[] Dendrochronology Program Library Run QURU Program COF 14:29 Fri 09 Mar 2018 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 30385

------------------------------------------------------------------------------------------------------------------------------------

 QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

 Title of run: QURU\_CORE2ROWO3RO\_EWLW\_ORIGINAL-50

 File of DATED series: QURU\_CORE2ROWO3RO\_EWLW

 CONTENTS:

 Part 1: Title page, options selected, summary, absent rings by series

 Part 2: Histogram of time spans

 Part 3: Master series with sample depth and absent rings by year

 Part 4: Bar plot of Master Dating Series

 Part 5: Correlation by segment of each series with Master

 Part 6: Potential problems: low correlation, divergent year-to-year changes, absent rings, outliers

 Part 7: Descriptive statistics

 RUN CONTROL OPTIONS SELECTED VALUE

 1 Cubic smoothing spline 50% wavelength cutoff for filtering

 32 years

 2 Segments examined are 50 years lagged successively by 25 years

 3 Autoregressive model applied A Residuals are used in master dating series and testing

 4 Series transformed to logarithms Y Each series log-transformed for master dating series and testing

 5 CORRELATION is Pearson (parametric, quantitative)

 Critical correlation, 99% confidence level .3281

 6 Master dating series saved N

 7 Ring measurements listed Y

 8 Parts printed 1234567

 9 Absent rings are omitted from master series and segment correlations (Y)

 Time span of Master dating series is 1875 to 2015 141 years

 Continuous time span is 1875 to 2015 141 years

 Portion with two or more series is 1882 to 2015 134 years

 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 \*C\* Number of dated series 67 \*C\*

 \*O\* Master series 1875 2015 141 yrs \*O\*

 \*F\* Total rings in all series 6298 \*F\*

 \*E\* Total dated rings checked 6291 \*E\*

 \*C\* Series intercorrelation .687 \*C\*

 \*H\* Average mean sensitivity .190 \*H\*

 \*A\* Segments, possible problems 2 \*A\*

 \*\*\* Mean length of series 94.0 \*\*\*

 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 ABSENT RINGS listed by SERIES: (See Master Dating Series for absent rings listed by year)

 No ring measurements of zero value

 1900 -1.227 2 1950 -.322 67 2000 .662 67

 1901 -1.720 2 1951 .817 67 2001 1.283 67

 1902 -1.374 2 1952 -1.819 67 2002 .694 67

 1903 .255 2 1953 -.293 67 2003 .250 67

 1904 .050 2 1954 -.414 67 2004 1.655 67

 1905 -1.428 2 1955 1.524 67 2005 .777 67

 1906 1.519 2 1956 .765 67 2006 -1.027 67

 1907 1.293 2 1957 -.148 67 2007 -.549 67

 1908 -.453 2 1958 -.039 67 2008 -.592 67

 1909 -1.371 2 1959 .230 67 2009 .941 67

 1910 -.992 2 1960 .072 67 2010 -.277 67

 1911 .352 2 1961 .912 67 2011 -.666 67

 1912 .935 2 1962 -.221 67 2012 -.626 67

 1913 .253 2 1963 -2.789 67 2013 .782 67

 1914 .412 4 1964 -1.207 67 2014 .584 67

 1915 .712 6 1965 -1.699 67 2015 -.224 66

 1916 .196 13 1966 -.544 67

 1917 .233 16 1967 .439 67

 1918 -.524 18 1968 .005 67

 1919 -1.181 27 1969 .585 67

 1920 -.088 29 1970 .034 67

 1921 .128 34 1971 .450 67

 1922 -.178 38 1972 1.391 67

 1923 .403 43 1973 .388 67

 1924 .084 47 1974 .743 67

 1875 -2.093 1 1925 .893 50 1975 1.977 67

 1876 .786 1 1926 -1.165 51 1976 .505 67

 1877 .359 1 1927 .380 52 1977 .499 67

 1878 1.033 1 1928 1.152 54 1978 .877 67

 1879 -1.771 1 1929 .171 56 1979 .395 67

 1880 -1.796 1 1930 -1.531 56 1980 .786 67

 1881 .752 1 1931 .304 57 1981 -1.611 67

 1882 -.343 2 1932 1.006 58 1982 -2.262 67

 1883 .590 2 1933 .411 59 1983 -1.184 67

 1884 -1.239 2 1934 .481 60 1984 -.645 67

 1885 .082 2 1935 -.115 61 1985 .502 67

 1886 1.295 2 1936 -2.009 62 1986 -.234 67

 1887 2.368 2 1937 .130 62 1987 .848 67

 1888 1.452 2 1938 .828 64 1988 .579 67

 1889 1.679 2 1939 1.170 65 1989 1.464 67

 1890 .851 2 1940 -.061 65 1990 -.361 67

 1891 .931 2 1941 -.678 65 1991 -2.394 67

 1892 -.004 2 1942 -1.147 66 1992 -.838 67

 1893 .082 2 1943 -.135 66 1993 .401 67

 1894 -1.385 2 1944 1.465 67 1994 .721 67

 1895 -2.026 2 1945 1.093 67 1995 .774 67

 1896 .261 2 1946 .425 67 1996 .316 67

 1897 .025 2 1947 .007 67 1997 -1.147 67

 1898 -.718 2 1948 .275 67 1998 -.299 67

 1899 -1.946 2 1949 -.382 67 1999 -.681 67

PART 5: CORRELATION OF SERIES BY SEGMENTS: QURU\_CORE2ROWO3RO\_EWLW\_ORIGINAL-50 14:29 Fri 09 Mar 2018 Page 5

------------------------------------------------------------------------------------------------------------------------------------

 Correlations of 50-year dated segments, lagged 25 years

 Flags: A = correlation under .3281 but highest as dated; B = correlation higher at other than dated position

 Seq Series Time\_span 1875 1900 1925 1950 1975

 1924 1949 1974 1999 2024

 --- -------- --------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----

 1 1556A 1922 2015 .77 .78 .89 .75

 2 1556B 1922 2015 .57 .73 .79 .69

 3 1557A 1917 2015 .75 .75 .81 .73

 4 1557B 1920 2015 .69 .78 .87 .73

 5 1564A 1923 2015 .82 .84 .90 .72

 6 1564B 1923 2015 .69 .79 .86 .74

 7 1565A 1919 2015 .67 .67 .75 .73

 8 1565B 1924 2015 .73 .72 .73 .63

 9 1565C 1919 2015 .53 .55 .61 .68

 10 1567A 1923 2015 .84 .84 .74 .53

 11 1567B 1927 2015 .82 .75 .52

 12 1577A 1916 2015 .65 .70 .64 .54

 13 1577B 1931 2015 .67 .70 .60

 14 1580A 1934 2015 .75 .71 .69

 15 1580B 1926 2015 .79 .81 .73

 16 1584A 1925 2015 .74 .78 .68

 17 1584B 1929 2015 .59 .73 .80

 18 1588A 1925 2015 .69 .82 .70

 19 1588B 1924 2015 .66 .67 .74 .66

 20 1589A 1929 2015 .53 .64 .61

 21 1589B 1923 2015 .47 .48 .77 .76

 22 1591A 1922 2015 .60 .63 .79 .65

 23 1591B 1922 2015 .70 .70 .84 .58

 24 1592A 1924 2015 .61 .61 .71 .69

 25 1592B 1914 2015 .45 .51 .64 .62

 26 1593A 1935 2015 .76 .84 .74

 27 1593B 1918 2015 .71 .73 .77 .59

 28 1594A 1928 2015 .81 .85 .77

 29 1594B 1916 2015 .80 .87 .83 .63

 30 1595A 1917 2015 .79 .78 .81 .59

 31 1595B 1924 2015 .65 .66 .72 .27A

 32 1596A 1917 2015 .73 .77 .83 .65

 33 1596B 1921 2015 .64 .69 .84 .73

 34 1597A 1933 2015 .77 .73 .70

 35 1597B 1919 2015 .82 .80 .83 .66

 36 1598A 1921 2015 .64 .68 .80 .67

 37 1598B 1921 2015 .79 .79 .82 .70

 38 1599A 1932 2015 .91 .87 .65

 39 1599B 1938 2015 .83 .85 .73

 40 1600A 1882 2015 .41 .40 .58 .69 .56

 41 1600B 1875 2015 .41 .32A .65 .70 .56

 42 1528A 1919 2015 .70 .76 .81 .72

 43 1528B 1916 2015 .72 .75 .76 .76

 44 1529A 1928 2015 .67 .68 .75

 45 1529B 1916 2015 .55 .60 .61 .76

 46 1530A 1918 2015 .66 .67 .79 .84

 47 1530B 1915 2015 .64 .77 .77 .74

 48 1531A 1914 2015 .61 .66 .69 .68

 49 1531B 1915 2015 .69 .71 .76 .72

 50 1532A 1925 2015 .66 .85 .87

 51 1532B 1919 2015 .74 .73 .84 .81

 52 1533A 1921 2015 .54 .56 .66 .77

 53 1533B 1921 2014 .53 .55 .60 .70

 54 1534A 1920 2015 .68 .68 .73 .70

 55 1534B 1916 2015 .62 .64 .80 .73

 56 1535A 1944 2015 .78 .80 .81

 57 1535B 1936 2015 .79 .80 .80

 58 1538A 1919 2015 .79 .82 .81 .65

 59 1538B 1916 2015 .75 .80 .78 .74

 60 1539A 1942 2015 .76 .78 .77

 61 1539B 1939 2015 .73 .77 .77

 62 1540A 1916 2015 .64 .72 .81 .73

 63 1540B 1919 2015 .61 .67 .80 .83

 64 1541A 1923 2015 .79 .79 .68 .49

 65 1541B 1919 2015 .67 .70 .71 .66

 66 1542A 1919 2015 .70 .73 .82 .82

 67 1542B 1938 2015 .74 .82 .79

 Av segment correlation .41 .66 .71 .77 .69

PART 6: POTENTIAL PROBLEMS: QURU\_CORE2ROWO3RO\_EWLW\_ORIGINAL-50 14:29 Fri 09 Mar 2018 Page 6

------------------------------------------------------------------------------------------------------------------------------------

 For each series with potential problems the following diagnostics may appear:

 [A] Correlations with master dating series of flagged 50-year segments of series filtered with 32-year spline,

 at every point from ten years earlier (-10) to ten years later (+10) than dated

 [B] Effect of those data values which most lower or raise correlation with master series

 Symbol following year indicates value in series is greater (>) or lesser (<) than master series value

 [C] Year-to-year changes very different from the mean change in other series

 [D] Absent rings (zero values)

 [E] Values which are statistical outliers from mean for the year

====================================================================================================================================

 1556A 1922 to 2015 94 years Series 1

 [B] Entire series, effect on correlation ( .764) is:

 Lower 1926> -.020 2010< -.019 1936> -.014 1977< -.013 1931< -.010 1929< -.009 Higher 1952 .035 1963 .026

 1556A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 219 228 248 260 232 269 273 165

 1930 123 143 163 217 216 180 180 240 273 354

 1940 254 215 193 217 257 251 257 188 222 230

 1950 210 282 154 161 141 176 186 152 169 172

 1960 164 193 156 107 124 104 127 138 140 151

 1970 153 145 210 169 162 226 149 114 168 142

 1980 170 103 98 122 112 138 146 187 178 222

 1990 140 96 111 122 146 164 144 128 158 138

 2000 139 181 166 164 170 153 124 131 131 134

 2010 108 119 125 141 118 123

====================================================================================================================================

 1556B 1922 to 2015 94 years Series 2

 [B] Entire series, effect on correlation ( .621) is:

 Lower 1924< -.077 1926> -.014 1977< -.013 2003< -.010 1938< -.009 1962> -.008 Higher 1963 .033 1952 .028

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1924 -4.6 SD

 1556B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 220 236 204 245 238 229 308 253

 1930 217 227 238 258 253 262 209 276 210 237

 1940 199 180 224 263 326 385 290 173 146 138

 1950 145 167 97 142 126 158 146 124 126 152

 1960 146 187 174 112 144 128 135 158 130 159

 1970 169 154 194 174 216 210 129 97 128 105

 1980 125 81 85 97 122 133 100 138 137 159

 1990 106 67 70 102 111 109 95 93 83 92

 2000 98 97 103 83 104 113 82 100 86 105

 2010 88 88 95 104 116 120

====================================================================================================================================

 1557A 1917 to 2015 99 years Series 3

 [B] Entire series, effect on correlation ( .743) is:

 Lower 1930> -.021 1949> -.007 1971< -.006 1990> -.006 1943< -.006 2006> -.006 Higher 1952 .036 1991 .020

 1557A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1917 310 250 234

 1920 310 300 305 303 303 270 223 290 303 242

 1930 246 263 263 239 274 298 203 236 255 257

 1940 249 193 192 210 270 283 254 262 277 253

 1950 215 249 162 218 193 219 181 172 172 188

 1960 176 235 199 141 190 166 187 185 172 201

 1970 163 157 208 198 227 219 195 168 206 213

 1980 208 127 125 156 157 175 120 159 185 187

 1990 150 92 126 168 188 175 150 135 156 142

 2000 157 158 149 165 208 188 150 154 168 196

 2010 146 154 160 174 163 159

====================================================================================================================================

 1557B 1920 to 2015 96 years Series 4

 [B] Entire series, effect on correlation ( .710) is:

 Lower 1920< -.052 1930> -.041 2006> -.024 1949> -.009 2015> -.007 1984> -.005 Higher 1963 .041 1952 .026

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 +3.2 SD

 1557B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1920 245 334 346 382 345 338 271 310 345 291

 1930 343 350 355 317 308 277 200 257 301 310

 1940 244 195 194 233 315 264 240 244 287 286

 1950 222 284 190 238 228 243 212 220 210 239

 1960 218 248 218 148 167 163 173 168 162 195

 1970 167 169 199 207 211 236 186 174 199 184

 1980 175 113 124 126 164 173 118 149 182 187

 1990 128 89 101 134 152 128 129 112 127 120

 2000 122 130 126 122 135 124 130 119 122 136

 2010 120 120 117 128 124 127

====================================================================================================================================

 1564A 1923 to 2015 93 years Series 5

 [B] Entire series, effect on correlation ( .777) is:

 Lower 2015< -.036 1930> -.029 2011> -.008 1923< -.007 1925< -.005 1992> -.005 Higher 1963 .023 1952 .020

 1564A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 221 269 242 147 278 365 333

 1930 289 249 312 289 264 200 108 154 154 142

 1940 120 91 72 105 136 141 123 111 118 101

 1950 104 107 70 93 84 131 117 97 85 97

 1960 84 98 76 42 67 43 78 116 132 147

 1970 139 105 133 122 146 173 110 130 127 104

 1980 113 70 48 66 87 89 78 107 119 166

 1990 89 55 116 122 117 120 110 86 107 80

 2000 91 98 94 109 107 86 68 82 72 79

 2010 78 90 85 97 96 56

====================================================================================================================================

 1564B 1923 to 2015 93 years Series 6

 [B] Entire series, effect on correlation ( .704) is:

 Lower 1924< -.069 2010> -.026 1930> -.021 1960< -.017 1926> -.009 1949> -.009 Higher 1952 .047 1963 .030

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2010 +3.5 SD

 1564B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 241 152 215 199 263 281 221

 1930 211 237 276 243 186 152 102 193 228 206

 1940 137 98 78 117 169 174 165 159 161 179

 1950 171 181 87 145 124 154 121 106 110 109

 1960 75 97 91 62 92 69 83 102 117 129

 1970 126 128 146 137 205 237 180 219 229 180

 1980 188 122 74 113 137 188 175 220 204 196

 1990 135 89 147 176 188 196 202 145 135 112

 2000 128 123 121 109 140 114 91 99 97 138

 2010 159 129 96 97 94 84

====================================================================================================================================

 1565A 1919 to 2015 97 years Series 7

 [B] Entire series, effect on correlation ( .699) is:

 Lower 1965> -.037 1926> -.033 1927< -.008 1997> -.007 1954< -.007 2000< -.005 Higher 1952 .040 1963 .032

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1965 +4.1 SD

 1565A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 193

 1920 248 300 285 275 216 233 258 237 232 220

 1930 208 236 254 287 250 231 154 225 246 292

 1940 224 191 173 204 289 230 196 194 189 189

 1950 152 164 121 160 133 195 181 179 147 143

 1960 148 187 184 139 171 212 205 205 175 177

 1970 150 181 193 189 166 264 194 204 170 149

 1980 154 107 66 102 110 148 110 124 113 141

 1990 107 54 73 147 136 122 115 97 87 101

 2000 102 140 142 112 132 138 106 91 83 113

 2010 101 118 127 127 135 123

====================================================================================================================================

 1565B 1924 to 2015 92 years Series 8

 [B] Entire series, effect on correlation ( .695) is:

 Lower 2007< -.022 1965> -.021 1962> -.010 1959< -.008 1958< -.007 2009< -.006 Higher 1963 .042 1952 .021

 1565B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1924 248 308 221 253 236 226

 1930 208 242 236 269 234 230 148 198 235 277

 1940 215 195 173 184 259 226 170 179 163 171

 1950 143 150 117 168 140 177 185 186 143 134

 1960 152 173 197 129 175 186 214 207 179 178

 1970 154 188 198 192 172 255 187 182 159 129

 1980 151 108 77 86 117 143 108 124 114 132

 1990 106 59 75 151 145 131 123 107 91 105

 2000 102 152 148 116 129 145 117 84 96 107

 2010 116 115 126 135 134 122

====================================================================================================================================

 1565C 1919 to 2015 97 years Series 9

 [B] Entire series, effect on correlation ( .596) is:

 Lower 1959< -.026 1954< -.021 1980< -.018 1965> -.016 1977< -.013 1928< -.011 Higher 1952 .033 1991 .032

 1565C Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 308

 1920 377 345 296 309 240 240 169 199 175 159

 1930 151 164 177 238 250 244 174 195 214 236

 1940 167 158 157 163 170 138 148 168 139 125

 1950 108 107 89 139 97 135 131 117 100 83

 1960 106 127 116 92 105 113 135 143 112 124

 1970 100 108 127 129 118 175 114 76 87 76

 1980 55 55 35 61 84 85 82 113 106 129

 1990 94 49 67 108 106 97 78 65 72 71

 2000 72 109 108 89 92 91 70 61 65 78

 2010 68 81 78 105 116 92

====================================================================================================================================

 1567A 1923 to 2015 93 years Series 10

 [B] Entire series, effect on correlation ( .719) is:

 Lower 2013< -.028 1981> -.019 1937< -.012 1997> -.010 1962> -.009 1959< -.009 Higher 1952 .041 1963 .038

 1567A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 219 204 233 162 198 211 199

 1930 145 156 218 161 156 129 85 91 139 148

 1940 126 105 96 136 145 124 138 135 127 108

 1950 132 126 70 80 96 106 109 88 83 64

 1960 70 77 89 51 53 47 66 68 72 68

 1970 62 85 91 77 91 106 94 104 122 83

 1980 62 54 34 35 41 40 45 51 49 50

 1990 50 31 56 54 56 74 60 61 77 59

 2000 80 72 84 75 76 70 60 55 57 61

 2010 50 56 59 51 53 54

====================================================================================================================================

 1567B 1927 to 2015 89 years Series 11

 [B] Entire series, effect on correlation ( .663) is:

 Lower 2005< -.034 2010< -.032 1997> -.024 1981> -.013 1954> -.011 1999> -.007 Higher 1963 .037 1936 .025

 1567B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1927 243 314 278

 1930 185 233 261 205 183 127 82 117 136 146

 1940 127 105 89 124 135 148 138 121 129 104

 1950 103 117 75 80 106 128 101 75 72 72

 1960 68 76 84 56 60 59 65 72 84 84

 1970 70 92 110 92 105 113 102 103 109 91

 1980 77 64 52 52 47 50 60 81 78 85

 1990 66 45 57 59 71 67 58 67 69 67

 2000 64 62 62 59 71 53 51 49 53 66

 2010 47 46 42 46 42 36

====================================================================================================================================

 1577A 1916 to 2015 100 years Series 12

 [B] Entire series, effect on correlation ( .594) is:

 Lower 1977< -.069 1930> -.038 1923< -.020 1990> -.016 1954> -.013 1986> -.007 Higher 1963 .049 1952 .033

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1930 +3.9 SD; 1977 -4.6 SD

 1577A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 201 181 183 134

 1920 176 183 175 121 119 158 138 205 220 209

 1930 215 182 201 167 148 124 78 111 138 141

 1940 128 115 89 120 155 128 102 112 121 118

 1950 116 110 74 89 124 122 102 85 122 86

 1960 97 97 93 59 72 70 73 85 98 98

 1970 78 106 105 97 100 123 105 64 126 97

 1980 129 91 99 131 161 227 247 245 238 250

 1990 283 163 226 245 304 338 281 209 244 201

 2000 259 240 236 233 227 196 182 225 206 244

 2010 181 180 205 226 182 130

====================================================================================================================================

 1577B 1931 to 2015 85 years Series 13

 [B] Entire series, effect on correlation ( .664) is:

 Lower 2014< -.027 1977< -.022 1954> -.018 1979< -.012 1986> -.008 1934< -.008 Higher 1952 .035 1936 .023

 1577B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1931 165 129 138 116 114 79 106 129 136

 1940 135 123 115 165 166 144 139 134 130 108

 1950 108 125 81 88 140 150 132 92 105 97

 1960 106 106 83 56 51 55 73 72 86 82

 1970 74 86 110 93 84 109 86 58 90 73

 1980 96 77 82 128 159 191 230 259 257 312

 1990 226 161 202 223 269 336 303 197 240 190

 2000 238 265 270 294 279 261 201 234 238 264

 2010 231 241 223 273 211 187

====================================================================================================================================

 1580A 1934 to 2015 82 years Series 14

 [B] Entire series, effect on correlation ( .731) is:

 Lower 1968< -.022 1963> -.015 1955< -.013 2010> -.011 1962> -.008 2002< -.007 Higher 1952 .042 1936 .021

 1580A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1934 355 302 171 254 304 320

 1940 222 233 228 244 271 225 204 201 210 183

 1950 180 208 122 147 159 182 196 181 172 197

 1960 149 256 209 125 133 118 160 183 111 145

 1970 140 159 184 164 171 204 171 154 160 139

 1980 183 103 87 86 95 108 99 141 121 136

 1990 100 73 88 136 151 159 108 90 89 105

 2000 146 163 112 122 141 150 101 146 146 224

 2010 180 149 125 170 163 148

====================================================================================================================================

 1580B 1926 to 2015 90 years Series 15

 [B] Entire series, effect on correlation ( .761) is:

 Lower 1930> -.022 1928< -.015 2011> -.010 2000< -.006 1932< -.005 2002< -.005 Higher 1952 .023 1936 .015

 1580B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1926 104 183 153 150

 1930 159 173 164 166 179 187 140 183 239 212

 1940 175 171 166 179 222 192 185 154 197 161

 1950 149 175 101 142 155 166 169 161 153 158

 1960 141 218 166 82 108 95 127 152 108 144

 1970 170 164 170 133 164 191 157 128 149 160

 1980 192 99 76 105 106 119 109 153 155 172

 1990 104 80 123 175 234 221 175 121 138 127

 2000 135 177 132 172 203 178 103 127 134 210

 2010 180 189 140 192 170 153

====================================================================================================================================

 1584A 1925 to 2015 91 years Series 16

 [B] Entire series, effect on correlation ( .728) is:

 Lower 2011< -.024 1927< -.009 1928< -.007 2014> -.006 1957> -.006 1965> -.006 Higher 1952 .038 1963 .016

 1584A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1925 215 170 156 162 166

 1930 157 227 242 229 222 229 159 252 210 222

 1940 165 160 154 177 206 193 192 206 211 184

 1950 173 205 153 204 197 244 186 194 171 158

 1960 154 170 155 131 148 146 143 147 132 158

 1970 166 164 182 154 163 237 214 262 245 218

 1980 232 158 144 166 194 234 211 203 189 197

 1990 129 117 149 152 153 190 218 143 143 139

 2000 169 194 180 145 193 164 114 133 138 142

 2010 134 102 119 136 168 149

====================================================================================================================================

 1584B 1929 to 2015 87 years Series 17

 [B] Entire series, effect on correlation ( .676) is:

 Lower 1930> -.022 1952> -.022 2007< -.012 1949> -.009 1945< -.008 2015> -.007 Higher 1991 .029 1936 .025

 1584B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1929 173

 1930 188 221 247 217 199 186 152 182 223 257

 1940 192 200 209 218 247 202 242 209 185 212

 1950 188 217 174 215 183 194 204 152 129 123

 1960 107 122 104 96 123 121 116 141 151 177

 1970 146 172 180 158 183 237 182 218 248 242

 1980 228 157 144 172 198 226 207 212 224 220

 1990 153 115 181 189 207 232 247 160 193 163

 2000 164 196 178 153 200 166 138 120 139 165

 2010 129 143 143 162 183 182

====================================================================================================================================

 1588A 1925 to 2015 91 years Series 18

 [B] Entire series, effect on correlation ( .693) is:

 Lower 1930> -.037 2015< -.033 2002< -.017 1935< -.010 1965> -.009 2006> -.008 Higher 1963 .050 1952 .016

 1588A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1925 381 259 273 323 280

 1930 308 313 336 274 248 184 171 237 202 239

 1940 164 169 179 188 205 189 192 201 251 203

 1950 153 186 122 122 169 214 161 165 134 148

 1960 141 158 123 81 122 137 144 198 160 200

 1970 212 195 194 139 179 210 168 189 186 145

 1980 157 111 104 117 124 202 152 161 152 166

 1990 87 73 138 158 182 202 213 119 151 124

 2000 180 194 124 145 205 161 156 169 168 174

 2010 144 142 146 169 157 126

====================================================================================================================================

 1588B 1924 to 2015 92 years Series 19

 [B] Entire series, effect on correlation ( .678) is:

 Lower 1930> -.014 1973< -.014 1945< -.010 1989< -.010 2002< -.010 1956< -.008 Higher 1963 .056 1991 .018

 1588B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1924 182 188 133 155 201 183

 1930 172 214 276 298 237 187 144 169 217 227

 1940 134 117 153 191 241 170 189 174 234 214

 1950 217 172 110 119 171 243 163 158 154 162

 1960 145 148 118 77 131 152 189 210 174 221

 1970 217 199 199 139 209 275 219 245 244 204

 1980 229 153 149 170 214 295 219 179 202 190

 1990 118 74 170 262 306 300 284 206 220 205

 2000 248 248 175 211 338 250 195 191 250 301

 2010 199 202 167 213 225 180

====================================================================================================================================

 1589A 1929 to 2015 87 years Series 20

 [B] Entire series, effect on correlation ( .560) is:

 Lower 1930> -.023 1939< -.015 1961< -.015 1973< -.015 1929> -.009 2010> -.009 Higher 1963 .034 1991 .031

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1938 +3.4 SD

 1589A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1929 399

 1930 282 238 239 192 182 184 132 283 432 271

 1940 227 174 168 187 200 190 145 150 141 106

 1950 107 111 99 124 113 116 108 106 79 65

 1960 76 68 61 49 64 57 57 70 100 103

 1970 83 95 105 72 102 127 100 86 102 122

 1980 100 72 69 76 98 100 77 105 93 110

 1990 79 58 91 116 124 103 91 83 118 132

 2000 153 181 168 151 150 107 95 93 111 113

 2010 125 111 111 136 125 127

====================================================================================================================================

 1589B 1923 to 2015 93 years Series 21

 [B] Entire series, effect on correlation ( .606) is:

 Lower 1930> -.068 1931< -.019 1928< -.015 1956< -.012 2009< -.010 1951< -.010 Higher 1963 .060 1991 .030

 [C] Year-to-year changes diverging by over 4.0 std deviations:

 1929 1930 4.1 SD

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 +4.6 SD

 1589B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 228 273 167 130 154 133 134

 1930 341 227 180 137 160 157 161 327 364 343

 1940 255 186 188 212 287 286 219 246 225 192

 1950 171 161 145 201 219 282 181 192 152 144

 1960 134 166 123 82 100 90 92 116 131 146

 1970 132 136 124 112 160 158 125 118 136 148

 1980 136 98 81 109 130 162 136 146 152 156

 1990 127 91 129 159 150 130 149 111 116 123

 2000 149 165 158 128 142 123 107 98 110 114

 2010 115 115 117 143 138 151

====================================================================================================================================

 1591A 1922 to 2015 94 years Series 22

 [B] Entire series, effect on correlation ( .628) is:

 Lower 1930> -.048 2002< -.015 1997> -.014 2001< -.011 1957> -.010 1936> -.010 Higher 1963 .035 1981 .030

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 +3.5 SD

 1591A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 333 372 387 398 355 549 555 487

 1930 548 470 568 493 486 318 310 537 561 519

 1940 382 213 290 343 539 481 424 426 415 402

 1950 355 372 270 315 401 564 395 380 352 331

 1960 258 276 240 152 199 174 167 200 184 211

 1970 223 257 316 258 296 380 244 225 251 287

 1980 311 157 154 196 252 244 178 205 259 255

 1990 180 134 162 200 206 199 178 177 169 168

 2000 198 174 142 154 183 178 141 165 177 183

 2010 167 144 167 189 220 181

====================================================================================================================================

 1591B 1922 to 2015 94 years Series 23

 [B] Entire series, effect on correlation ( .654) is:

 Lower 1930> -.047 2005< -.019 2003< -.012 1928< -.011 2006> -.008 1982> -.008 Higher 1963 .050 1952 .027

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 +3.4 SD

 1591B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1922 239 271 267 245 172 245 257 234

 1930 306 281 340 294 296 260 218 276 362 347

 1940 324 254 230 306 343 281 296 328 335 270

 1950 231 256 198 234 262 307 245 217 205 194

 1960 196 198 166 123 166 149 155 178 188 177

 1970 142 174 193 171 190 256 170 155 198 211

 1980 200 118 134 175 181 177 150 155 181 192

 1990 131 89 171 170 153 176 160 132 139 147

 2000 146 151 149 103 111 94 115 110 98 123

 2010 128 139 136 153 147 133

====================================================================================================================================

 1592A 1924 to 2015 92 years Series 24

 [B] Entire series, effect on correlation ( .654) is:

 Lower 2005< -.025 1952> -.016 1926> -.015 1949> -.011 1945< -.011 1967< -.010 Higher 1981 .026 1936 .025

 1592A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1924 249 313 268 266 256 199

 1930 179 199 210 221 217 196 137 219 317 276

 1940 228 198 190 286 298 206 178 261 269 296

 1950 221 226 197 235 264 292 243 227 223 209

 1960 152 209 165 108 133 99 115 123 126 202

 1970 152 176 184 174 167 239 153 162 194 172

 1980 179 114 112 134 167 197 143 191 169 184

 1990 138 111 144 167 181 194 131 115 104 116

 2000 142 166 127 103 136 93 84 100 114 106

 2010 77 77 91 104 97 77

====================================================================================================================================

 1592B 1914 to 2015 102 years Series 25

 [B] Entire series, effect on correlation ( .538) is:

 Lower 1930> -.034 1952> -.031 2005< -.025 1916< -.012 1932< -.010 1984> -.009 Higher 1936 .027 1981 .027

 [E] Outliers 3 3.0 SD above or -4.5 SD below mean for year

 1915 +3.0 SD; 1930 +3.5 SD; 1984 +3.0 SD

 1592B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1914 200 286 176 203 184 157

 1920 194 172 163 182 193 205 122 212 230 203

 1930 214 174 156 158 159 174 132 210 213 193

 1940 204 183 157 174 177 174 163 194 163 178

 1950 143 172 153 173 154 160 151 121 119 125

 1960 106 130 123 96 97 66 82 89 111 164

 1970 140 151 190 157 156 228 166 140 199 185

 1980 192 99 101 170 203 154 130 134 123 146

 1990 98 80 130 157 141 159 123 114 134 123

 2000 137 143 136 113 108 72 74 79 89 87

 2010 84 101 99 111 111 97

====================================================================================================================================

 1593A 1935 to 2015 81 years Series 26

 [B] Entire series, effect on correlation ( .746) is:

 Lower 2015< -.015 1948< -.014 1967< -.011 1977< -.011 1997> -.010 1945< -.008 Higher 1952 .031 1981 .017

 1593A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1935 394 211 393 296 348

 1940 276 149 128 210 268 185 159 247 165 183

 1950 162 188 130 167 153 221 196 162 161 173

 1960 170 185 137 94 114 110 129 120 107 160

 1970 160 170 222 164 226 261 153 91 175 211

 1980 189 76 79 109 140 139 108 135 143 187

 1990 119 69 81 108 119 106 98 106 118 101

 2000 141 129 114 94 136 115 84 106 106 109

 2010 92 103 94 111 118 84

====================================================================================================================================

 1593B 1918 to 2015 98 years Series 27

 [B] Entire series, effect on correlation ( .661) is:

 Lower 1930> -.022 2003< -.011 1927< -.011 1919> -.010 1977< -.010 1990> -.010 Higher 1952 .054 1963 .050

 1593B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1918 277 297

 1920 313 360 330 299 281 345 232 280 360 287

 1930 351 372 443 392 379 376 331 407 491 531

 1940 365 302 281 327 383 389 335 444 333 341

 1950 300 309 184 277 268 345 245 291 233 203

 1960 180 219 206 131 183 170 186 206 139 152

 1970 162 172 186 146 175 246 181 136 194 233

 1980 284 135 119 145 207 234 176 191 212 255

 1990 197 117 133 168 178 141 150 121 142 125

 2000 194 162 203 114 166 163 113 145 134 140

 2010 146 163 137 155 166 155

====================================================================================================================================

 1594A 1928 to 2015 88 years Series 28

 [B] Entire series, effect on correlation ( .792) is:

 Lower 2014< -.012 1942< -.012 1982> -.008 1929< -.007 2005> -.006 1954> -.005 Higher 1963 .034 1991 .009

 1594A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1928 353 245

 1930 207 222 278 243 274 248 203 345 303 290

 1940 251 198 140 201 292 275 261 197 214 173

 1950 169 197 143 196 187 220 191 136 123 154

 1960 136 175 159 91 105 77 107 112 119 128

 1970 139 155 191 178 203 234 197 215 245 196

 1980 190 105 111 101 97 106 125 140 168 197

 1990 117 82 104 113 123 142 135 93 121 124

 2000 141 188 164 189 201 219 166 171 149 195

 2010 171 158 151 159 145 150

====================================================================================================================================

 1594B 1916 to 2015 100 years Series 29

 [B] Entire series, effect on correlation ( .733) is:

 Lower 1922< -.023 2014< -.015 1919> -.011 2010> -.009 1985< -.008 1982> -.008 Higher 1952 .039 1963 .016

 1594B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 101 163 118 141

 1920 156 170 127 143 174 251 209 254 310 270

 1930 171 200 273 251 239 222 180 280 292 270

 1940 232 187 134 190 244 267 238 216 203 175

 1950 184 199 136 200 209 327 320 222 223 203

 1960 194 225 189 134 152 127 150 213 234 239

 1970 183 189 210 188 219 260 282 292 333 239

 1980 259 138 130 105 145 132 159 185 188 196

 1990 130 80 94 114 150 166 153 117 112 121

 2000 148 175 190 207 232 244 167 193 166 202

 2010 198 174 188 175 148 140

====================================================================================================================================

 1595A 1917 to 2015 99 years Series 30

 [B] Entire series, effect on correlation ( .717) is:

 Lower 2010> -.016 2012< -.013 1926> -.012 2006> -.011 1972< -.008 1949> -.007 Higher 1963 .047 1952 .034

 1595A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1917 226 193 176

 1920 258 341 339 347 314 400 329 330 414 319

 1930 266 350 401 344 350 296 235 262 300 340

 1940 228 224 156 216 241 285 280 256 224 226

 1950 163 164 106 174 178 239 175 189 163 161

 1960 159 203 186 110 172 131 140 169 157 217

 1970 216 232 194 187 214 249 198 233 259 229

 1980 263 137 133 162 195 211 166 189 237 196

 1990 137 98 142 137 158 147 123 97 103 119

 2000 132 139 160 133 145 130 120 108 100 116

 2010 128 119 90 96 112 104

====================================================================================================================================

 1595B 1924 to 2015 92 years Series 31

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1966 2015 0 .21 -.08 -.09 -.05 -.11 -.03 .07 .16 .02 .20 .27\* - - - - - - - - - -

 [B] Entire series, effect on correlation ( .469) is:

 Lower 2009< -.127 1930> -.029 1997> -.015 2001< -.011 2003< -.011 1925< -.011 Higher 1952 .064 1981 .030

 1966 to 2015 segment:

 Lower 2009< -.211 1997> -.030 2001< -.018 1982> -.018 1967< -.015 2004< -.014 Higher 1981 .093 1991 .090

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2009 -5.3 SD

 1595B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1924 317 329 340 431 499 400

 1930 397 363 445 381 388 337 257 316 387 408

 1940 298 271 268 296 338 289 292 201 204 228

 1950 238 226 149 186 216 259 207 167 161 200

 1960 170 217 182 137 179 124 136 136 173 173

 1970 179 173 200 169 198 209 173 198 223 206

 1980 207 112 139 137 166 162 133 144 173 183

 1990 148 93 131 134 158 161 126 121 91 96

 2000 98 100 117 92 94 112 97 95 98 76

 2010 91 95 97 106 109 95

====================================================================================================================================

 1596A 1917 to 2015 99 years Series 32

 [B] Entire series, effect on correlation ( .700) is:

 Lower 2015> -.017 1936> -.016 2008< -.014 1930> -.012 1978< -.011 1957> -.011 Higher 1963 .050 1952 .046

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2015 +3.4 SD

 1596A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1917 198 170 230

 1920 265 275 294 337 358 393 330 359 398 383

 1930 344 422 405 414 398 284 285 357 414 393

 1940 207 189 173 224 270 269 225 184 227 184

 1950 199 216 113 176 192 222 163 221 182 194

 1960 164 197 160 101 154 144 160 188 167 200

 1970 176 177 178 155 167 222 161 159 128 136

 1980 151 93 101 127 162 231 199 197 194 226

 1990 122 81 115 156 166 168 130 109 128 118

 2000 149 178 158 130 137 123 104 113 88 112

 2010 101 115 118 107 113 133

====================================================================================================================================

 1596B 1921 to 2015 95 years Series 33

 [B] Entire series, effect on correlation ( .684) is:

 Lower 1930> -.022 1928< -.017 1922> -.014 1958< -.010 2015> -.008 1986> -.008 Higher 1952 .048 1963 .026

 1596B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1921 236 295 268 249 250 250 264 238 246

 1930 267 297 306 343 295 308 232 357 282 310

 1940 239 165 144 180 231 289 274 214 271 197

 1950 225 250 112 167 162 201 167 149 114 135

 1960 129 138 123 92 127 110 150 169 176 199

 1970 158 153 168 137 151 223 142 132 169 173

 1980 233 110 114 135 159 223 210 172 146 187

 1990 115 89 150 169 187 209 167 153 162 143

 2000 185 239 184 197 209 165 111 173 132 171

 2010 147 168 146 165 178 182

====================================================================================================================================

 1597A 1933 to 2015 83 years Series 34

 [B] Entire series, effect on correlation ( .742) is:

 Lower 1979< -.013 2006> -.008 1962> -.008 1954< -.008 1960> -.007 1985< -.006 Higher 1952 .044 1936 .017

 1597A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1933 382 371 357 285 413 430 417

 1940 333 273 259 342 369 340 309 254 307 241

 1950 218 241 149 209 177 222 226 224 202 238

 1960 318 362 316 176 195 167 180 189 192 197

 1970 189 218 276 250 289 300 204 168 183 124

 1980 115 98 91 108 125 121 109 138 139 173

 1990 141 101 110 162 154 160 139 135 130 133

 2000 180 279 281 189 182 169 168 171 184 228

 2010 196 156 149 218 199 144

====================================================================================================================================

 1597B 1919 to 2015 97 years Series 35

 [B] Entire series, effect on correlation ( .763) is:

 Lower 2003< -.020 1930> -.012 1972< -.010 1927< -.007 2006> -.007 1973> -.006 Higher 1963 .036 1952 .035

 1597B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 141

 1920 171 167 185 309 331 361 203 197 253 285

 1930 245 278 306 313 292 231 208 241 228 236

 1940 211 176 166 190 233 236 239 226 200 174

 1950 182 203 135 198 174 215 231 216 182 183

 1960 163 205 182 99 152 111 134 125 123 137

 1970 139 187 161 214 226 269 184 208 176 158

 1980 178 108 99 116 122 143 129 165 168 153

 1990 97 76 101 127 114 109 120 115 160 153

 2000 218 261 219 136 164 165 156 155 141 163

 2010 150 132 121 205 176 159

====================================================================================================================================

 1598A 1921 to 2015 95 years Series 36

 [B] Entire series, effect on correlation ( .655) is:

 Lower 1929< -.032 1922< -.024 1930> -.023 2015> -.015 2014< -.010 1988< -.008 Higher 1952 .055 1963 .024

 1598A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1921 156 117 148 162 212 172 212 196 137

 1930 180 194 235 218 266 242 192 296 292 270

 1940 225 172 164 187 204 197 179 201 235 183

 1950 173 160 103 150 146 170 173 136 135 103

 1960 95 107 91 61 79 81 115 132 137 143

 1970 116 101 160 139 170 203 155 174 147 107

 1980 140 88 85 118 144 175 156 176 118 128

 1990 104 77 138 169 162 187 151 144 149 144

 2000 185 199 192 255 264 215 180 192 193 229

 2010 219 213 205 217 202 244

====================================================================================================================================

 1598B 1921 to 2015 95 years Series 37

 [B] Entire series, effect on correlation ( .757) is:

 Lower 1979< -.013 1954> -.012 1971< -.011 2010> -.008 1922< -.006 1962> -.006 Higher 1963 .040 1952 .037

 1598B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1921 216 132 166 163 196 154 207 197 185

 1930 149 183 300 230 262 185 126 161 190 193

 1940 170 139 151 184 219 200 180 211 219 198

 1950 194 189 141 195 237 270 227 200 210 217

 1960 218 214 208 141 164 163 179 192 167 190

 1970 180 159 190 168 185 246 216 244 227 130

 1980 178 118 111 141 161 227 198 198 201 216

 1990 150 117 147 188 204 187 182 149 174 160

 2000 183 229 249 260 286 237 195 203 200 240

 2010 255 246 216 242 273 272

====================================================================================================================================

 1599A 1932 to 2015 84 years Series 38

 [B] Entire series, effect on correlation ( .787) is:

 Lower 2014< -.070 1982> -.017 2012> -.009 2007> -.005 1985< -.005 1954> -.004 Higher 1952 .036 1963 .024

 1599A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1932 288 224 232 207 169 223 246 316

 1940 235 183 136 192 249 262 224 212 204 184

 1950 186 193 126 196 214 322 314 218 218 190

 1960 187 207 186 123 143 109 144 192 215 265

 1970 210 223 234 213 238 273 252 255 300 242

 1980 266 136 144 98 128 131 146 165 163 213

 1990 128 77 99 116 132 153 133 106 122 119

 2000 135 182 189 194 207 199 134 158 148 172

 2010 150 142 160 163 133 134

====================================================================================================================================

 1599B 1938 to 2015 78 years Series 39

 [B] Entire series, effect on correlation ( .804) is:

 Lower 2014< -.039 1982> -.012 1942< -.008 1954> -.006 1986> -.006 1985< -.005 Higher 1952 .037 1963 .012

 1599B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1938 329 346

 1940 265 206 141 209 264 254 233 196 199 187

 1950 185 238 143 203 203 237 238 198 191 216

 1960 172 189 159 100 119 93 107 136 146 166

 1970 161 180 224 210 220 267 225 265 279 240

 1980 223 144 144 118 113 114 147 155 192 234

 1990 130 86 125 140 152 158 174 119 143 118

 2000 165 199 196 221 247 245 172 187 178 202

 2010 183 161 165 181 144 147

====================================================================================================================================

 1600A 1882 to 2015 134 years Series 40

 [B] Entire series, effect on correlation ( .517) is:

 Lower 2014< -.041 1911> -.020 1895> -.018 1926> -.017 2006> -.012 1913> -.009 Higher 1991 .026 1981 .015

 [E] Outliers 2 3.0 SD above or -4.5 SD below mean for year

 1911 +3.8 SD; 1926 +3.1 SD

 1600A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1882 252 267 217 244 258 316 256 240

 1890 207 205 196 183 134 124 152 122 98 79

 1900 92 98 95 122 127 91 152 150 135 126

 1910 136 204 202 201 201 203 214 211 190 197

 1920 180 193 198 265 406 448 413 414 412 297

 1930 284 357 462 417 400 303 237 351 366 329

 1940 333 245 217 285 391 361 263 318 338 291

 1950 244 280 235 220 250 312 318 231 194 204

 1960 226 223 209 180 163 137 169 191 170 185

 1970 187 169 239 237 220 260 178 141 164 200

 1980 206 133 124 137 166 153 113 145 140 188

 1990 173 110 124 152 179 174 142 125 153 135

 2000 138 150 148 152 148 138 142 138 134 158

 2010 128 120 130 150 88 80

====================================================================================================================================

 1600B 1875 to 2015 141 years Series 41

 [\*] Early part of series cannot be checked from 1875 to 1881 -- not matched by another series

 [A] Segment High -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

 --------- ---- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

 1900 1949 0 .11 -.05 -.08 -.03 .19 .05 .15 .27 -.08 -.05 .32\* .08 -.33 -.23 .09 -.08 .09 .12 .07 .06 -.03

 [B] Entire series, effect on correlation ( .525) is:

 Lower 1911< -.021 1919> -.013 1982> -.011 1895< -.009 1913< -.009 1905> -.009 Higher 1963 .031 1952 .022

 1900 to 1949 segment:

 Lower 1911< -.062 1919> -.043 1913< -.026 1916> -.018 1943< -.013 1918> -.012 Higher 1906 .049 1901 .031

 1600B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1875 169 232 223 243 176

 1880 175 240 227 250 198 222 273 272 256 274

 1890 238 225 163 165 138 113 161 172 163 137

 1900 140 118 131 155 148 147 191 195 158 150

 1910 164 170 209 197 213 239 299 272 267 284

 1920 244 210 201 304 381 357 263 254 297 258

 1930 254 296 410 337 279 229 207 327 272 255

 1940 210 163 135 155 219 207 174 179 191 199

 1950 201 214 148 163 190 203 160 161 172 181

 1960 172 156 138 116 149 125 156 152 141 131

 1970 123 131 152 141 144 181 143 137 137 138

 1980 174 108 135 116 163 145 140 154 171 185

 1990 113 93 111 120 170 161 141 136 155 151

 2000 147 167 160 162 159 174 155 145 151 150

 2010 163 164 166 178 156 137

====================================================================================================================================

 1528A 1919 to 2015 97 years Series 42

 [B] Entire series, effect on correlation ( .711) is:

 Lower 2014< -.030 1919< -.016 1937< -.013 1949< -.009 2015> -.008 1924> -.007 Higher 1952 .024 2004 .009

 1528A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 54

 1920 88 102 96 112 157 163 110 131 173 162

 1930 114 145 169 128 151 124 92 89 133 170

 1940 141 129 112 127 171 140 91 69 78 53

 1950 76 75 45 54 42 67 59 59 63 91

 1960 78 104 78 48 49 46 58 83 79 90

 1970 83 105 132 122 129 138 109 144 124 94

 1980 92 65 47 59 70 83 87 133 124 133

 1990 101 73 70 120 116 129 120 90 103 112

 2000 140 150 127 114 211 184 112 139 143 190

 2010 161 131 120 158 125 155

====================================================================================================================================

 1528B 1916 to 2015 100 years Series 43

 [B] Entire series, effect on correlation ( .741) is:

 Lower 1952> -.018 1946< -.013 1942> -.008 1994< -.008 1999< -.007 2015> -.006 Higher 1963 .027 1981 .015

 1528B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 108 105 69 79

 1920 140 221 222 193 180 192 119 123 167 160

 1930 120 148 173 138 149 145 99 118 135 166

 1940 140 126 122 94 132 114 74 69 73 78

 1950 66 85 66 59 40 80 84 76 92 148

 1960 127 142 98 28 51 33 73 140 122 132

 1970 119 146 171 183 134 166 165 150 137 132

 1980 123 65 53 78 64 150 134 177 124 164

 1990 116 81 88 123 100 125 134 91 106 71

 2000 131 202 147 116 178 149 101 99 114 178

 2010 115 108 88 115 145 159

====================================================================================================================================

 1529A 1928 to 2015 88 years Series 44

 [B] Entire series, effect on correlation ( .687) is:

 Lower 1986< -.040 1963> -.030 1932< -.010 1941> -.010 1990> -.010 1955< -.007 Higher 1981 .022 1930 .020

 1529A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1928 264 188

 1930 96 168 162 149 164 132 124 147 201 183

 1940 159 186 164 147 231 247 199 139 118 100

 1950 115 173 108 86 68 99 99 83 101 99

 1960 135 165 103 77 82 79 121 153 153 157

 1970 117 122 180 147 137 166 140 149 142 137

 1980 136 78 59 84 78 118 74 99 93 105

 1990 96 64 68 87 86 91 73 62 72 86

 2000 104 124 98 69 115 89 62 74 77 88

 2010 83 72 73 75 82 75

====================================================================================================================================

 1529B 1916 to 2015 100 years Series 45

 [B] Entire series, effect on correlation ( .643) is:

 Lower 1952> -.034 1953< -.033 1955< -.012 1920> -.011 2008< -.009 2009< -.008 Higher 1981 .021 1991 .019

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1920 +3.9 SD

 1529B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 205 195 198 201

 1920 292 213 154 192 174 189 146 203 219 183

 1930 78 162 183 181 166 131 99 132 145 137

 1940 112 106 95 104 144 156 124 94 95 85

 1950 91 105 90 56 58 76 98 79 81 74

 1960 114 112 111 72 90 90 135 191 170 176

 1970 126 124 194 131 171 212 181 181 166 142

 1980 159 79 75 90 105 113 82 120 115 127

 1990 112 72 84 108 133 103 106 81 107 95

 2000 111 105 87 85 95 96 75 78 58 64

 2010 63 62 64 80 72 61

====================================================================================================================================

 1530A 1918 to 2015 98 years Series 46

 [B] Entire series, effect on correlation ( .741) is:

 Lower 1952> -.034 1926> -.025 1937< -.011 1942> -.010 1957< -.009 1938< -.008 Higher 1963 .035 1991 .012

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1952 +3.1 SD

 1530A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1918 133 101

 1920 151 178 160 178 197 279 243 309 282 215

 1930 139 232 198 162 182 185 126 121 119 129

 1940 127 176 188 153 247 207 164 134 135 117

 1950 119 203 134 133 86 115 101 66 64 70

 1960 97 106 81 49 65 60 72 101 90 106

 1970 94 111 141 115 99 114 94 108 93 99

 1980 101 67 52 69 51 81 64 94 76 93

 1990 60 44 58 61 60 70 75 49 62 59

 2000 82 88 66 97 107 106 60 68 56 81

 2010 58 58 55 67 67 52

====================================================================================================================================

 1530B 1915 to 2015 101 years Series 47

 [B] Entire series, effect on correlation ( .682) is:

 Lower 1915< -.062 1952> -.021 2010> -.014 1981> -.009 1937< -.008 2006< -.008 Higher 1963 .037 1926 .014

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1915 -4.7 SD

 1530B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1915 120 152 170 160 144

 1920 229 193 181 217 210 270 148 204 233 150

 1930 96 155 166 126 122 116 77 77 78 93

 1940 77 100 101 112 175 173 152 104 90 80

 1950 95 129 90 107 64 96 81 66 71 70

 1960 109 112 73 40 62 60 74 85 83 97

 1970 104 119 156 100 103 127 106 105 120 79

 1980 72 59 37 43 40 64 60 82 66 84

 1990 61 45 50 60 71 64 73 62 83 86

 2000 102 125 96 103 149 126 70 84 79 110

 2010 121 100 96 115 108 93

====================================================================================================================================

 1531A 1914 to 2015 102 years Series 48

 [B] Entire series, effect on correlation ( .636) is:

 Lower 1916< -.027 1981> -.022 1930< -.020 1952> -.012 1973< -.010 1932< -.008 Higher 1936 .014 1963 .014

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 -5.1 SD

 1531A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1914 215 218 75 146 150 94

 1920 104 112 113 122 108 115 95 117 149 125

 1930 50 95 89 92 117 109 72 105 114 132

 1940 102 132 125 145 184 169 155 79 92 60

 1950 63 83 58 66 71 113 94 61 73 61

 1960 72 65 48 28 42 35 61 84 71 72

 1970 63 83 98 48 58 69 53 63 62 52

 1980 51 48 34 32 29 33 32 52 50 54

 1990 41 32 35 42 44 49 42 38 32 39

 2000 52 68 55 52 57 57 41 38 33 47

 2010 35 40 41 50 42 34

====================================================================================================================================

 1531B 1915 to 2015 101 years Series 49

 [B] Entire series, effect on correlation ( .703) is:

 Lower 1930< -.031 1991> -.021 1952> -.012 1926> -.010 1992< -.008 1994< -.006 Higher 1963 .019 1936 .012

 1531B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1915 167 148 116 109 99

 1920 113 128 152 172 155 197 158 187 215 194

 1930 71 141 152 120 138 130 86 121 131 139

 1940 133 131 140 152 236 221 143 84 100 69

 1950 79 82 59 69 73 117 91 76 73 80

 1960 81 87 58 34 50 43 64 77 68 77

 1970 77 100 120 73 73 88 77 86 92 67

 1980 78 48 37 46 43 50 41 57 48 53

 1990 39 42 34 58 46 59 50 43 45 44

 2000 63 76 58 62 71 65 48 45 46 62

 2010 45 44 46 46 46 47

====================================================================================================================================

 1532A 1925 to 2015 91 years Series 50

 [B] Entire series, effect on correlation ( .733) is:

 Lower 1930< -.026 1936> -.024 1947< -.013 1952> -.012 1941> -.011 2002< -.005 Higher 1981 .010 1991 .008

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1930 -5.0 SD

 1532A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1925 113 77 95 126 112

 1930 52 121 118 104 148 115 113 133 117 133

 1940 82 131 116 112 143 133 116 62 91 60

 1950 71 92 59 74 55 116 92 70 67 65

 1960 85 101 64 43 49 56 96 133 99 120

 1970 133 153 193 153 146 186 126 131 141 140

 1980 137 70 52 93 79 102 95 165 131 156

 1990 109 70 103 124 141 109 127 79 109 100

 2000 127 131 97 111 190 171 97 92 111 161

 2010 104 93 85 128 140 110

====================================================================================================================================

 1532B 1919 to 2015 97 years Series 51

 [B] Entire series, effect on correlation ( .769) is:

 Lower 1940< -.015 1926> -.014 2010> -.013 1952> -.012 1965> -.008 1941> -.005 Higher 1963 .025 1991 .013

 1532B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 57

 1920 80 93 111 156 133 158 126 170 181 127

 1930 53 125 132 128 194 154 95 147 118 121

 1940 65 116 102 107 168 165 124 85 95 74

 1950 71 124 75 102 76 135 127 98 99 151

 1960 130 139 98 45 70 97 123 175 125 129

 1970 144 176 213 188 166 214 155 167 153 141

 1980 153 89 51 99 81 123 100 142 99 131

 1990 98 57 108 134 150 118 119 69 99 82

 2000 97 127 100 97 136 111 89 84 89 126

 2010 125 95 75 112 130 97

====================================================================================================================================

 1533A 1921 to 2015 95 years Series 52

 [B] Entire series, effect on correlation ( .639) is:

 Lower 1952> -.032 1943< -.011 1960< -.010 1940> -.009 1944< -.008 1941> -.006 Higher 1936 .019 1982 .011

 1533A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1921 84 84 117 123 122 81 102 124 110

 1930 29 94 105 80 90 69 38 48 64 58

 1940 69 67 49 34 42 44 50 58 53 40

 1950 54 57 40 49 43 59 48 27 31 33

 1960 18 31 30 24 33 37 73 135 87 90

 1970 76 84 118 85 79 87 70 85 95 87

 1980 103 66 44 59 64 88 96 88 71 102

 1990 70 58 91 124 122 94 113 71 93 80

 2000 106 123 130 116 151 118 98 104 132 160

 2010 87 79 92 136 158 114

====================================================================================================================================

 1533B 1921 to 2014 94 years Series 53

 [B] Entire series, effect on correlation ( .606) is:

 Lower 1952> -.028 1963> -.021 1944< -.019 1929> -.009 1945< -.008 2003> -.007 Higher 1926 .012 1981 .011

 1533B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1921 87 81 96 97 97 65 85 120 138

 1930 38 90 124 105 120 99 57 67 89 78

 1940 53 62 45 49 43 40 55 65 56 44

 1950 54 62 47 67 62 85 67 47 34 33

 1960 24 37 33 34 44 41 67 136 92 96

 1970 95 102 143 111 101 146 73 73 95 101

 1980 95 62 52 81 53 94 100 131 90 134

 1990 90 81 116 163 123 118 116 64 97 99

 2000 108 105 131 203 199 127 85 114 119 164

 2010 79 85 95 114 115

====================================================================================================================================

 1534A 1920 to 2015 96 years Series 54

 [B] Entire series, effect on correlation ( .687) is:

 Lower 2001< -.013 1953< -.010 1948< -.010 1940> -.007 1942> -.007 1961< -.006 Higher 1991 .016 1930 .010

 1534A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1920 90 86 69 109 88 130 72 158 191 137

 1930 33 110 255 154 166 146 88 153 137 123

 1940 151 132 129 124 170 122 79 63 52 44

 1950 70 72 45 39 48 69 62 50 68 71

 1960 58 55 35 33 45 53 81 94 82 124

 1970 141 129 139 127 147 149 111 138 109 89

 1980 119 68 63 58 75 126 105 122 83 104

 1990 86 56 67 86 78 76 74 55 96 61

 2000 89 71 91 82 118 78 72 75 84 96

 2010 79 61 59 66 87 70

====================================================================================================================================

 1534B 1916 to 2015 100 years Series 55

 [B] Entire series, effect on correlation ( .669) is:

 Lower 2011< -.021 1945< -.011 1916> -.009 1940> -.008 1929> -.007 1952> -.007 Higher 1991 .017 1981 .011

 1534B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 109 86 70 55

 1920 56 72 56 60 58 87 58 109 127 133

 1930 34 78 98 70 89 103 75 78 105 112

 1940 109 96 66 75 80 54 68 52 48 40

 1950 46 78 45 77 42 72 68 48 41 47

 1960 47 58 42 32 33 38 51 58 66 93

 1970 85 75 89 88 97 101 81 105 88 73

 1980 88 54 54 48 54 80 78 109 87 116

 1990 77 49 66 80 79 66 81 57 83 67

 2000 84 87 92 91 106 67 49 62 64 66

 2010 58 44 59 55 57 49

====================================================================================================================================

 1535A 1944 to 2015 72 years Series 56

 [B] Entire series, effect on correlation ( .792) is:

 Lower 1954< -.043 1965> -.007 1970< -.007 1949< -.006 1988< -.006 1977< -.005 Higher 1963 .043 1952 .015

 1535A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1944 485 525 353 331 295 196

 1950 222 296 172 185 130 234 214 129 159 152

 1960 141 173 137 82 138 136 140 163 122 139

 1970 105 146 212 173 172 235 160 92 123 121

 1980 122 88 71 89 117 164 104 105 93 124

 1990 91 76 111 163 146 126 139 99 127 110

 2000 177 146 107 106 157 134 79 103 113 131

 2010 97 85 106 132 83 75

====================================================================================================================================

 1535B 1936 to 2015 80 years Series 57

 [B] Entire series, effect on correlation ( .774) is:

 Lower 1957< -.025 1991> -.017 1941> -.012 1942> -.011 1939< -.010 1977< -.008 Higher 1952 .039 1981 .017

 1535B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1936 153 200 282 207

 1940 225 267 244 195 270 249 207 157 197 144

 1950 131 200 103 140 153 151 112 76 112 133

 1960 148 163 104 73 114 115 154 197 152 153

 1970 134 150 238 181 181 252 145 92 121 122

 1980 157 79 73 103 113 152 123 110 100 140

 1990 85 89 126 143 134 106 146 91 117 103

 2000 165 146 101 107 148 112 88 103 108 132

 2010 93 90 101 122 110 107

====================================================================================================================================

 1538A 1919 to 2015 97 years Series 58

 [B] Entire series, effect on correlation ( .743) is:

 Lower 2001< -.013 1991> -.011 2013< -.010 1969< -.009 1940> -.008 1941< -.007 Higher 1963 .037 1926 .012

 1538A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 111

 1920 120 115 112 104 115 113 74 86 98 87

 1930 49 76 98 99 98 76 49 60 82 96

 1940 113 63 71 95 127 119 116 99 82 77

 1950 85 111 67 56 57 106 86 71 93 116

 1960 109 94 71 40 73 77 108 114 121 102

 1970 98 124 183 159 183 216 176 192 169 167

 1980 185 100 75 93 122 178 161 188 119 171

 1990 112 79 69 100 99 104 86 76 75 83

 2000 132 104 96 102 147 130 86 87 83 106

 2010 109 86 90 90 122 107

====================================================================================================================================

 1538B 1916 to 2015 100 years Series 59

 [B] Entire series, effect on correlation ( .748) is:

 Lower 1952> -.019 1922> -.014 1916> -.008 1994< -.007 1957< -.007 1942> -.007 Higher 1963 .040 1991 .017

 1538B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 176 158 157 122

 1920 143 131 178 155 132 130 94 124 131 128

 1930 66 149 139 119 96 75 56 91 87 143

 1940 100 69 87 83 126 140 120 82 104 88

 1950 101 120 81 69 68 104 88 64 89 109

 1960 88 93 70 44 64 70 108 129 118 118

 1970 114 130 141 125 141 221 172 177 159 119

 1980 141 92 63 91 93 137 99 113 92 99

 1990 87 58 63 76 72 84 68 66 57 71

 2000 88 92 77 67 78 87 67 62 57 75

 2010 74 73 61 73 85 87

====================================================================================================================================

 1539A 1942 to 2015 74 years Series 60

 [B] Entire series, effect on correlation ( .728) is:

 Lower 2011< -.016 1942> -.014 1949< -.013 2006> -.011 1995< -.008 2014< -.005 Higher 1981 .026 1952 .014

 1539A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1942 256 214 290 280 179 145 139 94

 1950 127 203 127 113 79 145 136 103 174 253

 1960 212 181 113 78 96 125 185 265 232 216

 1970 244 267 325 230 188 277 240 274 210 251

 1980 235 113 71 109 108 171 141 190 184 230

 1990 151 91 93 115 146 123 127 88 127 109

 2000 184 208 152 119 203 173 137 130 124 183

 2010 150 106 120 132 122 125

====================================================================================================================================

 1539B 1939 to 2015 77 years Series 61

 [B] Entire series, effect on correlation ( .721) is:

 Lower 1963> -.027 1940> -.014 2006> -.012 1990> -.012 2010> -.010 1942> -.008 Higher 1981 .026 1952 .019

 1539B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1939 232

 1940 207 185 175 161 188 162 149 117 119 93

 1950 92 182 109 93 61 149 134 106 187 227

 1960 199 194 103 68 83 74 102 174 164 176

 1970 222 243 316 207 159 220 188 203 185 203

 1980 218 117 85 131 106 152 137 169 178 231

 1990 188 101 107 112 119 120 145 96 130 117

 2000 177 204 180 146 193 177 155 133 133 169

 2010 165 131 126 153 146 127

====================================================================================================================================

 1540A 1916 to 2015 100 years Series 62

 [B] Entire series, effect on correlation ( .676) is:

 Lower 1920< -.025 2006> -.023 1918> -.019 1952> -.013 1936> -.011 1934< -.011 Higher 1963 .039 1981 .011

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 1918 +3.6 SD

 1540A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1916 132 169 211 140

 1920 71 122 103 121 119 151 87 114 145 137

 1930 45 92 102 123 80 98 89 154 175 123

 1940 104 70 67 84 104 98 63 52 51 42

 1950 48 81 56 53 46 84 80 60 77 83

 1960 85 90 68 30 45 62 73 100 99 92

 1970 106 98 145 95 86 104 96 102 105 79

 1980 103 58 40 61 50 64 48 86 69 108

 1990 68 53 57 82 92 105 102 69 69 75

 2000 105 110 102 91 145 126 123 106 93 133

 2010 116 91 89 112 120 106

====================================================================================================================================

 1540B 1919 to 2015 97 years Series 63

 [B] Entire series, effect on correlation ( .702) is:

 Lower 1936> -.017 1932< -.017 1919> -.016 1922> -.010 1952> -.009 1934< -.009 Higher 1981 .015 1926 .014

 1540B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 110

 1920 119 94 120 105 78 108 55 77 119 104

 1930 30 65 57 68 58 73 81 119 170 131

 1940 138 121 121 114 146 126 84 59 71 53

 1950 71 115 72 74 51 106 97 72 112 150

 1960 132 123 84 37 37 38 54 105 88 98

 1970 120 125 148 123 119 157 132 151 121 108

 1980 148 83 55 68 68 108 79 105 99 142

 1990 101 75 88 106 109 113 118 71 80 86

 2000 113 138 100 87 129 132 95 81 84 118

 2010 101 82 79 108 123 92

====================================================================================================================================

 1541A 1923 to 2015 93 years Series 64

 [B] Entire series, effect on correlation ( .672) is:

 Lower 2006> -.018 1993< -.015 1991> -.013 2012> -.010 1963> -.009 2007> -.008 Higher 1936 .023 1930 .020

 1541A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1923 156 154 154 114 163 206 168

 1930 113 255 269 193 194 203 137 187 191 194

 1940 201 212 161 170 257 289 239 151 186 131

 1950 153 228 138 129 127 201 146 109 157 174

 1960 196 187 106 74 105 93 108 173 184 176

 1970 125 155 233 218 226 284 203 206 181 195

 1980 143 91 71 90 75 91 92 128 108 125

 1990 99 73 63 56 60 73 64 65 73 79

 2000 82 73 84 89 109 87 82 99 89 88

 2010 64 65 91 85 71 66

====================================================================================================================================

 1541B 1919 to 2015 97 years Series 65

 [B] Entire series, effect on correlation ( .663) is:

 Lower 2010< -.016 1933< -.015 1994< -.012 1953< -.011 2007> -.009 1997> -.009 Higher 1981 .025 1926 .016

 [E] Outliers 1 3.0 SD above or -4.5 SD below mean for year

 2007 +3.5 SD

 1541B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 198

 1920 239 221 242 245 284 346 212 289 336 289

 1930 239 340 370 208 237 256 205 377 366 306

 1940 269 276 174 175 282 281 230 167 199 151

 1950 235 259 136 110 127 209 166 124 209 231

 1960 200 200 129 105 117 125 148 212 193 228

 1970 184 225 261 227 220 267 194 242 210 191

 1980 159 83 87 86 84 132 112 140 109 115

 1990 101 77 74 78 71 98 79 82 81 82

 2000 96 91 101 83 107 83 71 99 70 82

 2010 58 65 77 70 62 65

====================================================================================================================================

 1542A 1919 to 2015 97 years Series 66

 [B] Entire series, effect on correlation ( .753) is:

 Lower 1938< -.019 1919> -.008 1952> -.007 1925< -.007 1954< -.007 1922> -.007 Higher 1991 .013 1963 .011

 1542A Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1919 141

 1920 127 151 161 157 124 115 85 139 156 125

 1930 59 147 140 114 109 119 81 110 74 159

 1940 95 94 87 96 125 128 76 63 62 67

 1950 80 112 60 76 45 100 78 59 84 83

 1960 78 88 75 46 62 58 85 139 151 152

 1970 167 188 238 146 131 194 136 163 146 106

 1980 108 71 45 66 73 117 98 120 103 137

 1990 92 61 149 163 166 130 140 94 142 123

 2000 153 181 131 128 194 157 91 90 104 168

 2010 123 94 91 117 118 121

====================================================================================================================================

 1542B 1938 to 2015 78 years Series 67

 [B] Entire series, effect on correlation ( .753) is:

 Lower 1940< -.033 2011< -.015 2015> -.007 1984< -.007 1941> -.007 1954< -.005 Higher 1952 .010 1991 .009

 1542B Ring measurements

 Annual values

 Date 0 1 2 3 4 5 6 7 8 9

 1938 116 155

 1940 91 108 100 102 174 149 107 77 82 92

 1950 123 163 76 91 56 156 112 85 137 148

 1960 116 144 73 39 60 63 86 184 171 200

 1970 172 176 229 181 135 225 194 237 158 136

 1980 134 77 41 62 57 104 95 150 107 152

 1990 103 64 124 149 152 141 145 86 114 104

 2000 161 178 133 127 204 168 95 98 126 157

 2010 128 87 99 115 120 124

====================================================================================================================================

PART 7: DESCRIPTIVE STATISTICS: QURU\_CORE2ROWO3RO\_EWLW\_ORIGINAL-50 14:29 Fri 09 Mar 2018 Page 7

------------------------------------------------------------------------------------------------------------------------------------

 Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

 No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

 Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 1 1556A 1922 2015 94 4 0 .764 1.72 3.54 .509 .724 .160 2.62 .465 .033 1

 2 1556B 1922 2015 94 4 0 .621 1.57 3.85 .657 .861 .167 2.75 .437 -.076 1

 3 1557A 1917 2015 99 4 0 .743 2.03 3.10 .515 .780 .135 2.63 .497 -.107 2

 4 1557B 1920 2015 96 4 0 .710 2.03 3.82 .752 .895 .126 2.70 .535 .041 1

 5 1564A 1923 2015 93 4 0 .777 1.25 3.65 .660 .864 .214 2.70 .563 .042 1

 6 1564B 1923 2015 93 4 0 .704 1.51 2.81 .519 .753 .199 2.50 .442 -.043 1

 7 1565A 1919 2015 97 4 0 .699 1.70 3.00 .572 .825 .165 2.82 .539 .010 3

 8 1565B 1924 2015 92 4 0 .695 1.64 3.08 .519 .790 .166 2.67 .449 .012 1

 9 1565C 1919 2015 97 4 0 .596 1.32 3.77 .665 .913 .169 2.77 .543 -.009 1

 10 1567A 1923 2015 93 4 0 .719 .93 2.33 .474 .897 .159 2.58 .500 -.031 1

 11 1567B 1927 2015 89 3 0 .663 .95 3.13 .542 .913 .149 2.74 .464 -.039 2

 12 1577A 1916 2015 100 4 0 .594 1.56 3.38 .627 .862 .175 2.56 .529 .002 1

 13 1577B 1931 2015 85 3 0 .664 1.56 3.36 .737 .905 .168 2.57 .431 -.007 2

 14 1580A 1934 2015 82 3 0 .731 1.65 3.55 .567 .733 .187 2.58 .359 -.028 3

 15 1580B 1926 2015 90 3 0 .761 1.56 2.39 .351 .451 .196 2.51 .351 -.056 2

 16 1584A 1925 2015 91 3 0 .728 1.77 2.62 .357 .606 .134 2.79 .524 -.034 1

 17 1584B 1929 2015 87 3 0 .676 1.81 2.57 .389 .685 .144 2.53 .517 .072 1

 18 1588A 1925 2015 91 3 0 .693 1.79 3.81 .557 .738 .179 2.58 .481 .078 1

 19 1588B 1924 2015 92 4 0 .678 1.97 3.38 .511 .552 .207 2.52 .432 .013 2

 20 1589A 1929 2015 87 3 0 .560 1.29 4.32 .674 .833 .169 2.86 .582 -.012 2

 21 1589B 1923 2015 93 4 0 .606 1.61 3.63 .596 .726 .167 2.70 .511 .070 3

 22 1591A 1922 2015 94 4 0 .628 2.92 5.68 1.268 .850 .164 2.73 .518 .010 2

 23 1591B 1922 2015 94 4 0 .654 2.02 3.62 .680 .850 .146 2.57 .425 -.007 2

 24 1592A 1924 2015 92 4 0 .654 1.78 3.17 .611 .787 .178 2.70 .508 .013 2

 25 1592B 1914 2015 102 4 0 .538 1.49 2.86 .421 .688 .159 2.63 .438 -.009 1

 26 1593A 1935 2015 81 3 0 .746 1.55 3.94 .666 .655 .230 2.74 .643 .019 2

 27 1593B 1918 2015 98 4 0 .661 2.38 5.31 .967 .841 .189 2.50 .413 -.022 1

 28 1594A 1928 2015 88 3 0 .792 1.76 3.53 .594 .776 .172 2.69 .508 .013 1

 29 1594B 1916 2015 100 4 0 .733 1.93 3.33 .552 .708 .175 2.67 .449 -.019 3

 30 1595A 1917 2015 99 4 0 .717 2.03 4.14 .795 .852 .168 2.49 .414 -.010 3

 31 1595B 1924 2015 92 4 1 .469 2.03 4.99 .992 .922 .143 2.41 .425 -.052 3

 32 1596A 1917 2015 99 4 0 .700 2.02 4.22 .896 .888 .169 2.50 .398 .005 1

 33 1596B 1921 2015 95 4 0 .684 1.91 3.57 .600 .730 .190 2.54 .466 -.010 1

 34 1597A 1933 2015 83 3 0 .742 2.16 4.30 .837 .852 .154 2.61 .381 -.089 2

 35 1597B 1919 2015 97 4 0 .763 1.83 3.61 .572 .763 .163 2.69 .434 -.027 1

 36 1598A 1921 2015 95 4 0 .655 1.68 2.96 .502 .788 .169 2.54 .436 -.002 1

 37 1598B 1921 2015 95 4 0 .757 1.95 3.00 .396 .568 .154 2.67 .427 -.052 3

 38 1599A 1932 2015 84 3 0 .787 1.88 3.22 .551 .722 .171 2.60 .494 -.019 3

 39 1599B 1938 2015 78 3 0 .804 1.85 3.46 .526 .739 .163 2.42 .447 -.042 1

 40 1600A 1882 2015 134 5 0 .517 2.08 4.62 .868 .887 .143 2.66 .469 -.001 2

 41 1600B 1875 2015 141 5 1 .525 1.88 4.10 .587 .827 .131 2.65 .404 -.026 3

 42 1528A 1919 2015 97 4 0 .711 1.09 2.11 .380 .728 .209 2.82 .495 .012 2

 43 1528B 1916 2015 100 4 0 .741 1.20 2.22 .411 .644 .251 2.60 .508 -.011 2

 44 1529A 1928 2015 88 3 0 .687 1.18 2.64 .445 .738 .199 2.75 .503 -.040 2

 45 1529B 1916 2015 100 4 0 .643 1.23 2.92 .477 .773 .185 2.66 .393 -.011 3

 46 1530A 1918 2015 98 4 0 .741 1.14 3.09 .580 .849 .209 2.79 .539 -.002 1

 47 1530B 1915 2015 101 4 0 .682 1.07 2.70 .460 .781 .207 2.67 .479 .005 1

 48 1531A 1914 2015 102 4 0 .636 .76 2.18 .411 .790 .215 2.39 .315 -.022 1

PART 7: DESCRIPTIVE STATISTICS: QURU\_CORE2ROWO3RO\_EWLW\_ORIGINAL-50 14:29 Fri 09 Mar 2018 Page 8

------------------------------------------------------------------------------------------------------------------------------------

 Corr //-------- Unfiltered --------\\ //---- Filtered -----\\

 No. No. No. with Mean Max Std Auto Mean Max Std Auto AR

 Seq Series Interval Years Segmt Flags Master msmt msmt dev corr sens value dev corr ()

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 49 1531B 1915 2015 101 4 0 .703 .90 2.36 .472 .846 .195 2.52 .326 -.039 1

 50 1532A 1925 2015 91 3 0 .733 1.09 1.93 .332 .508 .258 2.49 .359 -.007 1

 51 1532B 1919 2015 97 4 0 .769 1.18 2.14 .358 .507 .271 2.49 .432 .040 1

 52 1533A 1921 2015 95 4 0 .639 .80 1.60 .332 .720 .250 2.53 .376 -.031 2

 53 1533B 1921 2014 94 4 0 .606 .88 2.03 .362 .642 .254 2.50 .369 -.041 1

 54 1534A 1920 2015 96 4 0 .687 .94 2.55 .393 .608 .261 2.69 .429 .037 1

 55 1534B 1916 2015 100 4 0 .669 .72 1.33 .222 .529 .227 2.51 .396 -.048 1

 56 1535A 1944 2015 72 3 0 .792 1.54 5.25 .829 .824 .243 2.72 .513 -.040 2

 57 1535B 1936 2015 80 3 0 .774 1.43 2.82 .498 .654 .234 2.67 .491 .003 2

 58 1538A 1919 2015 97 4 0 .743 1.06 2.16 .354 .715 .202 2.61 .447 -.015 2

 59 1538B 1916 2015 100 4 0 .748 1.02 2.21 .343 .711 .201 2.67 .439 .030 3

 60 1539A 1942 2015 74 3 0 .728 1.67 3.25 .611 .674 .253 2.80 .621 .030 2

 61 1539B 1939 2015 77 3 0 .721 1.54 3.16 .477 .622 .216 2.92 .551 .011 2

 62 1540A 1916 2015 100 4 0 .676 .93 2.11 .324 .611 .243 2.62 .408 -.018 2

 63 1540B 1919 2015 97 4 0 .702 .98 1.70 .300 .551 .252 2.58 .456 -.001 2

 64 1541A 1923 2015 93 4 0 .672 1.41 2.88 .596 .778 .197 2.79 .475 -.018 2

 65 1541B 1919 2015 97 4 0 .663 1.74 3.77 .848 .828 .197 2.66 .532 .011 1

 66 1542A 1919 2015 97 4 0 .753 1.14 2.38 .388 .576 .254 2.63 .429 .012 1

 67 1542B 1938 2015 78 3 0 .753 1.25 2.37 .442 .547 .287 2.73 .603 .020 2

 --- -------- --------- ----- ----- ----- ------ ----- ----- ----- ----- ----- ----- ----- ----- --

 Total or mean: 6298 250 2 .687 1.53 5.68 .556 .745 .190 2.92 .462 -.008

 - = [ COFECHA QURU COF ] = -