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A NOTE ON CALIBRATION CURVES

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Following the 12th International Radiocarbon Conference in Trondheim, a special calibration issue was published (Stuiver and Kra 1986) carrying a bidecadal calibration curve from 1950 cal AD–2500 cal BC (Stuiver and Pearson 1986; Pearson and Stuiver 1986) that was recommended at the conference (Mook 1986).

Following the 14th International Radiocarbon Conference in Tucson, a second calibration issue was published (Stuiver, Long and Kra 1993), motivated by the wealth of calibration data that had become available in the interim, with dendrochronological data extending all the way into Preboreal (Kromer and Becker 1993). In addition, small corrections were made to data published before, including a shift of 18 ^{14}C yr in the Stuiver/Pearson data set (Stuiver and Pearson 1993). No recommendations were made, however, concerning the preferred curve.

At the 15th International Radiocarbon Conference in Glasgow, the latter correction was questioned (McCormac *et al.* 1995) causing a discussion among archaeologists (Bowman 1994). In the meantime, a high-precision wiggle-match study of medieval oak beams found in the Netherlands, which were also dated by dendrochronology, concluded that a match can only be found using the original 1986 calibration curve (Van der Plicht, Jansma and Kars 1995).

In order to test the evidence that the recommended calibration curve is still the correct one, we decided to remeasure some of the Irish oak wood used for construction of the bidecadal calibration curve (Pearson *et al.* 1986, 1993), covering the same time period as the oak beams from the Netherlands (van der Plicht, Jansma and Kars 1995). The results are reported here.

We choose to remeasure four bidecadal calibration data points, dendrochronologically dated at 1100–1120, 1120–1140, 1220–1240 and 1260–1280 cal AD. We sampled the 10 outer and inner rings separately, and thus obtained 8 measurements. They were measured in the large (25 liter) Groningen counter. The results are summarized in Table 1.

The 8 measurements are wiggle-matched to the calibration curves discussed (Stuiver and Pearson 1986; Stuiver and Pearson 1993). The wiggle-match fit results are also presented in the table.

We conclude that the recommended calibration curve (Stuiver and Pearson 1986) yields an excellent fit to our remeasured data. The results for the revised calibration curve (Stuiver and Pearson 1993) are off by about 15 calendar years, which is consistent with the 18 ^{14}C yr correction, if we take into account the uncertainties involved.

In conclusion, there are now three pieces of evidence indicating that the recommended 1986 calibration curve (Stuiver and Pearson 1986) is still the proper one: 1) possible local effects on ^{14}C measurements of tree rings (McCormac *et al.* 1995); 2) a high-precision wiggle-match case study of medieval oak trees in the Netherlands (van der Plicht, Jansma and Kars 1995), and 3) a high-preci-

sion wiggle-match measurement of Irish oaks used for the construction of the recommended calibration curve (this note).

We stress that the effects discussed here are very small (about 2‰) and are therefore in general not detrimental in terms of the archaeological utility of radiocarbon dates. Nevertheless, in order to end possible confusion, we propose that at the 16th International Radiocarbon Conference in Groningen (1997) a new recommendation should be made concerning the proper calibration curve.

TABLE 1. Remeasurement of Four Bidecadal Irish Wood Samples

					Wiggle-matched results		Averaged	
Sample	GrN-	Rings	^{14}C age	Dendro age	1986 curve	1993 curve	^{14}C age	Dendro age
River Blackwater	21784	outer 10	721 ± 12	1275 ± 5	1272	1285	758 ± 8	1270 ± 10
	21403	inner 10	790 ± 11	1265 ± 5	1262	1275		
Arran Quay	21785	outer 10	798 ± 12	1235 ± 5	1232	1245	810 ± 8	1230 ± 10
	21404	inner 10	823 ± 12	1225 ± 5	1222	1235		
Trim Castle 1	21786	outer 10	917 ± 11	1135 ± 5	1132	1145	924 ± 8	1130 ± 10
	21405	inner 10	934 ± 13	1125 ± 5	1122	1135		
Trim Castle 2	21787	outer 10	930 ± 12	1115 ± 5	1112	1125	943 ± 7	1110 ± 10
	21406	inner 10	950 ± 9	1105 ± 5	1102	1115		

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