[] Dendrochronology Program Library Run MHM\_M Program COF 14:44 Fri 23 Feb 2007 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 26353

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

QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: Mount Hunger-Middlesex-Mid Corr4-30

File of DATED series: mhm\_mid\_compact\_corr4-30.dta

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 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 1906 to 2006 101 years

Continuous time span is 1906 to 2006 101 years

Portion with two or more series is 1906 to 2006 101 years

>> 41a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 41a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 41a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 41b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 42a 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 42a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 42a 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 42a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 42a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 43a 1977 absent in 1 of 40 series, but is not usually narrow: master index is 1.179

>> 44a 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 44a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 44b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 45b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 46a 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 46a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 46a 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 46a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 46a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 46b 1993 absent in 1 of 40 series, but is not usually narrow: master index is .367

>> 46b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 46b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 46b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 46b 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 46b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 48a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 48b 1999 absent in 2 of 40 series, but is not usually narrow: master index is .599

>> 48b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 49a 1999 absent in 2 of 40 series, but is not usually narrow: master index is .599

>> 49a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 49a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 49b 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 49b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 50a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 50a 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 50a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 50a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 50b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 50b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 50b 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 50b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 52a 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 52a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 52a 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 52a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 52a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 52b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 52b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 52b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 52b 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 52b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 53a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 55b 1927 absent in 1 of 40 series, but is not usually narrow: master index is .931

>> 55b 1928 absent in 1 of 40 series, but is not usually narrow: master index is .324

>> 55b 1930 absent in 1 of 40 series, but is not usually narrow: master index is -.074

>> 56a 1980 absent in 1 of 40 series, but is not usually narrow: master index is -.275

>> 56b 1998 absent in 2 of 40 series, but is not usually narrow: master index is .567

>> 56b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 56b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 58b 1949 absent in 1 of 40 series, but is not usually narrow: master index is .339

>> 58b 1995 absent in 1 of 40 series, but is not usually narrow: master index is .020

>> 58b 1998 absent in 2 of 40 series, but is not usually narrow: master index is .567

>> 58b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 58b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 58b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 58b 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 58b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 59a 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 59b 2003 absent in 14 of 40 series, but is not usually narrow: master index is -.063

>> 60a 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 60a 2005 absent in 12 of 40 series, but is not usually narrow: master index is 1.129

>> 60a 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

>> 60b 2002 absent in 10 of 40 series, but is not usually narrow: master index is -.129

>> 60b 2004 absent in 11 of 40 series, but is not usually narrow: master index is .446

>> 60b 2006 absent in 16 of 40 series, but is not usually narrow: master index is .137

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

41a 3 absent rings: 2003 2005 2006

41b 1 absent rings: 2004

42a 8 absent rings: 1985 2000 2001 2002 2003 2004 2005 2006

43a 1 absent rings: 1977

43b 3 absent rings: 1982 1984 2000

44a 2 absent rings: 2002 2003

44b 1 absent rings: 2003

45b 1 absent rings: 2002

46a 6 absent rings: 2001 2002 2003 2004 2005 2006

46b 7 absent rings: 1993 2001 2002 2003 2004 2005 2006

48a 1 absent rings: 2006

48b 2 absent rings: 1999 2006

49a 4 absent rings: 1945 1999 2005 2006

49b 3 absent rings: 1945 2005 2006

50a 4 absent rings: 2003 2004 2005 2006

50b 4 absent rings: 2003 2004 2005 2006

51b 1 absent rings: 2000

52a 6 absent rings: 2000 2002 2003 2004 2005 2006

52b 8 absent rings: 1985 1990 2000 2002 2003 2004 2005 2006

53a 2 absent rings: 1985 2003

55b 4 absent rings: 1927 1928 1929 1930

56a 1 absent rings: 1980

56b 4 absent rings: 1998 2001 2002 2006

58a 2 absent rings: 1985 2000

58b 9 absent rings: 1949 1985 1995 1998 2002 2003 2004 2005 2006

59a 1 absent rings: 2003

59b 1 absent rings: 2003

60a 5 absent rings: 1989 1990 2004 2005 2006

60b 5 absent rings: 1989 1990 2002 2004 2006

100 absent rings 2.632%

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 -.011 40 2000 -.808 40 6

1951 .355 40 2001 -.532 40 4

1952 1.278 40 2002 -.129 40 10<<

1953 .040 40 2003 -.063 40 14<<

1954 .576 40 2004 .446 40 11<<

1955 .729 40 2005 1.129 40 12<<

1906 .947 2 1956 1.279 40 2006 .137 40 16<<

1907 -.495 6 1957 -2.949 40

1908 -.903 9 1958 -1.115 40

1909 -1.225 14 1959 .242 40

1910 -1.271 16 1960 .177 40

1911 .334 21 1961 .362 40

1912 -2.138 25 1962 -.197 40

1913 -.457 29 1963 .750 40

1914 .800 29 1964 .581 40

1915 .361 31 1965 .731 40

1916 -.055 34 1966 .422 40

1917 .242 34 1967 .681 40

1918 .663 35 1968 -1.207 40

1919 -.825 37 1969 .120 40

1920 1.472 38 1970 .211 40

1921 .596 40 1971 -.033 40

1922 .576 40 1972 .133 40

1923 -.131 40 1973 -.586 40

1924 1.158 40 1974 .098 40

1925 1.418 40 1975 .037 40

1926 .253 40 1976 -1.169 40

1927 .931 40 1<< 1977 1.179 40 1<<

1928 .324 40 1<< 1978 1.445 40

1929 -.741 40 1 1979 -.208 40

1930 -.074 40 1<< 1980 -.275 40 1<<

1931 -.010 40 1981 -1.185 40

1932 -1.268 40 1982 -.812 40 1

1933 -.696 40 1983 -.488 40

1934 1.112 40 1984 -.510 40 1

1935 .888 40 1985 -1.475 40 5

1936 -5.120 40 1986 .121 40

1937 -1.005 40 1987 .025 40

1938 .022 40 1988 .445 40

1939 1.004 40 1989 -.406 40 2

1940 1.498 40 1990 -.457 40 3

1941 .831 40 1991 .652 40

1942 .809 40 1992 .385 40

1943 .203 40 1993 .367 40 1<<

1944 -.067 40 1994 1.268 40

1945 -2.256 40 2 1995 .020 40 1<<

1946 -1.787 40 1996 -.071 40

1947 .154 40 1997 1.458 40

1948 -.765 40 1998 .567 40 2<<

1949 .339 40 1<< 1999 .599 40 2<<

PART 5: CORRELATION OF SERIES BY SEGMENTS: Mount Hunger-Middlesex-Mid Corr4-30 14:44 Fri 23 Feb 2007 Page 5

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

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 41a 1921 2006 .49 .63 .67 .27B .33B

2 41b 1919 2006 .91 .92 .76 .34B .54 .63

3 42a 1908 2006 .85 .84 .81 .46 .36A .21B

4 42b 1909 2006 .85 .89 .85 .44 .45 .57

5 43a 1910 2006 .88 .90 .88 .58 .52 .60

6 43b 1912 2006 .89 .93 .94 .66 .17B .31B

7 44a 1920 2006 .36A .52 .69 .49 .61

8 44b 1915 2006 .50 .41A .55 .75 .49 .51

9 45a 1918 2006 .67 .63 .59 .40A .23B .23A

10 45b 1911 2006 .47 .64 .66 .50 .59 .67

11 46a 1912 2006 .73 .77 .76 .84 .28B .22B

12 46b 1907 2006 .78 .78 .81 .67 .40A .55

13 47a 1911 2006 -.18B-.22B-.25B-.17B-.22B-.24B Tried Multiple times to fix this, but I can’t figure it out

14 47b 1913 2006 .11B .20B .01B-.13B-.18B-.09B

15 48a 1910 2006 .87 .84 .83 .70 .72 .61

16 48b 1906 2006 .58 .89 .82 .52 .44 .47

17 49a 1915 2006 .94 .93 .90 .70 .55 .66

18 49b 1919 2006 .94 .95 .89 .77 .59 .52

19 50a 1907 2006 .68 .79 .79 .80 .61 .59

20 50b 1908 2006 .84 .93 .95 .80 .74 .74

21 51a 1913 2006 .61 .87 .78 .39A .32A .37A

22 51b 1912 2006 .61 .63 .65 .69 .60 .35B

23 52a 1912 2006 .67 .40B .43B .68 .75 .81

24 52b 1913 2006 .41A .47 .60 .87 .63 .61

25 53a 1909 2006 .64 .50B .42B .41A .64 .83

26 53b 1907 2006 .74 .93 .71 .33B .59 .54

27 54a 1907 2006 .76 .87 .88 .77 .62 .70

28 54b 1908 2006 .70 .79 .74 .54 .45 .53

29 55a 1909 2006 .85 .94 .94 .80 .60 .64

30 55b 1916 2006 .84 .73 .45 .33B .55 .51

31 56a 1911 2006 .61 .60 .64 .63 .51 .64

32 56b 1909 2006 .89 .87 .81 .57 .55 .58

33 57a 1913 2006 .61 .79 .70 .44 .42A .55

34 57b 1921 2006 .87 .83 .36A .06B .19B AS good as I can get 35 58a 1916 2006 .78 .78 .91 .65 .34B .50

36 58b 1911 2006 .79 .77 .83 .63 .23A-.09B Should be fine - ???

37 59a 1906 2006 .75 .94 .81 .27B .34A .53

38 59b 1909 2006 .81 .82 .70 .02B .06B .25B As good as I’m going to get

39 60a 1911 2006 .45 .62 .76 .56 .23B .44

40 60b 1916 2006 .79 .80 .76 .28B .30B .44B As good as I’m going to get

Av segment correlation .69 .72 .70 .53 .42 .47

PART 6: POTENTIAL PROBLEMS: Mount Hunger-Middlesex-Mid Corr4-30 14:44 Fri 23 Feb 2007 Page 5

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

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

[A] Correlations with master dating series of flagged 30-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

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

41a 1921 to 2006 86 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

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

1965 1994 -5 .12 -.13 .06 -.13 .02 .32\* .09 .22 -.18 -.04 .27|-.15 -.13 .22 -.02 -.21 -.02 -.44 .14 -.20 -.13

1977 2006 -5 .11 .01 -.04 -.03 .14 .34\* .12 .30 -.08 .17 .33| - - - - - - - - - -

[B] Entire series, effect on correlation ( .488) is:

Lower 1935< -.043 2005< -.024 1986< -.015 1977< -.014 1982> -.012 1975> -.011 Higher 1957 .106 1936 .036

1965 to 1994 segment:

Lower 1977< -.066 1986< -.062 1982> -.044 1976> -.034 1991< -.025 1975> -.024 Higher 1968 .067 1978 .054

1977 to 2006 segment:

Lower 2005< -.090 1982> -.063 1986< -.048 1977< -.047 1987> -.026 2000> -.019 Higher 1997 .091 1978 .062

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

41a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 172 178 209 284 256 236 259 226 230

1930 266 219 151 174 204 89 51 254 245 212

1940 158 130 213 128 135 87 108 229 149 256

1950 211 251 178 84 133 191 281 76 110 107

1960 135 146 166 161 146 134 193 179 119 185

1970 166 147 144 112 168 219 157 106 147 96

1980 120 100 128 111 76 64 55 107 81 54

1990 48 52 48 61 72 45 52 95 91 90

2000 38 11 8 0 11 0 0

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

41b 1919 to 2006 88 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 -5 .17 .02 -.15 -.24 -.22 .40\*-.10 -.13 -.07 .15 .34|-.24 .03 -.13 -.15 -.13 .10 .17 -.01 .02 -.11

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

Lower 1957> -.064 1985< -.025 1967< -.018 2004< -.018 1989> -.008 1955< -.006 Higher 1936 .114 1945 .011

1950 to 1979 segment:

Lower 1957> -.177 1967< -.066 1955< -.024 1951< -.013 1979> -.012 1972> -.011 Higher 1977 .053 1968 .052

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

2004 .446 40 11 >> WARNING: Ring is not usually narrow

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

1957 +3.0 SD; 1985 -5.1 SD

41b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 113

1920 260 157 162 156 217 254 230 280 216 188

1930 168 176 102 112 238 227 55 116 141 189

1940 229 231 228 235 177 103 81 244 155 187

1950 150 142 233 180 185 145 235 179 138 143

1960 181 147 102 141 185 154 125 76 65 74

1970 115 70 110 77 59 48 44 90 75 59

1980 46 32 24 29 27 4 26 30 36 50

1990 54 80 43 44 66 51 46 63 60 79

2000 46 35 18 23 0 88 76

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

42a 1908 to 2006 99 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 -.26 -.35 .09 -.43 -.14 -.01 .15 .23 .14 .03 .36\*-.24 .04 .02 .01 .34 .21 -.29 .12 .01 -.13

1977 2006 -3 -.24 -.01 -.03 -.38 -.32 .00 .11 .24\*-.15 -.12 .21| - - - - - - - - - -

[B] Entire series, effect on correlation ( .681) is:

Lower 1977< -.016 1982> -.016 1957> -.012 1948> -.010 1960< -.008 1999< -.008 Higher 1936 .183 1912 .007

1965 to 1994 segment:

Lower 1977< -.098 1982> -.071 1981> -.024 1974< -.022 1973> -.021 1970< -.021 Higher 1985 .115 1976 .052

1977 to 2006 segment:

Lower 1982> -.086 1977< -.084 1999< -.035 1981> -.028 2006> -.027 1998< -.020 Higher 1985 .154 1997 .061

[D] 8 Absent rings: Year Master N series Absent

1985 -1.475 40 5

2000 -.808 40 6

2001 -.532 40 4

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

42a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1908 207 202

1910 238 312 242 322 347 393 385 380 382 366

1920 357 398 359 299 379 346 324 351 361 241

1930 208 274 261 222 265 303 48 202 203 199

1940 254 245 234 252 138 90 125 229 215 192

1950 116 110 194 143 155 188 140 90 83 117

1960 80 132 142 125 163 147 164 178 103 118

1970 81 70 84 93 64 95 50 50 80 58

1980 75 64 95 57 31 0 37 42 58 40

1990 44 60 55 55 45 39 21 45 10 3

2000 0 0 0 0 0 0 0

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

42b 1909 to 2006 98 years Series 4

[B] Entire series, effect on correlation ( .701) is:

Lower 1957> -.031 1981> -.011 1932> -.009 1915< -.009 1919> -.008 2006< -.008 Higher 1936 .157 1945 .011

42b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 219

1910 249 334 239 258 344 275 347 359 349 352

1920 351 405 371 366 385 372 357 340 355 267

1930 251 241 268 220 277 258 22 149 214 244

1940 325 282 218 200 125 54 78 114 144 219

1950 144 163 281 233 256 283 282 178 156 212

1960 164 174 130 152 190 177 189 223 154 216

1970 145 95 112 124 82 68 69 108 84 43

1980 51 69 49 73 36 28 47 64 73 31

1990 24 55 47 47 44 27 17 37 26 48

2000 27 21 21 22 33 34 11

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

43a 1910 to 2006 97 years Series 5

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

Lower 1977< -.039 1956< -.018 1998< -.014 1916> -.009 1913> -.008 1967< -.008 Higher 1936 .149 1945 .015

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

1977 1.179 40 1 >> WARNING: Ring is not usually narrow

43a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 336 416 316 486 448 359 491 427 450 340

1920 469 340 368 322 359 329 335 385 339 271

1930 308 300 266 206 306 305 21 162 278 256

1940 364 292 209 200 160 50 133 201 172 134

1950 206 224 253 145 158 162 99 37 86 211

1960 159 140 139 158 110 191 83 67 83 135

1970 159 141 92 86 58 65 19 0 65 55

1980 29 36 11 2 6 7 28 36 92 67

1990 65 81 59 72 115 81 65 91 20 36

2000 20 34 54 53 60 65 36

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

43b 1912 to 2006 95 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 -2 -.09 -.32 -.07 .21 -.05 -.04 -.24 -.08 .45\* .14 .17| .13 -.17 -.06 .20 .00 .35 -.11 -.12 .32 .04

1977 2006 -2 .05 -.45 -.03 .15 -.01 .17 -.35 -.07 .35\* .05 .31| - - - - - - - - - -

[B] Entire series, effect on correlation ( .730) is:

Lower 1985> -.019 1968> -.015 2000< -.014 1986< -.010 1975< -.009 1970< -.008 Higher 1936 .102 1957 .031

1965 to 1994 segment:

Lower 1985> -.081 1968> -.063 1986< -.042 1973> -.034 1970< -.029 1975< -.024 Higher 1981 .074 1976 .045

1977 to 2006 segment:

Lower 1985> -.102 1986< -.032 1989> -.029 1990> -.026 1995> -.020 1979> -.012 Higher 2000 .077 1981 .045

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

1982 -.812 40 1

1984 -.510 40 1

2000 -.808 40 6

43b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 302 460 496 398 430 411 428 407

1920 471 435 392 371 405 395 295 318 275 282

1930 227 230 192 194 262 273 33 141 203 231

1940 307 310 313 231 200 65 62 127 143 137

1950 99 138 210 131 144 171 167 64 77 158

1960 134 100 126 132 112 137 125 132 119 98

1970 51 79 104 93 48 16 16 51 62 44

1980 40 11 0 13 0 37 16 30 52 58

1990 77 59 38 63 62 75 81 88 52 120

2000 0 18 13 32 65 51 18

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

44a 1920 to 2006 87 years Series 7

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

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

1920 1949 0 .28 .04 -.14 -.13 .05 -.07 -.17 .09 -.01 .07 .36\*-.09 -.32 -.16 .02 -.01 -.34 .09 -.01 .27 -.04

[B] Entire series, effect on correlation ( .492) is:

Lower 1936> -.116 1975< -.014 1924< -.010 1973> -.008 1958> -.008 1959< -.008 Higher 1957 .116 1985 .013

1920 to 1949 segment:

Lower 1936> -.193 1948< -.023 1924< -.018 1922< -.016 1930> -.014 1925< -.012 Higher 1920 .038 1934 .030

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

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

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

1936 +3.2 SD

44a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1920 198 134 76 73 112 126 123 155 142 114

1930 224 157 105 148 235 181 111 100 126 178

1940 198 154 103 140 114 91 76 149 63 88

1950 118 165 131 130 145 149 187 63 145 124

1960 112 191 146 139 138 164 144 124 119 145

1970 147 134 90 120 133 51 67 140 116 74

1980 47 31 67 59 71 25 37 71 42 49

1990 36 72 90 64 80 60 31 109 67 33

2000 29 18 0 0 24 53 82

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

44b 1915 to 2006 92 years Series 8

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

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

1920 1949 0 .19 -.07 -.34 -.23 .02 -.04 -.02 .25 .09 .03 .41\*-.18 -.43 -.16 .17 -.12 -.26 .11 -.06 .20 .20

[B] Entire series, effect on correlation ( .488) is:

Lower 1936> -.063 2003< -.033 1945> -.017 1925< -.011 1949< -.009 1958> -.008 Higher 1957 .105 1920 .014

1920 to 1949 segment:

Lower 1949< -.033 1945> -.030 1925< -.029 1947< -.022 1924< -.017 1922< -.014 Higher 1920 .046 1934 .027

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

44b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 177 149 146 140 109

1920 225 163 109 91 115 120 118 157 178 124

1930 195 163 80 101 215 190 87 87 100 149

1940 184 134 115 147 134 117 86 79 57 83

1950 118 153 154 125 148 118 127 33 138 129

1960 105 195 152 111 106 109 86 82 29 77

1970 108 94 123 100 119 47 44 93 136 78

1980 65 50 65 39 64 50 54 94 88 30

1990 31 51 70 44 47 41 42 107 43 54

2000 34 44 39 0 56 55 83

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

45a 1918 to 2006 89 years Series 9

[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 -.34 -.02 -.20 .29 -.20 .27 .12 .04 -.07 -.09 .40\*-.15 -.34 -.07 .07 -.18 .27 .05 .25 .24 .13

1965 1994 6 -.14 -.08 -.04 .11 -.17 .32 -.03 -.03 .06 -.18 .23|-.06 -.50 -.17 -.07 -.05 .44\* .02 .32 .28 .26

1977 2006 0 .04 -.05 .18 -.13 -.31 .06 -.25 -.22 -.05 -.14 .23\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .453) is:

Lower 1975< -.057 1982> -.017 1964< -.016 1948> -.014 1945> -.010 1968> -.009 Higher 1936 .052 1957 .023

1950 to 1979 segment:

Lower 1975< -.121 1968> -.035 1964< -.033 1954< -.015 1958> -.006 1979> -.006 Higher 1976 .037 1957 .032

1965 to 1994 segment:

Lower 1975< -.136 1982> -.047 1994< -.040 1968> -.030 1983> -.016 1980> -.011 Higher 1976 .072 1973 .046

1977 to 2006 segment:

Lower 1982> -.083 1994< -.051 1997< -.046 1983> -.028 1980> -.024 2006> -.021 Higher 2005 .046 2000 .044

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

1975 -5.0 SD

45a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1918 207 142

1920 201 248 172 151 155 186 139 151 152 126

1930 221 154 109 100 191 160 77 106 138 184

1940 180 154 165 126 78 110 81 118 153 169

1950 138 112 151 126 100 129 162 89 106 132

1960 105 95 59 118 63 99 99 92 82 90

1970 96 75 69 25 49 9 16 48 66 47

1980 68 41 77 62 40 36 52 44 68 32

1990 22 37 26 26 23 19 16 23 30 40

2000 22 25 14 6 55 97 95

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

45b 1911 to 2006 96 years Series 10

[B] Entire series, effect on correlation ( .521) is:

Lower 1911< -.038 1957> -.014 1924< -.011 1967< -.010 1912> -.008 1975< -.006 Higher 1945 .034 1977 .011

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

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

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

1968 -4.8 SD

45b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 34 184 315 356 290 242 267 231 213

1920 264 268 236 180 181 213 229 248 226 137

1930 255 193 140 160 254 214 94 111 140 214

1940 209 176 139 104 156 89 104 201 162 198

1950 183 172 208 153 157 218 217 129 152 151

1960 122 166 109 142 165 117 78 57 18 94

1970 72 80 97 54 98 40 41 149 110 42

1980 22 21 56 36 48 37 50 66 144 60

1990 68 84 62 53 76 41 40 77 100 53

2000 23 8 0 10 31 34 5

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

46a 1912 to 2006 95 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

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

1965 1994 9 .10 -.23 .24 -.18 -.13 -.18 -.06 .13 .03 -.17 .28|-.20 -.24 .01 -.24 .08 -.02 .02 .00 .47\*-.25

1977 2006 -8 .25 -.35 .43\*-.04 -.15 -.09 -.13 .04 .02 -.30 .22| - - - - - - - - - -

[B] Entire series, effect on correlation ( .622) is:

Lower 1985> -.031 1993< -.019 2006> -.011 1976< -.009 1994< -.006 1921< -.006 Higher 1957 .076 1977 .009

1965 to 1994 segment:

Lower 1985> -.133 1993< -.054 1979> -.022 1994< -.019 1981> -.019 1990> -.017 Higher 1976 .146 1977 .116

1977 to 2006 segment:

Lower 1985> -.143 1993< -.070 2006> -.039 1994< -.032 1991< -.026 1990> -.020 Higher 1977 .122 1997 .071

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

2001 -.532 40 4

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1957 -4.5 SD

46a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 229 269 262 286 214 204 226 174

1920 251 179 224 164 223 263 208 225 197 156

1930 141 174 104 104 131 101 35 73 80 145

1940 140 146 139 132 105 69 46 67 49 79

1950 103 95 167 109 74 94 110 10 57 94

1960 102 123 110 149 111 141 106 100 79 104

1970 91 82 78 103 89 120 25 200 157 128

1980 118 100 99 79 58 119 84 61 86 63

1990 79 48 30 11 26 16 18 40 19 18

2000 4 0 0 0 0 0 0

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

46b 1907 to 2006 100 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

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

1965 1994 0 -.12 .03 .12 -.08 -.02 .01 -.17 .05 .19 -.07 .40\*-.34 -.35 -.02 -.01 .24 .02 -.27 .02 .17 .14

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

Lower 1993< -.069 1973> -.014 1907> -.012 1979> -.010 1909> -.010 1945> -.010 Higher 1936 .071 1957 .052

1965 to 1994 segment:

Lower 1993< -.151 1973> -.055 1979> -.041 1982> -.022 1983> -.017 1992< -.015 Higher 1976 .097 1994 .061

[D] 7 Absent rings: Year Master N series Absent

1993 .367 40 1 >> WARNING: Ring is not usually narrow

2001 -.532 40 4

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1993 -6.1 SD

46b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 248 211 232

1910 228 220 162 201 321 269 186 202 201 142

1920 261 235 246 208 247 283 198 260 234 155

1930 146 248 118 108 125 167 36 101 139 220

1940 157 176 173 166 187 102 56 72 34 107

1950 111 79 94 104 124 124 209 60 81 98

1960 132 127 133 169 146 161 97 121 105 108

1970 81 93 126 172 117 62 29 141 141 139

1980 107 65 98 109 81 57 74 60 79 66

1990 28 54 31 0 65 37 31 55 37 25

2000 8 0 0 0 0 0 0

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

47a 1911 to 2006 96 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

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

1911 1940 -5 - - - - - .67\*-.17 -.03 .21 .20 -.18| .19 -.02 -.27 -.29 .01 -.09 -.12 .04 -.07 .09

1920 1949 -5 .08 .10 -.02 .03 .26 .65\*-.15 -.13 .08 .23 -.22| .14 .11 -.14 -.06 .09 -.05 .04 .12 -.16 .06

1935 1964 7 -.14 -.07 .01 -.02 .12 .39 .29 -.18 .00 .02 -.25| .01 -.24 -.04 .09 .21 -.07 .50\* .12 -.19 -.08

1950 1979 -4 -.24 -.21 -.02 -.01 -.05 .05 .81\*-.05 .05 -.10 -.17|-.02 -.26 -.10 .16 .12 -.20 .41 .10 .15 .04

1965 1994 4 -.17 .02 -.14 -.12 .21 -.27 .04 .09 -.07 .19 -.22| .15 -.03 .10 .27\* .01 -.32 .24 .23 .07 .10

1977 2006 -9 -.33 .33\*-.11 -.16 .26 -.12 -.23 .04 -.20 .22 -.24| - - - - - - - - - -

[B] Entire series, effect on correlation ( -.178) is:

Lower 1952< -.021 1977< -.017 1936> -.017 1932> -.013 1985> -.010 1957> -.009 Higher 1982 .024 1920 .019

1911 to 1940 segment:

Lower 1936> -.091 1932> -.036 1918< -.024 1919> -.020 1929> -.019 1935< -.019 Higher 1920 .056 1925 .053

1920 to 1949 segment:

Lower 1936> -.067 1932> -.033 1948> -.022 1945> -.020 1942< -.019 1935< -.019 Higher 1920 .060 1925 .058

1935 to 1964 segment:

Lower 1936> -.057 1952< -.043 1957> -.030 1945> -.022 1948> -.016 1941< -.013 Higher 1956 .047 1940 .025

1950 to 1979 segment:

Lower 1952< -.056 1977< -.045 1957> -.026 1961< -.025 1973> -.019 1958> -.016 Higher 1956 .045 1972 .020

1965 to 1994 segment:

Lower 1977< -.068 1985> -.036 1989> -.026 1973> -.020 1988< -.020 1983> -.020 Higher 1982 .091 1976 .031

1977 to 2006 segment:

Lower 1977< -.082 1985> -.047 1989> -.037 2004< -.034 1983> -.030 1988< -.019 Higher 1982 .175 2000 .057

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

1935 1936 6.4 SD 1936 1937 -4.4 SD 1972 1973 4.1 SD

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

1936 +5.0 SD; 1961 -5.4 SD; 1972 -5.4 SD

47a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 282 191 212 174 157 175 147 137 235

1920 254 196 148 162 157 251 162 181 156 200

1930 167 128 187 168 125 86 150 93 101 120

1940 135 75 80 100 127 130 88 111 146 110

1950 63 119 72 106 145 156 180 127 162 137

1960 149 28 76 142 164 129 115 123 100 116

1970 95 87 22 123 98 82 57 42 70 103

1980 83 92 7 154 84 110 86 75 30 113

1990 61 63 67 80 42 37 32 52 51 40

2000 17 20 42 33 6 9 10

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

47b 1913 to 2006 94 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

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

1913 1942 -2 - - - -.16 .12 .10 -.18 .31 .33\* .00 .11| .06 -.21 -.07 .16 .09 -.04 .24 .18 -.18 .11

1920 1949 -10 .44\* .43 -.31 -.27 .03 .09 -.28 .32 .42 .00 .20| .03 -.24 -.16 .19 .06 -.21 .27 .15 -.17 -.05

1935 1964 -10 .44\* .34 .07 -.33 -.07 .03 -.22 .19 .22 .01 .01| .09 -.22 .02 .24 -.07 -.08 .18 -.04 -.07 -.10

1950 1979 -8 -.01 -.13 .83\*-.09 -.04 -.02 -.05 .06 -.30 -.17 -.13| .20 -.13 .27 .11 -.10 -.08 -.05 .14 .00 -.07

1965 1994 -8 .00 -.20 .60\* .10 .09 -.15 -.11 .14 -.31 .07 -.18| .00 -.10 .38 -.26 -.09 -.10 .11 .04 .06 .09

1977 2006 -10 .26\* .09 .10 .16 .00 -.27 -.07 .01 -.15 .18 -.09| - - - - - - - - - -

[B] Entire series, effect on correlation ( .001) is:

Lower 1965< -.058 1985> -.021 1956< -.019 1957> -.014 1939< -.014 1968> -.011 Higher 1946 .025 1945 .023

1913 to 1942 segment:

Lower 1936> -.162 1939< -.043 1923> -.020 1938< -.019 1919> -.011 1941< -.010 Higher 1920 .043 1924 .030

1920 to 1949 segment:

Lower 1936> -.181 1939< -.048 1938< -.034 1923> -.017 1941< -.013 1928< -.013 Higher 1945 .045 1946 .042

1935 to 1964 segment:

Lower 1956< -.055 1936> -.043 1957> -.040 1939< -.039 1938< -.020 1954< -.015 Higher 1946 .052 1945 .048

1950 to 1979 segment:

Lower 1965< -.128 1956< -.048 1968> -.025 1954< -.012 1958> -.009 1962> -.006 Higher 1977 .047 1952 .030

1965 to 1994 segment:

Lower 1965< -.179 1985> -.069 1968> -.033 1981> -.024 1986< -.014 1991< -.008 Higher 1977 .082 1982 .054

1977 to 2006 segment:

Lower 1985> -.118 1997< -.061 1981> -.037 1999< -.027 2006> -.025 1986< -.024 Higher 1982 .115 1977 .089

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

1935 1936 4.9 SD 1956 1957 4.3 SD 1964 1965 -4.9 SD

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

1936 +4.0 SD; 1965 -7.7 SD; 1985 +3.3 SD

47b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 69 259 326 207 259 259 254

1920 305 203 209 300 298 258 217 238 180 195

1930 233 194 171 189 210 164 163 161 106 111

1940 178 133 143 182 176 86 43 123 144 151

1950 131 151 155 67 86 162 96 147 162 172

1960 167 123 148 142 182 41 115 147 189 184

1970 144 138 103 121 115 154 124 155 126 104

1980 99 124 57 90 97 151 60 120 60 57

1990 47 51 80 40 67 50 56 14 14 9

2000 17 47 28 23 4 5 10

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

48a 1910 to 2006 97 years Series 15

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

Lower 1948> -.019 1999< -.010 1919< -.009 1982> -.008 1921< -.008 1945> -.008 Higher 1936 .104 1912 .012

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

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

48a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 243 274 196 210 263 260 248 273 289 165

1920 318 208 279 301 296 255 262 257 222 183

1930 202 204 150 173 212 209 76 128 155 157

1940 238 188 192 227 163 143 128 181 228 244

1950 138 155 215 193 174 188 176 109 105 161

1960 145 121 130 136 117 108 98 107 53 79

1970 79 77 97 66 100 116 66 138 112 46

1980 54 52 82 69 62 38 55 53 65 58

1990 77 72 56 76 99 46 57 46 13 4

2000 8 3 22 50 62 45 0

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

48b 1906 to 2006 101 years Series 16

[B] Entire series, effect on correlation ( .656) is:

Lower 1943< -.016 1969< -.015 1912> -.015 1999< -.015 1957> -.012 1914< -.011 Higher 1936 .145 1945 .011

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

1999 .599 40 2 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

48b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1906 176 171 173 157

1910 188 259 218 195 200 275 223 279 325 202

1920 329 297 314 251 275 297 263 249 191 208

1930 204 225 185 179 234 225 70 146 154 175

1940 217 131 148 79 135 86 102 155 108 139

1950 128 173 212 165 157 118 179 107 101 194

1960 180 192 150 126 152 139 125 135 106 79

1970 91 74 115 109 124 140 64 154 135 78

1980 111 87 126 84 115 93 86 83 66 47

1990 93 106 125 79 117 69 60 94 36 0

2000 20 4 25 50 69 10 0

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

49a 1915 to 2006 92 years Series 17

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

Lower 2005< -.021 1976> -.014 1999< -.011 1915< -.010 1948> -.009 1962> -.009 Higher 1936 .118 1957 .018

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

1945 -2.256 40 2

1999 .599 40 2 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1945 -4.6 SD

49a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 160 211 248 260 177

1920 364 275 282 237 270 267 197 237 211 174

1930 176 192 155 141 212 202 14 124 107 157

1940 165 160 159 131 92 0 73 132 128 110

1950 103 126 153 97 138 95 141 55 111 101

1960 145 154 178 162 159 135 98 114 71 116

1970 121 158 154 135 115 135 137 183 160 89

1980 72 50 43 47 83 81 127 85 106 72

1990 83 74 122 81 86 62 93 106 30 0

2000 9 4 11 31 31 0 0

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

49b 1919 to 2006 88 years Series 18

[B] Entire series, effect on correlation ( .780) is:

Lower 1999< -.018 1989> -.015 1976> -.013 1963< -.010 1998< -.007 1987< -.005 Higher 1936 .044 1957 .040

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

1945 -2.256 40 2

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

49b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 233

1920 397 318 276 241 305 310 226 237 230 190

1930 179 162 135 107 214 249 16 114 139 190

1940 192 169 146 101 103 0 75 145 110 141

1950 159 145 190 148 130 115 147 49 124 133

1960 170 189 114 117 142 198 146 221 107 164

1970 137 130 140 105 147 129 127 123 118 90

1980 111 87 84 72 90 64 84 60 85 98

1990 81 63 58 60 80 42 52 96 12 2

2000 9 10 3 24 21 0 0

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

50a 1907 to 2006 100 years Series 19

[B] Entire series, effect on correlation ( .648) is:

Lower 1907< -.039 1948> -.016 2005< -.012 1955< -.008 1946> -.008 1909> -.008 Higher 1936 .081 1957 .065

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

50a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 56 174 204

1910 191 230 191 267 326 327 263 316 315 203

1920 294 254 252 244 253 285 239 276 239 213

1930 196 254 204 182 297 201 111 199 230 255

1940 212 230 198 199 238 146 194 263 247 210

1950 165 187 193 161 176 142 185 83 113 165

1960 184 181 189 187 188 166 197 242 154 135

1970 188 173 136 104 108 203 95 161 150 127

1980 104 46 38 34 63 68 89 76 50 38

1990 37 52 57 54 101 49 35 63 81 39

2000 28 36 24 0 0 0 0

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

50b 1908 to 2006 99 years Series 20

[B] Entire series, effect on correlation ( .785) is:

Lower 2005< -.012 1909> -.011 1924< -.011 2004< -.008 1908< -.008 2003< -.007 Higher 1936 .080 1957 .020

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

50b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1908 131 217

1910 179 243 213 292 342 408 326 380 352 343

1920 494 411 413 346 331 368 348 356 355 303

1930 312 364 270 269 372 308 123 216 224 234

1940 303 288 285 282 219 112 117 171 134 188

1950 181 244 271 180 262 221 244 105 172 148

1960 171 183 168 226 162 184 158 115 49 117

1970 185 109 100 66 124 136 73 145 115 74

1980 77 43 36 57 49 33 82 70 52 28

1990 31 43 52 32 53 39 35 64 57 51

2000 32 21 31 0 0 0 0

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

51a 1913 to 2006 94 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 -.19 .26 -.07 -.03 -.16 .10 -.17 -.03 .11 .07 .39\*-.26 -.05 -.18 .12 .15 -.31 -.11 .09 .30 .15

1965 1994 0 -.15 -.03 -.03 -.12 .06 .31 -.17 -.13 .10 .05 .32\* .04 .13 -.18 .17 .03 -.25 -.06 .16 .18 -.01

1977 2006 0 -.09 -.07 .16 -.15 -.06 .18 -.23 -.24 .08 -.01 .37\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .500) is:

Lower 1917< -.062 1981< -.020 1982> -.016 1968> -.012 1957> -.012 1929> -.011 Higher 1936 .074 1945 .025

1950 to 1979 segment:

Lower 1968> -.039 1979> -.036 1959< -.033 1971< -.029 1974< -.026 1952< -.012 Higher 1977 .038 1956 .035

1965 to 1994 segment:

Lower 1968> -.054 1982> -.053 1979> -.036 1974< -.018 1991< -.014 1993< -.013 Higher 1981 .101 1977 .047

1977 to 2006 segment:

Lower 1982> -.062 1979> -.042 1999< -.033 2006> -.021 1998< -.018 1990> -.016 Higher 1981 .103 1997 .039

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

1917 -5.7 SD

51a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 203 220 229 198 143 203 181

1920 259 283 251 224 262 308 235 251 201 248

1930 221 174 154 175 237 209 90 152 211 240

1940 300 271 233 198 159 74 94 159 131 229

1950 226 257 215 140 169 201 291 205 196 176

1960 206 256 215 232 246 264 216 223 228 223

1970 270 174 197 171 136 138 129 216 226 221

1980 163 56 185 162 143 105 105 93 84 90

1990 123 90 109 66 112 104 93 127 35 13

2000 5 17 38 45 74 87 107

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

51b 1912 to 2006 95 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

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

1977 2006 -3 .02 -.07 -.02 -.21 -.11 -.06 .01 .46\* .04 -.31 .35| - - - - - - - - - -

[B] Entire series, effect on correlation ( .578) is:

Lower 1941< -.044 1999< -.031 1998< -.014 1973> -.011 1928< -.007 1918< -.007 Higher 1957 .032 1945 .027

1977 to 2006 segment:

Lower 1999< -.111 1998< -.036 2005< -.026 2006> -.024 1981> -.021 1990> -.020 Higher 1977 .076 1985 .074

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

2000 -.808 40 6

51b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 135 146 228 192 169 202 185 203

1920 294 280 312 221 325 339 292 340 216 241

1930 267 204 168 187 222 255 128 181 217 306

1940 291 114 214 160 178 59 103 116 167 197

1950 266 316 291 229 289 203 282 159 183 192

1960 261 293 300 334 258 275 213 237 184 191

1970 183 185 199 218 176 136 119 260 179 123

1980 159 124 107 81 59 34 67 45 75 72

1990 109 135 104 79 106 91 95 123 40 9

2000 0 72 100 68 88 66 88

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

52a 1912 to 2006 95 years Series 23

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

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

1920 1949 -7 .14 -.01 -.19 .71\*-.02 -.18 -.21 -.16 .01 .06 .40| .03 .13 .06 -.03 -.04 .09 .12 -.09 -.23 -.01

1935 1964 -7 .08 -.06 -.15 .63\*-.11 -.26 -.12 -.15 -.06 -.08 .43|-.01 .25 -.03 -.18 .20 -.25 .02 -.11 -.16 .03

[B] Entire series, effect on correlation ( .545) is:

Lower 1943< -.061 1936> -.050 1952< -.014 1948> -.012 1919> -.012 1945> -.007 Higher 1957 .051 1912 .024

1920 to 1949 segment:

Lower 1943< -.266 1948> -.024 1930< -.018 1947< -.005 1939< -.004 1933> -.004 Higher 1936 .036 1920 .022

1935 to 1964 segment:

Lower 1943< -.207 1952< -.028 1948> -.021 1961< -.010 1958> -.008 1962> -.007 Higher 1957 .153 1940 .018

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

2000 -.808 40 6

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1943 -4.5 SD

52a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1912 84 132 227 203 218 252 287 296

1920 331 261 283 279 351 353 313 320 286 233

1930 177 237 178 226 288 256 152 155 158 167

1940 243 241 213 58 147 126 104 119 182 197

1950 187 185 124 123 196 177 202 81 154 178

1960 131 108 155 156 127 120 176 150 40 136

1970 142 143 127 47 98 127 72 127 142 71

1980 68 30 16 38 45 2 29 43 70 42

1990 21 45 33 55 66 56 56 96 74 80

2000 0 10 0 0 0 0 0

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

52b 1913 to 2006 94 years Series 24

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

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

1913 1942 0 - - - .02 -.18 -.01 .08 -.02 -.09 .17 .41\*-.17 -.03 .20 -.03 .22 .18 .09 -.27 -.18 .08

[B] Entire series, effect on correlation ( .587) is:

Lower 1936> -.127 1919> -.013 1943< -.012 2005< -.007 1975> -.006 1914< -.006 Higher 1957 .091 1985 .011

1913 to 1942 segment:

Lower 1936> -.127 1919> -.032 1931< -.029 1914< -.023 1913< -.022 1930< -.011 Higher 1920 .034 1925 .019

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

1935 1936 4.0 SD

[D] 8 Absent rings: Year Master N series Absent

1985 -1.475 40 5

1990 -.457 40 3

2000 -.808 40 6

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1936 +4.0 SD

52b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 163 202 194 182 244 307 308

1920 362 305 307 305 342 360 259 285 291 232

1930 214 177 198 181 241 269 198 209 208 231

1940 230 206 203 101 115 91 122 150 62 132

1950 125 170 209 184 180 168 212 41 113 135

1960 132 139 114 140 114 140 111 135 47 117

1970 107 69 74 14 33 79 40 57 63 34

1980 11 3 5 24 23 0 28 7 19 15

1990 0 19 20 6 26 24 22 46 33 46

2000 0 5 0 0 0 0 0

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

53a 1909 to 2006 98 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

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

1920 1949 -7 .21 -.30 -.06 .63\*-.13 -.05 .02 -.08 -.17 .10 .50|-.16 .09 .03 -.01 .04 -.20 .13 -.19 .06 .10

1935 1964 -7 .03 -.28 -.12 .45\*-.21 .09 -.03 -.15 -.04 .14 .42|-.28 .30 -.10 -.23 .00 -.10 .04 .02 .21 .00

1950 1979 0 -.24 -.18 -.20 -.15 -.03 .28 -.02 -.01 .16 .18 .41\*-.32 -.01 -.26 -.32 -.19 .31 .20 .05 .25 -.02

[B] Entire series, effect on correlation ( .491) is:

Lower 1943< -.067 1957> -.028 2003< -.023 1945> -.020 1910> -.014 1974< -.014 Higher 1936 .043 1912 .028

1920 to 1949 segment:

Lower 1943< -.213 1945> -.047 1949< -.008 1928> -.007 1926< -.002 1937< -.002 Higher 1936 .112 1924 .018

1935 to 1964 segment:

Lower 1943< -.202 1957> -.038 1945> -.034 1951< -.016 1949< -.009 1959< -.007 Higher 1936 .172 1956 .020

1950 to 1979 segment:

Lower 1974< -.093 1957> -.082 1951< -.045 1959< -.021 1971> -.017 1953> -.008 Higher 1956 .036 1977 .036

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

1985 -1.475 40 5

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

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

1943 -5.2 SD

53a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 157

1910 209 81 16 158 177 234 122 168 211 163

1920 181 183 185 172 250 276 170 194 236 137

1930 186 160 109 132 178 228 86 82 115 139

1940 119 113 119 35 75 92 66 89 57 66

1950 74 63 98 113 144 134 190 120 99 93

1960 107 136 99 158 145 135 118 106 92 101

1970 93 119 91 60 27 54 44 86 85 53

1980 30 15 16 31 20 0 51 39 46 27

1990 30 56 40 35 55 47 50 69 39 30

2000 18 26 24 0 15 37 19

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

53b 1907 to 2006 100 years Series 26

[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 -5 -.15 -.13 .06 -.16 -.29 .47\*-.17 .27 -.18 .07 .33|-.19 -.07 -.21 .19 -.09 .17 -.16 .18 -.11 -.09

[B] Entire series, effect on correlation ( .609) is:

Lower 1957> -.043 1911< -.021 1962< -.016 1909> -.016 2003< -.014 1910> -.012 Higher 1936 .116 1912 .016

1950 to 1979 segment:

Lower 1957> -.117 1962< -.033 1977< -.028 1960< -.015 1972> -.013 1956< -.011 Higher 1976 .037 1952 .030

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

1912 -4.9 SD

53b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 129 117 204

1910 228 97 15 203 190 312 271 263 308 265

1920 335 220 276 206 286 290 193 276 212 154

1930 170 162 121 123 166 237 68 111 128 146

1940 153 176 166 110 88 76 65 117 97 123

1950 146 152 166 84 132 148 119 108 88 134

1960 86 115 54 106 144 139 151 147 93 88

1970 100 114 135 66 51 69 39 43 49 35

1980 17 25 29 41 19 2 51 54 48 29

1990 41 61 56 55 69 43 46 65 59 67

2000 34 37 50 14 18 54 58

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

54a 1907 to 2006 100 years Series 27

[B] Entire series, effect on correlation ( .725) is:

Lower 1915< -.057 1976> -.021 1946> -.019 1961< -.008 1912> -.007 1939< -.006 Higher 1936 .103 1957 .033

54a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1907 117 117 99

1910 86 185 151 147 226 96 166 202 232 141

1920 252 189 235 227 290 256 231 225 172 128

1930 120 101 105 139 170 136 14 58 93 86

1940 88 94 127 111 73 28 97 111 59 77

1950 70 76 102 62 83 112 170 51 56 106

1960 101 71 86 93 107 135 118 118 85 106

1970 117 91 116 77 108 104 124 141 117 45

1980 46 45 30 50 32 47 76 67 68 48

1990 63 86 75 107 98 90 88 105 115 91

2000 48 65 67 80 135 141 133

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

54b 1908 to 2006 99 years Series 28

[B] Entire series, effect on correlation ( .615) is:

Lower 1915< -.040 1957> -.019 1912> -.019 1946> -.016 1968> -.015 1985> -.011 Higher 1936 .121 1945 .014

54b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1908 110 98

1910 73 167 150 112 216 74 154 200 222 137

1920 156 214 204 203 237 239 212 214 158 119

1930 120 107 57 81 113 76 7 71 95 116

1940 109 89 69 65 71 20 81 71 64 87

1950 110 90 94 93 111 103 135 78 56 98

1960 68 61 66 87 94 95 77 104 87 75

1970 58 33 31 25 33 26 17 44 57 37

1980 32 27 15 30 30 36 57 29 29 35

1990 33 49 54 48 60 50 57 85 88 71

2000 49 58 77 46 70 86 41

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

55a 1909 to 2006 98 years Series 29

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

Lower 1912> -.016 1976> -.015 1988< -.013 1995< -.009 1915> -.007 1987> -.006 Higher 1936 .061 1957 .028

55a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 91

1910 134 237 178 156 204 271 180 213 210 137

1920 289 193 203 183 215 232 187 184 152 133

1930 137 151 115 125 166 158 44 86 136 163

1940 260 209 205 206 120 50 89 161 124 177

1950 184 167 166 120 173 185 182 47 58 84

1960 79 80 76 105 105 115 118 97 62 72

1970 97 91 87 79 118 116 118 192 138 106

1980 110 82 86 63 71 53 88 105 57 58

1990 56 67 78 59 79 25 24 77 60 31

2000 12 16 44 23 29 86 18

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

55b 1916 to 2006 91 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

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

1950 1979 1 .10 -.01 -.01 -.05 -.23 .01 -.32 .07 -.21 -.10 .33| .51\* .11 -.15 -.16 -.08 .11 -.27 -.05 -.11 .03

[B] Entire series, effect on correlation ( .401) is:

Lower 1956< -.107 1927< -.054 1946> -.018 1932> -.011 2000> -.005 1967< -.005 Higher 1936 .099 1957 .022

1950 to 1979 segment:

Lower 1956< -.316 1967< -.012 1972> -.011 1962> -.004 1966< -.003 1953> -.003 Higher 1957 .067 1977 .041

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

1955 1956 -4.1 SD

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

1927 .931 40 1 >> WARNING: Ring is not usually narrow

1928 .324 40 1 >> WARNING: Ring is not usually narrow

1929 -.741 40 1

1930 -.074 40 1 >> WARNING: Ring is not usually narrow

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

1956 -5.1 SD

55b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1916 228 194 179 127

1920 199 156 191 202 224 213 168 0 0 0

1930 0 128 139 104 147 174 43 85 139 132

1940 135 156 154 178 149 108 163 228 117 114

1950 114 128 129 123 177 133 60 57 63 97

1960 104 127 112 134 123 126 92 77 71 80

1970 83 72 106 60 83 63 52 89 108 57

1980 42 47 55 48 47 35 58 46 39 41

1990 33 40 58 61 65 27 30 99 98 242

2000 149 129 101 48 39 59 43

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

56a 1911 to 2006 96 years Series 31

[B] Entire series, effect on correlation ( .578) is:

Lower 1936> -.023 1937< -.014 1980< -.014 1981> -.011 1998< -.010 1945> -.009 Higher 1957 .034 1912 .020

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

1936 1937 -4.2 SD 1980 1981 4.5 SD

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

1980 -.275 40 1 >> WARNING: Ring is not usually narrow

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

1980 -5.9 SD

56a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 223 121 204 225 222 175 179 207 133

1920 183 175 229 198 270 266 288 291 193 161

1930 206 198 159 169 217 180 107 83 172 241

1940 224 157 185 169 148 120 76 167 103 135

1950 148 134 140 87 78 101 149 67 56 114

1960 163 206 141 123 114 120 142 97 73 85

1970 66 77 93 93 68 85 69 95 109 27

1980 0 44 40 20 39 11 22 25 33 22

1990 15 21 29 31 34 14 10 37 13 72

2000 34 15 13 44 61 89 23

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

56b 1909 to 2006 98 years Series 32

[B] Entire series, effect on correlation ( .708) is:

Lower 1957> -.016 1980< -.013 1919> -.012 1998< -.009 1970< -.008 1945> -.008 Higher 1936 .119 1912 .014

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

1998 .567 40 2 >> WARNING: Ring is not usually narrow

2001 -.532 40 4

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

56b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 141

1910 128 217 113 219 255 276 191 222 269 268

1920 348 237 295 238 268 279 198 234 253 208

1930 228 236 194 184 262 298 90 189 210 280

1940 197 229 188 144 120 120 80 169 126 131

1950 88 83 138 89 112 108 142 68 54 76

1960 150 106 74 108 101 106 86 63 31 41

1970 27 42 62 58 79 70 45 113 72 19

1980 3 24 17 25 13 19 16 24 31 24

1990 15 33 13 16 54 15 22 28 0 21

2000 21 0 0 69 105 75 0

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

57a 1913 to 2006 94 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

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

1965 1994 0 -.16 -.01 .24 -.03 -.04 -.05 -.11 .15 -.05 -.24 .42\*-.30 -.08 .36 .07 .24 .26 -.13 .02 .18 -.15

[B] Entire series, effect on correlation ( .521) is:

Lower 1976< -.023 1913< -.018 1964< -.014 1914< -.012 1961< -.011 1985> -.010 Higher 1945 .022 1936 .022

1965 to 1994 segment:

Lower 1985> -.049 1968> -.031 1966< -.023 1973> -.017 1992< -.012 1987< -.011 Higher 1976 .072 1977 .025

57a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 69 90 179 197 203 179 202

1920 272 229 229 185 278 251 212 228 222 123

1930 130 88 68 85 110 126 43 123 131 184

1940 158 135 128 133 58 19 45 88 75 137

1950 131 148 154 118 112 114 117 74 86 93

1960 101 71 65 105 68 87 63 76 72 68

1970 64 74 84 74 115 93 29 65 60 32

1980 38 41 39 44 49 53 63 43 62 59

1990 60 72 54 70 79 53 47 91 129 95

2000 51 61 72 64 93 121 111

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

57b 1921 to 2006 86 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 0 -.27 -.04 .01 .07 -.21 .25 -.14 .27 .12 -.21 .36\*-.32 -.12 .19 .11 -.13 .18 -.21 -.09 .14 -.07

1965 1994 3 -.10 -.22 .13 .32 -.17 -.01 -.14 .10 .18 -.27 .06|-.04 -.08 .44\* .21 .04 .22 .08 -.01 .20 .05

1977 2006 -10 .39\*-.37 -.07 .19 -.14 .06 -.18 -.29 .04 -.34 .19| - - - - - - - - - -

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

Lower 1978< -.039 1968> -.026 1985> -.022 1943> -.008 1992< -.008 1990> -.007 Higher 1936 .208 1945 .010

1950 to 1979 segment:

Lower 1978< -.125 1968> -.089 1950> -.015 1964< -.012 1960< -.012 1959< -.011 Higher 1957 .155 1976 .050

1965 to 1994 segment:

Lower 1978< -.173 1968> -.082 1985> -.063 1992< -.025 1990> -.015 1984> -.014 Higher 1976 .117 1967 .057

1977 to 2006 segment:

Lower 1978< -.142 1985> -.092 1990> -.028 1984> -.025 1992< -.016 1989> -.013 Higher 2000 .130 1997 .038

57b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 270 264 186 273 264 197 170 162 120

1930 126 94 101 94 124 110 21 69 88 92

1940 127 92 85 107 73 43 53 69 67 89

1950 89 67 74 64 59 67 80 55 57 57

1960 51 74 50 73 65 67 95 148 134 93

1970 69 62 96 70 93 84 39 64 37 34

1980 40 50 54 46 74 91 84 79 84 75

1990 95 72 37 75 75 39 48 71 94 82

2000 17 21 53 52 57 44 28

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

58a 1916 to 2006 91 years Series 35

[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 -5 -.20 -.08 .13 -.03 -.26 .39\* .16 .18 .14 .08 .34|-.10 -.06 .11 -.26 -.28 .10 -.15 .08 .25 .16

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

Lower 1968> -.041 1920< -.034 1928< -.012 1982> -.007 1963< -.006 1979> -.005 Higher 1936 .092 1957 .053

1965 to 1994 segment:

Lower 1968> -.193 1982> -.027 1979> -.020 1977< -.009 1980> -.008 1972< -.006 Higher 1985 .117 1994 .029

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

1985 -1.475 40 5

2000 -.808 40 6

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

1968 +3.1 SD

58a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1916 218 237 260 207

1920 156 238 230 196 187 176 127 139 93 113

1930 116 123 68 103 115 139 29 76 86 129

1940 116 113 81 88 70 33 64 156 75 105

1950 91 91 151 108 92 139 127 51 114 145

1960 110 134 135 115 142 148 134 174 225 179

1970 152 108 82 45 79 111 73 87 102 88

1980 86 56 74 36 23 0 49 66 68 25

1990 12 60 48 63 81 57 57 73 78 78

2000 0 22 57 33 44 65 65

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

58b 1911 to 2006 96 years Series 36

[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 -.21 -.06 -.16 -.24 -.22 .11 -.10 .00 .07 .06 .23\*-.07 .01 -.17 -.22 .03 .07 -.19 -.10 -.38 -.10

1977 2006 -8 -.14 -.06 .43\* .13 -.28 .38 .30 .18 .20 -.17 -.09| - - - - - - - - - -

[B] Entire series, effect on correlation ( .528) is:

Lower 1949< -.046 1947< -.017 2001> -.017 1997< -.015 1969< -.012 2002< -.011 Higher 1936 .184 1957 .051

1965 to 1994 segment:

Lower 1969< -.067 1982> -.055 1976> -.044 1979> -.043 1981> -.030 1970< -.023 Higher 1985 .122 1968 .081

1977 to 2006 segment:

Lower 1997< -.062 2001> -.052 1982> -.043 2000> -.034 1979> -.033 1981> -.016 Higher 1985 .161 1991 .043

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

1949 .339 40 1 >> WARNING: Ring is not usually narrow

1985 -1.475 40 5

1995 .020 40 1 >> WARNING: Ring is not usually narrow

1998 .567 40 2 >> WARNING: Ring is not usually narrow

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

2001 +3.2 SD

58b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 62 79 56 135 182 201 184 224 179

1920 199 251 210 151 196 202 104 112 124 122

1930 105 107 79 89 128 128 37 83 78 85

1940 95 92 101 100 91 38 76 24 83 0

1950 61 38 94 129 135 155 176 42 81 119

1960 101 147 149 115 128 161 110 100 51 32

1970 39 60 73 70 63 74 76 88 92 90

1980 86 67 86 63 31 0 28 15 13 25

1990 10 62 38 27 21 0 34 10 0 4

2000 12 38 0 0 0 0 0

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

59a 1906 to 2006 101 years Series 37

[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 8 .01 -.12 -.02 -.18 .01 -.04 .14 -.12 -.23 .02 .27| .11 -.03 -.06 .01 -.28 .05 .13 .30\*-.11 -.11

1965 1994 0 .01 -.15 .14 .04 .13 -.03 .22 -.33 -.19 -.03 .34\* .08 -.12 .00 .29 -.20 -.06 -.07 .18 -.04 -.09

[B] Entire series, effect on correlation ( .614) is:

Lower 1972< -.044 1957> -.025 1977< -.018 1971> -.013 1912> -.012 1956< -.011 Higher 1936 .117 1920 .007

1950 to 1979 segment:

Lower 1972< -.077 1977< -.047 1956< -.028 1971> -.027 1953> -.023 1957> -.022 Higher 1968 .102 1978 .047

1965 to 1994 segment:

Lower 1972< -.084 1977< -.066 1985> -.055 1982> -.039 1971> -.028 1973> -.018 Higher 1968 .110 1978 .066

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

59a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1906 130 122 78 25

1910 42 205 169 172 238 241 254 262 295 198

1920 310 253 269 260 329 325 268 292 269 205

1930 185 207 147 168 250 231 65 143 170 218

1940 259 241 199 184 143 93 81 86 72 97

1950 75 75 155 189 174 139 92 79 96 143

1960 131 134 95 114 114 87 85 78 32 86

1970 102 158 48 69 74 61 58 46 120 61

1980 44 25 74 57 67 66 72 63 50 26

1990 29 51 55 91 126 77 64 95 71 75

2000 37 45 34 0 60 121 26

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

59b 1909 to 2006 98 years Series 38

[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 -1 -.15 .06 -.18 -.07 -.24 .29 -.03 -.07 -.28 .48\* .02|-.14 .03 -.02 .07 -.28 -.01 .23 .18 -.20 .23

1965 1994 -1 -.05 .01 -.03 -.15 -.09 .12 .00 -.12 -.05 .40\* .06|-.25 -.18 -.01 .11 -.13 -.16 -.03 .10 .01 .15

1977 2006 -1 -.09 .13 .23 -.10 .14 .05 .10 -.24 .07 .30\* .25| - - - - - - - - - -

[B] Entire series, effect on correlation ( .497) is:

Lower 1977< -.049 1957> -.034 1912> -.017 1969< -.017 2003< -.015 1945> -.015 Higher 1936 .190 1920 .010

1950 to 1979 segment:

Lower 1977< -.142 1979> -.040 1969< -.027 1968> -.020 1953> -.012 1951< -.011 Higher 1978 .056 1952 .048

1965 to 1994 segment:

Lower 1977< -.188 1979> -.054 1969< -.041 1968> -.039 1983> -.024 1976> -.018 Higher 1978 .084 1994 .064

1977 to 2006 segment:

Lower 1977< -.191 1979> -.061 1983> -.029 1995> -.020 2003< -.009 1982> -.008 Higher 1978 .052 2005 .045

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

2003 -.063 40 14 >> WARNING: Ring is not usually narrow

59b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1909 77

1910 73 147 157 148 193 159 222 250 230 210

1920 255 231 225 233 251 232 223 224 213 204

1930 167 192 118 153 199 191 56 111 168 199

1940 221 178 182 178 203 146 87 54 52 93

1950 64 69 150 148 119 112 108 103 87 152

1960 149 145 101 126 119 106 117 101 101 62

1970 101 65 62 59 72 70 77 40 110 126

1980 102 59 73 104 72 57 76 73 151 51

1990 46 58 56 49 95 100 42 87 83 112

2000 59 64 42 0 41 92 40

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

60a 1911 to 2006 96 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

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

1965 1994 -2 -.47 .03 -.03 -.08 .17 .11 -.03 .09 .34\* .32 .23|-.14 .08 .26 -.16 -.38 -.01 .01 .07 -.25 .03

[B] Entire series, effect on correlation ( .484) is:

Lower 1920< -.036 1968> -.028 1919> -.023 1964< -.015 2004< -.013 1913> -.010 Higher 1957 .100 1936 .048

1965 to 1994 segment:

Lower 1968> -.128 1979> -.042 1976> -.040 1977< -.024 1965< -.015 1971> -.015 Higher 1985 .067 1973 .041

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

1989 -.406 40 2

1990 -.457 40 3

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2005 1.129 40 12 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1968 +3.0 SD

60a Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 92 87 182 136 112 124 137 115 207

1920 117 193 169 198 217 175 228 218 115 48

1930 94 121 98 132 184 240 72 123 188 195

1940 238 165 122 170 133 80 64 94 68 111

1950 112 144 172 141 151 131 155 78 121 136

1960 111 160 163 164 117 133 151 241 244 183

1970 166 214 169 105 127 145 142 121 140 146

1980 140 86 37 49 52 24 45 25 29 0

1990 0 23 22 37 22 18 12 24 9 24

2000 5 17 11 12 0 0 0

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

60b 1916 to 2006 91 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

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

1950 1979 -4 -.20 -.07 -.13 -.01 -.09 .17 .32\* .08 -.03 -.13 .28|-.15 -.12 -.11 .08 -.23 -.23 .20 -.31 .03 .16

1965 1994 -6 -.26 .00 -.05 .05 .41\* .03 .02 .26 .21 -.04 .30| .02 .35 .18 -.14 -.16 -.18 -.04 -.33 -.25 .03

1977 2006 -6 -.18 -.19 .21 .07 .57\*-.10 -.05 .24 .22 .06 .44| - - - - - - - - - -

[B] Entire series, effect on correlation ( .574) is:

Lower 1968> -.036 1961< -.017 1919> -.013 1927< -.013 1976> -.013 1957> -.012 Higher 1936 .232 1945 .014

1950 to 1979 segment:

Lower 1968> -.127 1961< -.066 1963< -.041 1976> -.034 1978< -.022 1964< -.012 Higher 1957 .123 1977 .068

1965 to 1994 segment:

Lower 1968> -.173 1976> -.051 1978< -.039 1988< -.035 1987< -.031 1991< -.013 Higher 1977 .100 1994 .069

1977 to 2006 segment:

Lower 2000> -.059 2004< -.044 1997< -.039 1978< -.031 2003> -.028 1988< -.024 Higher 1977 .076 1994 .054

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

1989 -.406 40 2

1990 -.457 40 3

2002 -.129 40 10 >> WARNING: Ring is not usually narrow

2004 .446 40 11 >> WARNING: Ring is not usually narrow

2006 .137 40 16 >> 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

1968 +3.0 SD

60b Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1916 79 102 158 220

1920 305 256 230 208 249 246 180 175 255 173

1930 298 256 219 234 246 268 105 193 180 238

1940 206 153 202 245 161 94 122 105 80 73

1950 78 130 151 92 108 113 140 89 82 97

1960 88 60 76 81 93 155 129 176 222 167

1970 164 190 172 142 156 166 157 215 135 75

1980 96 70 33 40 61 27 41 5 6 0

1990 0 10 22 17 32 18 16 9 21 21

2000 16 7 0 14 0 17 0

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

PART 7: DESCRIPTIVE STATISTICS: Mount Hunger-Middlesex-Mid Corr4-30 14:44 Fri 23 Feb 2007 Page 6

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

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 41a 1921 2006 86 5 2 .488 1.37 2.84 .735 .723 .356 2.64 .439 -.027 2

2 41b 1919 2006 88 6 1 .661 1.20 2.80 .738 .773 .354 2.56 .444 .051 1

3 42a 1908 2006 99 6 2 .681 1.58 3.98 1.191 .915 .306 2.31 .296 -.028 1

4 42b 1909 2006 98 6 0 .701 1.71 4.05 1.167 .908 .284 2.42 .322 .026 1

5 43a 1910 2006 97 6 0 .719 1.73 4.91 1.353 .880 .413 2.38 .325 .009 1

6 43b 1912 2006 95 6 2 .730 1.60 4.96 1.347 .925 .425 2.46 .400 -.003 1

7 44a 1920 2006 87 5 1 .492 1.06 2.35 .516 .663 .379 2.48 .387 -.048 2

8 44b 1915 2006 92 6 1 .488 1.01 2.25 .480 .621 .356 2.64 .421 -.022 3

9 45a 1918 2006 89 6 3 .453 .96 2.48 .572 .814 .340 2.64 .463 .041 1

10 45b 1911 2006 96 6 0 .521 1.30 3.56 .819 .816 .404 2.73 .459 .032 2

11 46a 1912 2006 95 6 2 .622 1.08 2.86 .710 .840 .346 2.61 .350 -.043 1

12 46b 1907 2006 100 6 1 .603 1.24 3.21 .767 .796 .363 2.66 .470 -.021 2

13 47a 1911 2006 96 6 6 -.178 1.11 2.82 .592 .707 .363 2.57 .439 -.005 3

14 47b 1913 2006 94 6 6 .001 1.34 3.26 .754 .793 .323 2.38 .356 -.021 3

15 48a 1910 2006 97 6 0 .740 1.39 3.18 .821 .862 .298 2.55 .384 -.008 1

16 48b 1906 2006 101 6 0 .656 1.45 3.29 .752 .817 .353 2.44 .362 -.029 1

17 49a 1915 2006 92 6 0 .777 1.26 3.64 .722 .781 .390 2.51 .346 -.026 1

18 49b 1919 2006 88 6 0 .780 1.28 3.97 .791 .778 .395 2.62 .468 -.004 1

19 50a 1907 2006 100 6 0 .648 1.60 3.27 .864 .853 .259 2.47 .370 .042 1

20 50b 1908 2006 99 6 0 .785 1.79 4.94 1.224 .905 .285 2.63 .389 -.008 1

21 51a 1913 2006 94 6 3 .500 1.73 3.08 .718 .789 .266 2.49 .408 .017 1

22 51b 1912 2006 95 6 1 .578 1.79 3.40 .846 .784 .312 2.82 .493 .031 1

23 52a 1912 2006 95 6 2 .545 1.40 3.53 .931 .873 .378 2.40 .465 -.054 1

24 52b 1913 2006 94 6 1 .587 1.26 3.62 1.026 .925 .460 2.35 .361 -.035 2

25 53a 1909 2006 98 6 3 .491 1.00 2.76 .643 .779 .402 2.57 .427 .013 1

26 53b 1907 2006 100 6 1 .609 1.19 3.35 .794 .809 .345 2.45 .443 .016 1

27 54a 1907 2006 100 6 0 .725 1.11 2.90 .553 .731 .290 2.58 .389 -.032 2

28 54b 1908 2006 99 6 0 .615 .88 2.39 .552 .808 .311 2.47 .407 -.026 1

29 55a 1909 2006 98 6 0 .792 1.21 2.89 .634 .747 .305 2.77 .427 .033 1

30 55b 1916 2006 91 6 1 .401 1.03 2.42 .581 .705 .293 2.77 .460 .073 1

31 56a 1911 2006 96 6 0 .578 1.16 2.91 .751 .854 .382 2.68 .516 -.034 2

32 56b 1909 2006 98 6 0 .708 1.19 3.48 .916 .859 .446 2.61 .377 -.028 1

33 57a 1913 2006 94 6 1 .521 1.05 2.78 .588 .840 .264 2.61 .393 -.025 1

34 57b 1921 2006 86 5 3 .636 .86 2.73 .528 .848 .275 2.48 .346 -.038 2

35 58a 1916 2006 91 6 1 .703 1.03 2.60 .566 .789 .394 2.54 .450 -.046 2

36 58b 1911 2006 96 6 2 .528 .84 2.51 .600 .824 .494 2.65 .397 -.062 1

37 59a 1906 2006 101 6 2 .614 1.29 3.29 .823 .841 .344 2.67 .437 .008 1

38 59b 1909 2006 98 6 3 .497 1.23 2.55 .630 .821 .300 2.61 .397 .009 1

39 60a 1911 2006 96 6 1 .484 1.12 2.44 .682 .804 .375 2.57 .412 -.015 1

40 60b 1916 2006 91 6 3 .574 1.21 3.05 .849 .873 .430 2.46 .339 -.058 1

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

Total or mean: 3800 237 55 .578 1.27 4.96 .781 .813 .351 2.82 .406 -.009

- = [ COFECHA MHM\_MCOF ] = -