[] Dendrochronology Program Library Run GRANV Program COF 14:33 Mon 29 Jan 2007 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 26328

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: Granville Corr3-30

File of DATED series: granville\_compact\_corr3.dta

CONTENTS:

RUN CONTROL OPTIONS SELECTED VALUE

1 Cubic smoothing spline 50% wavelength cutoff for filtering

32 years

2 Segments examined are 30 years lagged successively by 15 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 .4226

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 1917 to 2006 90 years

Continuous time span is 1917 to 2006 90 years

Portion with two or more series is 1919 to 2006 88 years

>> 142a 2000 absent in 3 of 40 series, but is not usually narrow: master index is -.041

>> 142a 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 142a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 142a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 143a 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 143a 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 143a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 143a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 143b 2001 absent in 5 of 40 series, but is not usually narrow: master index is .150

>> 143b 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 143b 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 143b 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 143b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 146a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 146a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 146b 1987 absent in 1 of 40 series, but is not usually narrow: master index is -.226

>> 146b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 148a 2001 absent in 5 of 40 series, but is not usually narrow: master index is .150

>> 148a 2002 absent in 4 of 40 series, but is not usually narrow: master index is -.092

>> 148a 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 148a 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 148a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 148a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 148b 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 148b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 154b 2001 absent in 5 of 40 series, but is not usually narrow: master index is .150

>> 156a 1998 absent in 2 of 40 series, but is not usually narrow: master index is .026

>> 156a 1999 absent in 2 of 40 series, but is not usually narrow: master index is .292

>> 156a 2000 absent in 3 of 40 series, but is not usually narrow: master index is -.041

>> 156a 2001 absent in 5 of 40 series, but is not usually narrow: master index is .150

>> 156a 2002 absent in 4 of 40 series, but is not usually narrow: master index is -.092

>> 156a 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 156a 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 156a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 156a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 156b 1994 absent in 1 of 40 series, but is not usually narrow: master index is .380

>> 156b 1996 absent in 1 of 40 series, but is not usually narrow: master index is -.066

>> 156b 1997 absent in 1 of 40 series, but is not usually narrow: master index is 1.102

>> 156b 1998 absent in 2 of 40 series, but is not usually narrow: master index is .026

>> 156b 1999 absent in 2 of 40 series, but is not usually narrow: master index is .292

>> 156b 2000 absent in 3 of 40 series, but is not usually narrow: master index is -.041

>> 156b 2001 absent in 5 of 40 series, but is not usually narrow: master index is .150

>> 156b 2002 absent in 4 of 40 series, but is not usually narrow: master index is -.092

>> 156b 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 156b 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 156b 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 156b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 157a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 157b 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 157b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 158a 2002 absent in 4 of 40 series, but is not usually narrow: master index is -.092

>> 158a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 159a 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 159a 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 159a 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 159a 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 159b 2003 absent in 8 of 40 series, but is not usually narrow: master index is -.287

>> 159b 2004 absent in 7 of 40 series, but is not usually narrow: master index is .928

>> 159b 2005 absent in 11 of 40 series, but is not usually narrow: master index is -.138

>> 159b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

>> 160b 2006 absent in 15 of 40 series, but is not usually narrow: master index is 1.380

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

142a 4 absent rings: 2000 2003 2005 2006

143a 4 absent rings: 2003 2004 2005 2006

143b 5 absent rings: 2001 2003 2004 2005 2006

146a 2 absent rings: 2005 2006

146b 2 absent rings: 1987 2006

148a 6 absent rings: 2001 2002 2003 2004 2005 2006

148b 2 absent rings: 2005 2006

154b 1 absent rings: 2001

156a 9 absent rings: 1998 1999 2000 2001 2002 2003 2004 2005 2006

156b 13 absent rings: 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006

157a 1 absent rings: 2006

157b 2 absent rings: 2005 2006

158a 3 absent rings: 1945 2002 2006

159a 5 absent rings: 1990 2003 2004 2005 2006

159b 5 absent rings: 1990 2003 2004 2005 2006

160b 1 absent rings: 2006

65 absent rings 2.041%

Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab Year Value No Ab

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

1950 -.026 40 2000 -.041 40 3<<

1951 .260 40 2001 .150 40 5<<

1952 1.396 40 2002 -.092 40 4<<

1953 .269 40 2003 -.287 40 8<<

1954 .730 40 2004 .928 40 7<<

1955 1.450 40 2005 -.138 40 11<<

1956 -.333 40 2006 1.380 40 15<<

1957 .336 40

1958 -.330 40

1959 -.108 40

1960 -.936 40

1961 .268 40

1962 -.215 40

1963 -.739 40

1964 .181 40

1965 .129 40

1966 -.807 40

1917 -4.073 1 1967 .603 40

1918 .475 1 1968 .273 40

1919 .108 3 1969 .601 40

1920 -.650 3 1970 -.318 40

1921 .235 4 1971 .673 40

1922 -1.236 8 1972 .182 40

1923 -1.147 14 1973 .681 40

1924 .382 17 1974 -.857 40

1925 -.326 21 1975 1.118 40

1926 -1.227 23 1976 -.283 40

1927 -.253 23 1977 -.234 40

1928 .950 25 1978 1.020 40

1929 .461 26 1979 .297 40

1930 1.012 30 1980 .739 40

1931 1.666 30 1981 -.740 40

1932 .960 32 1982 .906 40

1933 .096 33 1983 .302 40

1934 .953 35 1984 -.122 40

1935 .756 35 1985 .428 40

1936 -4.412 38 1986 -.751 40

1937 -.446 38 1987 -.226 40 1<<

1938 .035 38 1988 .185 40

1939 .684 38 1989 -1.355 40

1940 .284 38 1990 -1.191 40 2

1941 .204 38 1991 -.031 40

1942 .931 38 1992 -.132 40

1943 1.236 39 1993 .698 40

1944 1.506 39 1994 .380 40 1<<

1945 -2.565 39 1 1995 -.959 40 1

1946 -2.050 39 1996 -.066 40 1<<

1947 -.417 39 1997 1.102 40 1<<

1948 -.730 40 1998 .026 40 2<<

1949 -.073 40 1999 .292 40 2<<

PART 5: CORRELATION OF SERIES BY SEGMENTS: Granville Corr3-30 14:33 Mon 29 Jan 2007 Page 5

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Correlations of 30-year dated segments, lagged 15 years

Flags: A = correlation under .4226 but highest as dated; B = correlation higher at other than dated position

Seq Series Time\_span 1905 1920 1935 1950 1965 1980

1934 1949 1964 1979 1994 2009

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

1 141a 1926 2006 .92 .77 .25B .40A .46

2 141b 1925 2006 .93 .88 .42A .16B .18A

3 142a 1923 2006 .86 .87 .50 .40A .58

4 142b 1925 2006 .72 .74 .59 .71 .71

5 143a 1925 2006 .80 .42A .12B .18B-.10B

6 143b 1930 2006 .75 .71 .44 .33B .23B

7 144a 1934 2006 .75 .75 .49 .46 .61

8 144b 1923 2006 .73 .74 .57 .44 .47

9 145a 1924 2006 .52 .46 .62 .60 .65

10 145b 1922 2006 .59 .58 .66 .75 .75

11 146a 1933 2006 .51B .51B-.10B .10B .44

12 146b 1936 2006 .44 .31B .16B-.11B

13 147a 1919 2006 .66 .66 .69 .34A .59 .70

14 147b 1926 2006 .62 .52 .06B .14B .33A

15 148a 1930 2006 .92 .91 .45 .40A .44

16 148b 1934 2006 .84 .84 .44 .01B .07B

17 149a 1929 2006 .86 .78 .73 .67 .58

18 149b 1928 2006 .79 .79 .67 .50 .41A

19 150a 1924 2006 .92 .90 .56 .62 .71

20 150b 1921 2006 .79 .78 .54 .55 .54

21 151a 1928 2006 .76 .65 .41A .43 .42A

22 151b 1930 2006 .88 .85 .34A .41A .58

23 152a 1932 2006 .86 .86 .75 .75 .68

24 152b 1932 2006 .83 .82 .70 .71 .63

25 153a 1922 2006 .91 .93 .40A .31A .56

26 153b 1923 2006 .89 .88 .59 .61 .49

27 154a 1917 2006 .73 .75 .84 .51 .52 .55

28 154b 1923 2006 .82 .68 .05B .34B .44

29 155a 1936 2006 .71 .51 .13B .19B

30 155b 1936 2006 .66 .52 .28B .13B

31 156a 1923 2006 .76 .76 .56 .47 .29A

32 156b 1922 2006 .71 .69 .46 .42A .37A

33 157a 1924 2006 .93 .86 .27B .54 .73

34 157b 1923 2006 .76 .67 .19B .55 .66

35 158a 1922 2006 .77 .82 .49 .52 .66

36 158b 1930 2006 .86 .81 .55 .54 .54

37 159a 1919 2006 .83 .84 .86 .50 .55 .52

38 159b 1925 2006 .84 .82 .59 .57 .66

39 160a 1943 2006 .00B .18B .43 .08B

40 160b 1948 2006 .50 .52 .34A-.29B

Av segment correlation .74 .79 .72 .44 .44 .44

141a 1926 to 2006 81 years Series 1

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

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

1950 1979 -3 -.18 -.17 -.02 .15 -.03 .05 .07 .38\*-.10 -.02 .25|-.09 -.11 .21 -.18 -.08 -.22 .14 -.18 -.07 -.05

1965 1994 0 -.05 .12 -.40 .24 -.10 -.11 -.08 .01 .26 -.16 .40\* .25 -.19 .13 .03 -.10 -.28 -.01 -.12 -.12 -.05

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

Lower 1963< -.045 1960> -.016 1973< -.016 1956> -.016 1984> -.011 1997< -.010 Higher 1936 .134 1945 .065

1950 to 1979 segment:

Lower 1960> -.059 1956> -.058 1973< -.049 1966> -.025 1970> -.023 1954< -.017 Higher 1963 .064 1955 .051

1965 to 1994 segment:

Lower 1973< -.118 1988< -.060 1984> -.051 1969< -.030 1970> -.027 1966> -.025 Higher 1978 .050 1982 .049

141a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 352 338 407 340

1930 371 395 374 256 357 348 86 246 248 241

1940 270 244 361 331 367 79 169 209 191 236

1950 190 225 239 171 173 263 262 229 216 201

1960 225 235 203 103 132 172 189 205 203 171

1970 198 199 170 137 143 198 158 161 226 216

1980 196 177 218 160 207 191 130 140 97 98

1990 92 92 114 129 127 69 117 92 106 68

2000 47 64 94 126 177 138 194

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

141b 1925 to 2006 82 years Series 2

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

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

1950 1979 0 -.01 -.29 .25 -.31 -.01 -.21 .04 -.08 .19 -.25 .42\*-.04 -.14 .21 -.04 .01 -.13 .16 -.34 -.03 .20

1965 1994 -2 -.17 .00 .10 -.26 -.05 -.18 .13 -.25 .26\*-.07 .16|-.08 .05 -.02 .19 .25 -.21 .07 -.28 -.14 .23

1977 2006 0 -.24 .12 -.12 -.16 -.07 .09 .11 -.16 .03 .15 .18\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .685) is:

Lower 1985< -.049 1966> -.022 1998> -.014 1989> -.014 1960> -.007 2004< -.007 Higher 1936 .153 1945 .052

1950 to 1979 segment:

Lower 1966> -.102 1960> -.030 1979> -.024 1964< -.020 1971< -.012 1957< -.011 Higher 1974 .052 1952 .051

1965 to 1994 segment:

Lower 1985< -.128 1966> -.070 1989> -.032 1986> -.014 1990> -.011 1971< -.007 Higher 1974 .066 1976 .055

1977 to 2006 segment:

Lower 1985< -.140 1998> -.040 1989> -.036 2004< -.023 1986> -.016 1990> -.013 Higher 2006 .075 1995 .063

141b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 357 319 336 426 343

1930 434 470 379 258 348 358 95 331 255 353

1940 292 251 323 291 352 128 204 311 253 287

1950 242 263 318 197 293 277 218 217 242 210

1960 230 254 206 217 205 245 259 231 201 197

1970 193 197 194 245 162 182 129 154 215 242

1980 233 159 153 173 149 85 145 173 126 133

1990 134 112 94 127 138 82 146 163 174 86

2000 64 78 76 86 85 87 141

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

142a 1923 to 2006 84 years Series 3

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

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

1965 1994 0 .33 -.37 .04 .19 -.13 .11 .07 -.16 .06 -.13 .40\*-.27 .02 -.14 .06 .03 .02 -.16 -.04 .24 -.17

[B] Entire series, effect on correlation ( .729) is:

Lower 1966> -.017 1923< -.017 1926> -.013 1963> -.012 1980< -.011 1974> -.010 Higher 1936 .063 1945 .054

1965 to 1994 segment:

Lower 1966> -.074 1980< -.056 1974> -.036 1967< -.035 1986> -.024 1968< -.014 Higher 1975 .058 1981 .051

[D] 4 Absent rings: Year Master N series Absent

2000 -.041 40 3 >> WARNING: Ring is not usually narrow

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

142a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 319 450 424 432 432 516 415

1930 449 519 455 428 419 323 187 245 311 296

1940 278 266 242 322 255 116 120 174 181 193

1950 177 167 220 164 166 222 142 157 154 139

1960 93 110 112 133 110 122 132 102 88 120

1970 79 93 83 88 92 124 83 88 112 92

1980 66 47 87 114 75 123 82 57 63 45

1990 28 30 54 64 43 20 33 50 29 5

2000 0 9 6 0 16 0 0

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

142b 1925 to 2006 82 years Series 4

[B] Entire series, effect on correlation ( .677) is:

Lower 1926< -.020 1960> -.012 1984< -.010 1963> -.009 1944< -.007 1925> -.007 Higher 1936 .063 1989 .009

142b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 471 398 395 497 406

1930 390 443 449 427 437 291 80 272 397 392

1940 255 222 264 183 133 17 26 21 21 36

1950 21 61 125 138 129 250 78 78 77 50

1960 124 197 129 189 204 248 229 245 296 275

1970 248 274 268 242 142 198 115 104 152 131

1980 181 113 137 136 56 80 44 39 58 13

1990 26 27 48 83 70 43 88 166 107 42

2000 26 5 6 5 22 2 21

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

143a 1925 to 2006 82 years Series 5

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

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

1935 1964 0 .08 .18 -.07 -.31 -.10 -.22 -.31 .22 -.09 .09 .42\* .10 -.06 -.09 -.04 -.09 -.11 -.11 -.13 .20 -.04

1950 1979 4 -.05 -.04 .09 -.35 .12 -.18 -.34 .32 -.04 .01 .12| .17 .03 -.08 .33\* .02 -.14 .23 -.17 -.10 -.08

1965 1994 -6 -.09 .08 -.19 .21 .23\*-.01 .20 .16 .18 -.13 .18|-.13 .10 -.21 .12 -.05 -.25 .08 .20 -.18 .06

1977 2006 -7 -.25 .28 -.20 .33\*-.09 .11 .19 .13 .16 .19 -.10| - - - - - - - - - -

[B] Entire series, effect on correlation ( .378) is:

Lower 1959< -.104 1960> -.020 1995> -.019 1974> -.019 1989> -.015 1984> -.015 Higher 1936 .093 1945 .047

1935 to 1964 segment:

Lower 1959< -.265 1960> -.034 1956> -.018 1963> -.017 1939< -.012 1964< -.005 Higher 1936 .132 1945 .061

1950 to 1979 segment:

Lower 1959< -.120 1960> -.066 1974> -.064 1956> -.034 1963> -.034 1969< -.022 Higher 1975 .055 1952 .051

1965 to 1994 segment:

Lower 1974> -.090 1989> -.073 1984> -.062 1993< -.056 1969< -.043 1986> -.035 Higher 1975 .085 1978 .076

1977 to 2006 segment:

Lower 1995> -.077 1993< -.057 1984> -.052 1989> -.051 1997< -.037 2005> -.030 Higher 2006 .119 1990 .091

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

1958 1959 -4.1 SD 1959 1960 5.4 SD

[D] 4 Absent rings: Year Master N series Absent

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1959 -7.0 SD

143a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 260 188 204 305 219

1930 334 350 281 199 426 335 76 186 315 219

1940 270 314 355 361 373 123 131 224 141 290

1950 338 234 300 231 211 255 261 223 199 120

1960 236 220 185 230 203 220 198 238 206 167

1970 157 207 235 249 246 276 156 135 269 187

1980 166 129 130 134 247 187 126 71 41 94

1990 38 47 33 13 13 59 19 5 6 3

2000 4 17 15 0 0 0 0

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

143b 1930 to 2006 77 years Series 6

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

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

1965 1994 -10 .33\*-.10 .06 .00 -.05 .12 -.26 .10 -.01 -.23 .33|-.24 .11 .27 .06 .15 .25 -.22 .19 .01 -.03

1977 2006 -10 .24\* .16 -.19 .06 -.21 .11 -.25 .21 -.21 -.15 .23| - - - - - - - - - -

[B] Entire series, effect on correlation ( .480) is:

Lower 1993< -.018 1982< -.017 1957< -.015 1970> -.013 2006< -.013 1986< -.011 Higher 1945 .066 1936 .047

1965 to 1994 segment:

Lower 1982< -.055 1993< -.052 1989> -.045 1970> -.040 1990> -.018 1971< -.017 Higher 1986 .076 1978 .045

1977 to 2006 segment:

Lower 1982< -.046 1993< -.045 1989> -.033 2006< -.031 1995> -.025 2004< -.022 Higher 1986 .137 1978 .058

[D] 5 Absent rings: Year Master N series Absent

2001 .150 40 5 >> WARNING: Ring is not usually narrow

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

143b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 457 444 350 235 347 291 124 159 181 154

1940 259 228 277 339 298 87 131 245 144 260

1950 241 188 241 206 223 285 205 123 110 165

1960 149 148 145 170 201 163 106 158 110 168

1970 178 127 138 131 105 150 111 125 155 135

1980 120 87 72 62 50 81 40 70 83 62

1990 54 56 58 24 42 40 43 64 18 11

2000 65 0 45 0 0 0 0

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

144a 1934 to 2006 73 years Series 7

[B] Entire series, effect on correlation ( .668) is:

Lower 1945> -.049 1960> -.017 1990> -.013 1965< -.012 1979< -.010 2004< -.008 Higher 1936 .153 1989 .010

144a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1934 356 291 186 275 277 243

1940 277 302 297 332 368 238 191 179 173 141

1950 148 187 243 197 224 250 102 140 100 114

1960 155 176 100 127 141 80 83 101 90 95

1970 133 158 180 240 137 176 111 76 107 66

1980 111 89 216 124 111 77 68 84 72 38

1990 68 75 42 53 38 17 24 81 59 56

2000 28 32 38 33 25 14 81

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144b 1923 to 2006 84 years Series 8

[B] Entire series, effect on correlation ( .608) is:

Lower 1985< -.072 1945> -.041 1956> -.017 1928< -.011 1925> -.010 1953< -.008 Higher 1936 .152 1926 .009

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

1985 -4.5 SD

144b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 365 480 459 332 404 332 331

1930 305 339 322 216 384 358 110 275 283 294

1940 216 358 407 413 314 185 110 107 110 76

1950 145 125 209 59 191 276 261 274 147 136

1960 90 95 83 119 195 152 155 221 182 177

1970 188 187 235 245 144 193 145 120 278 221

1980 170 105 133 106 130 48 51 90 84 70

1990 57 68 63 92 86 58 56 120 86 53

2000 53 62 49 16 30 19 76

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145a 1924 to 2006 83 years Series 9

[B] Entire series, effect on correlation ( .513) is:

Lower 1936> -.055 1960< -.023 1966> -.014 1946> -.012 1944< -.010 1981> -.010 Higher 1945 .023 1989 .013

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

1936 +3.5 SD; 1960 -4.7 SD

145a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 119 77 169 219 423 325

1930 401 499 419 441 570 611 400 349 543 684

1940 449 439 532 747 457 285 375 351 267 268

1950 232 288 328 276 325 464 315 294 183 268

1960 99 229 191 146 166 276 257 223 163 284

1970 144 178 163 160 96 181 110 145 212 165

1980 177 166 215 173 133 96 28 87 71 9

1990 16 19 27 17 40 39 120 214 103 52

2000 47 117 33 41 97 52 133

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

145b 1922 to 2006 85 years Series 10

[B] Entire series, effect on correlation ( .610) is:

Lower 1936> -.125 1924< -.024 1963> -.018 1965< -.009 1922> -.005 1970> -.005 Higher 1945 .069 1946 .012

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

1936 +3.4 SD

145b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 138 138 140 163 171 283 341 279

1930 330 409 360 368 477 451 344 395 519 408

1940 433 466 493 551 367 128 175 291 248 274

1950 202 218 313 231 312 341 156 191 156 197

1960 108 202 182 225 214 116 143 191 144 172

1970 178 172 140 131 79 215 110 99 201 119

1980 68 71 121 117 54 92 21 63 91 12

1990 6 39 46 57 78 34 35 101 47 59

2000 93 93 34 34 98 61 66

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

146a 1933 to 2006 74 years Series 11

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

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

1933 1962 -9 .20 .61\*-.15 -.39 -.15 .20 -.20 -.11 .14 -.19 .51| .24 -.18 -.15 -.09 .04 -.15 .00 -.06 .02 .07

1935 1964 -9 .23 .61\*-.15 -.35 -.18 .19 -.24 -.14 .10 -.22 .51| .21 -.18 -.03 -.11 .03 -.20 .02 -.10 -.01 -.03

1950 1979 8 .25 .16 .06 -.20 .06 .12 -.08 .11 .11 -.04 -.10| .06 .02 -.03 -.10 .15 .04 -.16 .27\*-.13 -.31

1965 1994 -3 .17 -.02 .25 -.16 .04 .02 -.22 .33\*-.05 -.02 .10| .00 .16 .01 -.03 .15 .33 -.16 .11 -.23 -.24

[B] Entire series, effect on correlation ( .314) is:

Lower 1968< -.046 1969< -.039 1955< -.033 1956> -.018 2006< -.015 1982< -.013 Higher 1945 .106 1989 .027

1933 to 1962 segment:

Lower 1955< -.098 1956> -.040 1935< -.019 1960> -.018 1938< -.017 1936> -.008 Higher 1945 .193 1952 .025

1935 to 1964 segment:

Lower 1955< -.099 1956> -.041 1935< -.019 1960> -.019 1938< -.017 1936> -.015 Higher 1945 .188 1952 .027

1950 to 1979 segment:

Lower 1955< -.080 1969< -.060 1956> -.048 1970> -.027 1976> -.019 1960> -.019 Higher 1952 .084 1958 .028

1965 to 1994 segment:

Lower 1969< -.079 1968< -.060 1974> -.033 1970> -.032 1981> -.031 1982< -.028 Higher 1989 .129 1980 .035

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

1969 1970 4.7 SD

[D] 2 Absent rings: Year Master N series Absent

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1969 -5.6 SD

146a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1933 638 597 436 364 627 426 405

1940 493 383 455 581 485 207 260 340 346 354

1950 266 241 369 290 243 174 291 278 169 170

1960 227 214 188 157 229 233 148 217 53 17

1970 283 328 261 223 189 145 221 161 192 327

1980 298 167 54 50 6 64 56 72 59 4

1990 32 47 39 34 58 27 10 84 18 83

2000 35 49 32 23 29 0 0

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

146b 1936 to 2006 71 years Series 12

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

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

1950 1979 -6 -.15 .03 -.27 -.28 .33\* .25 .05 .31 .31 -.20 .31|-.01 -.10 -.09 -.11 -.01 -.08 -.15 .20 .01 -.17

1965 1994 8 -.01 .14 -.13 .10 .35 .06 .02 .08 .12 -.22 .16|-.01 -.23 .03 .03 .14 .10 -.12 .36\* .24 -.17

1977 2006 -1 .09 -.08 -.35 .04 .09 .02 .04 -.20 -.03 .12\*-.11| - - - - - - - - - -

[B] Entire series, effect on correlation ( .237) is:

Lower 2006< -.064 1980< -.021 1998> -.020 1995> -.020 1944< -.018 1989> -.018 Higher 1936 .104 1946 .047

1950 to 1979 segment:

Lower 1965< -.039 1951< -.037 1970> -.030 1969< -.024 1974> -.019 1953> -.019 Higher 1966 .055 1955 .045

1965 to 1994 segment:

Lower 1989> -.092 1980< -.075 1970> -.034 1974> -.028 1965< -.024 1977> -.018 Higher 1975 .059 1978 .057

1977 to 2006 segment:

Lower 2006< -.145 1995> -.056 1980< -.041 1989> -.040 1998> -.023 1977> -.008 Higher 1978 .072 1981 .068

[D] 2 Absent rings: Year Master N series Absent

1987 -.226 40 1 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1998 +3.1 SD

146b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1936 375 572 615 490

1940 471 527 524 707 432 371 230 295 323 306

1950 272 235 308 340 316 333 278 262 249 266

1960 228 230 161 178 273 158 122 199 132 125

1970 201 234 246 199 162 207 163 198 217 155

1980 43 12 35 9 49 73 36 0 45 55

1990 18 15 15 18 15 49 45 35 120 41

2000 28 4 20 15 13 15 0

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

147a 1919 to 2006 88 years Series 13

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

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

1950 1979 0 -.05 .04 -.08 -.12 .06 -.03 .16 .12 .15 -.03 .34\*-.26 .24 -.17 -.06 -.31 .24 -.39 .16 -.08 -.05

[B] Entire series, effect on correlation ( .603) is:

Lower 1936> -.028 1923> -.014 1968< -.012 1925> -.010 1954< -.009 1975< -.009 Higher 1945 .063 1946 .013

1950 to 1979 segment:

Lower 1975< -.051 1954< -.048 1968< -.041 1953> -.036 1956> -.035 1973< -.030 Higher 1966 .071 1955 .067

147a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 301

1920 273 300 284 344 371 415 231 365 414 461

1930 365 448 440 397 344 339 215 230 288 301

1940 211 239 368 317 431 175 159 238 303 336

1950 337 341 389 480 316 480 396 377 385 410

1960 292 352 339 273 295 271 207 272 201 337

1970 306 337 275 210 182 190 182 243 213 174

1980 203 126 150 141 176 151 85 130 118 66

1990 51 79 87 105 68 63 87 95 54 122

2000 79 91 50 40 69 46 135

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

147b 1926 to 2006 81 years Series 14

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

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

1950 1979 -3 -.14 .15 .11 -.03 .08 .09 .12 .33\*-.24 -.06 .06|-.34 -.13 .01 -.13 -.33 .14 -.14 .29 -.14 .18

1965 1994 6 .05 .14 .11 -.01 -.03 .02 -.02 .01 -.07 -.35 .14| .06 -.24 .09 .02 -.09 .21\*-.13 .19 -.11 -.11

1977 2006 0 -.03 .29 -.07 -.04 -.03 .27 .03 -.11 .00 -.49 .33\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .422) is:

Lower 1973< -.028 1994< -.025 1954< -.018 1983< -.014 1970> -.012 1958> -.011 Higher 1946 .024 1926 .017

1950 to 1979 segment:

Lower 1973< -.086 1954< -.061 1970> -.045 1958> -.041 1969< -.029 1967< -.021 Higher 1955 .104 1966 .058

1965 to 1994 segment:

Lower 1973< -.076 1994< -.047 1970> -.041 1969< -.025 1983< -.025 1990> -.019 Higher 1982 .050 1993 .045

1977 to 2006 segment:

Lower 1994< -.072 1983< -.038 1990> -.024 1985< -.020 2002> -.015 1978< -.015 Higher 1995 .071 1982 .037

147b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 178 247 386 319

1930 376 361 405 380 376 357 253 300 281 331

1940 314 318 401 300 431 263 197 284 295 298

1950 277 325 378 371 285 505 363 395 465 481

1960 370 417 359 338 369 417 251 255 207 208

1970 324 266 246 146 160 212 169 131 143 136

1980 166 114 165 67 112 74 71 96 162 74

1990 84 138 81 135 31 31 62 67 54 63

2000 49 90 71 58 55 36 47

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

148a 1930 to 2006 77 years Series 15

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

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

1965 1994 0 .22 .06 .00 .03 .03 .01 -.02 .14 -.30 -.29 .40\*-.35 -.04 -.11 .08 .08 .08 .00 -.29 -.05 .19

[B] Entire series, effect on correlation ( .729) is:

Lower 1969< -.024 1997< -.017 1970< -.013 2005> -.009 1989> -.009 1971< -.008 Higher 1936 .139 1945 .029

1965 to 1994 segment:

Lower 1969< -.082 1971< -.032 1980< -.026 1989> -.022 1981> -.020 1967< -.019 Higher 1982 .050 1978 .040

[D] 6 Absent rings: Year Master N series Absent

2001 .150 40 5 >> WARNING: Ring is not usually narrow

2002 -.092 40 4 >> WARNING: Ring is not usually narrow

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

148a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 581 598 492 361 397 421 119 311 242 359

1940 349 339 304 404 416 103 127 224 137 182

1950 160 254 284 300 226 291 156 230 226 241

1960 175 230 137 157 180 228 137 131 168 84

1970 46 85 125 200 110 134 97 77 154 87

1980 83 98 154 114 73 90 61 89 109 71

1990 55 94 56 77 35 5 3 6 3 3

2000 1 0 0 0 0 0 0

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

148b 1934 to 2006 73 years Series 16

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

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

1965 1994 4 .12 .27 -.09 .16 -.07 .18 -.04 -.13 .03 -.38 .01|-.03 -.06 .02 .29\* .01 -.29 .21 -.37 -.01 -.01

1977 2006 -5 .12 .38 -.04 .15 .11 .42\*-.20 -.02 .06 -.36 .07| - - - - - - - - - -

[B] Entire series, effect on correlation ( .620) is:

Lower 1989> -.033 1990> -.032 1969< -.023 1966> -.013 1981> -.013 1997< -.011 Higher 1936 .120 1945 .075

1965 to 1994 segment:

Lower 1990> -.090 1989> -.089 1969< -.057 1966> -.033 1981> -.031 1985< -.019 Higher 1986 .097 1978 .070

1977 to 2006 segment:

Lower 1990> -.113 1989> -.110 1997< -.048 1981> -.036 1985< -.027 2005> -.020 Higher 1995 .111 1986 .110

[D] 2 Absent rings: Year Master N series Absent

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1990 +3.4 SD

148b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1934 373 485 203 299 283 338

1940 214 295 285 429 437 131 154 176 150 169

1950 140 212 288 244 184 290 184 187 164 213

1960 102 196 111 115 164 147 165 141 182 109

1970 78 103 98 112 111 148 143 162 201 143

1980 176 175 173 149 167 119 82 127 147 163

1990 191 131 95 84 46 20 19 22 16 10

2000 19 7 10 9 4 0 0

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

149a 1929 to 2006 78 years Series 17

[B] Entire series, effect on correlation ( .724) is:

Lower 1961< -.020 1981> -.018 1943< -.014 2003> -.011 1986> -.008 1994> -.005 Higher 1936 .047 1945 .010

149a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1929 323

1930 340 438 342 260 292 319 175 236 230 285

1940 237 206 315 195 382 149 112 234 210 210

1950 173 200 289 250 266 234 170 207 150 152

1960 111 113 170 116 179 165 134 183 225 219

1970 184 195 200 216 123 211 147 146 237 179

1980 281 253 296 233 175 156 175 138 144 112

1990 119 158 141 185 216 79 163 170 100 116

2000 91 101 81 155 158 94 112

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

149b 1928 to 2006 79 years Series 18

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

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

1977 2006 0 -.17 .19 -.26 -.06 .12 .25 -.19 .09 .14 .25 .41\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .650) is:

Lower 1981> -.016 1979< -.014 1990< -.012 2004< -.011 1967< -.010 1986> -.008 Higher 1936 .058 1974 .009

1977 to 2006 segment:

Lower 1981> -.062 2004< -.048 1979< -.034 1986> -.032 1996< -.015 1984> -.014 Higher 1990 .069 2006 .044

149b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1928 428 472

1930 419 480 308 245 265 279 160 257 213 311

1940 301 220 280 251 231 133 97 197 139 197

1950 193 193 271 180 170 216 123 137 166 145

1960 113 162 168 111 128 145 122 119 133 175

1970 128 125 162 157 98 185 124 155 185 96

1980 176 172 147 152 149 176 133 100 92 82

1990 40 83 100 162 114 82 62 162 125 211

2000 98 88 116 67 77 106 204

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

150a 1924 to 2006 83 years Series 19

[B] Entire series, effect on correlation ( .802) is:

Lower 1971< -.013 1974> -.011 1956> -.011 1943< -.009 1968< -.009 2001< -.008 Higher 1936 .098 1945 .019

150a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 556 447 342 405 483 523

1930 454 528 448 314 362 282 115 290 307 373

1940 262 262 254 211 275 122 140 157 153 150

1950 172 201 237 219 263 282 224 198 135 131

1960 103 162 168 120 185 155 91 117 84 164

1970 120 91 91 112 116 197 123 142 143 99

1980 85 79 214 116 83 69 40 33 62 22

1990 3 39 41 57 73 51 54 106 59 81

2000 76 34 27 40 69 28 71

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

150b 1921 to 2006 86 years Series 20

[B] Entire series, effect on correlation ( .641) is:

Lower 1968< -.021 1923> -.015 1961< -.011 1998< -.011 1956> -.010 1987< -.009 Higher 1936 .094 1945 .012

150b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 370 320 409 472 426 318 320 415 511

1930 383 480 405 380 415 367 139 316 363 379

1940 205 184 194 218 365 132 159 123 157 198

1950 207 244 309 193 220 206 194 220 160 159

1960 85 92 108 100 145 133 104 121 79 140

1970 139 230 127 138 125 181 105 139 151 137

1980 154 88 123 75 94 92 81 56 70 42

1990 46 68 73 52 70 57 54 65 32 56

2000 51 41 29 30 66 46 41

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

151a 1928 to 2006 79 years Series 21

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

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

1950 1979 0 -.01 -.17 .13 -.29 -.11 -.34 -.14 -.03 -.04 .05 .41\* .09 .28 .07 .27 -.05 -.11 .21 -.36 -.12 .15

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

1977 2006 0 .28 -.06 -.32 .26 -.24 -.05 -.29 .07 -.03 -.33 .42\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .559) is:

Lower 1964< -.021 1986< -.020 1960> -.013 1980< -.013 1995> -.013 1935< -.011 Higher 1945 .100 1931 .010

1950 to 1979 segment:

Lower 1964< -.106 1960> -.052 1959< -.046 1968> -.029 1957< -.018 1966> -.012 Higher 1956 .043 1974 .043

1977 to 2006 segment:

Lower 1995> -.059 1989> -.056 1980< -.042 1990> -.042 1993< -.017 1994> -.014 Higher 1986 .056 2004 .036

151a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1928 248 261

1930 384 443 299 242 294 168 96 135 162 195

1940 186 153 128 164 203 66 89 108 117 127

1950 157 169 172 142 138 146 98 97 93 71

1960 125 128 119 121 89 133 147 177 244 220

1970 163 172 181 216 148 181 146 159 211 191

1980 115 79 166 115 65 136 42 77 93 100

1990 111 114 114 87 174 130 105 113 57 97

2000 56 65 38 49 118 44 75

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

151b 1930 to 2006 77 years Series 22

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

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

1950 1979 0 .26 .03 -.07 -.31 -.11 -.20 -.31 .11 -.25 .10 .34\* .12 .13 .14 .26 -.17 -.06 .03 -.17 -.01 .00

1965 1994 0 .19 -.15 -.24 .32 -.27 .18 -.04 .21 -.23 -.03 .41\*-.18 -.02 .00 .01 -.04 .18 -.23 .08 .23 -.05

[B] Entire series, effect on correlation ( .747) is:

Lower 1955< -.018 1993< -.016 1942< -.016 1960> -.013 1975< -.012 1968> -.011 Higher 1936 .157 1945 .033

1950 to 1979 segment:

Lower 1955< -.089 1975< -.058 1960> -.046 1957< -.034 1973< -.032 1968> -.031 Higher 1952 .097 1978 .049

1965 to 1994 segment:

Lower 1993< -.067 1975< -.053 1973< -.028 1968> -.025 1980< -.019 1994< -.014 Higher 1978 .046 1981 .044

151b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 378 360 342 249 239 226 43 170 184 224

1940 193 142 108 163 192 61 82 119 121 116

1950 135 116 186 149 136 104 93 92 111 102

1960 141 152 121 131 140 139 110 183 268 295

1970 185 182 188 137 127 128 143 111 199 166

1980 122 75 121 99 78 170 79 111 124 85

1990 61 75 86 58 57 60 79 97 53 66

2000 80 104 65 64 104 60 99

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

152a 1932 to 2006 75 years Series 23

[B] Entire series, effect on correlation ( .775) is:

Lower 1945> -.025 2002< -.015 1956> -.013 1996> -.012 1986> -.009 1977> -.006 Higher 1936 .083 1989 .006

152a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1932 354 379 354 425 211 344 400 357

1940 294 312 374 470 438 221 206 281 262 248

1950 261 335 402 322 377 449 334 320 278 283

1960 184 277 214 216 246 227 186 268 273 265

1970 242 290 221 275 148 234 172 243 216 202

1980 262 155 190 200 152 169 164 177 158 98

1990 109 116 132 132 128 71 188 163 102 103

2000 111 104 51 75 135 99 168

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

152b 1932 to 2006 75 years Series 24

[B] Entire series, effect on correlation ( .736) is:

Lower 2002< -.026 1945> -.015 1932< -.014 1958< -.011 1977> -.011 1962< -.009 Higher 1936 .081 1989 .008

152b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1932 393 456 534 516 284 483 471 429

1940 471 346 452 545 451 287 275 368 286 305

1950 310 407 411 324 303 332 237 273 166 228

1960 190 228 151 142 214 208 209 295 315 303

1970 194 254 249 285 123 254 162 285 235 220

1980 221 145 207 155 119 156 145 192 135 89

1990 85 92 149 149 146 96 139 187 112 131

2000 138 119 52 124 156 70 203

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

153a 1922 to 2006 85 years Series 25

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

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

1950 1979 0 .16 -.18 .07 .01 -.36 -.22 -.30 .08 -.22 -.17 .40\*-.01 .09 .20 .05 -.01 -.10 -.03 -.17 -.18 .14

1965 1994 0 -.05 .15 -.11 .09 -.17 -.02 -.12 .04 -.14 -.21 .31\*-.07 -.08 -.14 -.09 .10 .09 -.21 .08 -.21 .00

[B] Entire series, effect on correlation ( .740) is:

Lower 1973< -.031 1986> -.028 2003< -.015 1975< -.012 1962> -.008 1966> -.007 Higher 1936 .126 1945 .019

1950 to 1979 segment:

Lower 1973< -.151 1975< -.054 1962> -.038 1966> -.031 1971< -.020 1968> -.019 Higher 1952 .062 1960 .056

1965 to 1994 segment:

Lower 1973< -.126 1986> -.108 1975< -.050 1966> -.022 1971< -.020 1983< -.011 Higher 1989 .070 1990 .059

153a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 258 306 408 342 303 367 404 368

1930 343 363 328 255 413 329 55 192 225 268

1940 221 171 184 190 317 78 70 89 96 122

1950 168 182 221 120 163 184 111 114 114 145

1960 100 118 166 118 134 153 142 194 191 145

1970 112 103 82 48 78 86 79 95 144 99

1980 168 71 114 73 89 109 176 156 158 63

1990 34 110 74 100 66 28 48 56 40 48

2000 65 60 55 23 57 43 53

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

153b 1923 to 2006 84 years Series 26

[B] Entire series, effect on correlation ( .750) is:

Lower 2004< -.017 1971< -.014 2002> -.014 1966> -.013 1997< -.012 1960> -.011 Higher 1936 .122 1946 .008

153b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 301 465 325 362 428 458 492

1930 499 452 386 293 367 345 102 208 294 252

1940 232 226 252 183 225 108 76 149 97 107

1950 141 155 201 168 175 205 123 192 132 124

1960 153 153 135 95 186 193 190 229 155 159

1970 56 71 177 164 54 139 81 84 153 163

1980 173 65 245 201 138 211 133 101 92 60

1990 37 141 79 123 105 33 24 43 48 69

2000 103 49 123 57 27 35 82

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

154a 1917 to 2006 90 years Series 27

[\*] Early part of series cannot be checked from 1917 to 1918 -- not matched by another series

[B] Entire series, effect on correlation ( .642) is:

Lower 1920> -.030 1926> -.016 1922> -.016 1919> -.011 1986> -.009 1972< -.009 Higher 1936 .167 1946 .009

154a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 36 178 244

1920 249 183 210 169 198 163 222 178 296 208

1930 231 320 224 271 250 250 84 161 184 235

1940 230 240 242 226 218 126 100 171 103 138

1950 127 136 190 126 132 170 142 170 160 167

1960 150 188 164 112 130 107 113 148 149 189

1970 165 152 95 108 90 178 163 122 209 148

1980 210 76 94 131 156 152 125 73 62 44

1990 46 51 45 84 51 30 23 36 37 26

2000 14 20 35 35 47 22 35

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

154b 1923 to 2006 84 years Series 28

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

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

1950 1979 9 -.09 .16 -.21 -.24 .15 .28 -.06 .22 .18 -.04 .05|-.08 .17 -.40 .18 -.10 .00 .03 -.10 .44\*-.19

1965 1994 9 -.17 .08 -.10 .15 .06 .28 -.09 -.07 .30 -.33 .34|-.22 .08 -.32 .17 .08 -.03 .01 .14 .45\*-.32

[B] Entire series, effect on correlation ( .558) is:

Lower 1974> -.018 1965< -.015 1950< -.014 1963> -.014 1926> -.014 1972< -.013 Higher 1936 .144 1945 .045

1950 to 1979 segment:

Lower 1974> -.056 1963> -.047 1960> -.032 1956> -.020 1970> -.019 1958> -.019 Higher 1978 .059 1966 .049

1965 to 1994 segment:

Lower 1974> -.082 1986> -.045 1965< -.029 1970> -.024 1994< -.023 1972< -.022 Higher 1981 .066 1978 .044

[D] 1 Absent rings: Year Master N series Absent

2001 .150 40 5 >> WARNING: Ring is not usually narrow

154b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 232 274 273 310 315 320 314

1930 357 386 378 340 319 262 136 214 229 347

1940 245 202 291 262 238 125 128 170 172 186

1950 116 125 140 184 142 147 149 130 152 103

1960 139 127 153 182 157 92 89 124 105 185

1970 180 227 109 216 185 177 140 120 168 112

1980 108 63 79 69 85 87 78 61 58 34

1990 25 17 14 51 6 14 1 26 1 13

2000 4 0 1 11 25 13 15

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

155a 1936 to 2006 71 years Series 29

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

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

1965 1994 -6 -.08 -.08 .13 -.18 .37\*-.04 .06 .09 .22 -.35 .13|-.19 -.17 .23 .02 -.23 .21 .03 .16 .12 .26

1977 2006 -6 -.30 .22 .13 -.19 .41\* .18 -.09 .09 -.06 -.23 .19| - - - - - - - - - -

[B] Entire series, effect on correlation ( .512) is:

Lower 1936> -.039 1980< -.021 1978< -.020 1995< -.016 1990> -.015 1992< -.013 Higher 1945 .127 1952 .011

1965 to 1994 segment:

Lower 1978< -.075 1980< -.073 1990> -.053 1982< -.026 1974> -.024 1989> -.014 Higher 1966 .091 1975 .082

1977 to 2006 segment:

Lower 1990> -.054 1978< -.050 1980< -.047 2005> -.040 1989> -.032 1982< -.016 Higher 1995 .196 1997 .048

155a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1936 183 323 382 426

1940 409 296 342 262 284 84 112 168 202 236

1950 230 296 325 224 262 248 222 235 219 221

1960 209 229 234 202 227 211 162 242 270 339

1970 292 310 341 427 357 456 344 377 220 182

1980 118 164 166 171 221 213 142 208 181 164

1990 188 211 108 122 135 55 84 138 96 141

2000 116 105 115 83 110 132 113

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

155b 1936 to 2006 71 years Series 30

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

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

1965 1994 10 .00 -.03 .20 -.12 .32 -.06 .18 .05 .07 -.17 .28|-.30 -.07 -.12 -.01 .04 -.04 .08 .17 -.19 .38\*

1977 2006 -6 -.18 .33 .03 .01 .37\* .16 .01 .11 -.28 -.07 .13| - - - - - - - - - -

[B] Entire series, effect on correlation ( .435) is:

Lower 1966< -.040 1936> -.037 2006< -.021 1970> -.018 1989> -.015 1986> -.014 Higher 1945 .063 1952 .018

1965 to 1994 segment:

Lower 1989> -.057 1970> -.050 1986> -.046 1982< -.037 1987> -.023 1967< -.018 Higher 1974 .071 1966 .060

1977 to 2006 segment:

Lower 2006< -.073 1989> -.057 1986> -.057 1982< -.038 1987> -.031 2005> -.028 Higher 1995 .147 1997 .072

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

1966 -5.4 SD

155b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1936 176 321 234 199

1940 256 208 316 348 303 73 69 83 67 109

1950 78 122 245 102 129 153 136 137 150 133

1960 114 171 137 109 155 150 51 104 172 234

1970 308 253 230 282 135 239 160 196 188 147

1980 137 124 110 106 114 104 149 231 179 146

1990 93 99 70 95 79 36 47 124 77 77

2000 122 74 133 118 185 175 118

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

156a 1923 to 2006 84 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

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

1977 2006 0 .00 -.28 -.17 -.18 -.35 .07 -.12 -.02 -.05 .02 .29\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .645) is:

Lower 1978< -.021 1944< -.021 1987< -.017 1948> -.012 1925< -.011 1969< -.011 Higher 1945 .076 1936 .073

1977 to 2006 segment:

Lower 1978< -.116 1987< -.062 2005> -.033 2003> -.020 1979< -.015 1988< -.012 Higher 2006 .050 1981 .038

[D] 9 Absent rings: Year Master N series Absent

1998 .026 40 2 >> WARNING: Ring is not usually narrow

1999 .292 40 2 >> WARNING: Ring is not usually narrow

2000 -.041 40 3 >> WARNING: Ring is not usually narrow

2001 .150 40 5 >> WARNING: Ring is not usually narrow

2002 -.092 40 4 >> WARNING: Ring is not usually narrow

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

156a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 270 325 201 237 313 399 436

1930 532 538 495 407 377 337 109 147 160 265

1940 206 417 423 369 240 68 116 184 257 217

1950 214 185 219 172 261 282 217 194 214 230

1960 193 182 202 183 201 186 163 244 297 235

1970 191 332 295 443 279 295 280 223 157 117

1980 167 121 143 146 94 71 45 5 5 2

1990 5 3 10 12 9 2 3 3 0 0

2000 0 0 0 0 0 0 0

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

156b 1922 to 2006 85 years Series 32

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

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

1965 1994 0 .08 -.17 .26 .02 -.31 -.02 .17 -.06 -.13 -.07 .42\*-.39 .35 -.09 .15 -.02 -.01 .09 -.19 -.27 -.06

1977 2006 0 -.12 -.11 .08 .13 -.57 .25 -.10 .13 -.14 .23 .37\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .592) is:

Lower 1970< -.016 1934< -.014 2005> -.010 1985< -.010 1976> -.009 1969< -.009 Higher 1945 .097 1936 .015

1965 to 1994 segment:

Lower 1976> -.044 1969< -.030 1985< -.030 1966> -.026 1989> -.023 1986> -.019 Higher 1974 .106 1980 .030

1977 to 2006 segment:

Lower 1985< -.063 2005> -.052 1988< -.023 2003> -.021 1997< -.017 2002> -.010 Higher 2006 .083 1980 .033

[D] 13 Absent rings: Year Master N series Absent

1994 .380 40 1 >> WARNING: Ring is not usually narrow

1995 -.959 40 1

1996 -.066 40 1 >> WARNING: Ring is not usually narrow

1997 1.102 40 1 >> WARNING: Ring is not usually narrow

1998 .026 40 2 >> WARNING: Ring is not usually narrow

1999 .292 40 2 >> WARNING: Ring is not usually narrow

2000 -.041 40 3 >> WARNING: Ring is not usually narrow

2001 .150 40 5 >> WARNING: Ring is not usually narrow

2002 -.092 40 4 >> WARNING: Ring is not usually narrow

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1970 -5.2 SD

156b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 130 180 329 229 264 372 462 623

1930 574 590 489 482 317 446 165 399 262 437

1940 366 351 398 383 341 101 178 273 321 468

1950 392 309 363 239 316 321 302 303 223 333

1960 245 313 307 305 274 334 288 328 246 218

1970 107 209 238 264 127 240 224 174 194 179

1980 311 167 224 205 91 38 35 13 4 4

1990 3 9 6 12 0 0 0 0 0 0

2000 0 0 0 0 0 0 0

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

157a 1924 to 2006 83 years Series 33

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

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

1950 1979 2 .24 -.02 .07 -.06 -.01 -.11 -.11 -.09 .15 -.37 .27|-.28 .38\*-.26 .21 .01 -.34 .01 -.13 .16 -.16

[B] Entire series, effect on correlation ( .697) is:

Lower 1972< -.071 2006< -.023 1960> -.016 1978< -.011 1962> -.009 1959> -.008 Higher 1936 .135 1945 .014

1950 to 1979 segment:

Lower 1972< -.159 1960> -.057 1978< -.038 1962> -.028 1959> -.019 1976> -.008 Higher 1956 .053 1952 .050

[D] 1 Absent rings: Year Master N series Absent

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1972 -5.0 SD

157a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 301 285 241 235 298 241

1930 321 405 377 288 360 344 63 208 230 277

1940 282 213 205 231 260 129 141 168 174 195

1950 236 241 281 241 258 241 187 244 219 281

1960 259 226 262 227 228 198 183 241 223 233

1970 193 211 128 175 175 214 187 169 150 148

1980 228 157 227 170 136 183 109 88 111 47

1990 41 84 55 99 77 65 66 123 51 51

2000 37 54 60 46 61 5 0

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

157b 1923 to 2006 84 years Series 34

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

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

1950 1979 -10 .38\*-.26 .17 .12 .12 .11 -.14 -.11 .08 -.35 .19|-.17 .07 -.08 .16 .05 -.13 .13 -.08 -.09 -.04

[B] Entire series, effect on correlation ( .572) is:

Lower 2006< -.029 1960> -.019 1955< -.019 1971< -.018 1970< -.012 2004< -.012 Higher 1936 .187 1989 .010

1950 to 1979 segment:

Lower 1960> -.071 1955< -.066 1971< -.055 1976> -.043 1962> -.036 1951< -.017 Higher 1975 .054 1956 .053

[D] 2 Absent rings: Year Master N series Absent

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

157b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 287 358 296 232 216 247 228

1930 236 358 348 227 297 312 70 163 181 248

1940 228 189 160 285 231 151 176 189 171 161

1950 201 142 165 152 232 149 128 195 128 163

1960 184 171 200 157 144 117 114 174 151 159

1970 85 97 124 137 127 182 178 146 143 137

1980 159 93 184 118 56 153 66 38 53 27

1990 20 62 34 63 45 31 43 105 51 48

2000 28 31 32 24 8 0 0

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

158a 1922 to 2006 85 years Series 35

[B] Entire series, effect on correlation ( .680) is:

Lower 2006< -.026 1926> -.015 2002< -.015 1925> -.012 1980< -.011 1946> -.011 Higher 1945 .075 1936 .044

[D] 3 Absent rings: Year Master N series Absent

1945 -2.565 39 1

2002 -.092 40 4 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

158a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 184 194 213 293 269 264 235 264

1930 317 300 279 239 240 268 42 77 152 169

1940 137 179 288 254 324 0 106 115 97 116

1950 144 156 185 161 211 153 108 115 101 165

1960 82 92 109 62 134 241 193 209 277 234

1970 153 171 110 130 115 154 135 96 105 104

1980 73 33 163 130 76 116 53 36 71 49

1990 50 70 61 92 85 32 41 72 68 68

2000 46 57 0 36 52 13 0

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

158b 1930 to 2006 77 years Series 36

[B] Entire series, effect on correlation ( .716) is:

Lower 1998> -.018 1966> -.015 1946> -.014 1974> -.012 2003< -.011 1960< -.011 Higher 1945 .061 1936 .058

158b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 385 241 258 181 183 187 25 104 118 235

1940 234 258 237 320 380 60 147 288 238 257

1950 258 235 343 344 265 239 120 216 227 220

1960 85 161 211 122 188 319 297 307 248 215

1970 165 273 184 177 183 232 168 148 136 146

1980 135 85 154 144 92 98 60 40 83 59

1990 64 56 40 85 72 28 41 71 118 71

2000 27 45 50 10 38 50 64

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

159a 1919 to 2006 88 years Series 37

[B] Entire series, effect on correlation ( .715) is:

Lower 1977< -.021 1922> -.018 1921> -.015 1976> -.011 1961> -.011 1952< -.010 Higher 1936 .115 1945 .009

[D] 5 Absent rings: Year Master N series Absent

1990 -1.191 40 2

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

159a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 123

1920 107 300 218 182 213 165 168 214 285 269

1930 331 345 367 268 325 369 87 244 223 253

1940 213 192 253 280 342 115 148 175 132 151

1950 188 170 162 147 179 185 136 177 144 154

1960 131 233 159 154 142 155 122 200 189 141

1970 107 148 129 145 103 148 136 58 112 69

1980 101 75 102 65 66 108 54 25 91 15

1990 0 92 70 87 62 20 65 72 17 6

2000 8 10 5 0 0 0 0

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

159b 1925 to 2006 82 years Series 38

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

Lower 1945> -.048 1977< -.024 1974> -.015 1952< -.010 2004< -.007 1973> -.005 Higher 1936 .111 1989 .008

[D] 5 Absent rings: Year Master N series Absent

1990 -1.191 40 2

2003 -.287 40 8 >> WARNING: Ring is not usually narrow

2004 .928 40 7 >> WARNING: Ring is not usually narrow

2005 -.138 40 11 >> WARNING: Ring is not usually narrow

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

159b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 315 289 347 458 352

1930 467 486 538 318 450 407 87 201 237 295

1940 192 220 265 301 313 182 134 145 118 134

1950 192 176 155 131 208 277 124 190 131 139

1960 115 170 152 133 180 159 155 202 205 207

1970 187 179 135 261 186 190 114 68 126 119

1980 124 111 172 94 60 144 54 66 60 14

1990 0 62 41 65 45 16 51 99 54 65

2000 13 10 6 0 0 0 0

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

160a 1943 to 2006 64 years Series 39

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

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

1943 1972 4 -.05 .00 .19 .25 -.11 -.13 -.19 -.09 -.05 -.13 .00|-.07 .24 -.01 .37\*-.07 .08 .20 -.32 .20 -.14

1950 1979 -8 .12 -.11 .35\* .10 -.05 -.24 .08 -.19 -.06 -.14 .18|-.15 .17 -.02 .23 .05 -.15 .34 -.34 .17 -.05

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

1977 2006 -8 .07 -.24 .49\*-.14 -.14 .06 -.16 .09 .30 -.06 .08| - - - - - - - - - -

[B] Entire series, effect on correlation ( .093) is:

Lower 1997< -.070 1995> -.033 1946> -.028 1967< -.024 1960> -.022 1961< -.020 Higher 1989 .099 1956 .036

1943 to 1972 segment:

Lower 1946> -.052 1967< -.047 1960> -.040 1961< -.039 1943< -.027 1954< -.023 Higher 1956 .085 1945 .059

1950 to 1979 segment:

Lower 1960> -.076 1967< -.065 1961< -.054 1954< -.033 1978< -.021 1958> -.020 Higher 1956 .109 1975 .051

1977 to 2006 segment:

Lower 1997< -.187 1995> -.088 1990> -.029 1986> -.022 1978< -.019 2005> -.017 Higher 1989 .363 2006 .049

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

1989 -4.7 SD

160a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 51 78 80 161 97 130 210

1950 285 246 199 169 142 222 110 183 262 308

1960 334 188 272 291 270 277 290 251 352 379

1970 286 466 404 406 338 434 346 412 365 412

1980 412 377 367 419 342 316 319 279 243 130

1990 241 174 210 267 205 277 214 16 11 49

2000 24 8 10 5 6 9 7

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

160b 1948 to 2006 59 years Series 40

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

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

1965 1994 0 .16 -.31 .23 -.22 -.09 -.17 .04 -.16 .08 -.26 .34\*-.19 .03 -.31 .16 -.11 -.31 .28 -.23 -.07 .29

1977 2006 -8 .27 -.13 .32\* .32 -.19 .06 -.01 -.17 -.01 .22 -.29| - - - - - - - - - -

[B] Entire series, effect on correlation ( .189) is:

Lower 1997< -.069 1990> -.028 1995> -.024 1981> -.022 1986> -.021 1960> -.018 Higher 1974 .075 1956 .060

1965 to 1994 segment:

Lower 1990> -.061 1981> -.046 1986> -.044 1973< -.026 1985< -.022 1982< -.017 Higher 1974 .155 1971 .036

1977 to 2006 segment:

Lower 1997< -.129 1990> -.039 1981> -.029 1995> -.026 1986> -.025 2005> -.011 Higher 2006 .068 1989 .040

[D] 1 Absent rings: Year Master N series Absent

2006 1.380 40 15 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1997 -5.2 SD

160b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1948 172 187

1950 246 225 192 101 140 185 71 111 111 126

1960 173 141 136 203 260 260 212 265 273 325

1970 269 416 306 243 131 237 161 148 210 205

1980 234 281 261 334 287 229 259 291 240 210

1990 244 184 220 227 198 185 67 7 34 4

2000 5 94 19 11 8 5 0

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

PART 7: DESCRIPTIVE STATISTICS: Granville Corr3-30 14:33 Mon 29 Jan 2007 Page 6

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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 141a 1926 2006 81 5 2 .687 1.99 4.07 .871 .731 .227 2.34 .410 -.014 1

2 141b 1925 2006 82 5 3 .685 2.17 4.70 .934 .724 .229 2.41 .377 -.077 2

3 142a 1923 2006 84 5 1 .729 1.63 5.19 1.383 .950 .353 2.59 .473 .093 1

4 142b 1925 2006 82 5 0 .677 1.66 4.97 1.369 .888 .419 2.69 .466 -.044 1

5 143a 1925 2006 82 5 4 .378 1.79 4.26 1.098 .762 .365 2.50 .359 -.022 2

6 143b 1930 2006 77 5 2 .480 1.44 4.57 1.015 .835 .365 2.57 .491 -.034 1

7 144a 1934 2006 73 5 0 .668 1.39 3.68 .891 .851 .308 2.77 .420 -.009 1

8 144b 1923 2006 84 5 0 .608 1.81 4.80 1.157 .815 .315 2.67 .421 -.026 1

9 145a 1924 2006 83 5 0 .513 2.33 7.47 1.668 .841 .388 2.62 .416 -.047 1

10 145b 1922 2006 85 5 0 .610 1.92 5.51 1.354 .870 .360 2.61 .511 .061 3

11 146a 1933 2006 74 5 4 .314 2.07 6.38 1.669 .855 .477 2.73 .517 .060 2

12 146b 1936 2006 71 4 3 .237 1.93 7.07 1.689 .921 .437 3.01 .502 .041 1

13 147a 1919 2006 88 6 1 .603 2.46 4.80 1.227 .843 .242 2.55 .515 .025 1

14 147b 1926 2006 81 5 3 .422 2.33 5.05 1.320 .871 .252 2.58 .482 .075 1

15 148a 1930 2006 77 5 1 .729 1.67 5.98 1.392 .845 .371 2.43 .383 .011 1

16 148b 1934 2006 73 5 2 .620 1.56 4.85 1.046 .769 .311 2.54 .508 -.080 1

17 149a 1929 2006 78 5 0 .724 1.95 4.38 .734 .587 .258 2.71 .565 -.044 1

18 149b 1928 2006 79 5 1 .650 1.74 4.80 .883 .785 .281 2.70 .561 .033 1

19 150a 1924 2006 83 5 0 .802 1.76 5.56 1.327 .898 .333 2.68 .371 .012 1

20 150b 1921 2006 86 5 0 .641 1.81 5.11 1.277 .866 .260 2.75 .500 .006 1

21 151a 1928 2006 79 5 2 .559 1.44 4.43 .720 .759 .289 2.60 .451 -.031 1

22 151b 1930 2006 77 5 2 .747 1.37 3.78 .702 .746 .276 2.45 .339 -.016 1

23 152a 1932 2006 75 5 0 .775 2.35 4.70 1.002 .782 .227 2.55 .451 -.064 1

24 152b 1932 2006 75 5 0 .736 2.48 5.45 1.236 .812 .267 2.50 .488 -.040 1

25 153a 1922 2006 85 5 2 .740 1.54 4.13 1.022 .809 .319 2.45 .364 -.002 1

26 153b 1923 2006 84 5 0 .750 1.75 4.99 1.160 .829 .372 2.44 .368 .015 1

27 154a 1917 2006 90 6 0 .642 1.41 3.20 .731 .768 .279 2.42 .369 -.014 1

28 154b 1923 2006 84 5 2 .558 1.47 3.86 1.038 .912 .408 2.55 .466 -.011 1

29 155a 1936 2006 71 4 2 .512 2.20 4.56 .944 .804 .222 2.39 .426 -.027 1

30 155b 1936 2006 71 4 2 .435 1.52 3.48 .720 .625 .315 2.57 .408 -.010 1

31 156a 1923 2006 84 5 1 .645 1.88 5.38 1.423 .892 .301 2.75 .440 .034 1

32 156b 1922 2006 85 5 2 .592 2.23 6.23 1.636 .858 .305 2.47 .365 .022 3

33 157a 1924 2006 83 5 1 .697 1.85 4.05 .907 .805 .280 2.50 .396 -.002 1

34 157b 1923 2006 84 5 1 .572 1.48 3.58 .866 .793 .333 2.67 .393 .034 1

35 158a 1922 2006 85 5 0 .680 1.37 3.24 .839 .726 .410 2.54 .377 -.031 1

36 158b 1930 2006 77 5 0 .716 1.64 3.85 .965 .721 .376 2.58 .486 -.034 2

37 159a 1919 2006 88 6 0 .715 1.44 3.69 .932 .774 .395 2.67 .396 -.061 1

38 159b 1925 2006 82 5 0 .733 1.66 5.38 1.233 .834 .397 2.65 .409 -.001 1

39 160a 1943 2006 64 4 3 .093 2.29 4.66 1.326 .868 .311 2.56 .456 -.047 1

40 160b 1948 2006 59 4 2 .189 1.79 4.16 .978 .829 .393 2.64 .479 .007 1

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Total or mean: 3185 198 49 .604 1.81 7.47 1.118 .812 .325 3.01 .438 -.006

- = [ COFECHA GRANVCOF ] = -