ANCIENT MONUMENTS LABORATORY

REPORT

3003

SERIES/No	CONTRACTOR
AUTHOR	Jennifer Hillam Nov 1979
TITLE	Tree-ring anlaysis of fen oaks from the Bronze Age settlement at West West Fen, Mildenhall Suffolk

AHk Rpt 3008

1207

Tree-ring analysis of fen oaks from the Bronze Age settlement at West Row Fen, Mildenhall, Suffolk.

by Jennifer Hillam, November 1979

Three unworked fen oaks (Quercus sp.), associated with the Bronze Age settlement at West Row Fen, were examined at the DoE dendrochronology laboratory in Sheffield. Details of the timbers are given in Table 1. Sample 0480 had only 27 annual rings and was rejected, the minimum number of rings required for dendrochronology being 50. When the cross-sectional surface of 0481 was cleaned with a surform plane, many narrow tree-rings were visible. However, the sequence was broken by two bands of very narrow rings (each ring was less than 0.3mm in width). These were not measured since the individual rings could not be resolved into their separate entities; hence a continuous ring sequence of sufficient length was not extracted. This is unfortunate as 0481 had been dated by radiocarbon analysis (Table 2). Similar bands of narrow rings are a feature of many Irish bog oaks which presumably grew under similar conditions; the exact reason for their existence is not known.

0499 also contained narrow rings but each one was easily distinguishable under a low power binocular microscope. The outer zone of sapwood was present up to the bark edge, making it possible to determine in which season the tree died or was felled. As the last ring was complete, the tree must have ended its life in winter when it was 119 years of age (Table 1).

The widths of the rings were measured and plotted as a graph to reflect the changing pattern of wide and narrow rings upon which dendrochronology is dependent. This pattern was then

compared with other tree-ring chronologies of the same period. Three radiocarbon dates for the site had already been produced at Harwell; these are set out in Table 2. Allowing for an error of two standard deviations on each result, there is a date range of 3790-3230 bp. Only three chronologies cover this period: a bog oak curve from the north of Ireland (Pilcher et al, 1977) and two sequences obtained from the analysis of the North Ferriby boats which were found in South Humberside (Hillam, forthcoming). These chronologies are floating in time since, in the British Isles, no absolutely-dated curve exists that is older than AD 700. The use of a computer program designed for tree-ring analysis (Baillie & Pilcher, 1973) indicated no similarities between the 0499 curve and those from Ireland and Humberside. Thus, at present, it is not possible to date the Suffolk fen oak more accurately by dendrochronology. The ring sequence is now being stored for future use in the dendrochronology program at Sheffield; the ring widths are given in Table 3.

References:

Baillie M.G.L. and Pilcher J.R. 1973, A simple crossdating program for tree-ring research. Tree Ring Bulletin 33, 7-14.

Hillam J. (forthcoming), Dendrochronology of the North Ferriby boats.

Pilcher J.R., Hillam J., Baillie M.G.L. and Pearson G.W. 1977, A long sub-fossil oak tree-ring chronology from the North of Ireland. New Phytologist 79(3), 713-29.

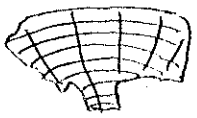
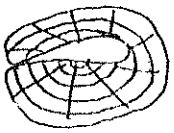
No.	No.of rings	Sapwood rings	Average width(mm)	Sketch	Dimensions (cm)
0480	27	-	c2.5		7 x 21
0481	100-200	-	c0.7		radius 10-11
0499	119	30 felled winter	0.72		radius 7.5-9.5

Table 1: Details of the West Row Fen fen oaks; sketches are not drawn to scale.

Material dated	Radiocarbon date	Harwell number
Mixed twigs	3410 ± 90 bp	HAR-2517
Oak timber, no.0481	3590 ± 90 bp	HAR-2510
Ash timber	3610 ± 90 bp	HAR-2516

Table 2: Radiocarbon dates with ±90 representing a 1 sigma error; taking two standard deviations, there is a potential date range for the site of 3790-3230 bp (see text).

Year	Ring width									
	0	1	2	3	4	5	6	7	8	9
0		12	5	6	8	5	8	6	7	9
10	6	3	6	4	3	4	4	6	9	5
20	3	3	7	5	6	5	3	3	4	3
30	4	5	5	4	6	4	5	7	8	9
40	7	6	10	10	7	9	10	7	6	9
50	5	4	5	5	5	8	7	8	6	5
60	7	12	12	7	8	9	7	5	11	11
70	4	7	6	7	5	8	12	11	8	4
80	6	7	5	4	6	5	8	5	5	6
90	4	3	6	4	5	5	7	6	7	7
100	7	7	5	7	9	12	11	10	13	10
110	9	8	4	6	6	6	18	24	29	31

Table 3: Ring widths (0.1mm) of 0499. The sequence runs from pith to bark edge, indicating that the tree was 119 years old when it died.