[] Dendrochronology Program Library Run 150\_1 Program COF 09:41 Wed 13 Apr 2011 Page 1

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[] P R O G R A M C O F E C H A Version 6.06P 27863

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

File of DATED series: 150\_EQU\_2

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 N

8 Parts printed 1234567

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

Time span of Master dating series is 1857 to 2010 154 years

Continuous time span is 1857 to 2010 154 years

Portion with two or more series is 1864 to 2010 147 years

>> 305A 1935 absent in 3 of 18 series, but is not usually narrow: master index is -.261

>> 305B 1935 absent in 3 of 18 series, but is not usually narrow: master index is -.261

>> 307A 2003 absent in 3 of 24 series, but is not usually narrow: master index is -.308

>> 307A 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 307A 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 307A 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 307A 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 307B 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 307B 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 307B 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 307B 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 308A 1973 absent in 3 of 23 series, but is not usually narrow: master index is -.118

>> 308A 1974 absent in 2 of 23 series, but is not usually narrow: master index is -.125

>> 308A 1975 absent in 2 of 23 series, but is not usually narrow: master index is .758

>> 308A 1980 absent in 2 of 24 series, but is not usually narrow: master index is .726

>> 308A 1982 absent in 2 of 24 series, but is not usually narrow: master index is -.375

>> 308A 1983 absent in 2 of 24 series, but is not usually narrow: master index is -.033

>> 308A 1985 absent in 2 of 24 series, but is not usually narrow: master index is -.359

>> 308A 1986 absent in 2 of 24 series, but is not usually narrow: master index is -.121

>> 308A 1987 absent in 2 of 24 series, but is not usually narrow: master index is 1.371

>> 308A 1988 absent in 2 of 24 series, but is not usually narrow: master index is 1.722

>> 308B 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 308B 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 308B 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 308B 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 310A 1935 absent in 3 of 18 series, but is not usually narrow: master index is -.261

>> 310B 1917 absent in 1 of 15 series, but is not usually narrow: master index is .822

>> 310B 1926 absent in 1 of 16 series, but is not usually narrow: master index is .013

>> 423A 1958 absent in 1 of 20 series, but is not usually narrow: master index is 1.438

>> 423A 1959 absent in 1 of 20 series, but is not usually narrow: master index is .569

>> 423A 1961 absent in 1 of 20 series, but is not usually narrow: master index is .663

>> 423A 1962 absent in 1 of 20 series, but is not usually narrow: master index is .106

>> 423A 1963 absent in 1 of 20 series, but is not usually narrow: master index is .289

>> 423A 1964 absent in 1 of 20 series, but is not usually narrow: master index is .474

>> 423A 1965 absent in 1 of 20 series, but is not usually narrow: master index is -.112

>> 423A 1971 absent in 2 of 22 series, but is not usually narrow: master index is .453

>> 423A 1973 absent in 3 of 23 series, but is not usually narrow: master index is -.118

>> 423A 1974 absent in 2 of 23 series, but is not usually narrow: master index is -.125

>> 423A 1975 absent in 2 of 23 series, but is not usually narrow: master index is .758

>> 423A 1980 absent in 2 of 24 series, but is not usually narrow: master index is .726

>> 423A 1982 absent in 2 of 24 series, but is not usually narrow: master index is -.375

>> 423A 1983 absent in 2 of 24 series, but is not usually narrow: master index is -.033

>> 423A 1985 absent in 2 of 24 series, but is not usually narrow: master index is -.359

>> 423A 1986 absent in 2 of 24 series, but is not usually narrow: master index is -.121

>> 423A 1987 absent in 2 of 24 series, but is not usually narrow: master index is 1.371

>> 423A 1988 absent in 2 of 24 series, but is not usually narrow: master index is 1.722

>> 423A 1989 absent in 1 of 24 series, but is not usually narrow: master index is .506

>> 423A 1990 absent in 1 of 24 series, but is not usually narrow: master index is .663

>> 423A 1991 absent in 1 of 24 series, but is not usually narrow: master index is 1.230

>> 423A 1992 absent in 1 of 24 series, but is not usually narrow: master index is .930

>> 423A 1993 absent in 1 of 24 series, but is not usually narrow: master index is 1.192

>> 423A 1995 absent in 1 of 24 series, but is not usually narrow: master index is -.131

>> 423A 1998 absent in 2 of 24 series, but is not usually narrow: master index is -.375

>> 423A 1999 absent in 2 of 24 series, but is not usually narrow: master index is .638

>> 423A 2000 absent in 2 of 24 series, but is not usually narrow: master index is .043

>> 423A 2001 absent in 2 of 24 series, but is not usually narrow: master index is .921

>> 423A 2002 absent in 2 of 24 series, but is not usually narrow: master index is 1.224

>> 423A 2003 absent in 3 of 24 series, but is not usually narrow: master index is -.308

>> 423A 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 423A 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 423A 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 423A 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 423B 1919 absent in 1 of 16 series, but is not usually narrow: master index is .613

>> 423B 1920 absent in 1 of 16 series, but is not usually narrow: master index is .354

>> 423B 1971 absent in 2 of 22 series, but is not usually narrow: master index is .453

>> 423B 1973 absent in 3 of 23 series, but is not usually narrow: master index is -.118

>> 423B 1998 absent in 2 of 24 series, but is not usually narrow: master index is -.375

>> 423B 1999 absent in 2 of 24 series, but is not usually narrow: master index is .638

>> 423B 2000 absent in 2 of 24 series, but is not usually narrow: master index is .043

>> 423B 2001 absent in 2 of 24 series, but is not usually narrow: master index is .921

>> 423B 2002 absent in 2 of 24 series, but is not usually narrow: master index is 1.224

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>> 423B 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 423B 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 424A 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 424A 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 424A 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 424A 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

>> 424B 2007 absent in 7 of 24 series, but is not usually narrow: master index is .311

>> 424B 2008 absent in 7 of 24 series, but is not usually narrow: master index is .034

>> 424B 2009 absent in 7 of 24 series, but is not usually narrow: master index is .425

>> 424B 2010 absent in 7 of 24 series, but is not usually narrow: master index is 1.540

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

\*C\* Number of dated series 24 \*C\*

\*O\* Master series 1857 2010 154 yrs \*O\*

\*F\* Total rings in all series 2520 \*F\*

\*E\* Total dated rings checked 2513 \*E\*

\*C\* Series intercorrelation .551 \*C\*

\*H\* Average mean sensitivity .277 \*H\*

\*A\* Segments, possible problems 24 \*A\*

\*\*\* Mean length of series 105.0 \*\*\*

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

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

305A 1 absent rings: 1935

305B 2 absent rings: 1935 1936

306A 1 absent rings: 1936

307A 8 absent rings: 2003 2004 2005 2006 2007 2008 2009 2010

307B 7 absent rings: 1936 2005 2006 2007 2008 2009 2010

308A 17 absent rings: 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987

1988

308B 8 absent rings: 1967 1968 2005 2006 2007 2008 2009 2010

310A 5 absent rings: 1935 1936 1937 1940 2004

310B 4 absent rings: 1917 1926 1936 1940

423A 53 absent rings: 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973

1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

2006 2007 2008 2009 2010

423B 24 absent rings: 1919 1920 1967 1968 1969 1970 1971 1972 1973 1996 1997 1998 1999 2000 2001 2002

2003 2004 2005 2006 2007 2008 2009 2010

424A 4 absent rings: 2007 2008 2009 2010

424B 7 absent rings: 2004 2005 2006 2007 2008 2009 2010

141 absent rings 5.595%

PART 2: TIME PLOT OF TREE-RING SERIES: 09:41 Wed 13 Apr 2011 Page 2

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1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050 Ident Seq Time-span Yrs

: : : : : : : : : : : : : : : : : : : : : -------- --- ---- ---- ----

. . . . . . . . . . . . . . . . . . . <===> . 302A 1 1971 2010 40

. . . . . . . . . . . . . . . . . . . <===> . 302B 2 1970 2010 41

. . . . . . . . . . . . . . . . . . . <===> . 303A 3 1976 2010 35

. . . . . . . . . . . . . . . . . . . <===> . 303B 4 1973 2010 38

. . . . . . . . . . . . . . . . . . <======> . 304A 5 1941 2010 70

. . . . . . . . . . . . . . . . . . <======> . 304B 6 1946 2010 65

. . . . . . . . . . . . . . . . . <=============> . 305A 7 1877 2010 134

. . . . . . . . . . . . . . . . . <============> . 305B 8 1885 2010 126

. . . . . . . . . . . . . . . . . <============> . 306A 9 1887 2010 124

. . . . . . . . . . . . . . . . . <===========> . 306B 10 1891 2010 120

. . . . . . . . . . . . . . . . . <============> . 307A 11 1880 2010 131

. . . . . . . . . . . . . . . . . .<=========> . 307B 12 1919 2010 92

. . . . . . . . . . . . . . . . . <============> . 308A 13 1883 2010 128

. . . . . . . . . . . . . . . . . <============> . 308B 14 1882 2010 129

. . . . . . . . . . . . . . . . . . <=======> . 309A 15 1935 2010 76

. . . . . . . . . . . . . . . . . . <=======> . 309B 16 1933 2010 78

. . . . . . . . . . . . . . . . . <=============> . 310A 17 1874 2010 137

. . . . . . . . . . . . . . . . . <============> . 310B 18 1881 2010 130

. . . . . . . . . . . . . . . . . <=============> . 311A 19 1875 2010 136

. . . . . . . . . . . . . . . . .<==============> . 311B 20 1864 2010 147

. . . . . . . . . . . . . . . . . <=============> . 423A 21 1874 2010 137

. . . . . . . . . . . . . . . . <===============> . 423B 22 1857 2010 154

. . . . . . . . . . . . . . . . . <=============> . 424A 23 1879 2010 132

. . . . . . . . . . . . . . . . . <===========> . 424B 24 1891 2010 120

: : : : : : : : : : : : : : : : : : : : :

1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 2000 2050

PART 3: Master Dating Series: 09:41 Wed 13 Apr 2011 Page 3

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

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1900 .479 15 1950 .104 20 2000 .043 24 2<<

1901 -1.187 15 1951 .869 20 2001 .921 24 2<<

1902 -2.807 15 1952 1.702 20 2002 1.224 24 2<<

1903 .172 15 1953 1.555 20 2003 -.308 24 3<<

1904 1.069 15 1954 1.205 20 2004 -2.163 24 5

1905 1.211 15 1955 1.486 20 2005 -1.228 24 6

1906 .797 15 1956 -.326 20 2006 -.803 24 6

1857 1.959 1 1907 1.352 15 1957 .363 20 2007 .311 24 7<<

1858 1.779 1 1908 .625 15 1958 1.438 20 1<< 2008 .034 24 7<<

1859 1.410 1 1909 -.330 15 1959 .569 20 1<< 2009 .425 24 7<<

1860 .695 1 1910 -.606 15 1960 -.556 20 1 2010 1.540 24 7<<

1861 -.007 1 1911 -2.073 15 1961 .663 20 1<<

1862 -.481 1 1912 -.845 15 1962 .106 20 1<<

1863 -.442 1 1913 -.307 15 1963 .289 20 1<<

1864 .341 2 1914 -.521 15 1964 .474 20 1<<

1865 .386 2 1915 -.044 15 1965 -.112 20 1<<

1866 -.910 2 1916 1.008 15 1966 -1.296 20 1

1867 -1.167 2 1917 .822 15 1<< 1967 -2.141 20 3

1868 -2.442 2 1918 -.424 15 1968 -2.171 20 3

1869 -.887 2 1919 .613 16 1<< 1969 -1.065 20 2

1870 -1.143 2 1920 .354 16 1<< 1970 -.688 21 2

1871 -3.816 2 1921 .619 16 1971 .453 22 2<<

1872 -.712 2 1922 .945 16 1972 -.462 22 3

1873 .355 2 1923 .351 16 1973 -.118 23 3<<

1874 -.539 4 1924 1.508 16 1974 -.125 23 2<<

1875 .059 5 1925 -.864 16 1975 .758 23 2<<

1876 -.019 5 1926 .013 16 1<< 1976 -.609 24 2

1877 -.008 6 1927 -.369 16 1977 -1.547 24 2

1878 -.368 6 1928 -.304 16 1978 -1.539 24 2

1879 .632 7 1929 -.718 16 1979 -.429 24 2

1880 1.791 8 1930 .200 16 1980 .726 24 2<<

1881 1.182 9 1931 1.226 16 1981 -.742 24 2

1882 .219 10 1932 1.791 16 1982 -.375 24 2<<

1883 .281 11 1933 1.920 17 1983 -.033 24 2<<

1884 .559 11 1934 .836 17 1984 -.546 24 2

1885 .601 12 1935 -.261 18 3<< 1985 -.359 24 2<<

1886 1.208 12 1936 -.727 18 5 1986 -.121 24 2<<

1887 -.859 13 1937 -.673 18 1 1987 1.371 24 2<<

1888 -.195 13 1938 -.161 18 1988 1.722 24 2<<

1889 .619 13 1939 -.219 18 1989 .506 24 1<<

1890 .163 13 1940 -1.410 18 2 1990 .663 24 1<<

1891 .134 15 1941 -.459 19 1991 1.230 24 1<<

1892 -.715 15 1942 -.193 19 1992 .930 24 1<<

1893 .250 15 1943 -1.059 19 1993 1.192 24 1<<

1894 .496 15 1944 -.580 19 1994 -.439 24 1

1895 -.543 15 1945 -.803 19 1995 -.131 24 1<<

1896 .742 15 1946 -.980 20 1996 -1.736 24 2

1897 -.651 15 1947 -.658 20 1997 -.541 24 2

1898 .612 15 1948 -1.726 20 1998 -.375 24 2<<

1899 -.130 15 1949 .534 20 1999 .638 24 2<<

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PART 4: Master Bar Plot: 09:41 Wed 13 Apr 2011 Page 4

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Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value Year Rel value

1900-------B 1950-----@ 2000-----@

1901-e 1951--------C 2001--------D

1902k 1952----------G 2002---------E

1903------A 1953----------F 2003----a

1904---------D 1954---------E 2004i

1905---------E 1955----------F 2005-e

1906--------C 1956----a 2006-c

1857----------H 1907---------E 1957------A 2007------A

1858----------G 1908-------C 1958---------F 2008-----@

1859---------F 1909---a 1959-------B 2009-------B

1860--------C 1910--b 1960--b 2010----------F

1861-----@ 1911h 1961--------C

1862---b 1912-c 1962-----@

1863---b 1913----a 1963------A

1864------A 1914---b 1964-------B

1865------B 1915-----@ 1965-----@

1866-d 1916---------D 1966-e

1867-e 1917--------C 1967i

1868j 1918---b 1968i

1869-d 1919-------B 1969-d

1870-e 1920------A 1970--c

1871o 1921-------B 1971-------B

1872--c 1922--------D 1972---b

1873------A 1923------A 1973----@

1874---b 1924----------F 1974----a

1875-----@ 1925-c 1975--------C

1876-----@ 1926-----@ 1976--b

1877-----@ 1927---a 1977f

1878---a 1928----a 1978f

1879--------C 1929--c 1979---b

1880----------G 1930------A 1980--------C

1881---------E 1931---------E 1981--c

1882------A 1932----------G 1982---a

1883------A 1933----------H 1983-----@

1884-------B 1934--------C 1984--b

1885-------B 1935----a 1985---a

1886---------E 1936--c 1986----@

1887-c 1937--c 1987---------E

1888----a 1938----a 1988----------G

1889-------B 1939----a 1989-------B

1890------A 1940f 1990--------C

1891-----A 1941---b 1991---------E

1892--c 1942----a 1992--------D

1893------A 1943-d 1993---------E

1894-------B 1944--b 1994---b

1895---b 1945-c 1995----a

1896--------C 1946-d 1996g

1897--c 1947--c 1997---b

1898-------B 1948g 1998---a

1899----a 1949-------B 1999--------C

PART 5: CORRELATION OF SERIES BY SEGMENTS: 09:41 Wed 13 Apr 2011 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 1860 1875 1890 1905 1920 1935 1950 1965 1980 1995

1889 1904 1919 1934 1949 1964 1979 1994 2009 2024

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

1 302A 1971 2010 .57 .62 .63

2 302B 1970 2010 .57 .84 .85

3 303A 1976 2010 .51 .67 .69

4 303B 1973 2010 .40A .35A .33A

5 304A 1941 2010 .26B .37A .55 .83 .84

6 304B 1946 2010 .47 .32B .43 .76 .76

7 305A 1877 2010 .55 .56 .64 .67 .72 .68 .62 .67 .68

8 305B 1885 2010 .47 .66 .64 .71 .72 .64 .44 .64 .64

9 306A 1887 2010 .46 .49 .66 .79 .72 .69 .63 .67 .69

10 306B 1891 2010 .49 .60 .54 .63 .57 .56 .75 .71

11 307A 1880 2010 .60 .72 .75 .73 .73 .82 .74 .36B .33B

12 307B 1919 2010 .58 .72 .57 .73 .56 .43B .41B

13 308A 1883 2010 .52 .51 .59 .64 .72 .72 .35B .64 .43

14 308B 1882 2010 .56 .57 .65 .64 .62 .65 .59 .50 .49

15 309A 1935 2010 .56 .45 .48 .57 .58

16 309B 1933 2010 .35A .51 .46 .45B .60 .63

17 310A 1874 2010 .42A .46 .44 .64 .76 .59 .51 .49 .46 .48

18 310B 1881 2010 .56 .46 .32A .52 .80 .81 .79 .81 .81

19 311A 1875 2010 .72 .61 .49 .54 .54 .60 .77 .83 .85

20 311B 1864 2010 .45 .52 .56 .50 .65 .38A .54 .68 .54 .59

21 423A 1874 2010 .59 .56 .56 .69 .57 .38A .54B .00A .00A .00A

22 423B 1857 2010 .48 .63 .68 .51B .38B .48 .56 .47 .36A .48

23 424A 1879 2010 .50 .60 .61 .65 .70 .65 .67 .76 .77

24 424B 1891 2010 .61 .75 .73 .64 .61 .65 .75 .75

Av segment correlation .48 .55 .57 .60 .62 .59 .60 .54 .60 .60

PART 6: POTENTIAL PROBLEMS: 09:41 Wed 13 Apr 2011 Page 5

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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

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

302A 1971 to 2010 40 years Series 1

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

Lower 1978> -.049 1987< -.035 2003> -.029 1977< -.023 1981> -.021 1983< -.012 Higher 1996 .055 2010 .026

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

302B 1970 to 2010 41 years Series 2

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

Lower 1977< -.068 1978> -.059 1976> -.025 1994> -.016 1972> -.010 1983< -.008 Higher 1996 .044 2004 .020

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

303A 1976 to 2010 35 years Series 3

[B] Entire series, effect on correlation ( .550) is:

Lower 1976> -.070 1978> -.055 2000< -.032 1994> -.021 2003> -.008 1997< -.007 Higher 1996 .065 2010 .030

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

303B 1973 to 2010 38 years Series 4

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

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

1973 2002 0 .00 -.20 -.16 -.14 -.29 -.02 -.04 .16 -.14 .22 .40\* .26 .02 -.24 -.14 .04 -.08 .13 .14 - -

1980 2009 0 -.29 -.25 .06 -.13 -.16 .06 .02 -.19 -.11 .04 .35\* .24 - - - - - - - - -

1981 2010 0 -.29 -.26 .08 -.14 -.16 .04 .04 -.17 -.09 .04 .33\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .342) is:

Lower 1978> -.044 2006> -.026 1993< -.021 2004> -.020 1979< -.018 1997< -.014 Higher 1977 .062 1987 .032

1973 to 2002 segment:

Lower 1978> -.070 1993< -.026 1985> -.022 1979< -.021 1976> -.017 1997< -.016 Higher 1977 .080 1987 .039

1980 to 2009 segment:

Lower 2006> -.046 1993< -.034 1985> -.023 1997< -.023 2004> -.021 1995< -.021 Higher 1987 .049 1981 .038

1981 to 2010 segment:

Lower 2006> -.046 1993< -.032 1985> -.024 1997< -.021 2004> -.020 1995< -.019 Higher 1987 .049 1981 .038

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

2006 +3.2 SD; 2007 +3.3 SD

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

304A 1941 to 2010 70 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

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

1941 1970 -1 -.19 -.41 -.08 .01 .11 .11 -.13 -.03 .13 .29\* .26| .19 .19 .22 .00 .22 -.01 .01 -.21 .11 .10

1950 1979 0 -.15 -.43 .14 .00 .19 -.04 .05 -.09 .20 .13 .37\* .11 -.08 .20 .16 .05 .05 -.20 -.12 .14 .30

[B] Entire series, effect on correlation ( .467) is:

Lower 1941< -.085 1977> -.046 1976> -.030 1948> -.018 1964< -.015 1956> -.014 Higher 2004 .045 1996 .023

1941 to 1970 segment:

Lower 1941< -.156 1948> -.035 1964< -.027 1956> -.021 1965> -.017 1943> -.015 Higher 1967 .082 1966 .045

1950 to 1979 segment:

Lower 1977> -.108 1976> -.069 1964< -.038 1956> -.023 1965> -.019 1960> -.012 Higher 1967 .063 1966 .045

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

1977 +3.6 SD

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

304B 1946 to 2010 65 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

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

1950 1979 10 .13 -.17 -.28 .05 .30 -.19 .22 .12 .08 .09 .32| .21 .08 .11 -.02 -.13 .06 .03 .15 -.08 .36\*

[B] Entire series, effect on correlation ( .554) is:

Lower 1977> -.057 1956> -.041 1984> -.020 1948> -.014 1976> -.012 1978> -.010 Higher 2004 .042 1996 .040

1950 to 1979 segment:

Lower 1977> -.127 1956> -.074 1973< -.018 1976> -.014 1969< -.013 1978> -.013 Higher 1966 .057 1952 .026

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

1977 +3.9 SD

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

305A 1877 to 2010 134 years Series 7

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

Lower 1895> -.022 1935< -.022 1918> -.014 1990< -.009 1878< -.008 1976> -.007 Higher 2004 .014 1901 .013

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

1935 -.261 18 3 >> WARNING: Ring is not usually narrow

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

305B 1885 to 2010 126 years Series 8

[B] Entire series, effect on correlation ( .600) is:

Lower 1887> -.032 1913< -.020 1889< -.017 1895> -.010 1987< -.008 1935< -.008 Higher 1925 .017 1901 .015

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

1935 -.261 18 3 >> WARNING: Ring is not usually narrow

1936 -.727 18 5

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

306A 1887 to 2010 124 years Series 9

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

Lower 1908< -.023 1902> -.018 1977> -.012 1895> -.010 1887> -.010 1910< -.007 Higher 1925 .021 1897 .010

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

1936 1937 4.1 SD

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

1936 -.727 18 5

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

1936 -4.6 SD

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

306B 1891 to 2010 120 years Series 10

[B] Entire series, effect on correlation ( .562) is:

Lower 1977> -.034 1897> -.031 1940> -.011 1942> -.010 1903< -.009 2010< -.008 Higher 1956 .016 1948 .009

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

1902 -6.0 SD; 1942 +3.4 SD; 1977 +3.5 SD

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

307A 1880 to 2010 131 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

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

1980 2009 -5 -.11 .08 -.14 -.15 -.12 .58\* .20 .28 -.17 -.08 .36|-.14 - - - - - - - - -

1981 2010 -5 -.11 .03 -.10 -.17 -.13 .55\* .29 .40 -.10 -.09 .33| - - - - - - - - - -

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

Lower 1999< -.034 1996> -.019 1899> -.013 1883< -.012 1886< -.009 2004> -.008 Higher 1925 .015 1911 .013

1980 to 2009 segment:

Lower 1999< -.134 1996> -.069 2001< -.017 1987< -.016 2004> -.016 1998> -.014 Higher 1981 .081 1994 .060

1981 to 2010 segment:

Lower 1999< -.132 1996> -.069 2001< -.016 2004> -.016 1998> -.015 1987< -.014 Higher 1981 .080 1994 .060

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

2003 -.308 24 3 >> WARNING: Ring is not usually narrow

2004 -2.163 24 5

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

307B 1919 to 2010 92 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

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

1980 2009 -9 -.27 .46\*-.06 .32 -.13 .04 -.07 -.05 -.22 .00 .43| .12 - - - - - - - - -

1981 2010 -9 -.27 .44\*-.04 .32 -.14 .01 -.02 .01 -.18 -.01 .41| - - - - - - - - - -

[B] Entire series, effect on correlation ( .524) is:

Lower 1990< -.039 1919< -.034 2003< -.021 1956> -.018 1940> -.014 2004> -.014 Higher 1925 .032 1952 .011

1980 to 2009 segment:

Lower 1990< -.077 2004> -.046 1981> -.030 1999< -.013 2000> -.008 2007< -.006 Higher 2003 .044 1987 .029

1981 to 2010 segment:

Lower 1990< -.074 2004> -.044 1981> -.030 1999< -.012 2000> -.008 2007< -.005 Higher 2003 .050 1987 .031

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

1936 -.727 18 5

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

308A 1883 to 2010 128 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

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1965 1994 2 -.21 .17 -.13 -.35 -.01 -.30 -.31 .13 .06 .08 .35| .19 .83\*-.17 .55 -.59 -.11 -.64 .09 .04 .27

[B] Entire series, effect on correlation ( .462) is:

Lower 2010< -.046 1925> -.022 1987< -.017 1895> -.016 1897> -.016 1988< -.016 Higher 2004 .024 1956 .016

1965 to 1994 segment:

Lower 1988< -.063 1987< -.063 1992< -.056 1981> -.035 1978> -.033 1977> -.033 Higher 1972 .078 1991 .077

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

1988 1989 4.5 SD

[D] 17 Absent rings: Year Master N series Absent

1972 -.462 22 3

1973 -.118 23 3 >> WARNING: Ring is not usually narrow

1974 -.125 23 2 >> WARNING: Ring is not usually narrow

1975 .758 23 2 >> WARNING: Ring is not usually narrow

1976 -.609 24 2

1977 -1.547 24 2

1978 -1.539 24 2

1979 -.429 24 2

1980 .726 24 2 >> WARNING: Ring is not usually narrow

1981 -.742 24 2

1982 -.375 24 2 >> WARNING: Ring is not usually narrow

1983 -.033 24 2 >> WARNING: Ring is not usually narrow

1984 -.546 24 2

1985 -.359 24 2 >> WARNING: Ring is not usually narrow

1986 -.121 24 2 >> WARNING: Ring is not usually narrow

1987 1.371 24 2 >> WARNING: Ring is not usually narrow

1988 1.722 24 2 >> WARNING: Ring is not usually narrow

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

1988 -4.7 SD; 2002 +3.1 SD

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

308B 1882 to 2010 129 years Series 14

[B] Entire series, effect on correlation ( .580) is:

Lower 1884< -.035 1981> -.019 1960< -.016 1895> -.011 1934< -.010 2004> -.009 Higher 1887 .021 1901 .017

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

1967 -2.141 20 3

1968 -2.171 20 3

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

309A 1935 to 2010 76 years Series 15

[B] Entire series, effect on correlation ( .519) is:

Lower 1976> -.039 1935> -.021 2007< -.018 1991< -.017 1960> -.014 1977> -.013 Higher 1987 .019 1948 .015

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

309B 1933 to 2010 78 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

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

1933 1962 0 -.09 -.25 .19 -.04 .19 .11 -.01 -.09 .03 -.31 .35\*-.02 -.18 .28 .03 -.19 .06 .04 .11 -.14 .13

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

1965 1994 1 -.15 -.11 -.15 .10 -.03 .11 -.08 -.24 -.18 .02 .45| .45\* .22 .29 .21 .26 .17 -.21 -.19 -.16 .08

[B] Entire series, effect on correlation ( .432) is:

Lower 1933< -.080 1944> -.020 1975< -.017 1952< -.015 2003> -.014 1971< -.012 Higher 1940 .034 1996 .031

1933 to 1962 segment:

Lower 1933< -.163 1944> -.034 1952< -.032 1960> -.024 1935> -.019 1946> -.011 Higher 1940 .133 1956 .049

1965 to 1994 segment:

Lower 1975< -.062 1971< -.046 1984> -.042 1973< -.031 1991< -.029 1969> -.021 Higher 1987 .089 1966 .052

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

1944 +3.4 SD

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

310A 1874 to 2010 137 years Series 17

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

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

1874 1903 0 .00 -.10 -.11 .01 -.17 .26 .03 .38 -.30 -.04 .42\* .10 -.01 -.25 -.10 .26 .11 .12 -.36 .20 .00

[B] Entire series, effect on correlation ( .546) is:

Lower 1896< -.033 1911> -.019 1977> -.019 1901> -.010 1992< -.009 1961< -.007 Higher 1925 .017 1902 .015

1874 to 1903 segment:

Lower 1896< -.157 1901> -.035 1890< -.022 1874< -.016 1897> -.015 1886< -.012 Higher 1902 .102 1887 .051

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

1935 -.261 18 3 >> WARNING: Ring is not usually narrow

1936 -.727 18 5

1937 -.673 18 1

1940 -1.410 18 2

2004 -2.163 24 5

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

1896 -4.8 SD; 2004 -6.2 SD

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

310B 1881 to 2010 130 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

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1905 1934 0 .19 -.38 .25 .02 -.02 -.17 -.26 .22 .00 .08 .32\*-.01 .17 -.01 .10 .01 -.26 -.29 -.22 .24 -.13

[B] Entire series, effect on correlation ( .550) is:

Lower 1917< -.076 1911> -.015 1926< -.015 1934> -.014 1902> -.011 1927> -.010 Higher 2004 .017 1940 .015

1905 to 1934 segment:

Lower 1917< -.122 1934> -.041 1911> -.028 1927> -.027 1926< -.026 1931< -.020 Higher 1925 .147 1924 .034

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

1917 1918 4.4 SD

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

1917 .822 15 1 >> WARNING: Ring is not usually narrow

1926 .013 16 1 >> WARNING: Ring is not usually narrow

1936 -.727 18 5

1940 -1.410 18 2

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

1917 -6.5 SD

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

311A 1875 to 2010 136 years Series 19

[B] Entire series, effect on correlation ( .662) is:

Lower 1920< -.030 1915< -.021 1960> -.018 1875< -.009 1892> -.009 1954< -.006 Higher 1887 .016 1996 .013

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311B 1864 to 2010 147 years Series 20

[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 .00 .01 -.03 -.12 .02 -.11 -.32 .19 -.16 -.29 .38\* .26 .02 .17 .11 .07 .00 -.17 .24 .06 .01

[B] Entire series, effect on correlation ( .550) is:

Lower 1887> -.021 1889< -.015 1919< -.014 1960> -.013 1864> -.012 1891< -.009 Higher 1871 .038 1925 .028

1935 to 1964 segment:

Lower 1960> -.092 1959< -.062 1955< -.034 1952< -.016 1950> -.010 1954< -.008 Higher 1949 .068 1961 .036

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423A 1874 to 2010 137 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

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

1935 1964 0 .26 .20 .19 -.16 .13 -.40 -.25 .06 -.28 -.05 .38\*-.03 .24 .23 -.17 .11 .02 -.04 -.12 -.13 .20

1950 1979 6 .08 .00 .10 -.51 .33 -.60 -.43 -.21 -.26 -.06 .54|-.25 .50 .41 -.36 -.33 .63\*-.15 -.22 .16 .28

1965 1994 0 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00\* .00 .00 .00 .00 .00 .00 .00 .00 .00 .00

1980 2009 0 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00\* .00 - - - - - - - - -

1981 2010 0 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .399) is:

Lower 1958< -.017 1981> -.014 1977> -.013 1954< -.012 1976> -.012 1948> -.012 Higher 1925 .053 1902 .024

1935 to 1964 segment:

Lower 1958< -.085 1954< -.066 1948> -.064 1940> -.048 1949< -.026 1957< -.015 Higher 1952 .082 1943 .071

1950 to 1979 segment:

Lower 1958< -.125 1954< -.093 1977> -.049 1978> -.043 1976> -.042 1957< -.030 Higher 1956 .145 1952 .112

1965 to 1994 segment:

Lower 1993< -.076 1991< -.057 1981> -.057 1977> -.050 1978> -.046 1976> -.041 Higher 1994 .143 1980 .072

1980 to 2009 segment:

Lower 1981> -.118 1993< -.045 1984> -.037 1991< -.027 1999< -.024 2001< -.023 Higher 1996 .096 1994 .072

1981 to 2010 segment:

Lower 1981> -.122 1993< -.044 1984> -.039 1991< -.026 1999< -.023 2001< -.022 Higher 1996 .096 2010 .074

[D] 53 Absent rings: Year Master N series Absent

1958 1.438 20 1 >> WARNING: Ring is not usually narrow

1959 .569 20 1 >> WARNING: Ring is not usually narrow

1960 -.556 20 1

1961 .663 20 1 >> WARNING: Ring is not usually narrow

1962 .106 20 1 >> WARNING: Ring is not usually narrow

1963 .289 20 1 >> WARNING: Ring is not usually narrow

1964 .474 20 1 >> WARNING: Ring is not usually narrow

1965 -.112 20 1 >> WARNING: Ring is not usually narrow

1966 -1.296 20 1

1967 -2.141 20 3

1968 -2.171 20 3

1969 -1.065 20 2

1970 -.688 21 2

1971 .453 22 2 >> WARNING: Ring is not usually narrow

1972 -.462 22 3

1973 -.118 23 3 >> WARNING: Ring is not usually narrow

1974 -.125 23 2 >> WARNING: Ring is not usually narrow

1975 .758 23 2 >> WARNING: Ring is not usually narrow

1976 -.609 24 2

1977 -1.547 24 2

1978 -1.539 24 2

1979 -.429 24 2

1980 .726 24 2 >> WARNING: Ring is not usually narrow

1981 -.742 24 2

1982 -.375 24 2 >> WARNING: Ring is not usually narrow

1983 -.033 24 2 >> WARNING: Ring is not usually narrow

1984 -.546 24 2

1985 -.359 24 2 >> WARNING: Ring is not usually narrow

1986 -.121 24 2 >> WARNING: Ring is not usually narrow

1987 1.371 24 2 >> WARNING: Ring is not usually narrow

1988 1.722 24 2 >> WARNING: Ring is not usually narrow

1989 .506 24 1 >> WARNING: Ring is not usually narrow

1990 .663 24 1 >> WARNING: Ring is not usually narrow

1991 1.230 24 1 >> WARNING: Ring is not usually narrow

1992 .930 24 1 >> WARNING: Ring is not usually narrow

1993 1.192 24 1 >> WARNING: Ring is not usually narrow

1994 -.439 24 1

1995 -.131 24 1 >> WARNING: Ring is not usually narrow

1996 -1.736 24 2

1997 -.541 24 2

1998 -.375 24 2 >> WARNING: Ring is not usually narrow

1999 .638 24 2 >> WARNING: Ring is not usually narrow

2000 .043 24 2 >> WARNING: Ring is not usually narrow

2001 .921 24 2 >> WARNING: Ring is not usually narrow

2002 1.224 24 2 >> WARNING: Ring is not usually narrow

2003 -.308 24 3 >> WARNING: Ring is not usually narrow

2004 -2.163 24 5

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

[E] Outliers 5 3.0 SD above or -4.5 SD below mean for year

1977 +3.6 SD; 1978 +3.9 SD; 1981 +3.6 SD; 1982 +3.3 SD; 1984 +3.3 SD

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

423B 1857 to 2010 154 years Series 22

[\*] Early part of series cannot be checked from 1857 to 1863 -- not matched by another series

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

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1905 1934 -2 .12 .18 -.16 -.11 -.33 -.07 .13 -.08 .52\* .13 .51|-.09 -.26 -.03 -.30 -.11 -.13 .12 -.11 -.05 -.01

1920 1949 -2 -.25 -.14 -.16 -.11 -.39 .08 .21 -.10 .69\* .00 .38|-.11 -.08 .12 -.17 -.02 .09 -.05 .13 .08 -.05

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

1980 2009 0 .27 -.11 .23 -.18 -.08 .32 -.06 .20 .31 .31 .36\* .05 - - - - - - - - -

[B] Entire series, effect on correlation ( .434) is:

Lower 1919< -.073 1935> -.013 1864< -.012 1874> -.011 1961< -.009 1980< -.008 Higher 1871 .027 1956 .015

1905 to 1934 segment:

Lower 1919< -.272 1934> -.031 1925> -.029 1930< -.010 1922< -.008 1923> -.008 Higher 1911 .082 1933 .034

1920 to 1949 segment:

Lower 1935> -.080 1934> -.036 1930< -.027 1925> -.026 1920< -.025 1922< -.021 Higher 1949 .057 1933 .044

1980 to 2009 segment:

Lower 1980< -.068 1991< -.038 2004> -.035 1986< -.031 1989> -.031 2001< -.021 Higher 1996 .102 1987 .049

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

1918 1919 -4.3 SD

[D] 24 Absent rings: Year Master N series Absent

1919 .613 16 1 >> WARNING: Ring is not usually narrow

1920 .354 16 1 >> WARNING: Ring is not usually narrow

1967 -2.141 20 3

1968 -2.171 20 3

1969 -1.065 20 2

1970 -.688 21 2

1971 .453 22 2 >> WARNING: Ring is not usually narrow

1972 -.462 22 3

1973 -.118 23 3 >> WARNING: Ring is not usually narrow

1996 -1.736 24 2

1997 -.541 24 2

1998 -.375 24 2 >> WARNING: Ring is not usually narrow

1999 .638 24 2 >> WARNING: Ring is not usually narrow

2000 .043 24 2 >> WARNING: Ring is not usually narrow

2001 .921 24 2 >> WARNING: Ring is not usually narrow

2002 1.224 24 2 >> WARNING: Ring is not usually narrow

2003 -.308 24 3 >> WARNING: Ring is not usually narrow

2004 -2.163 24 5

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

1919 -4.9 SD; 1935 +3.2 SD

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424A 1879 to 2010 132 years Series 23

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

Lower 1879< -.057 1903< -.011 1977> -.008 1888> -.006 1917< -.006 1913> -.006 Higher 1911 .013 2004 .009

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

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> 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

1879 -5.0 SD

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424B 1891 to 2010 120 years Series 24

[B] Entire series, effect on correlation ( .671) is:

Lower 1895< -.035 1977> -.009 1943> -.009 2003> -.007 1968> -.006 1914< -.005 Higher 1996 .012 1911 .012

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

2004 -2.163 24 5

2005 -1.228 24 6

2006 -.803 24 6

2007 .311 24 7 >> WARNING: Ring is not usually narrow

2008 .034 24 7 >> WARNING: Ring is not usually narrow

2009 .425 24 7 >> WARNING: Ring is not usually narrow

2010 1.540 24 7 >> WARNING: Ring is not usually narrow

>> WARNING: Last ring in series is ABSENT

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

PART 7: DESCRIPTIVE STATISTICS: 09:41 Wed 13 Apr 2011 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 302A 1971 2010 40 3 0 .560 2.01 4.76 1.178 .892 .242 2.55 .458 -.020 1

2 302B 1970 2010 41 3 0 .628 2.33 4.95 1.225 .838 .242 2.55 .433 -.049 1

3 303A 1976 2010 35 3 0 .550 2.34 3.78 .660 .405 .207 2.62 .556 -.153 1

4 303B 1973 2010 38 3 3 .342 2.78 4.53 .727 .604 .171 2.69 .514 -.049 1

5 304A 1941 2010 70 5 2 .467 1.74 3.80 .938 .922 .234 2.53 .515 -.023 1

6 304B 1946 2010 65 5 1 .554 1.73 3.98 1.030 .948 .192 2.52 .503 -.074 1

7 305A 1877 2010 134 9 0 .621 .82 2.97 .685 .939 .315 2.61 .399 .030 1

8 305B 1885 2010 126 9 0 .600 .64 2.82 .658 .959 .319 2.52 .470 -.003 1

9 306A 1887 2010 124 9 0 .641 1.07 4.92 1.002 .936 .319 2.65 .495 -.065 2

10 306B 1891 2010 120 8 0 .562 .97 4.11 .762 .875 .304 2.62 .353 .015 1

11 307A 1880 2010 131 9 2 .622 .91 3.49 .730 .940 .249 2.73 .460 -.039 1

12 307B 1919 2010 92 7 2 .524 .52 1.98 .464 .858 .382 2.75 .372 -.115 1

13 308A 1883 2010 128 9 1 .462 .92 5.14 1.160 .973 .254 2.76 .402 .025 1

14 308B 1882 2010 129 9 0 .580 .85 4.20 1.095 .979 .286 2.73 .459 -.076 1

15 309A 1935 2010 76 5 0 .519 .99 1.81 .424 .864 .205 2.53 .378 -.021 1

16 309B 1933 2010 78 6 2 .432 1.04 2.49 .485 .864 .213 2.84 .447 -.070 2

17 310A 1874 2010 137 10 1 .546 .98 4.55 .985 .964 .320 2.53 .304 -.041 1

18 310B 1881 2010 130 9 1 .550 .78 3.77 .682 .936 .372 2.56 .385 .046 1

19 311A 1875 2010 136 9 0 .662 1.52 3.89 .846 .877 .214 2.75 .466 -.059 1

20 311B 1864 2010 147 10 1 .550 1.34 3.81 .867 .902 .221 2.74 .411 -.064 2

21 423A 1874 2010 137 10 5 .399 .72 3.42 .992 .972 .194 2.70 .414 -.064 2

22 423B 1857 2010 154 10 3 .434 .79 3.54 .984 .967 .368 2.64 .361 -.039 1

23 424A 1879 2010 132 9 0 .572 1.23 4.43 1.171 .945 .256 2.49 .359 -.066 1

24 424B 1891 2010 120 8 0 .671 .71 5.12 .901 .940 .303 2.71 .407 -.094 1

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Total or mean: 2520 177 24 .551 1.07 5.14 .867 .918 .277 2.84 .418 -.040

- = [ COFECHA 150\_1COF ] = -