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[] P R O G R A M C O F E C H A Version 6.06P 29984

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QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: WILL\_ACSA\_Corr4-50

File of DATED series: WILL\_ACSA\_Corr4

CONTENTS:

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

Part 2: Histogram of time spans

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

Part 4: Bar plot of Master Dating Series

Part 5: Correlation by segment of each series with Master

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

Part 7: Descriptive statistics

RUN CONTROL OPTIONS SELECTED VALUE

1 Cubic smoothing spline 50% wavelength cutoff for filtering

32 years

2 Segments examined are 50 years lagged successively by 25 years

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

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

5 CORRELATION is Pearson (parametric, quantitative)

Critical correlation, 99% confidence level .3281

6 Master dating series saved N

7 Ring measurements listed Y

8 Parts printed 1234567

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

Time span of Master dating series is 1917 to 2016 100 years

Continuous time span is 1917 to 2016 100 years

Portion with two or more series is 1917 to 2016 100 years

>> 1420B 2012 absent in 1 of 26 series, but is not usually narrow: master index is -.128

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

\*C\* Number of dated series 26 \*C\*

\*O\* Master series 1917 2016 100 yrs \*O\*

\*F\* Total rings in all series 2136 \*F\*

\*E\* Total dated rings checked 2136 \*E\*

\*C\* Series intercorrelation .437 \*C\*

\*H\* Average mean sensitivity .237 \*H\*

\*A\* Segments, possible problems 22 \*A\*

\*\*\* Mean length of series 82.2 \*\*\*

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

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

1420B 2 absent rings: 2001 2012

1425A 3 absent rings: 1940 1993 2001

1425B 3 absent rings: 1933 2001 2006

8 absent rings .375%

PART 2: TIME PLOT OF TREE-RING SERIES: WILL\_ACSA\_Corr4-50 11:58 Wed 01 Feb 2017 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

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

. . . . . . . . . . . . . . . . . . <========> . 1414A 1 1927 2016 90

. . . . . . . . . . . . . . . . . . <========> . 1414B 2 1928 2016 89

. . . . . . . . . . . . . . . . . . <=======> . 1415A 3 1939 2016 78

. . . . . . . . . . . . . . . . . . <=======> . 1415B 4 1937 2016 80

. . . . . . . . . . . . . . . . . . <=======> . 1416A 5 1938 2016 79

. . . . . . . . . . . . . . . . . . <=======> . 1416B 6 1937 2016 80

. . . . . . . . . . . . . . . . . .<=========> . 1418A 7 1917 2016 100

. . . . . . . . . . . . . . . . . .<=========> . 1418B 8 1917 2016 100

. . . . . . . . . . . . . . . . . . <========> . 1420A 9 1922 2016 95

. . . . . . . . . . . . . . . . . . <========> . 1420B 10 1923 2016 94

. . . . . . . . . . . . . . . . . . <======> . 1421A 11 1944 2016 73

. . . . . . . . . . . . . . . . . . <=====> . 1421B 12 1950 2016 67

. . . . . . . . . . . . . . . . . . <======> . 1422A 13 1943 2016 74

. . . . . . . . . . . . . . . . . . <======> . 1422B 14 1943 2016 74

. . . . . . . . . . . . . . . . . . <======> . 1423A 15 1945 2016 72

. . . . . . . . . . . . . . . . . . <======> . 1423B 16 1947 2016 70

. . . . . . . . . . . . . . . . . . <======> . 1424A 17 1943 2016 74

. . . . . . . . . . . . . . . . . . <======> . 1424B 18 1943 2016 74

. . . . . . . . . . . . . . . . . .<=========> . 1425A 19 1917 2016 100

. . . . . . . . . . . . . . . . . .<=========> . 1425B 20 1917 2016 100

. . . . . . . . . . . . . . . . . . <========> . 1426A 21 1926 2016 91

. . . . . . . . . . . . . . . . . . <========> . 1426B 22 1923 2016 94

. . . . . . . . . . . . . . . . . . <======> . 1427A 23 1943 2016 74

. . . . . . . . . . . . . . . . . . <======> . 1427B 24 1948 2016 69

. . . . . . . . . . . . . . . . . . <======> . 1428A 25 1945 2016 72

. . . . . . . . . . . . . . . . . . <======> . 1428B 26 1944 2016 73

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

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: WILL\_ACSA\_Corr4-50 11:58 Wed 01 Feb 2017 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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1950 .563 26 2000 -1.716 26

1951 1.164 26 2001 -1.791 26 3

1952 -1.144 26 2002 -.065 26

1953 -1.260 26 2003 .565 26

1954 -1.092 26 2004 .325 26

1955 -1.402 26 2005 .060 26

1956 -.817 26 2006 -1.851 26 1

1957 -.516 26 2007 -1.147 26

1958 .114 26 2008 1.104 26

1959 -.750 26 2009 .378 26

1960 -.183 26 2010 -1.307 26

1961 .672 26 2011 .108 26

1962 -.721 26 2012 -.128 26 1<<

1963 .769 26 2013 .949 26

1964 .314 26 2014 1.034 26

1965 -.066 26 2015 .511 26

1966 -2.140 26 2016 .607 26

1917 -.271 4 1967 .874 26

1918 -.905 4 1968 -.413 26

1919 -3.526 4 1969 .957 26

1920 1.296 4 1970 -1.334 26

1921 1.824 4 1971 .190 26

1922 1.360 5 1972 .955 26

1923 .904 7 1973 -.765 26

1924 .608 7 1974 -.188 26

1925 1.668 7 1975 -.129 26

1926 1.008 8 1976 -.202 26

1927 .149 9 1977 -.078 26

1928 .834 10 1978 1.592 26

1929 .757 10 1979 -.540 26

1930 -.008 10 1980 .553 26

1931 .820 10 1981 -.344 26

1932 -.448 10 1982 .986 26

1933 -1.947 10 1 1983 1.077 26

1934 -1.166 10 1984 1.412 26

1935 -.811 10 1985 .584 26

1936 -.339 10 1986 -1.043 26

1937 -1.110 12 1987 .395 26

1938 -1.122 13 1988 -.498 26

1939 -.034 14 1989 -.734 26

1940 -1.548 14 1 1990 .692 26

1941 .698 14 1991 -.942 26

1942 .554 14 1992 -.525 26

1943 .035 19 1993 -1.398 26 1

1944 -.158 21 1994 .421 26

1945 1.209 23 1995 .100 26

1946 .305 23 1996 .290 26

1947 1.508 24 1997 .418 26

1948 .753 25 1998 1.865 26

1949 .688 25 1999 1.050 26

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PART 4: Master Bar Plot: WILL\_ACSA\_Corr4-50 11:58 Wed 01 Feb 2017 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

1950-------B 2000g

1951---------E 2001g

1952-e 2002----@

1953-e 2003-------B

1954-d 2004------A

1955-f 2005-----@

1956--c 2006g

1957---b 2007-e

1958-----@ 2008---------D

1959--c 2009------B

1960----a 2010-e

1961-------C 2011-----@

1962--c 2012----a

1963--------C 2013---------D

1964------A 2014---------D

1965----@ 2015-------B

1966i 2016-------B

1917---a 1967--------C

1918--d 1968---b

1919n 1969---------D

1920----------E 1970-e

1921----------G 1971-----A

1922----------E 1972---------D

1923--------D 1973--c

1924-------B 1974----a

1925----------G 1975----a

1926---------D 1976----a

1927-----A 1977----@

1928--------C 1978----------F

1929--------C 1979---b

1930-----@ 1980-------B

1931--------C 1981---a

1932---b 1982---------D

1933h 1983---------D

1934-e 1984----------F

1935--c 1985-------B

1936---a 1986-d

1937-d 1987------B

1938-d 1988---b

1939----@ 1989--c

1940f 1990-------C

1941-------C 1991--d

1942-------B 1992---b

1943-----@ 1993-f

1944----a 1994------B

1945---------E 1995-----@

1946------A 1996------A

1947----------F 1997------B

1948--------C 1998----------G

1949-------C 1999---------D

PART 5: CORRELATION OF SERIES BY SEGMENTS: WILL\_ACSA\_Corr4-50 11:58 Wed 01 Feb 2017 Page 5

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Correlations of 50-year dated segments, lagged 25 years

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

Seq Series Time\_span 1900 1925 1950 1975

1949 1974 1999 2024

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

1 1414A 1927 2016 .31A .59 .59

2 1414B 1928 2016 .24B .39 .48

3 1415A 1939 2016 .62 .67 .73

4 1415B 1937 2016 .58 .61 .68

5 1416A 1938 2016 .48 .53 .57

6 1416B 1937 2016 .54 .72 .63

7 1418A 1917 2016 .36 .32A .23B .31A

8 1418B 1917 2016 .33B .50 .37 .21B

9 1420A 1922 2016 .33 .33 .37 .39

10 1420B 1923 2016 .32A .36 .40 .46

11 1421A 1944 2016 .71 .76 .73

12 1421B 1950 2016 .47 .49

13 1422A 1943 2016 .22B .21B .29A

14 1422B 1943 2016 .43 .33 .23B

15 1423A 1945 2016 .45 .48 .37

16 1423B 1947 2016 .39 .40 .30A

17 1424A 1943 2016 .55 .55 .61

18 1424B 1943 2016 .21B .20B .25A

19 1425A 1917 2016 .40 .40 .27A .28A

20 1425B 1917 2016 .39 .18B .20B .23A

21 1426A 1926 2016 .54 .54 .50

22 1426B 1923 2016 .39 .47 .45 .38

23 1427A 1943 2016 .44 .51 .61

24 1427B 1948 2016 .26A .39 .60

25 1428A 1945 2016 .46 .46 .49

26 1428B 1944 2016 .54 .58 .59

Av segment correlation .36 .42 .45 .46

PART 6: POTENTIAL PROBLEMS: WILL\_ACSA\_Corr4-50 11:58 Wed 01 Feb 2017 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 50-year segments of series filtered with 32-year spline,

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

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

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

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

[D] Absent rings (zero values)

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

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

1414A 1927 to 2016 90 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

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

1927 1976 0 .18 -.09 -.02 -.06 .00 .05 .25 -.10 .21 -.30 .31\*-.11 -.05 .01 .12 -.23 .08 -.09 -.17 -.06 .15

[B] Entire series, effect on correlation ( .410) is:

Lower 1942< -.122 2006> -.040 1940> -.020 1998< -.018 2016< -.015 1950< -.013 Higher 1970 .034 2000 .034

1927 to 1976 segment:

Lower 1942< -.225 1940> -.034 1929< -.022 1950< -.022 1966> -.013 1944> -.010 Higher 1970 .074 1941 .024

1414A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1927 80 107 65

1930 77 134 89 51 54 57 90 57 79 92

1940 99 124 15 39 106 105 100 103 91 92

1950 48 117 72 72 94 104 91 110 109 115

1960 129 176 143 249 259 259 224 289 289 323

1970 196 308 374 293 267 259 278 253 352 307

1980 384 322 306 283 308 247 171 177 195 180

1990 249 172 146 114 185 170 154 150 130 107

2000 86 97 150 130 165 174 204 171 236 201

2010 106 148 158 169 193 148 118

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

1414B 1928 to 2016 89 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

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

1928 1977 -4 .02 -.22 -.16 -.04 -.05 -.07 .30\*-.22 .26 -.01 .24|-.26 .16 -.04 .20 -.04 .08 -.15 .08 .17 -.11

[B] Entire series, effect on correlation ( .368) is:

Lower 1950< -.032 1966> -.028 1999< -.017 1932> -.016 1930> -.016 1973> -.013 Higher 1993 .015 1941 .012

1928 to 1977 segment:

Lower 1950< -.075 1966> -.039 1932> -.027 1930> -.026 1958< -.024 1973> -.020 Higher 1941 .032 1969 .027

1414B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1928 61 58

1930 74 73 79 66 54 57 71 78 81 104

1940 94 127 95 117 70 126 123 128 111 146

1950 57 162 105 113 124 120 104 104 109 135

1960 213 209 170 320 328 307 289 298 279 370

1970 279 321 350 328 300 279 331 286 313 211

1980 271 204 243 245 256 221 179 202 179 192

1990 190 136 123 101 142 153 155 133 123 78

2000 92 79 96 136 160 149 94 83 137 120

2010 88 94 118 139 177 141 109

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

1415A 1939 to 2016 78 years Series 3

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

Lower 1973> -.034 1946< -.012 1959> -.011 1985< -.009 1951< -.008 1954> -.008 Higher 1966 .024 2000 .023

1415A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1939 107

1940 83 114 145 135 127 151 106 131 128 180

1950 147 131 90 100 141 115 125 166 213 215

1960 198 229 139 176 196 186 76 169 162 266

1970 222 313 357 387 336 286 268 273 345 298

1980 319 341 398 394 324 236 198 269 231 195

1990 302 205 190 129 190 227 257 236 283 298

2000 141 121 183 278 251 273 167 174 250 204

2010 162 198 233 236 290 275 271

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

1415B 1937 to 2016 80 years Series 4

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

Lower 1970> -.034 1951< -.026 1973> -.024 1954> -.016 1947< -.010 2016< -.009 Higher 2000 .042 1966 .029

1415B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1937 65 62 102

1940 79 121 150 124 111 126 92 102 114 150

1950 134 102 88 97 150 108 132 151 196 153

1960 155 201 150 186 179 198 129 282 224 367

1970 343 418 444 411 417 322 271 219 280 225

1980 320 281 279 319 320 282 208 212 236 204

1990 279 181 165 111 203 250 240 203 245 243

2000 107 119 193 241 224 251 151 158 218 172

2010 167 205 214 237 266 260 227

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

1416A 1938 to 2016 79 years Series 5

[B] Entire series, effect on correlation ( .549) is:

Lower 1986> -.033 2013< -.026 1987< -.021 1949< -.021 1963< -.019 1956> -.013 Higher 2000 .060 1966 .057

1416A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1938 28 41

1940 36 81 69 48 33 60 48 59 57 41

1950 88 95 59 68 92 88 119 116 122 87

1960 94 106 92 83 86 118 59 183 112 182

1970 126 174 229 174 198 353 316 426 371 220

1980 269 357 328 435 405 346 401 245 248 234

1990 375 236 298 294 354 256 294 274 333 314

2000 199 236 350 393 350 335 281 286 396 304

2010 302 308 325 293 308 349 351

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

1416B 1937 to 2016 80 years Series 6

[B] Entire series, effect on correlation ( .549) is:

Lower 2006> -.032 1949< -.026 2009< -.026 1937> -.025 1986> -.020 1963< -.012 Higher 1966 .056 1952 .018

1416B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1937 62 48 34

1940 39 61 74 41 30 48 27 41 40 22

1950 50 59 31 29 39 47 76 100 98 97

1960 130 115 97 79 113 115 54 103 110 167

1970 112 156 164 103 132 142 196 217 263 193

1980 306 306 341 435 447 369 353 348 231 209

1990 264 159 211 188 264 257 294 306 366 290

2000 212 162 203 215 241 220 249 233 274 210

2010 197 263 283 283 295 281 263

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

1418A 1917 to 2016 100 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

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

1925 1974 0 - - -.23 -.11 -.07 .04 .02 -.08 .10 .07 .32\* .05 .23 -.01 .13 -.22 .08 -.07 -.09 -.19 .02

1950 1999 -7 -.08 -.16 -.27 .25\* .00 -.17 .06 -.02 -.07 .24 .23| .03 .06 -.01 .03 -.26 -.09 .13 .04 -.07 -.14

1967 2016 0 -.08 -.08 -.34 .15 .13 .06 .07 -.02 -.15 .17 .31\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .324) is:

Lower 1919> -.079 1967< -.022 1991> -.020 1977< -.017 1972< -.016 1981> -.014 Higher 2006 .031 2008 .016

1925 to 1974 segment:

Lower 1967< -.057 1972< -.041 1962> -.040 1971< -.034 1948< -.025 1928< -.023 Higher 1947 .042 1933 .041

1950 to 1999 segment:

Lower 1967< -.048 1991> -.045 1972< -.034 1977< -.033 1962> -.031 1981> -.031 Higher 1993 .044 1998 .041

1967 to 2016 segment:

Lower 1991> -.043 1967< -.041 1981> -.030 1972< -.028 1977< -.026 1979> -.023 Higher 2006 .078 1993 .035

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

1918 1919 4.4 SD

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

1919 +3.2 SD

1418A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 72 58 75

1920 94 108 91 88 104 88 73 83 59 80

1930 75 70 36 26 56 78 71 85 91 197

1940 114 218 161 212 167 291 323 457 233 398

1950 300 355 208 134 181 184 184 256 225 166

1960 166 232 234 186 156 134 112 92 107 110

1970 92 69 62 70 99 93 86 52 83 97

1980 96 146 112 110 110 98 63 58 65 55

1990 82 97 52 30 71 61 55 72 84 49

2000 41 42 47 51 37 41 24 37 70 53

2010 41 36 46 42 51 48 64

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

1418B 1917 to 2016 100 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

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

1917 1966 1 - - - - - - - - - - .33| .39\* .05 -.08 .13 -.16 .07 -.14 -.10 -.24 -.04

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

1967 2016 -7 .08 .17 -.08 .22\*-.08 -.01 .10 -.04 .08 .08 .21| - - - - - - - - - -

[B] Entire series, effect on correlation ( .277) is:

Lower 1919> -.057 2000> -.021 1991> -.017 1918< -.015 1936< -.015 2013< -.013 Higher 2010 .021 1966 .019

1917 to 1966 segment:

Lower 1919> -.144 1918< -.037 1936< -.030 1922< -.019 1917> -.014 1948< -.013 Higher 1947 .031 1952 .030

1967 to 2016 segment:

Lower 2000> -.041 1991> -.036 2013< -.027 1980< -.020 1986> -.019 2002< -.018 Higher 2010 .059 1993 .056

1418B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 73 36 56

1920 76 105 66 77 74 68 72 78 80 113

1930 76 82 44 31 62 98 56 53 82 152

1940 110 189 175 218 176 267 258 481 264 399

1950 356 378 217 144 282 258 241 362 365 298

1960 240 277 236 237 201 173 149 162 194 267

1970 193 167 215 170 187 139 92 73 88 88

1980 75 89 95 115 121 112 105 142 88 85

1990 96 108 82 47 63 48 66 82 98 68

2000 68 53 45 67 68 72 59 57 57 46

2010 34 34 56 39 36 36 40

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

1420A 1922 to 2016 95 years Series 9

[B] Entire series, effect on correlation ( .329) is:

Lower 1933> -.028 2010> -.022 1999< -.021 1924< -.021 1927< -.018 1963< -.015 Higher 1952 .029 1978 .018

1420A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1922 45 38 20 55 39 17 45 81

1930 33 65 36 69 71 93 84 54 72 67

1940 44 90 65 99 51 121 81 114 97 112

1950 121 93 46 66 58 75 76 79 100 75

1960 97 86 43 57 69 68 99 182 180 223

1970 151 164 172 206 178 228 196 257 352 285

1980 315 311 371 338 361 323 321 301 269 226

1990 212 209 274 248 310 270 260 320 376 110

2000 88 33 78 172 201 159 80 103 237 208

2010 189 167 39 74 34 87 94

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

1420B 1923 to 2016 94 years Series 10

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

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

1923 1972 0 - - - - -.02 .06 -.08 .03 -.07 -.21 .32\*-.27 .11 .06 .13 -.09 .23 -.09 .18 .10 -.05

[B] Entire series, effect on correlation ( .356) is:

Lower 1966> -.039 2010> -.033 1924< -.028 1934> -.011 1973> -.011 1987< -.010 Higher 1978 .017 1952 .012

1923 to 1972 segment:

Lower 1966> -.086 1924< -.066 1934> -.025 1963< -.021 1929< -.019 1932> -.011 Higher 1952 .029 1933 .028

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

2000 2001 -4.1 SD

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

2001 -1.791 26 3

2012 -.128 26 1 >> WARNING: Ring is not usually narrow

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

2001 -5.7 SD

1420B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 50 22 58 43 44 50 39

1930 33 52 63 45 88 70 99 73 50 110

1940 73 116 128 97 46 125 56 104 73 111

1950 100 88 49 64 80 70 72 74 84 72

1960 98 115 52 116 138 180 266 320 286 355

1970 306 358 433 406 416 402 349 423 513 385

1980 462 451 474 408 454 383 347 340 312 402

1990 450 355 352 306 371 354 312 220 264 240

2000 155 0 104 175 157 140 61 50 100 98

2010 153 104 0 46 12 65 60

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

1421A 1944 to 2016 73 years Series 11

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

Lower 1979< -.025 1962> -.018 1993> -.016 1977> -.013 1944> -.012 2008< -.010 Higher 1966 .032 1970 .013

1421A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1944 209 171 139 177 194 204

1950 170 160 99 115 95 93 103 145 177 191

1960 213 238 265 321 269 244 157 293 298 381

1970 265 320 372 256 295 348 448 607 632 343

1980 459 415 422 413 386 353 276 408 291 257

1990 369 251 280 297 350 312 330 377 438 362

2000 188 145 180 182 186 128 93 115 143 160

2010 101 200 156 281 250 251 193

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

1421B 1950 to 2016 67 years Series 12

[B] Entire series, effect on correlation ( .509) is:

Lower 1995< -.126 1973> -.015 1970> -.015 2008< -.015 1954> -.014 1956> -.012 Higher 1966 .057 2010 .023

1421B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1950 146 152 137 145 182 175 214 222 187 142

1960 152 173 158 172 179 162 100 235 224 324

1970 249 290 358 297 249 214 178 250 384 232

1980 250 212 234 257 263 257 226 277 188 174

1990 244 167 152 128 169 70 178 168 228 218

2000 140 132 164 175 207 142 105 121 129 165

2010 95 151 146 173 198 165 155

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

1422A 1943 to 2016 74 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

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

1943 1992 -5 .08 -.13 -.11 .11 .07 .23\* .04 .17 .05 -.26 .22| .03 .04 -.36 .03 -.11 -.01 -.09 -.10 .05 .16

1950 1999 -5 -.04 -.12 -.10 .08 .01 .22\* .07 .04 .08 -.26 .21|-.06 .02 -.24 .18 -.12 -.02 -.02 -.03 .04 .18

1967 2016 0 .04 -.09 -.09 .04 .12 .24 -.01 -.09 .00 -.22 .29\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .288) is:

Lower 1969< -.065 1966> -.041 1943< -.023 1997< -.018 2012< -.018 1988> -.017 Higher 1991 .027 2010 .022

1943 to 1992 segment:

Lower 1969< -.095 1966> -.057 1943< -.030 1988> -.024 1989> -.024 1972< -.019 Higher 1991 .052 1967 .034

1950 to 1999 segment:

Lower 1969< -.101 1966> -.056 1997< -.028 1988> -.025 1989> -.024 1972< -.020 Higher 1991 .053 1967 .036

1967 to 2016 segment:

Lower 1969< -.085 1988> -.026 1989> -.025 1997< -.022 2012< -.022 1972< -.017 Higher 1991 .040 2010 .030

1422A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 121 173 229 216 207 185 206

1950 187 214 159 157 161 158 160 176 142 121

1960 140 194 165 227 202 197 190 283 210 67

1970 88 138 118 91 141 117 160 148 176 157

1980 156 121 167 178 171 162 166 180 225 248

1990 225 152 220 207 213 232 214 172 224 226

2000 194 189 265 257 261 212 186 221 249 227

2010 196 239 202 265 259 304 258

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

1422B 1943 to 2016 74 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

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

1967 2016 -5 .13 -.03 .10 -.08 .04 .27\* .08 .03 -.14 -.23 .23| - - - - - - - - - -

[B] Entire series, effect on correlation ( .362) is:

Lower 1970> -.046 2000> -.039 1978< -.033 1997< -.020 1989> -.017 1984< -.014 Higher 1966 .039 2010 .033

1967 to 2016 segment:

Lower 1970> -.057 2000> -.045 1978< -.037 1989> -.021 1997< -.021 1984< -.015 Higher 2010 .059 1991 .049

1422B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 119 125 219 173 214 225 195

1950 181 212 148 136 129 119 119 142 153 125

1960 152 207 204 274 277 227 113 232 175 131

1970 202 212 178 84 54 76 116 105 88 85

1980 149 107 174 193 156 165 177 218 217 252

1990 266 163 219 204 193 255 198 160 210 182

2000 202 183 265 265 273 205 170 158 161 150

2010 83 160 219 263 281 236 163

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

1423A 1945 to 2016 72 years Series 15

[B] Entire series, effect on correlation ( .347) is:

Lower 2000> -.041 2003< -.032 2006> -.021 1966> -.019 1979> -.019 1952> -.018 Higher 1970 .060 2010 .030

1423A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1945 204 226 277 218 176

1950 219 249 221 205 192 149 190 165 199 211

1960 213 231 221 287 254 236 242 314 263 287

1970 190 289 321 209 306 266 300 343 361 364

1980 367 296 365 283 332 374 244 245 244 246

1990 248 276 364 269 323 382 307 280 324 268

2000 250 258 150 52 46 91 168 114 170 223

2010 54 182 149 104 182 204 186

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

1423B 1947 to 2016 70 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

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

1967 2016 0 -.09 -.08 -.16 .26 -.24 .00 .00 .11 -.02 -.24 .30\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .331) is:

Lower 1973< -.023 2003< -.019 1990< -.015 1987< -.015 2001> -.013 2013< -.011 Higher 1986 .025 1978 .018

1967 to 2016 segment:

Lower 2003< -.022 1990< -.018 1987< -.018 2001> -.017 2013< -.014 1988> -.014 Higher 1986 .037 1978 .023

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

1973 -5.9 SD

1423B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1947 233 227 204

1950 263 256 184 215 193 141 151 136 166 159

1960 197 178 182 232 204 215 179 263 245 243

1970 189 267 261 95 246 232 285 326 341 283

1980 278 199 292 248 216 241 150 160 252 246

1990 181 214 255 165 256 231 260 227 257 257

2000 157 202 107 42 17 61 88 132 151 231

2010 89 266 146 91 156 110 102

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

1424A 1943 to 2016 74 years Series 17

[B] Entire series, effect on correlation ( .569) is:

Lower 2015< -.032 2010> -.028 1973> -.022 1945< -.016 1980< -.014 1990< -.012 Higher 2000 .064 2006 .022

1424A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 154 238 191 265 312 270 278

1950 255 227 184 148 126 135 124 149 159 141

1960 168 197 217 255 259 239 213 276 261 300

1970 231 295 320 317 260 314 286 305 360 262

1980 250 240 278 327 352 268 253 276 229 217

1990 201 185 169 192 213 189 165 169 181 240

2000 111 119 139 185 188 188 120 123 174 152

2010 161 153 150 161 161 132 146

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

1424B 1943 to 2016 74 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

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

1943 1992 5 .01 -.18 -.02 -.19 .26 -.13 .02 -.04 .19 -.08 .21|-.11 .16 .02 -.22 .27\* .05 .02 -.03 -.01 -.10

1950 1999 5 .03 -.15 -.04 -.16 .16 -.15 .08 -.07 .16 -.08 .20|-.19 .07 -.01 -.05 .36\* .04 -.05 .02 -.01 -.03

1967 2016 0 .05 .16 -.03 -.16 .08 -.21 -.02 -.03 .08 -.17 .25\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .210) is:

Lower 1973> -.025 1968< -.023 1966> -.021 1996< -.013 1955> -.013 1970> -.012 Higher 1986 .040 2000 .037

1943 to 1992 segment:

Lower 1973> -.036 1966> -.034 1968< -.027 1955> -.019 1970> -.019 1952> -.017 Higher 1986 .058 1978 .040

1950 to 1999 segment:

Lower 1973> -.035 1966> -.032 1968< -.025 1955> -.019 1970> -.018 1996< -.018 Higher 1986 .058 1978 .040

1967 to 2016 segment:

Lower 1968< -.044 1973> -.037 1970> -.019 1996< -.018 1991> -.016 1993> -.015 Higher 1986 .055 2000 .047

1424B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 97 286 234 247 347 281 268

1950 203 184 211 207 164 232 151 181 206 203

1960 182 226 229 291 309 264 269 283 197 279

1970 288 287 306 351 285 357 298 339 407 324

1980 317 279 303 330 304 232 152 218 238 259

1990 290 260 218 226 263 208 134 165 218 236

2000 142 133 130 129 146 210 182 217 191 169

2010 182 243 265 213 203 164 160

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

1425A 1917 to 2016 100 years Series 19

[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 1999 0 -.18 -.11 -.10 -.04 -.17 -.08 .18 .14 .13 .23 .27\*-.09 -.02 -.11 -.17 .04 .16 -.02 .00 -.11 -.27

1967 2016 0 -.16 -.16 -.03 .03 .02 -.06 .07 -.05 .07 .12 .28\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .400) is:

Lower 2010> -.022 1918> -.020 1966> -.019 1979> -.015 1991> -.015 1994< -.014 Higher 1940 .020 1993 .017

1950 to 1999 segment:

Lower 1994< -.040 1979> -.035 1969< -.035 1991> -.034 1966> -.033 1952> -.023 Higher 1993 .051 1970 .041

1967 to 2016 segment:

Lower 2010> -.050 1979> -.035 1991> -.034 1994< -.030 1969< -.026 1976> -.018 Higher 1993 .043 2001 .030

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

1940 -1.548 14 1

1993 -1.398 26 1

2001 -1.791 26 3

1425A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 65 71 19

1920 78 72 100 80 96 103 103 60 92 106

1930 80 97 70 28 42 57 57 69 94 126

1940 0 96 248 214 136 138 161 220 210 301

1950 319 349 290 197 202 201 165 153 214 190

1960 217 294 260 255 221 189 183 169 122 123

1970 115 124 150 146 125 127 157 132 141 142

1980 107 91 114 104 104 98 84 84 48 34

1990 67 72 39 0 4 32 36 45 56 45

2000 25 0 35 26 28 41 26 31 53 56

2010 61 43 34 59 49 64 64

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

1425B 1917 to 2016 100 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

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

1925 1974 -5 - - .03 .01 .01 .36\* .05 .06 .18 .25 .18|-.22 .32 -.32 -.02 -.25 .02 -.41 -.04 -.02 -.04

1950 1999 -2 -.01 .14 -.18 .10 -.18 .08 -.08 .05 .22\* .16 .20|-.29 .10 -.22 .03 .02 .08 -.25 -.02 -.02 -.04

1967 2016 0 -.04 .13 -.15 .07 -.02 .12 -.12 .03 .14 .11 .23\* - - - - - - - - - -

[B] Entire series, effect on correlation ( .400) is:

Lower 1918> -.031 1970> -.025 1941< -.022 1971< -.021 1952> -.020 1991> -.015 Higher 1919 .053 2006 .035

1925 to 1974 segment:

Lower 1941< -.057 1971< -.057 1970> -.054 1952> -.043 1964< -.028 1945< -.022 Higher 1933 .088 1966 .060

1950 to 1999 segment:

Lower 1971< -.051 1970> -.050 1952> -.041 1991> -.031 1964< -.024 1973> -.021 Higher 1966 .072 1998 .037

1967 to 2016 segment:

Lower 1970> -.053 1971< -.036 1991> -.031 1973> -.023 1986> -.022 1979> -.021 Higher 2006 .093 2001 .028

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

1933 -1.947 10 1

2001 -1.791 26 3

2006 -1.851 26 1

1425B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 42 61 32

1920 65 63 71 69 76 95 77 68 84 106

1930 86 104 81 0 47 51 50 56 42 46

1940 28 31 98 191 133 125 211 313 241 282

1950 291 331 326 191 256 263 228 233 290 298

1960 257 311 278 322 192 185 165 193 177 215

1970 211 143 160 170 166 140 124 111 123 131

1980 115 93 120 104 111 121 100 123 53 42

1990 75 81 63 42 34 28 30 40 54 46

2000 24 0 33 25 25 28 0 18 30 22

2010 19 16 12 33 33 31 29

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

1426A 1926 to 2016 91 years Series 21

[B] Entire series, effect on correlation ( .503) is:

Lower 2004< -.042 1976< -.023 2005< -.021 1970> -.020 1941< -.011 1932> -.010 Higher 1966 .026 2006 .022

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

2006 -4.6 SD

1426A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1926 37 33 44 28

1930 9 9 29 22 6 11 48 22 30 31

1940 38 54 117 193 195 273 250 312 318 373

1950 292 265 191 204 198 204 220 220 227 241

1960 227 244 229 273 283 326 259 331 260 308

1970 301 364 441 372 270 264 159 156 195 146

1980 142 204 250 238 315 322 232 344 268 185

1990 183 175 163 134 153 148 144 148 139 151

2000 118 117 118 110 82 65 54 58 94 107

2010 78 90 92 111 99 100 125

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1426B 1923 to 2016 94 years Series 22

[B] Entire series, effect on correlation ( .368) is:

Lower 2014< -.029 1990< -.025 1970> -.022 2004< -.018 2001> -.013 1924> -.009 Higher 2000 .034 1998 .013

1426B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 16 69 51 47 45 33 28

1930 34 31 33 27 34 29 61 27 28 27

1940 21 43 81 158 239 257 232 287 293 370

1950 235 280 196 189 160 182 162 185 177 201

1960 249 305 271 314 288 334 276 388 369 471

1970 420 370 399 281 333 253 184 175 238 185

1980 235 248 279 259 293 283 151 225 189 154

1990 129 131 164 145 158 165 152 155 167 167

2000 120 136 129 126 84 90 80 60 82 56

2010 65 75 84 93 55 72 89

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1427A 1943 to 2016 74 years Series 23

[B] Entire series, effect on correlation ( .496) is:

Lower 1949< -.040 1952> -.026 1964< -.024 2012< -.021 1970> -.013 1950< -.011 Higher 1966 .071 2000 .035

1427A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1943 263 225 217 198 194 148 99

1950 96 137 152 152 129 106 143 148 168 164

1960 204 173 161 161 87 103 36 236 272 282

1970 240 316 313 179 265 376 326 381 420 331

1980 369 286 316 313 333 298 249 325 271 251

1990 285 277 331 294 348 292 315 268 347 224

2000 152 159 248 262 251 163 147 192 248 253

2010 202 233 148 228 246 206 237

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

1427B 1948 to 2016 69 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

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

1948 1997 0 -.13 .03 -.23 .13 -.05 .08 .14 .09 -.12 -.21 .26\*-.16 -.16 .24 -.07 .09 -.03 .14 -.17 .13 -.08

[B] Entire series, effect on correlation ( .377) is:

Lower 1949< -.084 1952> -.037 1966> -.030 1963< -.023 1969< -.021 2008< -.014 Higher 1970 .056 1998 .022

1948 to 1997 segment:

Lower 1949< -.099 1952> -.049 1966> -.037 1963< -.029 1969< -.026 1953> -.011 Higher 1970 .119 1973 .032

1427B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1948 114 82

1950 126 144 157 153 140 142 185 157 199 158

1960 200 196 190 169 262 253 222 260 245 195

1970 130 237 261 177 285 340 303 299 331 246

1980 274 270 276 263 282 309 232 326 278 257

1990 265 217 217 257 274 216 257 253 337 315

2000 164 155 249 274 205 149 151 164 152 184

2010 115 158 121 181 132 112 125

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1428A 1945 to 2016 72 years Series 25

[B] Entire series, effect on correlation ( .520) is:

Lower 2010> -.036 1954< -.029 1986> -.028 1993> -.027 2015< -.022 1979> -.014 Higher 2000 .076 1970 .026

1428A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1945 299 235 239 265 223

1950 190 202 126 149 100 128 176 162 158 165

1960 175 179 157 218 237 232 195 258 231 289

1970 212 248 283 320 308 333 521 518 557 507

1980 586 483 484 477 469 400 467 477 416 383

1990 384 344 287 385 370 333 353 380 407 374

2000 211 252 281 327 262 296 200 268 295 286

2010 292 213 178 238 251 136 168

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1428B 1944 to 2016 73 years Series 26

[B] Entire series, effect on correlation ( .556) is:

Lower 2010> -.028 1986> -.022 1947< -.020 1966> -.015 1996< -.013 1944> -.013 Higher 2000 .029 2006 .027

1428B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1944 385 318 246 191 205 179

1950 192 160 102 112 88 106 151 129 151 149

1960 163 196 176 244 214 227 212 270 233 286

1970 205 270 290 312 329 318 385 366 462 398

1980 414 390 428 393 415 395 401 355 317 326

1990 429 334 353 318 335 330 250 350 445 444

2000 227 250 293 249 299 265 137 183 268 245

2010 250 204 231 254 206 156 204

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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 1414A 1927 2016 90 3 1 .410 1.65 3.84 .867 .863 .242 2.55 .421 -.001 1

2 1414B 1928 2016 89 3 1 .368 1.62 3.70 .852 .889 .194 2.43 .435 -.059 1

3 1415A 1939 2016 78 3 0 .701 2.14 3.98 .794 .778 .214 2.47 .407 .030 1

4 1415B 1937 2016 80 3 0 .671 2.04 4.44 .867 .823 .208 2.48 .462 .001 1

5 1416A 1938 2016 79 3 0 .549 2.14 4.35 1.238 .876 .240 2.64 .476 -.035 1

6 1416B 1937 2016 80 3 0 .549 1.75 4.47 1.093 .925 .235 2.47 .453 -.017 1

7 1418A 1917 2016 100 4 3 .324 1.13 4.57 .833 .829 .253 2.80 .500 .050 1

8 1418B 1917 2016 100 4 2 .277 1.33 4.81 .966 .853 .239 2.81 .576 .073 1

9 1420A 1922 2016 95 4 0 .329 1.44 3.76 .998 .873 .336 2.60 .531 -.036 1

10 1420B 1923 2016 94 4 1 .356 1.84 5.13 1.480 .939 .372 2.39 .338 .028 1

11 1421A 1944 2016 73 3 0 .730 2.60 6.32 1.170 .804 .212 2.60 .501 -.097 1

12 1421B 1950 2016 67 2 0 .509 1.93 3.84 .605 .613 .215 2.59 .435 -.049 1

13 1422A 1943 2016 74 3 3 .288 1.90 3.04 .473 .646 .170 2.68 .575 -.098 2

14 1422B 1943 2016 74 3 1 .362 1.79 2.81 .547 .627 .221 2.49 .448 -.044 1

15 1423A 1945 2016 72 3 0 .347 2.39 3.82 .777 .711 .230 2.49 .466 -.041 1

16 1423B 1947 2016 70 3 1 .331 1.99 3.41 .673 .559 .286 2.46 .346 -.038 1

17 1424A 1943 2016 74 3 0 .569 2.14 3.60 .639 .806 .143 2.50 .410 -.013 1

18 1424B 1943 2016 74 3 3 .210 2.35 4.07 .644 .678 .173 2.46 .378 -.025 1

19 1425A 1917 2016 100 4 2 .400 1.11 3.49 .780 .890 .357 2.40 .352 -.003 1

20 1425B 1917 2016 100 4 3 .400 1.15 3.31 .917 .920 .330 2.42 .406 -.034 1

21 1426A 1926 2016 91 3 0 .503 1.74 4.41 1.048 .920 .220 2.78 .568 .024 1

22 1426B 1923 2016 94 4 0 .368 1.70 4.71 1.107 .920 .215 2.51 .354 -.056 2

23 1427A 1943 2016 74 3 0 .496 2.32 4.20 .813 .760 .209 2.44 .462 .053 1

24 1427B 1948 2016 69 3 1 .377 2.13 3.40 .658 .709 .188 2.45 .426 -.013 1

25 1428A 1945 2016 72 3 0 .520 2.95 5.86 1.173 .891 .156 2.43 .445 -.038 1

26 1428B 1944 2016 73 3 0 .556 2.71 4.62 .962 .837 .167 2.58 .406 -.023 1

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Total or mean: 2136 84 22 .437 1.87 6.32 .895 .815 .237 2.81 .446 -.015

- = [ COFECHA WILLSCOF ] = -