[] Dendrochronology Program Library Run QURU Program COF 13:38 Thu 18 Jan 2018 Page 1

[]

[] P R O G R A M C O F E C H A Version 6.06P 30335

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

QUALITY CONTROL AND DATING CHECK OF TREE-RING MEASUREMENTS

Title of run: QURU\_GOSH1\_EWLWTOTAL\_ORIGINAL-50

File of DATED series: QURU\_GOSH1\_EWLWTOTAL

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 1866 to 2016 151 years

Continuous time span is 1866 to 2016 151 years

Portion with two or more series is 1868 to 2016 149 years

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

\*C\* Number of dated series 39 \*C\*

\*O\* Master series 1866 2016 151 yrs \*O\*

\*F\* Total rings in all series 3911 \*F\*

\*E\* Total dated rings checked 3909 \*E\*

\*C\* Series intercorrelation .656 \*C\*

\*H\* Average mean sensitivity .186 \*H\*

\*A\* Segments, possible problems 0 \*A\*

\*\*\* Mean length of series 100.3 \*\*\*

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

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

No ring measurements of zero value

1900 -1.086 4 1950 -.252 38 2000 1.719 39

1901 1.011 5 1951 -.110 39 2001 1.082 39

1902 1.687 5 1952 .156 39 2002 .489 39

1903 1.257 5 1953 -.676 39 2003 -.487 39

1904 1.510 6 1954 -1.744 39 2004 1.120 38

1905 .484 6 1955 2.186 39 2005 -1.114 38

1906 1.251 7 1956 .986 39 2006 -1.618 38

1907 -.485 7 1957 -1.894 39 2007 -.155 38

1908 -.441 8 1958 .712 39 2008 -1.275 38

1909 -.395 8 1959 .443 39 2009 -1.016 38

1910 .504 11 1960 .136 39 2010 -1.313 38

1911 1.011 12 1961 -.658 39 2011 -.075 37

1912 -.004 12 1962 -.451 39 2012 .549 37

1913 -.924 13 1963 .089 39 2013 .959 37

1914 -.964 13 1964 .843 39 2014 1.588 37

1915 -.455 14 1965 -.903 39 2015 1.061 36

1866 .681 1 1916 .620 14 1966 -1.007 39 2016 -1.008 36

1867 -.935 1 1917 .236 17 1967 -.151 39

1868 -.748 2 1918 .048 19 1968 -.403 39

1869 -1.604 3 1919 -.685 20 1969 1.062 39

1870 -.296 3 1920 -.008 22 1970 1.413 39

1871 2.054 3 1921 .402 23 1971 .290 39

1872 .772 3 1922 .610 23 1972 -.397 39

1873 .595 3 1923 -.135 26 1973 .304 39

1874 .471 3 1924 .387 29 1974 1.433 39

1875 1.678 3 1925 -.096 30 1975 1.610 39

1876 1.252 4 1926 -1.168 30 1976 -.023 39

1877 1.701 4 1927 .744 30 1977 -.971 39

1878 -.050 4 1928 .829 31 1978 .243 39

1879 -.523 4 1929 .655 31 1979 .157 39

1880 1.072 4 1930 -1.503 33 1980 -.709 39

1881 .190 4 1931 .714 34 1981 -3.479 39

1882 -.466 4 1932 .917 34 1982 -1.133 39

1883 -1.111 4 1933 -.183 35 1983 -1.225 39

1884 -.413 4 1934 -.172 35 1984 1.082 39

1885 -.732 4 1935 .320 35 1985 .248 39

1886 -.820 4 1936 -1.372 35 1986 -.095 39

1887 .561 4 1937 1.175 35 1987 .518 39

1888 -1.609 4 1938 .500 36 1988 .850 39

1889 -.186 4 1939 .457 36 1989 1.068 39

1890 -.994 4 1940 -.295 36 1990 1.002 39

1891 -1.868 4 1941 -1.295 36 1991 -.916 39

1892 -.771 4 1942 -.259 37 1992 .222 39

1893 .446 4 1943 .248 37 1993 .089 39

1894 -.064 4 1944 -.630 37 1994 .069 39

1895 -1.753 4 1945 .101 37 1995 -.886 39

1896 -1.410 4 1946 .963 37 1996 .251 39

1897 -.035 4 1947 .854 37 1997 -.017 39

1898 -.589 4 1948 .778 38 1998 1.535 39

1899 -3.793 4 1949 -.181 38 1999 .362 39

PART 5: CORRELATION OF SERIES BY SEGMENTS: QURU\_GOSH1\_EWLWTOTAL\_ORIGINAL-50 13:38 Thu 18 Jan 2018 Page 5

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

Correlations of 50-year dated segments, lagged 25 years

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

Seq Series Time\_span 1850 1875 1900 1925 1950 1975

1899 1924 1949 1974 1999 2024

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

1 1908A 1924 2010 .51 .54 .59 .60

2 1908B 1923 2016 .54 .57 .70 .74

3 1909A 1923 2016 .73 .74 .82 .84

4 1909B 1918 2016 .66 .69 .64 .64

5 1910A 1906 2016 .63 .69 .63 .67

6 1910B 1908 2016 .54 .54 .71 .65

7 1911A 1920 2016 .79 .80 .70 .71

8 1911B 1915 2016 .57 .75 .66 .63

9 1912A 1917 2016 .57 .61 .80 .82

10 1912B 1917 2003 .65 .68 .79 .80

11 1913A 1910 2016 .42 .50 .77 .84

12 1913B 1913 2016 .53 .65 .76 .84

13 1914A 1910 2016 .57 .70 .80 .82

14 1914B 1930 2016 .72 .80 .81

15 1915A 1920 2016 .54 .54 .69 .71

16 1915B 1919 2016 .56 .57 .64 .66

17 1916A 1948 2016 .76 .77 .76

18 1916B 1951 2016 .83 .72

19 1917A 1930 2016 .67 .68 .59

20 1917B 1931 2016 .34 .56 .55

21 1918A 1910 2016 .42 .45 .50 .60

22 1918B 1866 2016 .62 .61 .36 .45 .39 .38

23 1919A 1921 2016 .64 .65 .68 .67

24 1919B 1918 2016 .54 .69 .77 .68

25 1920A 1911 2016 .73 .78 .78 .75

26 1920B 1904 2016 .52 .66 .81 .91

27 1920C 1876 2016 .75 .45 .49 .66 .69

28 1921A 1901 2016 .52 .69 .75 .75

29 1921B 1925 2016 .66 .88 .91

30 1922A 1933 2016 .67 .68 .71

31 1922B 1942 2016 .68 .78 .82

32 1922C 1938 2016 .76 .80 .82

33 1923A 1917 2016 .64 .65 .70 .73

34 1923B 1924 2016 .66 .66 .60 .52

35 1923C 1924 2016 .69 .70 .69 .67

36 1924A 1923 2014 .53 .53 .82 .84

37 1924B 1928 2016 .66 .86 .88

38 1925A 1868 2016 .74 .75 .54 .57 .71 .75

39 1925B 1869 2016 .81 .75 .47 .57 .66 .68

Av segment correlation .72 .72 .57 .63 .72 .72

PART 6: POTENTIAL PROBLEMS: QURU\_GOSH1\_EWLWTOTAL\_ORIGINAL-50 13:38 Thu 18 Jan 2018 Page 5

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

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

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

1908A 1924 to 2010 87 years Series 1

[B] Entire series, effect on correlation ( .575) is:

Lower 1957> -.029 1981> -.023 2008> -.023 1962< -.021 1924< -.021 1935< -.015 Higher 2005 .018 1936 .016

1908A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 205 263 225 294 295 273

1930 238 283 210 197 230 177 149 276 194 189

1940 184 170 174 180 161 199 214 231 209 208

1950 162 164 188 153 101 215 203 164 215 147

1960 116 114 74 126 148 134 120 156 198 223

1970 218 164 131 104 129 151 93 61 83 80

1980 77 59 57 63 130 114 85 123 91 115

1990 94 57 85 92 88 67 83 92 143 95

2000 125 127 116 85 98 62 67 66 85 73

2010 66

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

1908B 1923 to 2016 94 years Series 2

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

Lower 1930> -.034 1938< -.023 1923< -.017 1981> -.015 1932< -.015 1936> -.008 Higher 1957 .013 1954 .013

1908B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 130 179 201 144 187 199 182

1930 204 254 165 179 182 158 160 239 138 142

1940 158 114 170 176 139 166 216 239 183 165

1950 143 223 214 124 80 147 196 112 163 163

1960 166 154 103 142 137 94 101 109 139 150

1970 196 109 76 96 122 128 99 66 84 101

1980 69 58 67 67 116 112 78 117 95 103

1990 88 67 96 96 109 88 107 112 159 120

2000 133 115 98 100 90 74 57 74 70 74

2010 52 93 84 108 124 89 60

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

1909A 1923 to 2016 94 years Series 3

[B] Entire series, effect on correlation ( .789) is:

Lower 1961> -.010 1994< -.010 2010> -.010 1926> -.009 2008> -.009 1958< -.007 Higher 1981 .055 1957 .021

1909A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 303 385 430 384 429 392 322

1930 242 360 365 305 321 326 209 402 418 405

1940 326 295 312 270 303 333 366 355 338 315

1950 265 315 287 202 162 267 294 154 202 239

1960 241 281 269 292 280 216 178 229 232 299

1970 285 301 300 287 316 319 260 213 224 227

1980 215 121 200 189 217 240 245 286 269 280

1990 279 231 298 228 174 178 227 216 306 223

2000 279 278 222 216 264 159 136 186 185 146

2010 184 193 194 226 211 217 122

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

1909B 1918 to 2016 99 years Series 4

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

Lower 1993< -.030 1961> -.018 2008> -.013 1988< -.013 1952< -.011 1944> -.009 Higher 1981 .029 1957 .029

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

1961 +3.2 SD

1909B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1918 269 219

1920 211 203 232 193 229 289 259 303 322 333

1930 204 312 326 264 269 222 155 222 271 263

1940 231 201 219 223 227 219 255 200 182 154

1950 170 174 132 141 95 194 179 104 216 185

1960 199 270 239 231 231 181 150 154 126 199

1970 213 214 187 184 235 220 179 126 147 135

1980 140 101 144 155 169 196 141 152 127 136

1990 168 130 162 117 145 157 166 195 221 196

2000 215 208 182 151 209 160 147 206 191 157

2010 159 140 188 180 183 184 115

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

1910A 1906 to 2016 111 years Series 5

[B] Entire series, effect on correlation ( .638) is:

Lower 1940< -.043 1981> -.026 1961> -.013 1990< -.013 1926> -.009 1991> -.008 Higher 1957 .034 1930 .013

1910A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1906 262 219 228 260

1910 316 247 254 225 196 192 228 241 222 244

1920 299 332 342 339 383 331 327 347 349 344

1930 266 336 344 302 300 356 253 290 266 275

1940 172 191 243 283 178 204 236 249 253 181

1950 160 159 166 151 105 183 180 116 190 184

1960 177 221 190 217 232 193 172 185 123 222

1970 219 197 166 131 158 177 104 94 116 91

1980 78 68 68 71 111 131 101 121 111 146

1990 105 110 121 131 120 103 108 128 133 138

2000 190 173 154 132 162 108 93 133 94 110

2010 79 106 106 136 159 156 111

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

1910B 1908 to 2016 109 years Series 6

[B] Entire series, effect on correlation ( .551) is:

Lower 1940< -.038 2016> -.022 1990< -.018 1941> -.016 1944< -.013 1965> -.012 Higher 1981 .046 1957 .033

1910B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1908 187 148

1910 211 273 238 190 187 233 211 195 204 184

1920 249 226 244 264 297 234 252 265 261 281

1930 228 299 333 252 234 269 215 272 212 270

1940 149 223 213 213 134 160 198 188 194 165

1950 180 206 220 173 137 258 197 129 186 170

1960 152 203 188 215 238 214 182 217 179 228

1970 202 209 182 165 195 200 127 119 156 146

1980 130 90 141 103 168 161 150 162 114 124

1990 98 106 129 155 150 126 131 164 194 180

2000 200 233 184 124 150 111 103 133 98 95

2010 77 79 84 99 107 83 92

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

1911A 1920 to 2016 97 years Series 7

[B] Entire series, effect on correlation ( .745) is:

Lower 1989< -.039 1979< -.021 1929< -.009 1946< -.006 1959< -.005 1991< -.004 Higher 1981 .022 1930 .011

1911A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1920 301 305 338 240 275 231 195 264 297 189

1930 134 235 221 162 181 193 138 224 195 188

1940 176 132 190 184 144 174 173 214 194 181

1950 193 215 235 202 170 308 274 170 229 181

1960 253 190 196 192 236 173 187 188 221 275

1970 271 185 176 252 304 247 196 149 185 92

1980 114 67 126 138 224 148 161 157 178 102

1990 150 89 138 162 179 162 196 191 234 206

2000 244 197 162 138 186 112 112 118 95 109

2010 76 112 128 143 163 153 102

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

1911B 1915 to 2016 102 years Series 8

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

Lower 1915< -.088 1989< -.010 1937< -.010 1981> -.010 1987< -.010 1917< -.008 Higher 1930 .017 1955 .014

1911B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1915 322 321 303 315 309

1920 338 326 299 272 275 271 228 273 271 259

1930 157 255 299 196 162 153 82 130 154 201

1940 180 173 184 196 165 176 181 238 250 219

1950 192 190 215 167 122 232 209 139 185 150

1960 159 129 119 157 192 147 143 140 138 158

1970 143 162 123 150 149 131 79 67 115 99

1980 97 78 96 100 130 101 104 93 118 104

1990 129 109 126 174 167 146 180 170 184 159

2000 191 161 139 105 165 100 115 105 91 97

2010 78 111 112 119 135 128 109

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

1912A 1917 to 2016 100 years Series 9

[B] Entire series, effect on correlation ( .691) is:

Lower 1941< -.017 1927< -.014 1930> -.011 1926> -.010 1954> -.010 1959< -.009 Higher 1981 .030 1955 .014

1912A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 243 186 147

1920 221 225 225 179 189 195 209 198 230 219

1930 207 234 239 222 224 231 200 233 244 213

1940 188 163 210 209 181 191 196 195 183 184

1950 197 199 229 206 190 274 245 167 227 179

1960 162 185 167 182 199 146 141 178 188 244

1970 275 223 171 223 252 244 181 155 179 197

1980 147 89 105 109 177 191 171 173 234 188

1990 171 117 137 166 192 131 149 128 168 151

2000 195 159 156 128 145 89 101 99 85 82

2010 90 161 131 117 103 89 68

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

1912B 1917 to 2003 87 years Series 10

[B] Entire series, effect on correlation ( .714) is:

Lower 1944< -.042 1993> -.013 1954> -.010 1958< -.009 1951> -.007 1949> -.006 Higher 1981 .048 1957 .033

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

1993 +3.3 SD

1912B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 264 235 155

1920 182 249 249 208 240 265 243 263 311 290

1930 249 312 314 273 276 297 254 457 374 325

1940 304 251 262 278 188 226 272 296 282 288

1950 263 310 285 211 206 303 253 152 181 200

1960 214 206 183 215 216 169 191 204 219 248

1970 272 214 188 217 249 227 187 157 162 167

1980 126 80 110 110 158 158 139 187 213 156

1990 168 122 150 243 166 138 148 135 195 154

2000 186 165 155 153

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

1913A 1910 to 2016 107 years Series 11

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

Lower 1942< -.053 1918< -.020 1934< -.013 1925< -.009 1954> -.009 1923> -.007 Higher 1981 .055 1955 .013

1913A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 204 212 198 177 164 144 180 156 120 184

1920 244 241 257 300 336 200 182 259 294 307

1930 219 290 332 286 178 213 200 200 185 225

1940 182 173 110 177 135 176 222 259 268 198

1950 218 253 232 164 174 301 209 160 253 195

1960 163 133 150 176 157 132 145 233 180 227

1970 247 249 175 146 216 228 178 135 181 156

1980 112 70 84 98 148 149 128 140 180 192

1990 186 159 142 174 182 138 202 184 217 178

2000 209 185 163 136 179 130 123 139 134 122

2010 102 131 126 155 151 174 93

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

1913B 1913 to 2016 104 years Series 12

[B] Entire series, effect on correlation ( .712) is:

Lower 1954> -.017 1914> -.016 2006> -.015 1953< -.010 1957> -.008 1940> -.008 Higher 1981 .033 1955 .010

1913B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1913 223 320 321 328 296 261 259

1920 272 226 288 203 202 186 177 253 285 310

1930 231 302 292 230 226 197 174 259 265 309

1940 301 205 239 215 182 220 203 294 302 231

1950 187 221 236 147 196 325 277 185 208 170

1960 167 139 138 185 203 139 188 218 220 286

1970 288 206 216 234 268 265 200 146 189 190

1980 129 79 89 98 217 169 176 211 210 222

1990 230 142 221 178 203 168 232 229 269 217

2000 271 230 198 193 253 167 197 208 143 129

2010 125 171 162 226 195 179 85

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

1914A 1910 to 2016 107 years Series 13

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

Lower 1954> -.019 1913> -.018 1911< -.018 1920< -.010 1921< -.009 1986> -.007 Higher 1981 .084 1957 .028

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

1916 +3.0 SD

1914A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 177 150 178 213 184 214 296 190 195 176

1920 151 158 194 180 213 259 228 288 285 328

1930 245 298 370 328 322 360 279 413 371 371

1940 282 224 220 252 227 260 286 279 270 243

1950 289 310 331 289 327 497 348 215 414 327

1960 337 335 321 292 349 304 253 279 325 317

1970 364 278 314 338 344 336 317 287 288 288

1980 274 146 275 264 345 275 392 352 418 421

1990 339 235 242 305 302 197 300 254 320 250

2000 303 345 310 206 298 187 220 248 165 188

2010 226 256 287 294 273 246 136

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

1914B 1930 to 2016 87 years Series 14

[B] Entire series, effect on correlation ( .790) is:

Lower 1959< -.013 1954> -.012 1972> -.009 2010> -.009 1971< -.008 2006> -.008 Higher 1981 .051 1957 .019

1914B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 279 367 433 357 348 376 252 370 391 399

1940 302 192 199 232 259 299 318 392 359 286

1950 275 319 318 249 264 362 342 224 282 235

1960 313 304 242 305 348 255 277 273 327 324

1970 351 258 333 346 382 385 331 247 262 290

1980 260 135 239 233 335 270 307 347 398 376

1990 351 190 245 220 260 187 239 214 276 265

2000 345 373 295 277 304 225 245 268 185 256

2010 268 253 295 366 337 297 150

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

1915A 1920 to 2016 97 years Series 15

[B] Entire series, effect on correlation ( .644) is:

Lower 1987< -.030 1926< -.021 1937< -.012 1973< -.010 1946< -.009 1991> -.009 Higher 1981 .089 1955 .013

1915A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1920 287 267 313 279 317 368 231 304 360 359

1930 297 335 386 336 358 402 278 279 276 392

1940 329 275 302 339 303 325 312 373 392 337

1950 335 365 347 300 279 433 376 268 320 333

1960 270 294 325 353 334 293 217 302 264 261

1970 370 221 261 209 324 377 290 209 231 241

1980 213 108 155 183 222 208 219 138 202 216

1990 214 183 197 186 153 121 181 179 249 226

2000 248 205 187 134 183 143 122 119 143 144

2010 158 215 196 211 183 170 124

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

1915B 1919 to 2016 98 years Series 16

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

Lower 1987< -.021 1930> -.017 2005> -.015 1954> -.014 1945< -.012 1942< -.012 Higher 1981 .044 1955 .019

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

1986 +3.0 SD

1915B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1919 203

1920 236 277 333 271 320 331 260 296 360 414

1930 360 430 389 345 317 375 299 401 361 446

1940 342 270 242 278 283 244 300 306 323 259

1950 247 318 315 255 260 443 324 214 211 244

1960 216 169 189 175 201 166 127 189 154 173

1970 256 159 171 136 172 200 142 105 151 137

1980 144 97 139 171 244 238 333 175 296 261

1990 258 186 246 229 181 161 239 213 199 211

2000 194 232 198 135 233 176 97 83 70 77

2010 95 126 156 181 184 171 131

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

1916A 1948 to 2016 69 years Series 17

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

Lower 1961< -.027 2002< -.022 1953> -.018 2008> -.017 2006> -.015 2001< -.013 Higher 1981 .113 1955 .019

1916A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1948 292 311

1950 305 297 286 335 271 408 298 231 299 308

1960 230 179 250 258 245 218 243 243 229 251

1970 274 223 264 275 317 280 216 195 218 240

1980 191 98 228 206 301 252 223 269 379 324

1990 334 206 235 239 233 213 231 184 215 190

2000 238 183 160 177 209 167 182 176 181 137

2010 160 163 168 190 233 199 130

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

1916B 1951 to 2016 66 years Series 18

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

Lower 2009< -.072 1966> -.008 2001< -.008 2010> -.007 1991> -.007 1976< -.006 Higher 1981 .073 1957 .025

1916B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1951 395 343 354 321 482 368 219 347 403

1960 335 222 269 287 299 265 303 327 276 335

1970 396 306 165 246 312 303 156 195 211 216

1980 190 107 204 208 278 239 275 267 360 357

1990 320 232 243 250 225 222 262 210 267 207

2000 251 200 184 163 205 168 156 195 166 103

2010 144 158 173 159 187 173 110

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

1917A 1930 to 2016 87 years Series 19

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

Lower 2006< -.035 1981> -.021 2008> -.008 1994< -.007 1948< -.007 1932< -.007 Higher 1930 .011 1937 .010

1917A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1930 277 301 288 276 338 360 286 432 316 300

1940 302 269 336 315 244 322 321 217 167 146

1950 123 101 150 136 99 170 162 104 183 182

1960 131 74 72 110 117 62 62 92 112 136

1970 148 128 75 93 111 95 75 35 57 70

1980 66 44 47 43 74 94 78 126 155 121

1990 131 92 111 101 76 82 111 120 128 109

2000 113 106 94 88 119 101 65 99 99 94

2010 64 109 105 126 126 138 85

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

1917B 1931 to 2016 86 years Series 20

[B] Entire series, effect on correlation ( .438) is:

Lower 1947< -.045 1981> -.039 1931< -.033 2008> -.022 1957> -.015 1935< -.012 Higher 2005 .027 1955 .019

1917B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1931 336 337 328 361 308 293 448 363 355

1940 347 315 328 306 283 357 389 166 99 93

1950 107 152 193 167 110 236 175 131 224 238

1960 168 89 92 108 133 100 89 119 128 168

1970 136 138 115 117 130 142 86 42 54 49

1980 63 57 32 40 62 67 70 100 125 101

1990 106 78 95 93 67 68 95 91 131 104

2000 120 103 89 80 104 78 75 104 135 129

2010 78 125 135 186 184 148 88

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

1918A 1910 to 2016 107 years Series 21

[B] Entire series, effect on correlation ( .490) is:

Lower 1957> -.026 1939< -.020 1944> -.018 1961> -.015 1972< -.012 1964< -.011 Higher 1936 .019 1955 .019

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

1961 +3.2 SD

1918A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1910 276 367 255 247 282 269 260 308 242 259

1920 229 238 274 264 269 241 238 331 344 255

1930 231 263 221 224 217 239 159 268 186 143

1940 161 138 175 206 266 233 202 272 211 178

1950 178 197 198 154 135 254 197 171 175 154

1960 194 199 144 156 110 90 80 78 83 95

1970 107 87 68 90 86 81 83 81 95 97

1980 96 82 88 89 129 97 90 107 116 135

1990 144 110 131 126 153 118 121 115 129 138

2000 164 146 128 121 109 96 86 91 95 95

2010 80 94 112 135 138 105 74

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

1918B 1866 to 2016 151 years Series 22

[\*] Early part of series cannot be checked from 1866 to 1867 -- not matched by another series

[B] Entire series, effect on correlation ( .478) is:

Lower 1985< -.028 1972< -.024 1938< -.023 1877< -.018 1869> -.009 1945< -.009 Higher 1899 .064 1955 .015

1918B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1866 167 139 129 135

1870 134 160 168 139 130 135 150 93 71 75

1880 99 94 71 63 52 46 39 51 40 49

1890 53 45 65 78 75 49 66 82 100 39

1900 45 139 166 175 203 207 262 185 185 178

1910 200 230 169 129 174 155 151 141 153 163

1920 190 165 160 197 199 181 179 208 192 184

1930 147 178 223 206 188 206 171 225 123 140

1940 118 133 159 141 172 125 186 182 169 168

1950 154 166 153 145 104 232 153 115 180 174

1960 112 140 136 101 121 97 78 68 71 83

1970 78 71 48 68 81 65 69 63 77 78

1980 68 55 71 61 77 49 59 74 74 102

1990 75 68 72 96 99 115 121 116 120 107

2000 118 128 111 93 103 95 80 89 77 95

2010 80 110 83 94 124 113 91

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

1919A 1921 to 2016 96 years Series 23

[B] Entire series, effect on correlation ( .637) is:

Lower 1954> -.018 2004< -.017 1922< -.017 1930> -.010 2005> -.009 1979< -.009 Higher 1957 .026 1981 .024

1919A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1921 305 198 237 232 212 171 194 269 284

1930 238 297 256 235 207 227 185 226 210 199

1940 232 212 198 209 193 231 250 298 258 199

1950 197 189 178 179 200 298 248 108 149 162

1960 169 146 145 144 167 146 124 135 123 123

1970 128 124 110 96 102 134 96 80 92 70

1980 79 52 90 95 134 128 113 152 116 133

1990 113 96 83 98 101 73 93 81 94 72

2000 88 81 78 54 48 55 34 45 45 63

2010 50 63 79 109 100 115 62

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

1919B 1918 to 2016 99 years Series 24

[B] Entire series, effect on correlation ( .617) is:

Lower 1922< -.059 2004< -.022 1937< -.019 2005> -.015 1986< -.014 1944> -.011 Higher 1981 .054 1957 .025

1919B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1918 291 184

1920 175 201 144 192 202 196 196 250 243 231

1930 182 234 214 189 194 250 188 188 194 216

1940 252 183 218 239 256 230 237 328 306 240

1950 193 192 173 162 144 234 180 109 126 121

1960 143 96 98 84 106 69 78 61 70 98

1970 109 87 76 88 93 88 73 58 66 55

1980 51 39 54 63 94 77 51 69 64 75

1990 70 55 68 69 83 64 66 71 67 58

2000 100 68 77 57 45 57 40 47 45 54

2010 49 45 78 103 99 91 60

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

1920A 1911 to 2016 106 years Series 25

[B] Entire series, effect on correlation ( .712) is:

Lower 1977> -.018 1991> -.015 1914< -.012 1912> -.011 1934< -.008 1982< -.007 Higher 1981 .037 1957 .029

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

1977 +3.1 SD

1920A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1911 288 320 274 224 231 292 255 266 247

1920 252 246 278 229 213 225 166 206 210 180

1930 138 184 185 191 154 186 170 270 233 226

1940 193 188 220 207 186 175 226 219 230 207

1950 208 218 205 173 158 263 237 154 230 224

1960 194 218 228 229 252 203 183 233 221 249

1970 249 248 230 224 273 309 252 298 241 241

1980 204 131 140 191 294 241 230 208 199 210

1990 259 232 235 218 200 179 217 196 243 193

2000 233 182 220 199 221 150 141 150 144 150

2010 138 157 173 184 254 274 175

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

1920B 1904 to 2016 113 years Series 26

[B] Entire series, effect on correlation ( .712) is:

Lower 1908< -.025 1944< -.022 1962< -.018 1904< -.013 1936> -.010 1919> -.007 Higher 1981 .052 2005 .008

1920B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1904 131 126 172 163 119 172

1910 189 186 171 133 142 182 267 256 225 221

1920 236 228 194 160 181 156 133 182 181 175

1930 149 198 193 172 146 156 159 223 210 173

1940 165 135 145 169 120 154 184 195 203 203

1950 179 184 212 172 136 243 263 165 205 172

1960 196 197 108 123 169 112 124 146 172 233

1970 231 207 201 240 299 275 218 187 181 202

1980 174 91 135 138 251 241 179 190 259 239

1990 318 224 265 213 214 176 260 199 318 235

2000 325 242 227 213 259 145 125 198 134 141

2010 106 133 203 189 277 253 135

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

1920C 1876 to 2016 141 years Series 27

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

Lower 1937< -.028 1991> -.019 1957> -.016 1941> -.011 2010> -.010 1887< -.008 Higher 1981 .056 1899 .045

1920C Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1876 109 159 129 104

1880 91 79 57 45 60 57 59 56 49 63

1890 59 56 71 111 115 93 116 160 150 72

1900 177 287 311 299 369 293 333 230 246 263

1910 283 366 280 271 261 345 350 361 366 334

1920 297 380 405 408 370 318 318 374 344 360

1930 256 322 396 342 291 286 239 200 219 204

1940 189 230 202 245 226 206 220 167 223 194

1950 180 159 150 157 118 282 211 189 245 273

1960 182 165 217 207 187 165 186 174 179 210

1970 206 174 179 184 219 189 168 159 166 175

1980 117 82 134 109 116 98 113 121 135 153

1990 125 147 147 124 114 125 142 127 154 122

2000 135 138 131 139 189 113 106 148 111 123

2010 137 106 136 112 133 120 91

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

1921A 1901 to 2016 116 years Series 28

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

Lower 1919> -.012 1906< -.011 1954> -.010 1928< -.009 1972< -.009 1982> -.007 Higher 1981 .053 1957 .029

1921A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1901 43 60 63 86 62 63 48 66 69

1910 74 81 87 100 118 138 186 190 178 209

1920 231 225 225 194 170 130 119 158 130 158

1930 117 140 144 129 146 146 136 158 183 152

1940 141 100 104 106 101 124 153 153 158 126

1950 133 92 101 92 102 138 124 83 106 101

1960 97 89 112 105 125 105 99 112 95 121

1970 106 122 88 108 109 139 124 120 124 123

1980 91 71 118 100 127 125 128 163 162 166

1990 168 114 144 128 155 156 203 151 188 190

2000 218 196 160 160 193 127 100 139 109 86

2010 98 96 115 120 115 140 94

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

1921B 1925 to 2016 92 years Series 29

[B] Entire series, effect on correlation ( .781) is:

Lower 1930> -.019 1933< -.011 1963< -.011 1926< -.009 1938> -.008 1925> -.007 Higher 1981 .053 1957 .010

1921B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1925 250 202 247 222 216

1930 210 243 217 159 188 186 155 202 254 207

1940 204 120 153 136 131 150 166 246 209 190

1950 185 160 165 135 141 201 203 132 155 175

1960 187 151 145 132 173 141 152 178 153 215

1970 215 187 153 191 263 257 190 156 199 226

1980 155 89 168 141 219 194 170 193 243 221

1990 257 141 175 152 159 149 147 140 206 176

2000 213 177 178 148 153 105 117 121 107 110

2010 79 96 109 125 176 154 81

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

1922A 1933 to 2016 84 years Series 30

[B] Entire series, effect on correlation ( .644) is:

Lower 2016> -.022 1957> -.019 1968< -.019 1983> -.016 2015< -.009 1962> -.008 Higher 1981 .100 1955 .014

1922A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1933 150 177 216 153 200 200 247

1940 207 177 226 205 167 178 202 134 115 108

1950 112 87 99 97 68 179 109 91 160 109

1960 110 64 122 104 93 96 98 117 71 110

1970 100 93 75 99 115 113 93 80 112 102

1980 107 67 110 124 153 105 92 106 96 127

1990 124 80 94 86 107 96 80 86 90 89

2000 132 117 110 71 89 62 50 58 46 67

2010 70 77 77 83 95 66 78

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

1922B 1942 to 2016 75 years Series 31

[B] Entire series, effect on correlation ( .689) is:

Lower 1947< -.077 1957> -.014 1996< -.012 1948< -.011 1988< -.009 1980> -.008 Higher 1981 .100 1955 .015

1922B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1942 281 293 280 319 419 168 192 202

1950 243 253 244 241 191 380 270 187 263 249

1960 283 145 198 184 191 155 191 236 195 246

1970 303 229 217 234 330 379 210 206 280 336

1980 300 127 258 258 398 271 283 277 216 276

1990 271 151 258 219 228 190 162 164 225 205

2000 218 207 202 183 180 126 104 115 99 113

2010 111 170 198 186 228 247 160

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

1922C 1938 to 2016 79 years Series 32

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

Lower 1947< -.042 1988< -.017 1944> -.013 1948< -.011 1997< -.009 1961< -.008 Higher 1981 .088 1955 .014

1922C Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1938 317 359

1940 328 255 335 341 350 373 429 191 200 198

1950 239 258 267 241 187 412 264 169 261 271

1960 306 154 219 194 219 173 188 236 208 239

1970 316 238 225 258 346 376 213 198 275 309

1980 287 119 233 228 401 269 322 296 205 234

1990 291 186 266 243 242 201 185 156 210 216

2000 234 205 193 192 198 137 103 109 102 114

2010 114 190 193 214 266 224 129

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

1923A 1917 to 2016 100 years Series 33

[B] Entire series, effect on correlation ( .670) is:

Lower 1925< -.018 1955< -.014 1944> -.010 1951< -.010 1939< -.010 1919> -.007 Higher 1957 .035 1930 .014

1923A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1917 248 224 282

1920 386 355 297 297 252 145 157 209 205 188

1930 115 183 203 189 162 188 169 286 244 155

1940 181 129 190 216 200 189 194 156 172 122

1950 133 90 140 94 72 89 88 56 90 76

1960 85 85 72 79 120 82 88 78 86 94

1970 98 92 120 158 183 204 183 144 209 200

1980 174 78 94 88 141 140 188 278 279 290

1990 310 211 224 226 242 194 199 229 313 236

2000 222 239 217 194 233 152 149 207 123 151

2010 141 194 196 178 213 177 122

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

1923B 1924 to 2016 93 years Series 34

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

Lower 1991> -.022 1939< -.019 1987< -.017 1986< -.012 1936> -.011 1970< -.010 Higher 1957 .035 1954 .011

1923B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 268 171 161 246 191 201

1930 107 153 215 199 177 197 187 259 226 148

1940 178 144 163 209 178 158 181 176 192 128

1950 137 114 114 101 83 134 106 66 112 95

1960 106 81 68 84 127 85 84 79 77 84

1970 84 86 133 179 173 204 187 143 201 167

1980 154 73 79 93 166 141 70 74 138 185

1990 260 260 252 252 232 218 264 253 297 266

2000 232 212 195 160 250 178 153 230 118 153

2010 143 192 229 157 210 185 114

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

1923C 1924 to 2016 93 years Series 35

[B] Entire series, effect on correlation ( .670) is:

Lower 2006> -.019 1992< -.014 1955< -.010 1951< -.010 2013< -.009 1953> -.007 Higher 1957 .035 2005 .010

1923C Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1924 261 166 151 156 150 147

1930 126 191 195 181 194 164 143 205 194 173

1940 144 121 155 195 165 190 196 185 159 125

1950 107 83 94 126 90 107 103 61 99 117

1960 105 99 95 141 172 116 122 130 123 157

1970 163 128 117 127 152 203 133 102 137 123

1980 121 91 110 124 146 165 191 180 200 199

1990 170 131 107 122 144 136 123 137 163 144

2000 155 127 143 109 144 110 129 156 97 101

2010 93 120 148 118 138 128 101

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

1924A 1923 to 2014 92 years Series 36

[B] Entire series, effect on correlation ( .688) is:

Lower 1928< -.048 1943< -.019 1923> -.016 1996< -.015 1974< -.013 1936> -.011 Higher 1981 .076 1957 .014

1924A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1923 250 181 209 156 202 142 175

1930 178 199 187 172 188 194 206 292 292 283

1940 268 214 239 174 168 221 281 236 268 207

1950 211 164 199 215 157 337 211 135 272 250

1960 253 163 214 200 265 137 114 155 129 156

1970 179 147 104 101 98 123 90 74 113 100

1980 87 53 79 67 122 108 91 103 94 117

1990 128 89 109 101 83 81 72 105 128 90

2000 125 122 139 100 138 85 68 86 75 69

2010 64 120 114 131 143

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

1924B 1928 to 2016 89 years Series 37

[B] Entire series, effect on correlation ( .807) is:

Lower 1932< -.022 1970< -.014 1931< -.012 1936> -.006 1974< -.005 1962> -.005 Higher 1981 .053 1957 .016

1924B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1928 182 183

1930 154 159 140 149 216 255 221 376 346 385

1940 323 256 304 254 221 256 308 312 330 264

1950 190 175 185 196 147 295 216 122 208 229

1960 230 158 189 198 261 144 131 140 118 145

1970 119 111 110 113 112 120 97 95 104 103

1980 89 50 72 81 147 155 129 156 140 153

1990 186 110 164 137 126 96 132 132 170 137

2000 171 138 125 106 139 106 91 131 82 111

2010 81 131 148 182 169 158 81

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

1925A 1868 to 2016 149 years Series 38

[B] Entire series, effect on correlation ( .686) is:

Lower 1939< -.013 1991> -.011 1995> -.008 1888> -.007 1964< -.007 1940< -.006 Higher 1981 .049 1899 .031

1925A Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1868 159 87

1870 155 221 160 171 160 185 133 161 109 89

1880 113 90 93 84 87 73 82 95 72 101

1890 66 53 67 91 93 69 66 122 104 55

1900 155 223 286 274 293 275 308 262 306 280

1910 328 389 295 307 297 369 372 370 358 293

1920 322 354 344 296 313 283 296 354 299 309

1930 228 255 285 229 242 254 207 213 198 169

1940 157 205 202 256 216 242 206 182 250 194

1950 209 184 169 175 133 248 201 161 220 230

1960 157 147 184 218 164 149 183 164 189 226

1970 213 173 172 172 234 198 164 169 196 213

1980 136 89 173 126 167 134 134 152 171 166

1990 151 161 162 138 159 165 168 160 151 136

2000 151 153 147 146 183 117 121 166 117 122

2010 141 120 143 135 185 140 108

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

1925B 1869 to 2016 148 years Series 39

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

Lower 1991> -.022 1920< -.018 2011< -.012 1937< -.011 1957> -.011 1977> -.009 Higher 1981 .054 1899 .034

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

1991 +3.0 SD

1925B Ring measurements

Annual values

Date 0 1 2 3 4 5 6 7 8 9

1869 91

1870 114 224 122 119 117 160 171 184 121 105

1880 141 106 95 83 98 104 91 140 74 93

1890 93 92 110 139 128 111 121 174 156 82

1900 199 280 347 325 388 336 349 247 285 270

1910 289 371 294 280 273 351 369 387 404 354

1920 286 394 392 422 365 344 347 410 428 392

1930 259 355 436 388 283 291 258 233 213 202

1940 175 214 211 255 246 227 219 188 210 189

1950 186 160 160 148 113 317 205 175 263 296

1960 170 179 211 188 187 176 187 181 181 233

1970 236 170 170 193 233 210 177 194 173 183

1980 117 67 136 103 116 102 114 129 147 141

1990 122 160 146 132 116 139 157 145 156 127

2000 142 157 130 117 175 118 103 142 99 113

2010 134 94 134 115 153 134 106

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

[\*] All segments correlate highest as dated with correlation with master series over .3281

PART 7: DESCRIPTIVE STATISTICS: QURU\_GOSH1\_EWLWTOTAL\_ORIGINAL-50 13:38 Thu 18 Jan 2018 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 1908A 1924 2010 87 4 0 .575 1.46 2.95 .638 .828 .207 2.81 .576 -.010 1

2 1908B 1923 2016 94 4 0 .621 1.29 2.54 .475 .696 .224 2.79 .590 -.005 1

3 1909A 1923 2016 94 4 0 .789 2.65 4.30 .709 .708 .163 2.47 .430 .010 1

4 1909B 1918 2016 99 4 0 .642 1.94 3.33 .515 .679 .172 2.49 .490 -.049 1

5 1910A 1906 2016 111 4 0 .638 1.92 3.83 .800 .887 .166 2.60 .454 -.033 1

6 1910B 1908 2016 109 4 0 .551 1.82 3.33 .562 .748 .178 2.60 .446 -.041 1

7 1911A 1920 2016 97 4 0 .745 1.86 3.38 .564 .620 .220 2.76 .549 -.047 1

8 1911B 1915 2016 102 4 0 .572 1.69 3.38 .667 .860 .170 2.51 .392 -.009 1

9 1912A 1917 2016 100 4 0 .691 1.79 2.75 .465 .727 .155 2.72 .449 .011 2

10 1912B 1917 2003 87 4 0 .714 2.20 4.57 .649 .746 .164 2.86 .464 .051 2

11 1913A 1910 2016 107 4 0 .639 1.86 3.36 .540 .649 .197 2.70 .509 .048 1

12 1913B 1913 2016 104 4 0 .712 2.15 3.28 .556 .597 .188 2.76 .570 -.003 1

13 1914A 1910 2016 107 4 0 .704 2.79 4.97 .685 .561 .177 2.67 .360 -.015 1

14 1914B 1930 2016 87 3 0 .790 2.93 4.33 .616 .472 .182 2.46 .472 -.039 1

15 1915A 1920 2016 97 4 0 .644 2.61 4.33 .797 .759 .171 2.60 .436 -.041 2

16 1915B 1919 2016 98 4 0 .609 2.33 4.46 .874 .787 .202 3.09 .639 .040 1

17 1916A 1948 2016 69 3 0 .700 2.36 4.08 .585 .610 .170 2.71 .418 .024 1

18 1916B 1951 2016 66 2 0 .733 2.50 4.82 .804 .681 .204 2.63 .483 -.011 2

19 1917A 1930 2016 87 3 0 .608 1.46 4.32 .895 .900 .222 2.64 .394 -.007 1

20 1917B 1931 2016 86 3 0 .438 1.55 4.48 .993 .888 .222 2.76 .533 .040 2

21 1918A 1910 2016 107 4 0 .490 1.66 3.67 .727 .872 .149 2.80 .587 .034 1

22 1918B 1866 2016 151 6 0 .478 1.21 2.62 .512 .839 .181 2.75 .437 .001 1

23 1919A 1921 2016 96 4 0 .637 1.48 3.05 .705 .888 .173 2.58 .336 -.038 1

24 1919B 1918 2016 99 4 0 .617 1.29 3.28 .747 .912 .183 2.89 .567 -.044 1

25 1920A 1911 2016 106 4 0 .712 2.15 3.20 .409 .550 .140 2.65 .457 .058 1

26 1920B 1904 2016 113 4 0 .712 1.90 3.25 .489 .519 .196 2.65 .485 .013 1

27 1920C 1876 2016 141 5 0 .641 1.91 4.08 .921 .901 .169 2.72 .412 .029 1

28 1921A 1901 2016 116 4 0 .695 1.27 2.31 .397 .813 .155 2.47 .425 -.008 3

29 1921B 1925 2016 92 3 0 .781 1.73 2.63 .428 .565 .183 2.56 .455 -.045 1

30 1922A 1933 2016 84 3 0 .644 1.13 2.47 .437 .744 .211 2.62 .446 -.053 1

31 1922B 1942 2016 75 3 0 .689 2.27 4.19 .679 .446 .213 2.63 .447 -.027 1

32 1922C 1938 2016 79 3 0 .736 2.38 4.29 .737 .498 .216 2.66 .419 -.003 1

33 1923A 1917 2016 100 4 0 .670 1.75 3.86 .695 .803 .199 2.69 .473 -.037 1

34 1923B 1924 2016 93 4 0 .603 1.63 2.97 .592 .725 .221 2.59 .431 -.001 1

35 1923C 1924 2016 93 4 0 .670 1.41 2.61 .349 .638 .172 2.58 .429 -.041 2

36 1924A 1923 2014 92 4 0 .688 1.56 3.37 .659 .756 .216 2.65 .458 -.005 1

37 1924B 1928 2016 89 3 0 .807 1.69 3.85 .728 .802 .207 2.69 .428 .010 1

38 1925A 1868 2016 149 6 0 .686 1.88 3.89 .778 .878 .179 2.53 .390 .050 1

39 1925B 1869 2016 148 6 0 .661 2.00 4.36 .945 .872 .185 2.68 .385 .023 1

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

Total or mean: 3911 152 0 .656 1.87 4.97 .652 .739 .186 3.09 .462 -.003

- = [ COFECHA QURU COF ] = -