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 ¹⁴C 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 ¹⁴C 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 ¹⁴C 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%o) 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

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

### REFERENCES


