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Tree-ring studies in the Somerset Levels; Meare Village West, 1979

TREE-RING STUDIES IN THE SOMERSET LEVELS: MEARE VILLAGE WEST, 1979

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The excavation of several mound structures and other features at Meare Village West in 1979 exposed concentrations and scatters of wooden boards, slats and fragments. These formed no recognisable structures and may be interpreted as waste and reused wood thrown down to consolidate the raised bog surface (Orme, Coles & Sturdy, 1979). Their condition and size seemed unpromising for dendrochronological analysis; drying out of the site had left them hard and cracked, and many of the pieces were very small. However some useful information could be extracted and suggests that the collection of further material would repay the effort.

In this case, which is not usual, the entire pieces were removed and transported to the Sheffield laboratory so that the most suitable sections could be sawn out; their dry condition meant that they were less heavy than usual, and also the

severe cracking may have led to the loss of some samples in transit. The wood proved to be very hard and black; with the very low water content, freezing was not essential, but helped during the planing of some pieces in which the fibres were liable to tear and distract the eye from the growth rings.

The 36 samples consisted of:

28 oak, mostly radial slats and boards (Quercus sp)

5 radial boards of alder (Alnus sp.)

1 tangential board of ash (Fraxinus)

1 split segment of birch (Betula)

1 unknown

They originated mainly in the 'pool' between the north mound and the central floor, with others from around the periphery of

the central floor and the north-west bump. All the pieces of wood examined of species other than oak lay in the 'pool' area.

OAK

The oak samples consisted mainly of small radial slats and boards between 30 and 150mm in width; the one wide board (4637) was tangentially cut and 300mm across. Several pieces came from distorted and knotty trunks of poor quality. Average ring-widths varied considerably; in the examples where ring-widths were measured, they varied from 1.1 to 3.52mm (Table 1). No samples had more than 69 growth rings, nor any trace of sapwood; it is difficult to estimate the age of the trees being felled in worked timber without sapwood. Certainly however they were immature, probably less than 100 years, and from poor scrubby woodland of varied age composition. As timber, the quality is very poor and contrasts strongly with the known woodworking ability of this period (^{cf. *Antiquary*} ~~Antiquary~~ # *of May 1848*); it must be interpreted to represent rubbish and debris simply thrown down for consolidation. There is little uniformity of growth rate or method of conversion to suggest even that some of the wood may have originated in the same structure, though some pieces are contemporary (see below).

Series of ring-widths between 31 and 69 years were measured on 9 pieces (those whose average ring-width appears in Table 1). Also available were the two curves from timbers sampled in 1978 (Morgan in Orme, Coles & Sturdy, 1979, 16) from area W. The curves were compared both visually and by computer (cf Morgan, 1979 for further details of the method), but the degree of reliability of cross-matching must be limited by the very short ring series and hence length of overlap. Usually a series of more than 50 rings is necessary to be certain of the match. The computer-calculated t values are affected accordingly, since they take into account the

length of overlap (Baillie & Pilcher, 1973).

Initially a group of four curves could be correlated visually, from timbers 1064, 3104, 4233 and 4401; their growth patterns are very similar (Fig. 2). A mean curve of 46 years calculated from them was then used for comparison with the remaining individual curves, enabling three more to be matched, though with a lesser degree of reliability. The relative positions of each curve with other details are given in Fig. 1; mean ring-width values can be found in Table 2.

The distribution of the matching timbers is wide. The group of four lie in the north-west bump (4233), to the west (4401) and east (3104) of the central floor and south of the 'pool' (1064). The other three came from the 'pool' (4463 and 4656) and east of the central floor (3984). Apart from spanning the same period of time, at least over several decades, little else can be determined from the correlations. The timbers vary from small slats (1064), to radial boards (4401, 4233, 4463, 4656) to quartered trunks, and thus do not appear to be a group of timbers from the same structure. Since they were probably reused, they offer little in relative dating of the different excavated features.

The curves end within a range of more than 20 years, and in the absence of sapwood and an uncertain amount of heartwood (lost through trimming and decay), it is impossible to say when the trees were felled. Some of the timbers may have come from trees cut decades after or before others. It is clear only that part of their life span is contemporary.

The number of curves which could not be matched is also of interest; these may date from an earlier or later phase. They include 4637, a wide tangential board from the 'pool', and 4650, a radial board from the north mound, as well as W2 and W3 from the 1978 excavation. Growth patterns were more sensitive - variable from

year to year - than in the correlated group.

The possibilities of absolute dendrochronological dating in this period are limited, although the Iron Age offers the greatest potential in prehistory as reference chronologies are extended back into the Roman period. Two chronologies span these centuries:

1. Garry Bog 2 in Northern Ireland (between b and c in Fig. 9 of Pilcher et al, 1977; Baillie, 1979), dated by an extensive series of C14 results to c.900-200 BC.
2. 'Donau 4' in Germany, based on 61 oak trunks from the Danube river gravels (values unpubl.; Becker, 1973; Becker, Delorme & Schmidt, 1977). This 613 year curve was provisionally dated to 397 BC-AD 216; however definite dating of the Hollstein chronology with which it is matched places the curve 27 years later at 370 BC-AD 243 (Fletcher, pers.comm.).

No convincing correlations appeared between the Garry Bog chronology and the Meare Village curves; a series of possible matches did however occur with the Donau 4 chronology, including the Meare mean curve and two individual curves. In view of the shortness of the curves, the small number which have been correlated, and the geographical distances involved, the results must remain tentative, and will be difficult to prove unless more oak samples from mature trees can be retrieved from the site. The possible positions give end years in the mid third century BC; since the amount of sapwood and lost heartwood is unknown, the actual time of felling of the trees cannot be determined, but must have been at least 20 years later. The dates correspond with C14 results in a satisfactory way, and may at least form the basis for further research on timber from the site. Their tentative nature precludes their publication as yet.

ALDER

Two alder boards provided a series of ring-widths longer than those of the oak, of 62 and 72 years (4632 and 4635 respectively). Their almost identical growth patterns indicate an origin in the same

tree; a high degree of sensitivity in growth rate suggests an environment of varied conditions from year to year, causing periods of stress alternating with rapid growth. The curve for 4632 ends two years before that for 4635; both are thin radial boards which were lying close together in the 'pool'. Another alder board lying nearby had few very wide growth rings. Two further boards, 3702 and 3703, from the area west of the central floor, had very few unclear growth rings.

References:

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MEAD VILLAGE WEST 78-79 tree-ring samples

Sample no.	No. of rings	Ave. ring width mm*	Dimensions mm	Species	Sketch	
78 W2	63	2.0	130x180	Oak		
W3	58	1.32	90x80	Oak		
79 1064	40	1.6	65x18	Oak		
2999	22		40x20	Oak		
3103	19		110x50	Oak		Very wide rings
3104	31	2.18	80x80	Oak		
3105	23		65x25	Oak		
3676	Small wide-ringed radial fragments, discarded.					
3700	13		50x28	Oak		
3701	16		50x24	Oak		
	?		105x40	Oak		Distorted, very wide rings
3702	c.20		55x18	Alder		
3703	?		60x35	Alder		
3706	14		38x12	Oak		
3707	5		30x7	Oak		
3709	20		90x35	Oak		Distorted, very wide rings
3710	6		23x23	Oak		
3712	31		34x20	Oak		
3714	30		65x50	Oak		
3984	39	3.52	150x110	Oak		
3986	26		130x45	Oak		
3988	29		75x75	Oak		
4254	26		80x85	Oak		
4283	20		40x15	Oak		

MVW tree-ring samples cont.:

4283A	44	1.94	90x20-40	Oak		
4295	6		35x20	Oak		
	?		75x20	Oak		Distorted, wide rings
4401	39	} 2.76	145x30	Oak		
A	35		100x30	Oak		
4465	44	2.05	110x25	Oak		
4632	62	1.1	120x15	Alder		
4633	19		90x40	Alder		Wide rings
4634	?		70x45			
4635	72	1.22	100x25	Alder		
4636	c.10		60radius	Birch		Wide rings
4637	91	} 2.18	30, 30-10	Oak		
4641	38		105x20	Oak		
4650	69	1.29	90x40	Oak		
4656	46	2.53	125x35	Oak		
4671	13		130x13	Ash		Wide rings

* where a value is given, it indicates that the ring-widths have been measured.

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Table 1

	0	1	2	3	4	5	6	7	8	9	T1
0		19.0	35.0	31.5	26.5	35.0	24.0	32.6	27.3	27.3	6
10	31.9	22.4	24.7	26.1	28.7	19.9	22.6	23.6	20.9	20.4	7
20	15.5	17.7	20.0	19.7	23.6	23.7	24.2	23.2	26.6	25.7	7
30	18.7	19.1	26.9	21.9	24.4	19.9	19.3	26.6	25.1	23.1	6
40	23.9	24.3	21.0	25.3	25.5	25.0	20.7	15.7	27.0	34.0	2
50	39.0	49.0	39.0	51.0	33.0	29.0	40.0	35.0			1

Table 2. Mean ring-width values (0.1mm) for seven timbers from the Meare Village site (see Fig. 1).

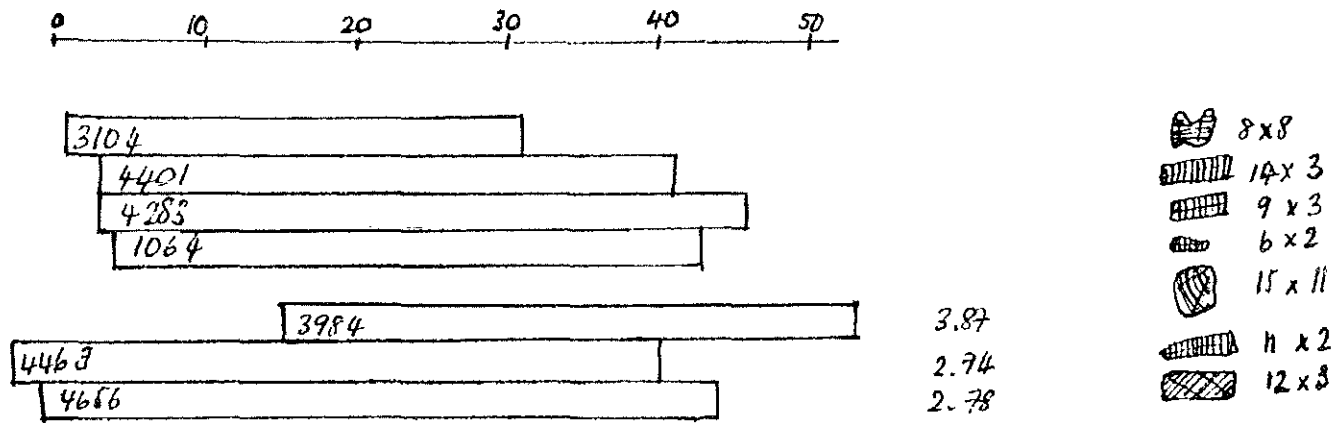


Fig. 1 Relative positions of each of the matched ring-width curves on an arbitrary scale. A mean curve calculated from the upper four was compared to the lower three, for which t values are given on the right; the varied shapes and sizes ^{of the timbers} are also illustrated.

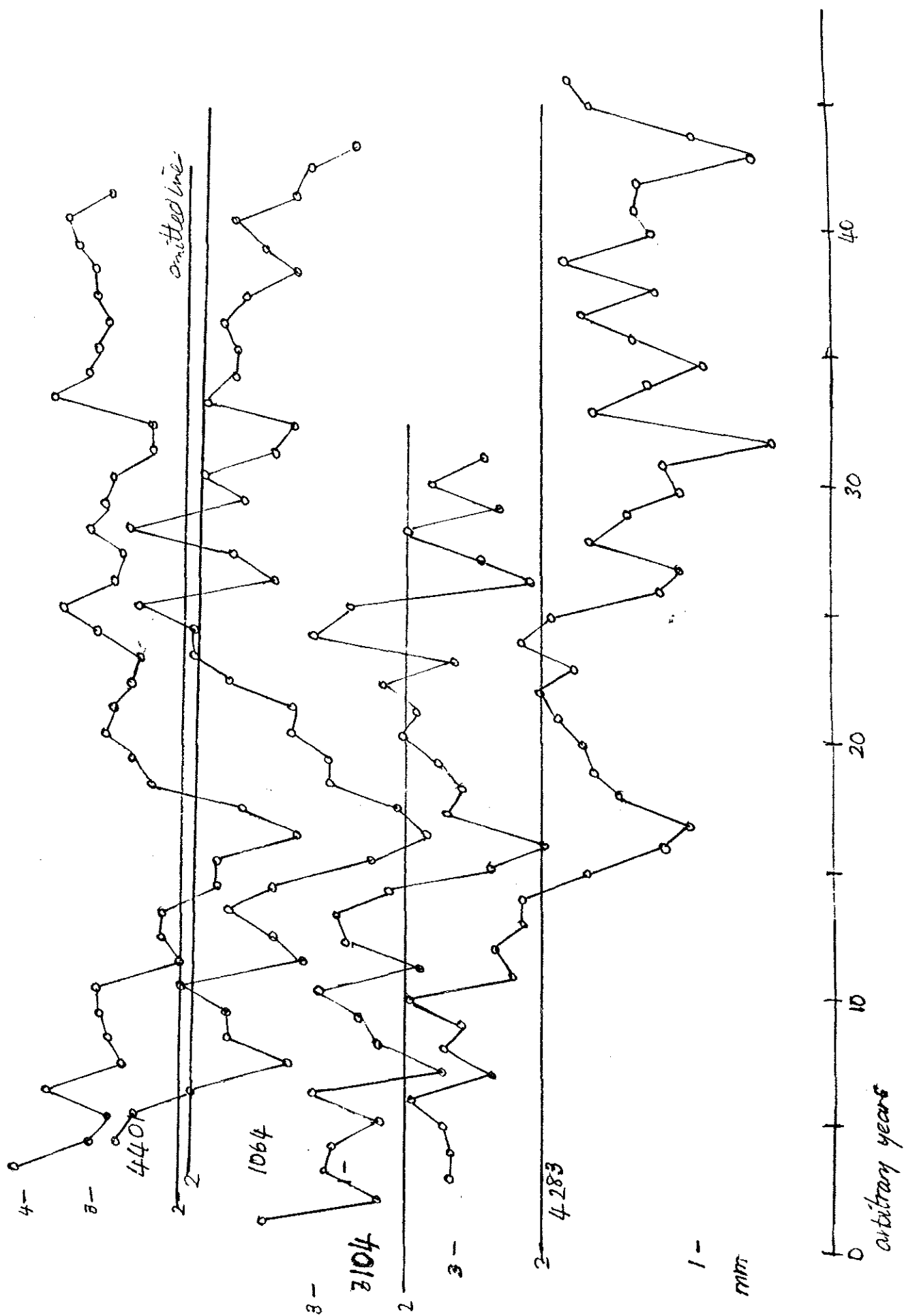


Fig. 2 Four of the stretched ring-width curves in their synchronous positions.