam *et al* 1987). In this study, some or all of the samples could have come from the same tree and therefore it might be possible to match the short ring patterns relative to each other.

The widths were plotted as graphs to facilitate visual comparison between the ring sequences. A computer program (Baillie & Pilcher 1973) was used to compare sequences of more than 50 rings with dated references chronologies from England (Hillam unpubl), Ireland (Brown *et al* 1986) and Germany (Becker pers comm). The sequences were also compared with undated Bronze Age chronologies from England.

Results

Although the samples were small, the annual rings were relatively narrow and the samples had 21-60 growth rings. The only exception was 13 which had 6 rings and was rejected. The orientation of the rings (Table 1) indicated that the pieces of wood came from larger tree trunks. None of the samples had sapwood.

No matching was found between any of the ring sequences. If any of the samples did come from the same tree, the ring patterns either did not overlap or the sequences were too short to detect any similarities.

Three samples (8, 10, 15) had more than 50 rings (Table 2). These were tested against all the available tree-ring data of Bronze Age date, but no relative or absolute dating was obtained.

Conclusion

Lack of absolute dating is not really surprising since samples with 50-60 rings are difficult to date from the historic period where there are many dated reference chronologies (Hillam *et al* 1987; Mills 1988). If excavations from other Bronze Age sites in Essex produce site chronologies, it may eventually be possible to date the three samples with more than 50 rings.

Acknowledgements

The Sheffield Dendrochronology Laboratory is funded by HBMC(E).

References

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Brown DM, Munro MAR, Baillie MGL & Pilcher JR 1986 Dendrochronology - the absolute Irish standard. *Radiocarbon* 28 (2A), 279-83.

Hillam J 1987 Dendrochronology - 20 years on. *Current Archaeology* 9(12), 358-63.

Hillam J, Morgan RA & Tyers I 1987 Sapwood estimates and the dating of short ring sequences. In RGW Ward (ed), *Applications of tree-ring studies: current research in dendrochronology and related areas*, BAR S333, 165-85.

Mills CM 1988 *Dendrochronology of Exeter and its application.*

Table 1: Details of the tree-ring samples. sketches are not to scale.

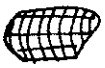
sample	number of rings	average ring width (mm)	sketch	dimensions (mm)
2	25	1.86		50 x 35
3	35	1.76		65 x 45
5	21	2.58		55 x 30
6	28	2.34		65 x 50
7	26	2.02		55 x 40
8	60	1.18		70 x 55
10	55	1.00		55 x 50
11	25	1.24		40 x 35
12	38	1.10		45 x 20
13	6	-		35 x 25
14	30	1.71		55 x 40
15	54	1.47		100 x 20

Table 2: Ring width data of samples with more than 50 rings.

Sample 8

years	ring widths (0.02mm)									
1	87	73	64	64	49	68	102	88	110	91
11	72	71	67	66	54	29	44	48	45	60
21	85	67	60	53	52	67	110	69	52	69
31	64	68	61	38	41	48	75	65	49	53
41	56	45	58	50	60	37	31	43	54	49
51	33	58	45	34	43	53	62	38	45	42

Sample 10

years	ring widths (0.02mm)									
1	87	92	76	68	65	94	55	42	53	65
11	75	49	59	45	54	65	54	45	32	44
21	47	30	42	38	31	54	34	29	37	38
31	43	34	28	30	43	36	33	52	29	48
41	44	61	62	48	82	48	39	42	39	53
51	53	69	51	44	52					

Sample 15

years	ring widths (0.02mm)									
1	124	97	130	102	63	125	105	98	137	33
11	92	49	73	87	82	51	72	120	86	112
21	47	103	71	78	67	89	110	69	43	55
31	59	68	57	60	49	108	52	74	42	58
41	27	44	38	43	77	51	102	38	51	79
51	68	58	40	48						

Lofts Farm, Heybridge, Essex (LEP840)

Dendrochronology samples

Details of samples:

sample	no of rings	sapwood rings	average ring width (mm)	dimensions (mm)	comments
2	35	17	1.72	130x115	felled winter; unsuitable for dating
1005	88	-	1.11	-	sample fragmented; no dating as yet

sample 1005, ring width data:

(made up from the ring sequences of three fragments)

years	ring widths (0.02mm)								
1	64	72	52	38	42	48	44	46	55	79
11	71	77	52	64	64	54	60	72	78	66
21	37	50	65	76	72	66	58	49	29	80
31	68	58	54	93	65	50	46	68	41	51
41	60	61	66	53	56	58	30	39	43	62
51	54	39	44	64	44	62	38	60	90	68
61	80	97	63	52	46	26	34	48	58	50
71	45	45	61	62	54	47	68	48	32	62
81	51	48	29	36	64	57	35	36		

Norwich, Fishergate (732N)

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ring width data:

years	ring widths (0.02mm)									
1	61	29	45	73	82	69	131	63	118	109
11	162	135	181	367	476	281	198	304	201	197
21	313	310	290	245	150	223	185	130	51	66
31	191	179	87	55	88	116	96	191	231	149
41	101	101	81	73	71	65	85	52	58	76
51	40	32	40	39	41	28	33	32	53	66
61	87	60	56	53	43	55	28	60	46	42
71	27	21	18	30	24	23	14	26	22	19
81	18	18	27	31	38	31	21	14	14	20
91	22	18	27	18	25	15	30			

details of sample:

number of rings	97, including 50 sapwood rings
average ring width	1.84mm
felled	winter/early spring
cross-section dimensions	350x260mm
sample	very knotty and asymmetrical

sketch: