

KG
11366
v. 749

Longitude Campaign
between Montreal
and Cambridge
1883

W. C. DEMAIN & SON,
STEAM PAPER RULERS,

AND DEALERS IN BLANK MUSIC PAPER.

8 HAWLEY AND 9 ARCH STREET.

63rd Passenger Elevator at 31 MILK STREET. Freight Elevator on ARCH STREET.

1889nae.proj.1753

June 1 1883.

$$\text{C.E. Mean } I = 13.1^h - h = -0.23 \quad C = +.20 \quad a = +.38$$

$$-\Delta I = +14.97$$

$$\begin{array}{r} I \quad S \quad h \quad 0 = +14.56 - .01 \quad +14.55 + .62 a - 1.00 c \quad +.24 + .20 + .44 \quad +14.99 \quad +.02 \\ +11.6 \quad 12.8 + .3 \quad 14.59 + .00 \quad 14.59 + .52 a + 1.00 c \quad +.20 + .20 + .40 \quad 14.99 \quad +.02 \\ +14.58 + .57 a + 1.01 c \quad +14.99 \quad +.02 \end{array}$$

$$\begin{array}{r} +.04 \quad 12.4 + .7 \quad +14.69 - .02 \quad +14.67 - .140 a + .299 c \quad -.53 + .60 + .07 \quad +14.74 \quad -.23 \\ +85.6 \quad 12.9 + .2 \quad 13.65 + .00 \quad +13.65 + .1035 a - .1313 c \quad +3.93 - 2.63 + 1.30 \quad 14.95 \quad -.02 \end{array}$$

$$\begin{array}{r} I \quad 6E \quad 0 = +.09 \quad -1.97 a + 1.98 c \quad 0 = -.18 + 3.88 a - 3.90 c \quad 0 = +.18 \quad a + 3.92 c \\ -.93 \quad +.978 a - 1.414 c \quad -.909 + 9.565 a - 138.29 c \quad +13.15 \quad a + 99.94 c \end{array}$$

$$\begin{array}{r} I \quad 6M \quad 0 = +1.48 \quad -2.55 a - 2.40 c \quad 0 = -3.77 + 6.52 a + 6.12 c \quad 0 = -3.55 \quad a + 5.76 c \\ II \quad +1.23 \quad -1.92 a - 2.22 c \quad 2.36 + 3.68 a + 4.26 c \quad -2.73 \quad a + 4.93 c \\ -15.40 + 109.71 a - 131.81 c \quad +7.05 \quad +214.55 c \end{array}$$

$$\begin{array}{r} -\Delta I \\ 0 = -15.40 + 109.71 a - 131.81 c \quad +14.99 \\ +7.05 - 131.81 a + 214.55 c \quad .99 \\ 0 = -14.0 + a - 1.20 c \quad .98 \\ +.053 - a + 1.629 \quad .91 \\ 0 = -.087 \quad -.428 c \quad .99 \\ C = +.203 \quad \text{for C.E. and 6M.} \\ a = +.384 \quad +14.972 \end{array}$$

C.W

$$I \quad 10.5 \quad 13.3 - .2 \quad 0 = +14.87 + .00 \quad +14.87 \quad +.81 a - 1.02 c \quad +.31 - .20 + .11 \quad +14.98 \quad +.01$$

$$\begin{array}{r} II \quad +28.5 \quad 13.1 + .0 \quad 0 = +15.04 + .00 \quad +15.04 \quad +.27 a - 1.14 c \quad +.10 - .23 - .13 \quad +14.91 \quad -.06 \\ +32.8 \quad 13.5 - .4 \quad +15.20 + .01 \quad +15.21 \quad +.10 a - 1.27 c \quad +.04 - .25 - .21 \quad 14.99 \quad -.02 \\ +33.2 \quad +15.12 \quad +.18 a - 1.20 c \quad 14.95 \quad -.02 \end{array}$$

$$\begin{array}{r} 6M \quad +73.0 \quad 13.3 - .2 \quad 0 = +16.35 + .00 \quad +16.35 \quad -1.74 a - 3.42 c \quad -.66 - .68 - 1.34 \quad +15.01 \quad +.04 \end{array}$$

Without weights
C.E. + C.W.

$$a = +3.95$$

$$C = +2.17$$

$$\Delta T = -14.916$$

Aa Cc

sum Aa+Cc+0.00

$$+2.45 +2.17 +4.62 -14.15 +10 +2.10 +2.16 +4.26 -14.51 +.04$$

$$+2.05 +2.21 +4.26 -14.49 +10 +1.76 +2.20 +3.96 -14.54 +.05$$

With weights
C.E. + C.W.

$$a = +3.39$$

$$C = +2.16$$

$$\Delta T = -14.933$$

With weights
C.E. only

$$a = +0.07$$

$$C = -0.56$$

$$\Delta T = -14.516$$

Without weights
C.E. and C.W.

$$a = +3.96$$

$$\Delta T = -14.930$$

$$C = +2.00$$

With weights
C.E. + C.W.

$$a = +3.40$$

$$\Delta T = -14.949$$

$$C = +2.00$$

With weights
C.E. only

$$a = +2.33$$

$$\Delta T = -14.950$$

$$C = +2.00$$

$$-5.53 +6.44 +0.96 -14.82 -15 -4.75 +6.46 +1.71 -14.76 -0.9$$

$$+4.088 -2.849 +1.239 -13.68 -0.3 +3.509 -2.836 +1.673 -14.26 -0.61$$

$$-0.10 -1.67 -1.77 -14.69 -0.2 -5.26 -15.46 -1.9$$

$$+0.92 +7.35 +8.07 -13.71 -0.6 +3.892 -11.04 -0.2$$

$$-0.2 +2.33 -14.70 +0.5$$

$$+0.2 +1.95 -14.74 +0.5$$

$$+2.11 -14.74 +0.5 +2.08 -14.74 +0.5$$

$$+1.77 -14.77 +0.2 +1.74 -14.78 +0.1$$

With weights
C.W. only

$$a = +4.13$$

$$C = +1.08$$

$$\Delta T = -15.081$$

$$a = +4.04$$

$$C = -14.951$$

$$+3.20 -2.21 +0.99 -14.82 +0.5 +2.74 -2.20 +0.54 -14.88 -0.1$$

$$+3.34 -1.10 +2.24 -14.86 +0.1 +3.04 -14.63 +0.4$$

$$+2.76 -14.67 +0.0 +3.27 -14.62 +0.5$$

$$+1.07 -2.47 -1.40 -15.06 -0.2 +9.1 -2.46 -1.55 -15.09 -0.5$$

$$+4.0 -2.76 -2.36 -15.18 +0.6 +3.4 -2.74 -2.40 -15.17 +0.4$$

$$+1.11 -1.23 -0.12 -15.09 -0.5 +1.01 -14.83 -0.2$$

$$+4.1 -1.37 -0.96 -15.18 +0.3 +3.8 -14.89 +0.7$$

$$+9.2 -14.86 -0.5 +1.09 -14.84 -0.3$$

$$+3.4 -14.92 +0.4 +4.0 -14.71 +0.5$$

$$-6.87 -7.42 -14.29 -16.34 +0.1 -5.90 -7.39 -13.29 -16.26 +0.9$$

$$-7.19 -3.69 -10.88 -16.17 +1.8 -6.54 -15.58 +0.9$$

$$-5.93 -15.54 +1.3 -7.03 -15.65 +0.2$$

$$14.516$$

$$15.081$$

$$14.795$$

$$14.950$$

$$14.951$$

$$14.950$$

June 1

Original Equations

Without weights

With weights

$$\begin{array}{rcll}
 \text{C.E. } 0 = +78 & +.57\delta a & +.101\delta e & +\delta\Delta T \\
 +70.4 & -1.40 & +2.99 & +\delta\Delta T \\
 +85.6\delta e & -.020 & +10.35 & -13.13 & +\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.E. } 0 = +.028 & +.80\delta a & +.141\delta e & +.140\delta\Delta T \\
 -.092 & -.56 & +.120 & +.40 \\
 -.002 & +.104 & -.131 & +.10
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.W. } 0 = +10.5 & +.81\delta a & -1.02\delta e & +\delta\Delta T \\
 +33.2 & +.18 & -1.20 & +\delta\Delta T \\
 +73.0 & +.040 & -1.74 & -3.42 & +\delta\Delta T \\
 -.200 & +8.77\delta a & -14.77\delta e & +6.00\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.W. } 0 = +.010 & +.81\delta a & -1.02\delta e & +.100\delta\Delta T \\
 -.028 & +.25 & -1.68 & +.140 \\
 +.008 & -.35 & -.68 & +.20
 \end{array}$$

Solution for C.E. and C.W. without weights.

$$\begin{array}{rcll}
 \text{C.E. } 0 = +.010 & +.32\delta a & +.58\delta e & +.57\delta\Delta T \\
 +32.0 & +.196 & -.419 & \\
 -.210 & +10.712 & -135.90 &
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.E. } 0 = +.020 & +.58\delta a & +.102\delta e & +.101\delta\Delta T \\
 -.690 & & +.894 & \\
 +.260 & & +172.40 &
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.W. } 0 = +.010 & +.66\delta a & -.83\delta e & +.81\delta\Delta T \\
 -.050 & +.32 & -.22 & \\
 -.070 & +3.03 & +5.75 & \\
 0 = +.060 & +113.41\delta a & -134.61\delta e & +87.7\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 \text{C.W. } 0 = -.010 & -.83\delta a & +.104\delta e & -.102\delta\Delta T \\
 +.020 & & +.144 & \\
 -.014 & & +11.70 & \\
 0 = -.540 & -134.61\delta a & +196.54\delta e & -14.77\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = +.060 & +113.41\delta a & -134.61\delta e & +87.7\delta\Delta T \\
 -.540 & -134.61 & +196.54 & -14.77 \\
 -.250 & +8.77 & -14.77 & +6.00
 \end{array}$$

$$\begin{array}{rcll}
 0 = +.001 & +\delta a & -1.187\delta e & +.077\delta\Delta T \\
 -.024 & -\delta a & +1.460\delta e & -.110\delta\Delta T \\
 -.023 & +\delta a & -1.684\delta e & +.684\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.003 & +.273\delta e & -.033\delta\Delta T \\
 -.027 & -.224\delta e & +.574\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.011 & +\delta e & +.121\delta\Delta T \\
 -.121 & -\delta e & +2.558\delta\Delta T
 \end{array}$$

$$0 = -.132 + 2.437\delta\Delta T$$

$$\delta\Delta T = +.054 - 14.970 = -14.916 \Delta T$$

$$\delta e = +.017 + 2.00 = +2.17 e$$

$$\delta a = +.015 + 3.80 = +3.95 a$$

Solution for C = 00

$$0 = -.024 + .607\delta\Delta T$$

$$\delta\Delta T = +.040 - 14.970 = -14.930 \Delta T$$

$$\delta a = -.024 + 3.80 = +3.76 a$$

$$\delta e = 0.00 + 2.00 = +2.00 e$$

$$\begin{array}{rcll}
 0 = +0.60 & +1.701 & -2.288 & +4.74 \\
 -.540 & -2.019 & +3.341 & -.798 \\
 -.200 & +.132 & -.251 & +3.24 \\
 & & & +4.56 & .457 & +0.05
 \end{array}$$

Solution for C.E. and C.W. with weights

$$C.E. = +.022 + .64 \delta a + 1.13 \delta c + 1.12 \delta \Delta T$$

$$+.051 + .31 - .67 - .22$$

$$-.002 + .108 - 1.36 + .10$$

$$0 = +.039 + 1.13 \delta a + 1.99 \delta c + 1.97 \delta \Delta T$$

$$-.116 - .48 + 1.44 + 1.72$$

$$+.003 - .13 - .037 - .080$$

$$0 = +.039 + 1.12 \delta a + 1.97 \delta c + 1.96 \delta \Delta T$$

$$+.16 + .01$$

$$C.W. = +.008 + .66 \delta a - .83 \delta c + .81 \delta \Delta T$$

$$-.001 + .06 - .42 + .35$$

$$-.003 + .12 + .24 - .07$$

$$0 = -.010 - .83 \delta a + 1.04 \delta c - 1.02 \delta \Delta T$$

$$+.047 - .505 + .46 - .14$$

$$0 = +.010 + .81 \delta a - 1.02 \delta c + 1.00 \delta \Delta T$$

$$+.176 + .04$$

$$0 = +.069 + 2.87 \delta a - 1.91 \delta c + 2.09 \delta \Delta T$$

$$0 = -.036 - 1.91 \delta a + 9.47 \delta c - 5.13 \delta \Delta T$$

$$0 = -.025 + 2.09 \delta a - 5.13 \delta c + 5.13 \delta \Delta T$$

$$0 = +.069 + 2.87 \delta a - 1.91 \delta c + 2.09 \delta \Delta T$$

$$-.036 - 1.91 + 9.47 - 5.13$$

$$-.025 + 2.09 - 5.13 + 5.13$$

$$0 = +.024 + .8 \delta a - .665 \delta c + .728 \delta \Delta T$$

$$-.019 - .8 + 4.958 \delta c - 2.686 \delta \Delta T$$

$$-.012 + .8 - 2.455 \delta c + 2.455 \delta \Delta T$$

$$0 = +.005 + 4.293 \delta c - 1.958 \delta \Delta T$$

$$-.031 + 2.503 \delta c - 2.318 \delta \Delta T$$

$$0 = +.0012 + \delta c - .4561 \delta \Delta T$$

$$-.0124 + \delta c - .0923 \delta \Delta T$$

$$0 = +.0136 - .3638 \delta \Delta T$$

$$\delta \Delta T = +.037 - 14.970 = -14.933 \Delta T$$

$$\delta c = +.016 + 2.00 = +.216 C$$

$$\delta a = -.041 + 3.80 = +.339 a$$

Solution for C.E. only with weights

$$0 = +.071 + 2.03 \delta a - .90 \delta c + 1.00 \delta \Delta T$$

$$-.068 - .90 + 5.15 + 2.32$$

$$+.022 + 1.00 + 2.32 + 2.13$$

$$0 = +.0350 + .8 \delta a - .446 \delta c + .493 \delta \Delta T$$

$$-.0756 - .8 + 5.722 \delta c + 2.578 \delta \Delta T$$

$$+.0020 + .8 + 2.320 \delta c + 2.130 \delta \Delta T$$

$$0 = +.0406 + 5.276 \delta c + 3.071 \delta \Delta T$$

$$-.0736 + 5.042 \delta c + 4.708 \delta \Delta T$$

$$0 = -.0077 + \delta c + .5821 \delta \Delta T$$

$$-.0092 + \delta c + .5854 \delta \Delta T$$

$$0 = +.0015 - .0033 \delta \Delta T$$

$$\delta \Delta T = +.454 - 14.970 = -14.516 \Delta T$$

$$\delta c = -.256 + 2.00 = -.056 C$$

$$\delta a = -.373 + 3.80 + .007 a$$

Solution for C = 00

$$0 = -.033 + 1.637 \delta \Delta T$$

$$\delta \Delta T = +.020 - 14.970 = -14.950 \Delta T$$

$$\delta a = -.045 + 3.80 = +.335 a$$

$$\delta c = 0.00 + 2.00 = +.200 c$$

$$0 = +.071 - .757 + 2.30 + .454 = +.755 - .757$$

$$-.068 + .336 - 1.318 + 1.053 = 1.389 - 1.386$$

$$+.002 - .373 - .694 + .967 = 1.969 - .967$$

$$0 = -.002 + .028 + .093 - .121 = .121 - .123$$

$$+.032 - .033 - .397 + .390 = .432 - .430$$

$$-.027 + .036 + .323 - .333 = .4359 - .366$$

$$\delta a = +.024 + 3.80 = +4.04 a$$

$$\delta c = 0.00 + 2.00 = +.200 c$$

Solution for C = 00

$$0 = -.036 + 1.727 \delta \Delta T$$

$$\delta \Delta T = +.021 - 14.970 = -14.949 \Delta T$$

$$\delta a = -.039 + 3.80 = +.341 a$$

$$\delta c = 0.00 + 2.00 = +.200 c$$

$$0 = +.069 - .118 - .030 + .077 = +.146 - .148$$

$$-.036 + .078 + .152 - .190 = +230 - .226$$

$$-.025 - .086 - .082 + .190 = +190 - .193$$

Solution for C.W. only with weights

$$0 = -.002 + .84 \delta a - 1.01 \delta c + 1.09 \delta \Delta T$$

$$+.032 - 1.01 + 4.32 - 3.51$$

$$-.027 + 1.09 - 3.51 + 2.00$$

$$0 = +.0001 + .8 \delta a - 1.202 \delta c + 1.298 \delta \Delta T$$

$$+.0317 - .8 + 4.277 \delta c - 3.475 \delta \Delta T$$

$$-.0248 + .8 - 3.220 \delta c + 2.661 \delta \Delta T$$

$$0 = +.0318 + 3.075 \delta c - 2.177 \delta \Delta T$$

$$+.0369 + 1.057 \delta c - .814 \delta \Delta T$$

$$0 = +.0134 + \delta c - .708 \delta \Delta T$$

$$+.0265 + \delta c - .770 \delta \Delta T$$

$$0 = +.0069 + .062 \delta \Delta T$$

$$\delta \Delta T = -.111 - 14.970 = -15.081 \Delta T$$

$$\delta c = -.092 + 2.00 = +1.08 c$$

$$\delta a = +.033 + 3.80 = +4.13 a$$

Solution for C = 00

$$0 = -.025 + 1.363 \delta \Delta T$$

$$\delta \Delta T = +.019 - 14.970 = -14.951 \Delta T$$

$$\delta a = +.024 + 3.80 = +4.04 a$$

$$\delta c = 0.00 + 2.00 = +.200 c$$

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June 2 1883

C. W. Mem. I = 149 - Δ = -022For C. W. only
 $C = -176$
 $a = +507$ For C. W. only
 $C = -189$
 $a = +456 - \Delta = +14345$

I	-22.6	13.2	+1.7	0	=+1407	-04	+1403	+98 a	+108 C	+50	-19	+31	+14340	+45	-20	+25	+14280	
													+0.15				-0.65	
II	+11.6	12.9	+2.0	0	=+1430	-04	+1426	+52 a	+102 C	+26	-18	+08	+1434	+01	+24	-19	+05	+1431
-	+28.5	13.1	+1.8		1435	-04	1431	+27	1114	+14	-20	-06	1425	-07	+12	-22	-10	1421
	+19.0	13.8	+1.1		1433	-02	1431	+42	+106	+21	-19	+02	1433	00	+19	-20	-01	1430
	+19.7						+1429	+40 a	+107 C				14307				+14273	
													-0.18				-0.72	
III	+56.6	12.8	+2.1	0	=+1513	-05	+1508	-44 a	+182 C	-22	-32	-54	+1454	+22	-20	-34	-54	+1454
	+48.9	13.7	+1.2		1484	-03	1481	-20	+155 C	-10	-27	-37	1444	+11	-09	-29	-38	1443
	+53.2						+1474	-32 a	+168 C				14490					+14485
													+1.65					+140

C. W.

$$X + 71.8 \text{ L.C. } 13.9 + 1.0 \text{ } 0 = +12.35 - 02 + 12.33 + 29.3 a - 3.21 C + 148 + 56 + 2.04 + 14370 + 1.34 + 61 + 1.95 + 14280$$

Equations for a and C

I	C.E. 0 = -1.70	+1.95 a	-4.29 C	0 = -3.31	+3.50 a	-8.37 C	0 = +7.29	-8.37 a	+18.40 C	0 = -11.48	+45.16 a	+66.52 C
II	-1.96	+2.53 a	-4.28 C	-4.96	+6.40 a	-10.83 C	-8.39	-a	+18.32 C	-14.36	+66.52 a	+106.99 C
I	C.E. 0 = -3.1	+2.16 a	+4.23 C	0 = -0.67	+4.66 a	+9.14 C	0 = -1.31	+9.14 a	+17.59 C	0 = -25.42	+a	+147.8 C
	+1.71	-1.67	-1.34	-1.19	+2.79	+2.24	-0.95	+1.80	-2.59	+a	+1.608 C	
	+1.21	-3.60	-3.83	-4.36	+12.46	+13.79	-4.63	+14.67	-4.36	+12.67	C = -2.84	a = +67.3
	+0.10	+1.63	+3.56	+0.16	+2.66	+5.80	+0.36	+12.67	-2.78	+31.02		
	-0.50	+3.18	+5.57	-1.59	+10.11	+17.71	-2.78	+31.02	-1.75	+3.13		
	+9.9	-2.02	-1.77	-2.00	+4.08	+3.57	-1.75	+3.13	-3.30	+2.581		
	-1.65	+2.81	+5.08	-1.83	+7.00	+14.27	-3.30	+2.581	-14.36	+66.52 a	+106.99 C	
				Sum C.E. = -11.48	+45.16	-66.52			0 = +1.32	+47.32 a	+143.71 C	

a and C from

$$C. W. \text{ and } C.E. + 1.32 + 47.32 a + 143.71 C \text{ Sum C.E. } -11.48 + 45.16 a + 66.52 C$$

$$0 = -3.57 + a + 85.5 C$$

$$+0.28 + a + 3.037 C$$

$$0 = -3.55 - 2.182 C$$

$$C.E. \quad C = -176 \quad a = +507$$

For C. E. only

$$C = -284$$

$$a = +673$$

$$-\Delta = +14.410$$

X I	-9.7	14.1 +0.8	0 = +13.66	-02	+13.64	+80 a	-101 C	+41	+18	+59	+1423	-10	+54	+29	+83	+14.97	+06		
	+2.4	14.7 +0.2			13.79	-00	13.79	+64 a	-100 C	+32	+18	+50	1429	-08	+43	+28	+75	1450	+09
X	-15.5	14.7 +0.2			13.70	-00	13.70	+88 a	-104 C	+45	+18	+63	1433	00	+59	+30	+89	1459	+18
	-7.6				+13.71	+77 a	-102 C						+14.283					+144.520	
													-042						+110
X II	+46.6	14.2 +0.7	0 = +13.99	-02	+13.97	-11 a	-146 C	-06	+26	+20	+1417	-15	-07	+41	+34	+14.31	-10		
X	+59.8	14.4 +0.5	+1407	-01	1406	-59 a	-199 C	-30	+35	+05	+1411	-22	-40	+56	+16	1422	-09		
	+53.2				+1402	-35 a	-172 C				+14.140					+14.265			
													-185						-145
X III	+21.7	16.4 -1.5	0 = +13.91	+03	+13.94	+38 a	-105 C	+19	+19	+38	+1432	00	+26	+31	+57	+14.51	+10		
X	+39.1	16.6 -1.7			13.85	+04	13.89	+07 a	-129 C	+04	+23	+27	1416	-17	+05	+37	+42	1431	-10
	+50.4				+13.92	+22 a	-118 C				+14.240					+14.410			+0.00
													-085						
X I	+57.0	16.7 -1.8	0 = +14.12	+04	+14.16	-46 a	-185 C	-23	+32	+09	+14250	-31	+52	+21	+14.370				
													-075						-040

C. E.

I	+71.8	L.C. 13.9	+1.0	0	= +13.42	-02	+13.40	+29.3 a	+321 C	+148	-56	+92	+14320	-025	+197	-91	+106	+14460
	+64.9	14.0	+0.9		14.44	-02	14.42	-90	-236	-46	+42	-04	14380	+055	-81	+67	+06	14480
	+78.1	14.2	+0.7		14.94	-02	14.92	-2.83	-465	-143	+88	-58	14340	+015	-190	+138	-52	14400
	+66.9	L.C. 14.3	+0.6		13.82	-01	13.81	+2.40	+254	+122	-45	+77	14580	+255	+162	-72	+90	14710
	+77.3	L.C. 15.1	-0.2		13.21	+00	13.21	+3.95	+455	+200	-80	+120	14410	+085	+266	-129	+137	14580
	+67.0	16.5	-1.6		14.67	+03	14.70	-1.25	-279	-63	+49	-14	14560	+235	-84	+79	-05	14650
	+67.9	L.C. 16.5	-1.6		13.03	+03	13.06	+3.58	+406	+182	-71	+111	14170	-155	+241	-115	+126	14320
													-0.90					-0.90

C. W. after reversal

I	+14.5	17.1	-2.2	0	= +14.22	+05	+14.27	+49 a	+104 C	+25	-18	+07	+1434	-10	+02	+21	+103	+1434
	+52.4	17.5	-2.6		14.98	+06	15.04	-2.8 a	+164	-14	-29	-43	14.61	+26	+28	-51	+103	14.35
	+12.6	17.5	-2.6		14.33	+06	14.39	+52 a	+103	+26	-18	+08	14.47	+13	+15	-31	+05	14.47
	+26.5						+14.57	+24 a	+124 C				+14.473					+14.473
													+1.48					+1.28

C. W.

$$+52.2 - 16.9 - 20 = +18.13 + 04 + 19.17 - 474 a + 740 C - 273 - 161 - 434 + 14830 - 330 - 223 - 553 + 12.64$$

Without weights
C.E. + C.W.

$a = +500$

$C = -176$

$\Delta T = -14.302$

With weights
C.E. + C.W.

$a = +542 + 509$

$C = -206 - 167$

$\Delta T = -14.355 + 14.346$

With weights
C.W. only

$a = +970 + 683$

$C = +113 - 834$

$\Delta T = -14.816 - 14.547$

Without weights
C.E. + C.W.

$a = +510$

$\Delta T = -14.356$

$C = -176$

With weights
C.E. + C.W.

$a = +512$

$\Delta T = -14.342$

$C = -176$

With weights
C.W. only

$a = +520$

$\Delta T = -14.370$

$C = -189$

$$+490 - 190 + 300 - 1400 + 03 + 531 - 222 + 309 - 1405 - 02 + 951 + 122 + 1073 - 1374 + 29 + 500 - 1386 - 02 + 502 - 1384 + 00 + 510 - 1386 - 03$$

$$+260 - 179 + 081 - 1422 + 04 + 282 - 210 + 072 - 1428 - 02 + 504 + 115 + 619 - 1420 + 06 + 264 - 1409 - 01 + 266 - 1408 + 00 + 270 - 1410 - 03$$

$$+135 - 201 - 166 - 1437 - 06 + 146 - 235 - 089 - 1444 - 13 + 262 + 129 + 391 - 1442 - 11 + 138 - 1422 - 11 + 138 - 1420 - 09 + 140 - 1423 - 14$$

$$+210 - 187 + 023 - 1428 + 03 + 228 - 218 + 010 - 1434 - 03 + 407 + 120 + 527 - 1429 + 02 + 214 - 1414 - 02 + 215 - 1413 - 01 + 218 - 1415 - 04$$

$$-220 - 320 - 546 - 1484 + 24 - 238 - 375 - 613 - 1497 + 11 - 427 + 206 - 221 - 1504 + 04 - 224 - 1458 + 18 - 225 - 1454 + 19 - 229 - 1460 + 14$$

$$-180 - 273 - 373 - 1468 + 13 - 108 - 319 - 427 - 1478 + 03 - 194 + 175 - 019 - 1484 - 03 - 102 - 1446 + 08 - 102 - 1444 + 10 - 104 - 1447 + 05$$

$$+1465 + 565 + 2030 - 1229 + 06 + 1588 + 661 + 2249 - 1211 + 22 + 2842 - 363 + 2479 - 1234 - 01 + 1494 - 1286 + 03 + 1580 - 1284 + 05 + 1524 - 1285 + 09$$

$$a \text{ and } C \text{ from C.W.}$$

$$C = -176 + 1.95a - 4.29C$$

$$C = -176 + 2.53a - 4.25C$$

$$C = -3963 + 435a - C$$

$$-4583 + 591a - C$$

$$C = -1620 + 1.36a$$

$$a = +456 \quad C = -189$$

With weights
C.E. only

$a = +617$

$C = -254$

$\Delta T = -14.401$

With weights
C.E. only

$a = +660$

$\Delta T = -14.443$

$C = -254$

$$+400 + 178 + 578 - 1372 - 08 + 434 + 208 + 692 - 1371 - 07 + 494 + 256 + 750 - 1365 - 01 + 408 - 1395 - 13 + 410 - 1393 - 11 + 528 - 1392 + 03$$

$$+320 + 176 + 496 - 1381 - 02 + 347 + 206 + 553 - 1380 - 01 + 395 + 254 + 649 - 1375 + 04 + 326 - 1403 - 06 + 328 - 1401 - 04 + 422 - 1402 + 05$$

$$+440 + 183 + 623 - 1368 + 02 + 477 + 214 + 691 - 1366 + 04 + 543 + 264 + 807 - 1359 + 11 + 449 - 1391 - 03 + 450 - 1389 - 01 + 581 - 1386 + 14$$

$$-55 + 257 + 202 - 1410 - 14 - 60 + 301 + 241 - 1411 - 14 - 068 + 371 + 303 - 1410 - 13 - 56 - 1441 - 18 - 56 - 1440 - 17 - 73 - 1452 - 14$$

$$-295 + 350 + 055 - 1425 - 19 - 320 + 410 + 090 - 1426 - 20 - 364 + 505 + 141 - 1426 - 20 - 301 - 1466 - 25 - 302 - 1464 - 23 - 389 - 1483 - 21$$

$$+190 + 190 + 380 - 1392 + 02 + 206 + 222 + 428 - 1393 + 01 + 334 + 274 + 608 - 1379 + 15 + 194 - 1416 - 03 + 194 - 1415 - 02 + 251 - 1419 + 06$$

$$+35 + 227 + 262 - 1404 - 15 + 38 + 266 + 304 - 1405 - 16 + 43 + 328 + 371 - 1403 - 14 + 36 - 1432 - 20 + 36 - 1431 - 19 + 42 - 1440 - 14$$

$$-230 + 326 + 096 - 1421 - 05 - 249 + 381 + 132 - 1422 - 06 - 284 + 470 + 186 - 1422 - 06 - 235 - 1459 - 11 - 235 - 1458 - 10 - 304 - 1455 - 07$$

$$+1465 - 565 + 960 - 1340 + 00 + 1588 - 661 + 927 - 1343 - 03 + 1808 - 815 + 993 - 1341 - 01 + 1494 - 1286 - 02 + 1580 - 1284 + 00 + 1934 - 1281 - 02$$

$$-450 + 415 - 035 - 1434 + 08 - 488 + 486 - 502 - 1436 + 04 - 555 + 599 + 044 - 1436 + 06 - 459 - 1482 + 02 - 461 - 1480 + 04 - 574 - 1504 + 09$$

$$-1415 + 854 - 561 - 1486 + 06 - 1534 + 999 - 535 - 1489 + 03 - 1746 + 1232 - 514 - 1491 + 01 - 1443 - 1580 - 03 - 1449 - 1579 - 02 - 1868 - 1631 - 01$$

$$+1200 - 447 + 753 - 1385 + 26 + 1301 - 523 + 778 - 1388 + 23 + 1481 - 645 + 836 - 1356 + 25 - 1142 - 1321 + 15 + 1229 - 1311 + 25 + 1584 - 1286 + 23$$

$$+1975 - 801 + 1174 - 1313 + 08 + 2141 - 937 + 1204 - 1315 + 06 + 2437 - 1156 + 1281 - 1312 + 04 + 2014 - 1234 + 07 + 2022 - 1232 + 09 + 2607 - 1184 + 08$$

$$-625 + 491 - 134 - 1419 + 26 - 677 + 575 - 102 - 1446 + 24 - 771 + 709 - 062 - 1496 + 24 - 638 - 1499 + 20 - 640 - 1478 + 21 - 825 - 1527 + 22$$

$$+1790 - 715 + 1075 - 1323 - 17 + 1940 - 836 + 1104 - 1325 - 19 + 2209 - 1031 + 1178 - 1322 - 16 + 1826 - 1253 - 18 + 1833 - 1251 - 16 + 2368 - 1206 - 17$$

$$+245 - 183 + 062 - 1424 + 03 + 266 - 214 + 052 - 1430 - 03$$

$$-140 - 289 - 429 - 1473 + 31 - 152 - 338 - 490 - 1484 + 20$$

$$+260 - 181 + 079 - 1422 + 17 + 282 - 212 + 070 - 1428 + 11$$

$$+250 - 1411 - 02 + 251 - 1409 + 00$$

$$-143 - 1450 + 25 - 143 - 1448 + 27$$

$$+265 - 1409 + 12 + 266 - 1408 + 13$$

June 21

For Equations for June 2 see page 47

June 4 Equations for a and c from b and c W.

<u>b</u>												
I	0	+1.75	-2.64 a	+2.87 c	0 = -	4.67	+6.97 a	-6.26 c	0 = +	4.19	-6.26 a	+5.62 c
		-1.52	+2.11	-4.37		-1.10	+4.55	-9.22		+2.27		+19.10
		-1.79	+2.03	-4.26		-1.60	+4.12	-8.65		+3.37		+15.15
		-1.59	+3.61	-6.34		-5.74	+13.03	-22.89		+10.08		+40.19
II		+1.84 ²⁹	-2.14	+2.36		-2.80	+4.58	-5.05		+3.09		+5.57
		98	+2.61	-4.38		-2.56	+6.81	-11.43		+4.29		+19.18
		-1.25	+2.53	-4.27		-3.16	+6.40	-10.80		+5.34		+18.23
		-2.09 ⁵	+4.11	-6.35		-8.59	+16.59	-26.10		+13.27		+40.32
II		+1.28	-2.11	+2.31		-2.70	+4.55	-4.87		+2.96		+5.34
		-1.01	+2.64	-4.43		-2.67	+6.97	-11.70		+4.52		+19.62
		-1.28	+2.56	-4.32		-3.28	+6.55	-11.06		+5.53		+15.66
		-2.12 ⁰⁸	+4.14	-6.40		-8.78	+17.14	-26.49		+13.57		+42.50
<u>b</u>												
I		+4.58	-3.72	-3.81		-17.04	+13.84	+14.17		-17.45	+14.17 a	+14.52
		-2.06	+1.51	+3.58		-3.11	+2.28	+5.41		-7.37		+12.82
		+2.97	-2.90	-2.73		-8.61	+8.41	+7.92		-8.11		+7.45
		+4.56	-3.74	-3.83		-17.05	+13.98	+14.32		-17.46		+14.67
		+3.67	-3.22	-3.14		-11.82	+10.36	+10.11		-11.52		+9.86
II		+4.20	-3.35	-3.82		-14.07	+11.22	+12.80		-16.04		+14.59
		-2.44	+1.88	+3.57		-4.59	+2.53	+6.71		-8.71		+12.74
		+2.59	-2.53	-2.74		-6.55	+6.40	+6.93		-7.10		+7.51
		+4.18	-3.37	-3.84		-14.09	+11.36	+12.94		-16.05		+14.75
		+3.29	-2.85	-3.15		-9.38	+8.12	+8.98		-10.36		+9.92

June 4 1883

6.6. Mean $\Pi = 14.6$ $-h = -.017$ C = +.26
a = +.89 $-M = +13.375$

Σ	-226	13.2 + 14	0 = +1224	-.02	+1222	+98a	+1.08c	+1.87	+28	+1.15	+13.37	+0.00
Σ	-105	13.3 + 1.3	12.35	-.02	12.33	+81a	+1.02c	+72	+27	+99	13.32	-.05
	-16.5				+12.28	+90a	+1.05c				+13.350	-.025

Σ	+11.6	12.9 + 1.7	0 = +1269	-.03	+1266	+52a	+1.02c	+46	+27	+73	+13.39	+0.02
Σ	+28.5	13.1 + 1.5	12.92	-.03	12.89	+27a	+1.14c	+24	+30	+54	13.43	+0.05
Σ	+19.0	13.8 + .8	12.68	-.01	12.67	+42a	+1.02c	+37	+27	+64	13.31	-.06
	+19.7				+12.74	+40a	+1.06c				+13.377	+0.02

Σ	+56.6	12.8 + 1.8	0 = +1324	-.03	+1321	-44a	+1.82c	-39	+47	+08	+13.29	-.08
Σ	+49.9	13.7 + .9	13.10	-.02	13.08	-20a	+1.55c	-18	+40	+22	13.30	-.08
Σ	+64.9	14.0 + .6	13.46	-.01	13.45	-90a	+2.36c	-80	+61	-19	13.26	-.11
	+54.1				+13.25	-51a	+1.91c				+13.283	-.092

Σ	+39.1	16.6 - 2.0	0 = +1298	+0.3	+1301	+07a	+1.29c	+06	+34	+40	+13.41	+0.04
Σ	+9.5	16.9 - 2.3	12.56	+0.4	12.60	+55a	+1.01c	+49	+26	+75	13.35	-.03
Σ	+14.5	17.1 - 2.5	12.67	+0.4	12.71	+48a	+1.03c	+43	+27	+70	13.41	+0.04
	+21.0				+12.77	+37a	+1.11				+13.390	+0.15

6.6.

Σ	+73.0	13.4 + 1.2	0 = +1405	-.02	+1403	-174a	+3.42c	-155	+89	-.66	+13.37	-.005
Σ	+72.5	13.4 + 1.2	11.78	-.02	11.76	+3.01a	-3.82c	+269	-112	+1.57	13.33	-.045
Σ	+71.9	13.9 + .7	11.50	-.01	11.49	+293a	-3.21c	+2.61	-.83	+1.78	13.27	-.105
Σ	+79.1	17.0 - 2.4	10.65	+0.4	10.69	+4.51a	-5.29c	+4.01	-1.38	+2.63	13.32	-.055

See page 8 for Equations for a and c

6.8

Σ	-9.7	14.1 + .5	0 = +1303	-.01	+1302	+80a	-1.01c	+71	-26	+45	+13.47	+0.00
Σ	-15.5	14.7 - .1	12.73	+0.0	12.73	+88a	-1.04c	+78	-27	+51	13.24	-.14
Σ	-22.3	15.9 - 1.3	12.80	+0.2	12.82	+98a	-1.08c	+87	-28	+59	13.41	+0.04
	-19.2				+12.86	+89a	-1.04c				+13.373	-.002

Σ	+2.5	14.7 - .1	0 = +1312	+0.0	+1312	+64a	-1.00c	+56	-26	+30	+13.42	+0.05
Σ	+17.4	16.3 - 1.7	13.33	+0.3	+13.36	+41a	-1.06c	+36	-28	+08	13.44	+0.06
	+14.0				+13.29	+52a	-1.03c				+13.430	+0.055

Σ	+64.9	14.0 + .6	0 = +1492	-.01	+1491	-90a	-2.36c	-80	-61	-141	+13.50	+0.13
Σ	+46.6	14.2 + .4	13.76	-.01	13.75	-.11a	-1.46c	-10	-38	-48	13.47	+0.09
Σ	+59.8	14.8 - .2	14.45	+0.0	14.45	-.59a	-1.99c	-53	-52	-105	13.40	+0.03
Σ	+58.9	16.0 - 1.4	14.29	+0.2	14.31	-.55a	-1.93c	-49	-50	-99	13.32	-.06
	+57.6				+14.40	-.54a	-1.73c				+13.422	+0.047

6.8

Σ	+78.1	14.2 + .4	0 = +1745	-.01	+1744	-283a	-4.85c	-252	-126	-378	+13.66	+2.85
Σ	+66.7	14.3 + .1	10.80	-.00	10.80	+240a	+2.54c	+200	+66	+266	13.46	+0.85
Σ	+74.6	14.9 - .3	15.82	+0.1	15.83	-2.01a	-3.77c	-1.80	-98	-278	13.05	-3.25
Σ	+82	15.8 - 1.2	17.40	+0.2	17.42	-2.85a	-4.87c	-2.54	-127	-3.81	13.61	+2.35
Σ	+76.2	16.2 - 1.6	16.50	+0.3	16.53	-2.33a	-4.18c	-2.07	-109	-3.16	13.37	-.005

Without weights. C.E. and C.W.	With Weights. C.E. and C.W.	With Weights. C.E. only	Without Weights C.E. and C.W.	With Weights C.E. and C.W.	With Weights C.E. only
$a = +.907$ $c = +.263$ $\Delta T = -13.379$	$a = +.903$ $c = +.261$ $\Delta T = -13.370$	$a = +.877$ $c = +.208$ $\Delta T = -13.267$	$a = +.900$ $\Delta T = -13.382$ $c = +.260$	$a = +.904$ $\Delta T = -13.380$ $c = +.260$	$a = +.892$ $\Delta T = -13.349$ $c = +.260$
+ 889 +284 +1173 -12.21 +.01 + 735 +268 +1003 -12.38 -.05	+ 885 +293 +1178 -12.20 +.02 + 731 +276 +1007 -12.36 -.03	801 +225 +1026 -12.24 -.03 662 +212 +874 -12.39 -.06	882 -12.50 +.00 729 -12.65 -.05	+ 886 -12.49 +.01 + 732 -12.65 -.05	+ 874 -12.48 -.02 + 723 -12.63 -.03
+ 472 +268 +740 -12.64 +.02 + 245 +300 +545 -12.83 +.06 + 381 +268 +649 -12.73 -.07	+ 470 +276 +746 -12.62 +.04 + 244 +309 +553 -12.82 +.07 + 379 +276 +655 -12.72 -.05	425 +212 +637 -12.63 +.03 221 +237 +458 -12.81 +.08	+ 468 -12.98 +.02 + 243 -13.14 +.05 + 378 -13.00 -.06	+ 471 -12.91 +.02 + 244 -13.14 +.05 + 380 -13.00 -.06	+ 464 -12.88 +.05 + 241 -13.11 +.08 + 375 -12.97 -.03
- 399 +479 +080 -13.30 -.09 - 181 +408 +227 -13.15 -.07 - 816 +621 -195 -13.57 -.12	- 397 +493 +096 -13.27 -.06 - 181 +420 +239 -13.13 -.05 - 813 +640 -173 -13.54 -.09	- 359 +378 +019 -13.25 -.04 - 163 +322 +159 -13.11 -.03 - 735 +491 -244 -13.51 -.06	- 396 -13.78 -.10 - 180 -13.56 -.08 - 910 -14.19 -.13	- 398 -13.78 -.10 - 181 -13.56 -.08 - 814 -14.19 -.13	- 392 -13.74 -.06 - 178 -13.53 -.05 - 803 -14.15 -.09
+ 63 +339 +402 -12.98 +.03 + 499 +266 +765 -12.61 -.01 + 435 +270 +706 -12.67 +.04	+ 63 +350 +413 -12.96 +.05 + 497 +274 +771 -12.60 +.00 + 433 +279 +712 -12.66 +.05	57 +268 +325 -12.94 +.07 449 +210 +659 -12.61 -.01 392 +214 +606 -12.66 +.05	+ 63 -13.32 +.03 + 495 -12.89 -.03 + 432 -12.95 +.03	+ 63 -13.32 +.03 + 497 -12.88 -.02 + 434 -12.95 +.03	+ 62 -13.29 +.06 + 491 -12.86 +.00 + 428 -12.92 +.06
- 1578 +899 -679 -14.06 -.03 + 2730 -873 +1857 -11.52 +.24 + 2657 -844 +1813 -11.57 -.08 + 4091 -1390 +2700 -10.68 +.01	- 1571 +927 -644 -14.01 +.02 + 2718 -800 +1818 -11.55 +.21 + 2646 -870 +1776 -11.57 -.10 + 4072 -1434 +2638 -10.73 -.04	1422 +7.11 -7.11 -13.98 +.05 2459 -690 +769 -11.50 +.26 2394 -668 +726 -11.54 +.05 3685 -1100 +2585 -10.68 +.01	1566 -14.95 -.03 1067 -03 +.27 2037 -10.74 -.08 4057 -9.32 -.01	1573 -14.95 -.03 + 2721 -10.66 -.02 + 2649 -10.73 -.07 + 4077 -9.30 +.01	1552 -14.70 +.02 + 2685 -10.66 -.02 + 2614 -10.73 -.07 + 4023 -9.33 -.02
			With Weights C. Only		With Weights C. Only
			$a = +.863$ $c = +.281$ $\Delta T = -13.375$		$a = +.906$ $\Delta T = -13.447$ $c = +.265$
+ 726 -266 +460 -12.92 +.10 + 798 -273 +525 -12.85 -.12 + 889 -284 +605 -12.77 +.05	+ 722 -274 +448 -12.92 +.10 + 795 -282 +518 -12.86 -.13 + 885 -293 +592 -12.78 +.04	706 -284 +422 -12.95 +.07 777 -292 +485 -12.89 -.16 865 -303 +562 -12.81 +.01	+ 720 -12.66 +.10 + 792 -12.59 +.13 + 882 -12.50 +.04	+ 723 -12.66 +.10 + 796 -12.58 -.12 + 886 -12.49 +.05	+ 725 -12.68 +.08 + 794 -12.61 -.15 + 888 -12.52 +.02
+ 580 -263 +317 -13.06 +.06 + 372 -279 +093 -13.29 +.07	+ 578 -271 +307 -13.06 +.06 + 370 -287 +083 -13.29 +.07	565 -281 +284 -13.09 +.03 362 -298 +064 -13.31 +.05	+ 576 -12.81 +.05 + 369 -13.01 +.07	+ 579 -12.80 +.06 + 371 -13.01 +.07	+ 580 -12.83 +.03 + 371 -13.04 +.04
- 816 -621 -1437 -14.82 +.09 - 100 -384 -484 -13.86 +.09 - 535 -523 -1058 -14.44 +.01 - 499 -508 -1007 -14.39 -.08	- 873 -640 -1453 -14.82 +.09 - 99 -396 -495 -13.86 +.09 - 533 -539 -1072 -14.44 +.01 - 477 -523 -1020 -14.39 -.08	795 -663 -1458 -14.83 +.08 97 -410 -507 -13.88 +.07 521 -559 -1080 -14.46 -.01 486 -542 -1028 -14.40 -.09	810 -14.19 +.11 99 -13.48 +.09 1391 +.02 1388 -.07	- 814 -14.19 +.11 - 99 -13.48 +.09 - 523 -13.91 +.02 - 447 -13.88 -.07	- 815 -14.22 +.08 - 100 -13.51 +.06 - 535 -13.94 -.01 - 448 -13.90 -.09
- 2567 -1276 -3843 -17.22 +.22 + 2177 +668 +2845 -10.53 +.27 - 1823 -991 -1814 -18.19 +.54 - 2585 -1281 -3866 -17.24 +.18 - 2113 -1099 -3212 -16.57 -.06	- 2555 -1314 -3869 -17.24 +.20 + 2167 +688 +2855 -10.52 +.28 - 1815 -1022 -2837 -16.21 -3.8 - 2574 -1320 -3894 -17.26 +.16 - 2104 -1133 -3227 -16.61 -.08	2499 -1363 -3862 -17.24 +.20 2117 +714 +2833 -10.54 +.26 1775 -1059 -2834 -16.21 -3.8 2516 -1368 -3884 -17.26 +.16 2057 -1175 -3232 -16.62 -.09	- 1593 +.25 1122 +.24 1809 -34 2565 +.20 2094 -04	- 2558 -15.44 +.24 + 2170 -11.21 +.25 - 1817 -15.20 +.35 - 2576 -15.74 +.19 - 2106 -15.49 -.05	- 2564 -15.97 +.21 + 2174 -11.23 +.23 - 1821 -15.23 +.38 - 2582 -15.79 +.16 - 2111 -15.52 -.08

June 4

Original Equations

Without rights

With rights

$\begin{matrix} -16.5 \\ +19.7 \\ +57.1 \\ +21.0 \\ +73.0 \\ +72.5 \text{ L.C.} \\ +71.9 \text{ L.C.} \\ +79.1 \text{ L.C.} \end{matrix}$	$\begin{matrix} 0 = -.025 \\ +.002 \\ -.092 \\ +.015 \\ -.005 \\ -.045 \\ -.105 \\ -.055 \end{matrix}$	$\begin{matrix} +.908a \\ +.40 \\ -.57 \\ +.37 \\ -.174 \\ +.301 \\ +.293 \\ +.451 \end{matrix}$	$\begin{matrix} +1.058e \\ +1.06 \\ +1.91 \\ +1.11 \\ +.342 \\ -.332 \\ -.321 \\ -.529 \end{matrix}$	$\begin{matrix} + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$	$\begin{matrix} 14 \text{ } 1.3 \\ 17 \text{ } 1.7 \\ 16 \text{ } 1.5 \\ 17 \text{ } 1.7 \\ 17 \text{ } 1.5 \\ 16 \text{ } .4 \\ 16 \text{ } .4 \\ 16 \text{ } .3 \end{matrix}$	$\begin{matrix} \text{L.C.O.} = -.035 \\ +.003 \\ -.147 \\ +.026 \\ -.004 \\ -.027 \\ -.063 \\ -.033 \end{matrix}$	$\begin{matrix} +1.268a \\ +.68 \\ -.82 \\ +.63 \\ -.122 \\ +1.81 \\ +1.76 \\ +2.71 \end{matrix}$	$\begin{matrix} +1.478e \\ +1.80 \\ +3.06 \\ +1.89 \\ +2.39 \\ -1.99 \\ -1.93 \\ -3.17 \end{matrix}$	$\begin{matrix} +1.408\delta \Delta T \\ +1.70 \\ +1.60 \\ +1.70 \\ +.70 \\ +.60 \\ +.60 \\ +.60 \end{matrix}$
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$\begin{matrix} \text{L.W. } 192 \\ +11.0 \\ +57.6 \\ +78.1 \\ +66.9 \text{ L.C.} \\ +74.6 \\ +78.2 \\ +76.2 \end{matrix}$	$\begin{matrix} 0 = -.002 \\ +.055 \\ +.047 \\ +.285 \\ +.085 \\ -.325 \\ +.235 \\ -.005 \end{matrix}$	$\begin{matrix} +.898a \\ +.52 \\ -.54 \\ -.283 \\ +2.40 \\ -.201 \\ -.285 \\ -.233 \end{matrix}$	$\begin{matrix} -1.048e \\ -.103 \\ -.193 \\ -.485 \\ +2.54 \\ -.377 \\ -.487 \\ -.418 \end{matrix}$	$\begin{matrix} + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$	$\begin{matrix} 17 \text{ } 1.6 \\ 13 \text{ } 1.4 \\ 18 \text{ } 1.7 \\ 17 \text{ } .4 \\ 16 \text{ } .5 \\ 17 \text{ } .5 \\ 17 \text{ } .4 \\ 17 \text{ } .5 \end{matrix}$	$\begin{matrix} \text{L.W.O.} = -.003 \\ +.072 \\ +.085 \\ +.200 \\ +.051 \\ -.228 \\ +.164 \\ -.004 \end{matrix}$	$\begin{matrix} +1.518a \\ +.68 \\ -.97 \\ +1.98 \\ +1.44 \\ -.141 \\ -.200 \\ -.163 \end{matrix}$	$\begin{matrix} -1.778e \\ -1.34 \\ -3.47 \\ -3.40 \\ +1.52 \\ -.264 \\ -.341 \\ -.293 \end{matrix}$	$\begin{matrix} +1.708\delta \Delta T \\ +1.30 \\ +1.80 \\ +.70 \\ +.60 \\ +.70 \\ +.70 \\ +.70 \end{matrix}$
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$0 = +.065 + 3.128a - 22.408e + 16.00\delta \Delta T$

Solution for L.C. and L.W. without rights

$\begin{matrix} \text{L.C. } 0 = -.023 \\ +.501 \\ +.047 \\ +.506 \\ +.507 \\ -.135 \\ -.308 \\ -.248 \end{matrix}$	$\begin{matrix} +.818a \\ +.16 \\ +.26 \\ +.14 \\ +.303 \\ +.906 \\ +.858 \\ +20.34 \end{matrix}$	$\begin{matrix} +.948e \\ +.42 \\ -.97 \\ +.41 \\ -.595 \\ -.999 \\ -.941 \\ -.2386 \end{matrix}$	$\begin{matrix} +.908\delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$
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$\begin{matrix} \text{L.C.O.} = -.026 \\ +.502 \\ -.176 \\ +.017 \\ -.017 \\ +.149 \\ +.337 \\ +.291 \end{matrix}$	$\begin{matrix} +.948a \\ +.12 \\ +3.65 \\ +1.23 \\ +11.70 \\ +11.02 \\ +10.30 \\ +27.98 \end{matrix}$	$\begin{matrix} +1.108e \\ +1.06 \\ +3.72 \\ +23.52 \\ +6.45 \\ +14.21 \\ +23.72 \\ +17.47 \end{matrix}$	$\begin{matrix} +1.058\delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$
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$\begin{matrix} \text{L.W. } 0 = -.002 \\ +.029 \\ -.025 \\ -.807 \\ +.204 \\ +.653 \\ -.670 \\ +.012 \end{matrix}$	$\begin{matrix} +.798a \\ +.27 \\ +.29 \\ +.801 \\ +.576 \\ +.404 \\ +.812 \\ +.543 \end{matrix}$	$\begin{matrix} -.938e \\ -.54 \\ +1.04 \\ +13.73 \\ +6.10 \\ +7.58 \\ +13.88 \\ +9.74 \end{matrix}$	$\begin{matrix} +.898\delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$
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$\begin{matrix} \text{L.W.O.} = +.002 \\ -.057 \\ -.091 \\ -.1382 \\ +.216 \\ +12.25 \\ -.1144 \\ +.021 \end{matrix}$	$\begin{matrix} -.938a \\ +1.06 \\ +3.72 \\ +23.52 \\ +6.45 \\ +14.21 \\ +23.72 \\ +17.47 \end{matrix}$	$\begin{matrix} +1.088e \\ +1.06 \\ +3.72 \\ +23.52 \\ +6.45 \\ +14.21 \\ +23.72 \\ +17.47 \end{matrix}$	$\begin{matrix} -1.040\delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \\ + \delta \Delta T \end{matrix}$
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$0 = -.633 + 2.198a + 15.333e - 22.40\delta \Delta T$

$\begin{matrix} 0 = -1.257 \\ -.633 \\ +.065 \end{matrix}$	$\begin{matrix} +75.998a \\ +2.198a \\ +3.128a \end{matrix}$	$\begin{matrix} +2.198e \\ +15.333e \\ -22.40\delta \Delta T \end{matrix}$	$\begin{matrix} +3.128\delta \Delta T \\ -22.40\delta \Delta T \\ +16.00\delta \Delta T \end{matrix}$
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$\begin{matrix} 0 = -.017 \\ -.289 \\ +.021 \end{matrix}$	$\begin{matrix} +\delta a \\ +\delta a \\ +\delta a \end{matrix}$	$\begin{matrix} +.0298e \\ +72.7538e \\ -.71798e \end{matrix}$	$\begin{matrix} +.042\delta \Delta T \\ -10.228\delta \Delta T \\ +5.128\delta \Delta T \end{matrix}$
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$\begin{matrix} 0 = +.272 \\ -.311 \end{matrix}$	$\begin{matrix} -72.7248e \\ +79.932e \end{matrix}$	$\begin{matrix} +10.270\delta \Delta T \\ -15.356\delta \Delta T \end{matrix}$
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$\begin{matrix} 0 = +.0037 \\ -.0039 \end{matrix}$	$\begin{matrix} -\delta e \\ +\delta e \end{matrix}$	$\begin{matrix} +.1412\delta \Delta T \\ -.1921\delta \Delta T \end{matrix}$
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$0 = -.0002 - .0509\delta \Delta T$

$\delta \Delta T = -.004 - 13.375 = -13.379 \Delta T$

$\delta e = +.003 + 260 = +.263 e$

$\delta a = +.017 + 890 = +907 a$

Solution for $c = 0$

$0 = +.038 + 5.086\delta \Delta T$

$\delta \Delta T = -.007 - 13.375 = -13.382 \Delta T$

$\delta a = +.010 + 890 = +900 a$

$\delta e = +.000 + 260 = +.260 e$

$0 = -1.257 + 996 + .006 - .012 = +1.002 - 1.269$
$-.633 + .437 + .478 + .090 + .605 - .633$
$+ .065 + .053 - .067 - .064 + .118 - .131$

Solution for C.C. and C.W. with rights.

$$\begin{aligned}
 C.C.0 = & \begin{array}{r} -0.044 + 1.59\delta a + 1.85\delta e + 1.76\delta \Delta T \\ +.082 + .46 + 1.22 + 1.16 \\ +.121 + .67 - 2.51 - 1.31 \\ +.016 + .40 + 1.19 + 1.07 \\ +.885 + 1.49 - 2.92 - .85 \\ -.049 + 3.28 - 3.60 + 1.09 \\ -.111 + 3.10 - 3.40 + 1.06 \\ -.089 + 7.34 - 8.59 + 1.63 \end{array} \\
 0 = & \begin{array}{r} -.051 + 1.85\delta a + 2.16\delta e + 2.06\delta \Delta T \\ +.005 + 3.24 + 2.06 \\ -.450 + 9.36 + 4.90 \\ +.049 + 3.57 + 3.21 \\ -.010 + 5.71 + 1.67 \\ +.054 + 3.96 - 1.19 \\ +.122 + 8.72 - 1.16 \\ +.105 + 10.25 - 1.90 \end{array} \\
 0 = & \begin{array}{r} -.049 + 1.76\delta a + 2.06\delta e + 1.96\delta \Delta T \\ +.005 + 3.24 + 2.06 \\ -.235 + 9.36 + 4.90 \\ +.044 + 3.57 + 3.21 \\ -.003 + 5.71 + 1.67 \\ -.016 + 3.96 - 1.19 \\ -.038 + 8.72 - 1.16 \\ -.020 + 10.25 - 1.90 \end{array}
 \end{aligned}$$

$$\begin{aligned}
 C.W.0 = & \begin{array}{r} -.005 + 2.28\delta a - 2.67\delta e + 2.57\delta \Delta T \\ +.049 + .46 - .91 + .88 \\ -.082 + .94 + 3.37 - 1.75 \\ -.396 + 3.92 + 6.73 - 1.39 \\ +.073 + 2.67 + 2.19 + .86 \\ +.321 + 1.99 + 3.72 - .99 \\ +.228 + 4.00 + 6.82 - 1.40 \\ +.007 + 2.66 + 4.78 - 1.14 \end{array} \\
 0 = & \begin{array}{r} +.005 - 2.67\delta a + 3.13\delta e - 3.01\delta \Delta T \\ -.096 + 1.80 - 1.74 \\ -.295 + 12.04 - 6.25 \\ -.680 + 11.56 - 2.38 \\ +.078 + 2.31 + .91 \\ +.602 + 6.97 - 1.85 \\ -.559 + 11.63 - 2.39 \\ +.012 + 8.58 - 3.05 \end{array} \\
 0 = & \begin{array}{r} -.005 + 2.57\delta a - 3.01\delta e + 2.89\delta \Delta T \\ +.094 + 1.80 - 1.74 \\ +.153 + 12.04 - 6.25 \\ +.140 + 11.56 - 2.38 \\ +.031 + 2.31 + .91 \\ +.160 + 6.97 - 1.85 \\ +.115 + 11.63 - 2.39 \\ -.003 + 8.58 - 3.05 \end{array} \\
 0 = & \begin{array}{r} -.510 + 3.65\delta a + 7.27\delta e + 3.25\delta \Delta T \\ -1.109 + 7.27\delta a + 9.79\delta e - 8.11\delta \Delta T \\ +.053 + 3.25\delta a - 8.11\delta e + 22.01\delta \Delta T \end{array} \\
 0 = & \begin{array}{r} -1.109 + 7.27\delta a + 9.79\delta e - 8.11\delta \Delta T \\ +.053 + 3.25\delta a - 8.11\delta e + 22.01\delta \Delta T \end{array}
 \end{aligned}$$

$$\begin{aligned}
 0 = & \begin{array}{r} -.510 + 3.65\delta a + 7.27\delta e + 3.25\delta \Delta T \\ -1.109 + 7.27\delta a + 9.79\delta e - 8.11\delta \Delta T \\ +.053 + 3.25\delta a - 8.11\delta e + 22.01\delta \Delta T \end{array}
 \end{aligned}$$

$$\begin{aligned}
 0 = & \begin{array}{r} -.014 + \delta a + 1.17\delta e + .089\delta \Delta T \\ -.153 + \delta a + 13.74\delta e - 1.116\delta \Delta T \\ +.016 + \delta a - 2.495\delta e + 6.772\delta \Delta T \end{array}
 \end{aligned}$$

$$\begin{aligned}
 0 = & \begin{array}{r} +.139 - 13.609\delta e + 1.205\delta \Delta T \\ -.169 + 16.221\delta e - 7.888\delta \Delta T \end{array}
 \end{aligned}$$

$$\begin{aligned}
 0 = & \begin{array}{r} +.0102 - \delta e + .0885\delta \Delta T \\ -.0104 + \delta e - .0487\delta \Delta T \end{array}
 \end{aligned}$$

$$0 = -.0002 + .0398\delta \Delta T$$

$$\delta \Delta T = +.005 - 13.375 - 13.370 \Delta T$$

$$\delta e = +.011 + .260 + .271 e$$

$$\delta a = +.013 + .890 + .903 a$$

Solution for C = 00

$$0 = +.030 + 5.683\delta \Delta T$$

$$\delta \Delta T = -.005 - 13.375 = -13.380$$

$$\delta a = +.014 + .890 = +.904$$

$$\delta e = 000 + .260 = +.260$$

$$\begin{aligned}
 0 = & \begin{array}{r} -.510 + 4.476 + .060 + .016 = +572 - 510 \\ -1.109 + .094 + 1.098 - .040 = +1.192 - 1.149 \\ +.053 + .012 - .089 + .110 = +.205 - .089 \end{array}
 \end{aligned}$$

E4

Solution for C. E. with weights

Without weights

With weights

$$0 = -0.025 + .908a + 1.058e + 8\Delta T$$

$$+ .002$$

$$- .092$$

$$+ .015$$

$$- .028$$

$$- .045$$

$$- .105$$

$$- .055$$

$$r_w$$

$$1.4$$

$$1.7$$

$$1.6$$

$$1.7$$

$$.7$$

$$.6$$

$$.6$$

$$.6$$

$$0 = -0.035 + 1.268a + 1.478e + 1.408\Delta T$$

$$+ .003$$

$$- .147$$

$$+ .026$$

$$- .024$$

$$- .027$$

$$- .063$$

$$- .033$$

$$0 = -0.044 + 1.598a + 1.858e + 1.768\Delta T$$

$$+ .002$$

$$+ .121$$

$$+ .016$$

$$+ .005$$

$$- .049$$

$$- .111$$

$$- .089$$

$$0 = -0.051 + 1.858a + 2.168e + 2.068\Delta T$$

$$+ .005$$

$$- .450$$

$$+ .049$$

$$- .010$$

$$+ .054$$

$$+ .122$$

$$+ .105$$

$$0 = -0.049 + 1.768a + 2.068e + 1.968\Delta T$$

$$+ .005$$

$$- .235$$

$$+ .044$$

$$- .003$$

$$- .016$$

$$- .038$$

$$- .020$$

$$0 = -1.49 + 18.338a - 16.768e + 5.618\Delta T$$

$$0 = -1.76 - 16.768a + 41.778e + 10.658\Delta T$$

$$0 = -3.12 + 5.618a + 10.658e + 11.878\Delta T$$

$$0 = -1.49 + 18.338a - 16.768e + 5.618\Delta T$$

$$- 1.76 - 16.768a + 41.778e + 10.658\Delta T$$

$$- 3.12 + 5.618a + 10.658e + 11.878\Delta T$$

$$0 = -0.008 + 8a - 9.148e + 3.068\Delta T$$

$$- .011 - 8a + 2.4938e + 1.6358\Delta T$$

$$- .056 + 8a + 1.8988e + 2.1168\Delta T$$

$$0 = -0.019 + 1.5798e + 9.418\Delta T$$

$$- .067 + 4.3918e + 2.7518\Delta T$$

$$0 = -0.0120 + 8e + 5.9359\Delta T$$

$$- .0153 + 8e + 6.2658\Delta T$$

$$0 = +.0033 - 0.3068\Delta T$$

$$\Delta T = +.108 - 13.375 = -13.267\Delta T$$

$$8e = -0.052 + 2.60 = +2.08e$$

$$8a = -0.073 + 8.90 = +8.827a$$

Solution for C = 00

$$0 = -0.048 + 1.8108\Delta T$$

$$\Delta T = +.026 - 13.375 = -13.349\Delta T$$

$$8a = +.002 + 8.90 = +8.902a$$

$$8e = 0.00 + 2.60 = +2.60e$$

$$0 = -1.49 - 1.338 + .572 + .606 = +1.478 - 1.487 = -0.009$$

$$- 1.76 + 1.223 - 2.172 + 1.150 = +2.373 - 2.348 = +.025$$

$$- 3.12 - .409 - .585 + 1.282 = +1.282 - 1.276 = +.006$$

Solution for C. W. with weights

$$0 = -.082 + .89 \delta a - 1.04 \delta e + \delta \Delta T$$

$$\begin{array}{r} +.055 \\ +.047 \\ +.285 \\ +.085 \\ -.325 \\ +.235 \\ -.005 \end{array}$$

$$\begin{array}{r} 1.7 \\ 1.3 \\ 1.8 \\ .7 \\ .6 \\ .7 \\ .7 \\ .7 \end{array}$$

$$0 = -.003 + 1.51 \delta a - 1.77 \delta e + 1.70 \delta \Delta T$$

$$\begin{array}{r} +.072 \\ +.085 \\ +.200 \\ +.051 \\ -.228 \\ +.164 \\ -.004 \end{array}$$

$$0 = -.005 + 2.28 \delta a - 2.67 \delta e + 2.57 \delta \Delta T$$

$$\begin{array}{r} +.049 \\ -.082 \\ -.396 \\ +.073 \\ +.321 \\ -.328 \\ +.027 \end{array}$$

$$0 = +.005 - 2.67 \delta a + 3.13 \delta e - 3.01 \delta \Delta T$$

$$\begin{array}{r} -.096 \\ -.295 \\ -.680 \\ +.078 \\ +.602 \\ -.559 \\ +.012 \end{array}$$

$$0 = -.005 + 2.57 \delta a - 3.01 \delta e + 2.89 \delta \Delta T$$

$$\begin{array}{r} +.094 \\ +.153 \\ +.140 \\ +.031 \\ -.160 \\ +.115 \\ -.005 \end{array}$$

$$0 = -.361 + 18.32 \delta a + 24.03 \delta e - 2.36 \delta \Delta T$$

$$0 = -.933 + 24.03 \delta a + 58.02 \delta e - 18.76 \delta \Delta T$$

$$0 = +.365 - 2.36 \delta a - 18.76 \delta e + 10.14 \delta \Delta T$$

$$0 = -.361 + 18.32 \delta a + 24.03 \delta e - 2.36 \delta \Delta T$$

$$\begin{array}{r} -.933 + 24.03 \delta a + 58.02 \delta e - 18.76 \delta \Delta T \\ +.365 - 2.36 \delta a - 18.76 \delta e + 10.14 \delta \Delta T \end{array}$$

$$0 = -.020 + \delta a + 1.312 \delta e - .129 \delta \Delta T$$

$$\begin{array}{r} -.039 + \delta a + 2.414 \delta e - 7.807 \delta \Delta T \\ +.155 - \delta a - 7.949 \delta e + 4.297 \delta \Delta T \end{array}$$

$$0 = +.019 - 1.102 \delta e + 7.678 \delta \Delta T$$

$$\begin{array}{r} +.116 - 5.535 \delta e - 3.510 \delta \Delta T \end{array}$$

$$0 = +.0172 - \delta e + 6.9673 \delta \Delta T$$

$$\begin{array}{r} +.0210 - \delta e - .6841 \delta \Delta T \end{array}$$

$$0 = -.0038 + 7.6014 \delta \Delta T$$

$$\delta \Delta T = +.000 - 13.375 = -13.375$$

$$\delta e = +.021 + 260 = +.281$$

$$\delta a = -.007 + 890 = +.883$$

Solution for c = 00

$$0 = +.135 + 4.168 \delta \Delta T$$

$$\delta \Delta T = -.032 - 13.375 = -13.407$$

$$\delta e = +.016 + 890 = +.906$$

$$\delta e = 000 + 260 = +.260$$

$$0 = \begin{array}{r} -.361 - .128 + .505 - .000 \\ -.933 - .168 + 1.218 - .000 \\ +.365 + .017 - .394 + .000 \end{array} = \begin{array}{r} +.505 - .489 = +.016 \\ +.1218 - .1101 = +.1117 \\ +.382 - .394 = -.012 \end{array} \quad \begin{array}{l} E_4 \\ \\ \end{array}$$

June 5 1883

$$L.E. \text{ Mean } T = 14.4 - h = -0.13$$

for C.W. + C.E.

$$C = +.24$$

$$a = +1.20 - .27 = +1.059$$

for C.E. only

$$C = +.168$$

$$a = +1.09 - .27 = +.82$$

I	-22.6	13.2 + 1.20 =	+11.70	-02	+11.68	+98 a	+1.08 C	+1.17	+26 + 1.43	+13.11	+05 + 1.07	+17 + 1.24	+12.92	+04
-	-10.5	13.3 + 1.1	11.95	-01	11.94	+81	+1.02	+97	+24 + 1.21	13.15	+09 + .88	+16 + 1.04	+12.98	+10
	-16.6				+11.81	+90 a	+1.05 C			+13.130			+12.950	+079
II	+11.6	12.9 + 1.5 0 =	+12.17	-02	+12.15	+52 a	+1.02 C	+62	+24 + 86	+13.01	-05 + .57	+16 + .70	+12.88	+00
-	+28.5	13.1 + 1.3	12.49	-02	12.47	+27	+1.14	+33	+27 + 60	13.07	+01 + .29	+18 + 47	12.94	+06
X	+19.0	13.8 + .6	12.31	-01	12.30	+42	+1.06	+50	+25 + 75	13.05	-01 + .46	+17 + 63	12.93	+05
X	+28.0	13.9 + .5	12.42	-01	12.41	+28	+1.13	+34	+27 + 61	13.02	-04 + .31	+18 + 49	12.90	+02
	+21.8				+12.33	+37 a	+1.09 C			13.038			12.912	+036
III	+56.6	12.8 + 1.6 0 =	+12.91	-02	+12.89	-44 a	+1.82 C	-52	+44 - 08	+12.81	-25 - 48	+29 - 19	+12.70	-18
-	+49.9	13.7 + .7	12.76	-01	12.75	-20	+1.55	-24	+37 + 13	12.88	-18 - .22	+25 + 03	12.78	-10
X	+64.9	14.0 + .4	13.60	+00	13.60	-90	+2.36	-108	+57 - 51	13.09	+03 - .98	+38 - 60	13.00	+12
	+57.1				13.08	-51 a	+1.91 C			12.927			12.876	-049

IV	+73.0	13.4 + 1.0 0 =	+14.25	-01	+14.24	-174 a	+3.42 C	-208	+82 - 126	+12.98	-07 - 1.90	+55 - 135	+12.89	+014
-	+72.5	13.4 + 1.0	+10.32	-01	10.31	+3.01	-3.32	+3.61	-80 + 281	13.11	+054 + 3.28	-53 + 2.75	13.06	+184
X	+71.9	13.9 + .5	+10.19	-01	10.18	+2.93	-3.21	+3.51	-77 + 274	12.92	-139 + 3.19	-51 + 2.68	12.84	-036
X	+78.1	14.1 + .3	+15.23	-00	15.23	-2.83	+4.85	-339	+116 - 2.23	13.00	-059 - 3.08	+78 - 2.30	12.93	+054

Equations for C.W. + C.E.	0 = +2.43 - 2.64 a + 2.37 C	0 = -6.42 + 6.94 a - 6.26 C	0 = +5.76 - 6.26 a + 5.62 C	a and C from C.E. and C.W.	
I	-1.50 + 2.11 - 4.37	-3.16 + 4.45 - 9.22	+6.56	+19.10	0 = -17.11 + 138.88 a + 22.47 C
	-163 + 2.03 - 4.26	-3.31 + 4.12 - 8.65	+6.94	+18.15	-8657 + 22.47 a + 250.89 C
II	+3.42 - 3.73 + 3.80	-12.76 + 13.91 - 14.17	+13.00	+14.44	0 = -1.232 + a + 1.62 C
	+1.91 - 2.11 + 2.33	-4.03 + 4.45 - 4.92	+4.45	+5.43	-3.853 + a + 1.116 C
	-2.02 + 2.64 - 4.41	-5.33 + 6.97 - 11.64	+8.91	+19.65	0 = +2.621 - 11.004 C
	-2.15 + 2.56 - 4.30	-5.50 + 6.55 - 11.01	+9.24	+18.47	
	+2.90 - 3.20 + 3.76	-9.28 + 10.24 - 12.03	+10.40	+14.14	
C.W.	+5.19 - 3.79 - 3.78	-19.67 + 14.36 + 14.33	+6.576 - 77.90 a + 114.82 C		C = +.288 a = +1.20
	-2.61 + 1.44 + 3.61	-3.76 + 2.07 + 5.20	-19.62 + 14.33 a + 14.29		
	-3.36 + 2.03 + 4.36	-6.82 + 4.12 + 8.85	-9.42	+13.03	
	+4.49 - 2.97 - 2.70	-13.34 + 8.82 + 8.02	-14.65	+19.01	
	+5.58 - 3.81 - 3.80	-21.26 + 14.52 + 14.48	-12.12	+7.29	
II	+4.48 - 3.21 - 3.77	-14.38 + 10.30 + 12.10	-21.20	+14.44	
	-3.32 + 2.02 + 3.62	-6.71 + 4.08 + 7.31	-16.89	+14.21	
	-4.07 + 2.61 + 4.37	-10.62 + 6.81 + 11.41	-12.02	+13.10	
	+3.78 - 2.39 - 2.69	-9.03 + 5.71 + 6.43	-17.78	+19.10	
	+4.87 - 3.23 - 3.79	-15.72 + 10.43 + 12.24	-10.17	+7.24	
C.W.		-121.30 + 81.22 a + 100.37 C	-18.46	+14.36	
Summed C.E. and C.W.		-171.11 + 138.88 a + 22.47 C	-152.33 + 100.37 a + 136.07 C		
			-86.57 + 22.47 a + 250.89 C		

for C.W. only

$$a = +1.46$$

$$C = +.05 - .27 = +.82$$

I	-22.3	15.9 - 1.5 0 =	+12.24	+02	+12.26	+98 a	-1.08 C	+1.17	-26 + 91	+13.17	+11 + 1.43	-05 + 1.38	+13.64	+27
-	-19.5	16.0 - 1.6	12.21	+02	12.23	+94	-1.06	+1.13	-25 + 88	13.11	+05 + 1.37	-05 + 1.38	13.55	+18
	-20.9				+12.24	+96 a	-1.07 C			13.140			13.596	+225
II	+21.8	16.4 - 2.0 0 =	+12.93	+02	+12.95	+38 a	-1.08 C	+1.16	-26 + 20	+13.15	+ .55	-05 + 1.50	+13.45	+08
													13.450	+080
III	+59.8	14.8 - 0.4 0 =	+14.22	+00	+14.22	-59 a	-1.99 C	-70	-48 - 118	+13.04	-02 - 8.6	-10 - 96	+13.26	-11
-	+58.9	16.0 - 1.6	14.14	+02	14.14	-55	-1.93	-65	-46 - 111	13.03	-03 - 8.0	-10 - 90	13.24	-13
X	+61.8	16.4 - 2.0	14.66	+02	14.66	-70	-2.12	-84	-51 - 135	13.21	+15 - 1.02	-11 - 1.13	13.53	+16
	+60.2				+14.34	-61 a	-2.01 C			13.093			13.343	-027

IV	+78.1	14.2 + 0.2 0 =	+17.43	-00	+17.43	-283 a	-4.85 C	-339	-116 - 455	+12.88	-179 - 4.13	-24 - 437	+13.06	-310
-	+66.9	14.3 + 0.1	9.63	-00	9.63	+240	+2.54	+2.88	+61 + 349	13.12	+061 + 3.50	+13 + 3.63	13.26	-110
X	+72.3	14.4 + 0.0	8.88	-00	8.88	+299	+3.29	+3.59	+79 + 438	13.26	+201 + 4.37	+17 + 4.54	13.42	+050
X	+74.5	14.8 - .4	16.73	-00	16.73	-2.01	-3.77	-2.41	-90 - 331	13.42	+361 - 2.93	-19 - 3.12	13.61	+240
X	+78.1	15.8 - 1.4	17.80	+02	17.82	-2.85	-4.87	-3.42	-117 - 489	13.23	+171 - 4.16	-24 - 4.40	13.42	+050

With out weights
to E and to W.

$$a = +1.195$$

$$c = +.248$$

$$\Delta T = -13.070$$

With weights
to E and to W.

$$a = +1.190 + 1.184$$

$$c = +.259 + .260$$

$$\Delta T = -13.075 - 13.073$$

With weights
to E only.

$$a = +1.066 + 1.010$$

$$c = +.156 + .115$$

$$\Delta T = -12.893 - 12.827$$

With out weights
to E and to W.

$$a = +1.195$$

$$\Delta T = -13.082$$

$$c = +.240$$

With weights
to E and to W.

$$a = +1.194$$

$$\Delta T = -13.073$$

$$c = +.240$$

With weights
to E only.

$$a = +1.072$$

$$\Delta T = -12.899$$

$$c = +.160$$

$$+1171 + 268 + 1439 - 1165 + 03 + 1166 + 280 + 1446 - 1153 + 15 + 1045 + 1467 + 1212 - 1168 + 00 + 1171 - 1191 + 03 + 1170 - 1190 + 04 + 1051 - 1185 + 00$$

$$+ 968 + 253 + 1221 - 1187 + 07 + 964 + 264 + 1228 - 1185 + 09 + 863 + 158 + 1021 - 1187 + 07 + 968 - 1211 + 07 + 967 - 1211 + 07 + 868 - 1213 + 07$$

$$+ 621 + 253 + 874 - 1222 - 07 + 619 + 264 + 883 - 1219 - 04 + 554 + 158 + 712 - 1218 - 03 + 621 - 1246 - 07 + 621 - 1245 - 06 + 557 - 1234 - 03$$

$$+ 323 + 283 + 606 - 1248 - 01 + 321 + 295 + 626 - 1245 + 02 + 288 + 177 + 465 - 1243 + 04 + 323 - 1276 - 02 + 323 - 1275 - 01 + 289 - 1261 + 04$$

$$+ 502 + 263 + 765 - 1232 - 02 + 500 + 275 + 775 - 1230 + 00 + 448 + 164 + 612 - 1228 + 02 + 502 - 1258 - 03 + 502 - 1257 - 02 + 450 - 1245 + 02$$

$$+ 335 + 280 + 615 - 1248 - 07 + 333 + 293 + 626 - 1245 - 04 + 298 + 175 + 473 - 1242 - 01 + 335 - 1275 - 07 + 335 - 1274 - 06 + 300 - 1260 - 01$$

$$- 526 + 451 - 075 - 1316 - 27 - 524 + 471 - 053 - 1313 - 24 - 469 + 282 - 187 - 1308 - 19 - 526 - 1361 - 28 - 526 - 1360 - 27 - 472 - 1377 - 19$$

$$- 239 + 384 + 145 - 1294 - 19 - 238 + 401 + 163 - 1291 - 16 - 513 + 240 + 027 - 1287 - 12 - 239 - 1332 - 20 - 239 - 1331 - 19 - 214 - 1311 - 11$$

$$- 1076 + 585 - 491 - 1358 + 02 - 1071 + 611 - 460 - 1354 + 06 - 959 + 366 - 593 - 1349 + 11 - 1076 - 1416 + 01 - 1075 - 1415 + 02 - 965 - 1386 + 12$$

$$- 2079 + 848 - 1231 - 1432 - 08 - 2071 + 886 - 1185 - 1426 - 02 - 1855 + 530 - 1325 - 1422 + 02 - 2079 - 1516 - 10 - 2078 - 1515 - 09 - 1865 - 1476 + 03$$

$$+ 3597 - 823 + 2774 - 1032 - 01 + 3582 - 860 + 2722 - 1035 - 04 + 3209 - 515 + 2674 - 1020 + 11 + 3597 - 948 + 03 + 3594 - 948 + 03 + 3227 - 967 + 11$$

$$+ 3501 - 796 + 2705 - 1038 - 20 + 3487 - 831 + 2636 - 1042 - 24 + 3123 - 498 + 2625 - 1027 - 07 + 3501 - 958 - 17 + 3498 - 958 - 17 + 3141 - 926 - 09$$

$$- 3382 + 1203 - 2179 - 1527 - 04 - 3368 + 1256 - 2112 - 1519 + 04 - 3017 + 752 - 2265 - 1516 + 07 - 3382 - 1646 - 07 - 3379 - 1645 - 06 - 3034 - 1593 + 06$$

a and c from G.E.

$$0 = -4980 + 5766 - 7790 + 11482 + c$$

$$+ 6576 - 7790 + 11482 + c$$

$$0 = -884 + a - 1.352 + c$$

$$+ 844 - a + 1.474 + c$$

$$0 = -.020 + 0.122 + c$$

$$c = +.164 \quad a = +1.086$$

a and c from G.W.

$$0 = -121.30 + 81.22a + 100.37c$$

$$- 152.33 + 100.37c + 136.07c$$

$$0 = -1.493 + a + .807c$$

$$- 1.518 + a + 1.356c$$

$$0 = -0.025 + 0.549c$$

$$c = +0.45 \quad a = +1.458$$

With weights
to W. only

$$a = +1.257 + 1.215$$

$$c = +.189 + .226$$

$$\Delta T = -13.270 - 13.170$$

With weights
to W. only

$$a = +1.448$$

$$\Delta T = -13.437$$

$$c = +.050$$

$$+ 1171 - 268 + 903 - 1219 + 07 + 1166 - 280 + 886 - 1219 + 07 + 1232 - 204 + 1028 - 1224 + 02 + 1171 - 1191 + 09 + 1170 - 1190 + 10 + 1419 - 1202 + 19$$

$$+ 1123 - 263 + 860 - 1223 + 00 + 1119 - 275 + 844 - 1223 + 00 + 1182 - 200 + 982 - 1229 - 06 + 1123 - 1196 + 02 + 1122 - 1195 + 03 + 1361 - 1208 + 10$$

$$+ 454 - 268 + 186 - 1290 + 05 + 452 - 280 + 172 - 1290 + 05 + 478 - 204 + 274 - 1300 - 05 + 454 - 1262 + 06 + 454 - 1262 + 07 + 550 - 1289 + 06$$

$$- 705 - 494 - 1199 - 1429 - 07 - 702 - 515 - 1217 - 1429 - 07 - 742 - 376 - 1118 - 1439 - 17 - 705 - 1379 - 05 - 704 - 1378 - 04 - 854 - 1429 - 17$$

$$- 657 - 479 - 1136 - 1423 - 07 - 654 - 500 - 1154 - 1423 - 09 - 691 - 365 - 1056 - 1433 - 19 - 657 - 1374 - 06 - 637 - 1371 - 03 - 796 - 1423 - 19$$

$$- 836 - 526 - 1362 - 1445 + 21 - 833 - 549 - 1382 - 1446 + 20 - 880 - 401 - 1281 - 1455 + 11 - 836 - 1392 + 23 - 836 - 1391 + 24 - 7014 - 445 + 10$$

$$- 3382 - 1203 - 4585 - 1768 - 25 - 3368 - 1256 - 4624 - 1770 - 27 - 3557 - 917 - 4474 - 1774 - 31 - 3382 - 1646 - 19 - 3379 - 1645 - 18 - 4078 - 1751 - 35$$

$$+ 2868 + 630 + 3998 - 959 + 04 + 2856 + 658 + 3514 - 956 + 07 + 3017 + 480 + 3497 - 977 - 14 + 2868 - 1021 + 03 + 2866 - 1021 + 03 + 3475 - 996 - 28$$

$$+ 3573 + 816 + 4389 - 870 + 18 + 3558 + 852 + 4410 - 866 + 22 + 3758 + 622 + 4380 - 887 - 01 + 3573 - 951 + 16 + 3570 - 950 + 17 + 4330 - 911 - 16$$

$$- 2402 - 935 - 3337 - 1613 + 30 - 2392 - 976 - 3368 - 1644 + 29 - 2527 - 712 - 3239 - 1651 + 22 - 2402 - 1548 + 45 - 2400 - 1547 + 36 - 29104 - 1638 + 19$$

$$- 3406 - 1208 - 4614 - 1770 + 12 - 3392 - 1261 - 4653 - 1773 + 09 - 3582 - 920 - 4502 - 1777 + 05 - 3406 - 1649 + 16 - 3403 - 1648 + 17 - 4127 - 1756 + 02$$

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Original Equations

Without rights

With rights

$$\begin{array}{rcl}
 S & & \\
 -16.6 & 0 = +.071 & +.908a + 1.058e + \delta \Delta T \\
 +21.8 & -.021 & +.37 + 1.09 + \delta \Delta T \\
 +57.1 & -.132 & -.51 + 1.91 + \delta \Delta T \\
 +73.0 & -.079 & -1.74 + 3.42 + \delta \Delta T \\
 +25.3 \text{ Le} & +.051 & +3.01 - 3.32 + \delta \Delta T \\
 +71.9 \text{ Le} & -.139 & +2.93 - 3.21 + \delta \Delta T \\
 +78.1 & -.059 & -2.83 + 4.85 + \delta \Delta T
 \end{array}$$

$$\begin{array}{rcl}
 \sqrt{W} & & \\
 14 & 1.3 & \\
 20 & 2.0 & \\
 1.6 & 1.5 & \\
 7 & 0.5 & \\
 6 & 0.4 & \\
 6 & 0.4 & \\
 6 & 0.4 &
 \end{array}$$

$$\begin{array}{rcl}
 C.E. & 0 = +.099 & +.126 \delta a + 1.47 \delta e + 1.40 \delta \Delta T \\
 & -.042 & +.74 + 2.18 + 2.00 \\
 & -.211 & -.82 + 3.06 + 1.60 \\
 & -.055 & -1.22 + 2.39 + .70 \\
 & +.031 & +1.81 - 1.99 + .60 \\
 & -.083 & +1.76 - 1.93 + .60 \\
 & -.035 & -1.70 + 2.91 + .60
 \end{array}$$

$$\begin{array}{rcl}
 C.W. & 0 = +.081 & +.968a - 1.078e + \delta \Delta T \\
 +21.8 & +.091 & +.38 - 1.08 + \delta \Delta T \\
 +60.2 & +.034 & -.61 - 2.01 + \delta \Delta T \\
 +78.1 & -.179 & -2.83 - 4.85 + \delta \Delta T \\
 +66.9 \text{ Le} & +.061 & +2.40 + 2.54 + \delta \Delta T \\
 +72.3 \text{ Le} & +.201 & +2.99 + 3.29 + \delta \Delta T \\
 +74.5 & +.361 & -2.01 - 3.77 + \delta \Delta T \\
 +78.1 & +.171 & -2.85 - 4.87 + \delta \Delta T
 \end{array}$$

$$\begin{array}{rcl}
 \sqrt{W} & & \\
 14 & 1.3 & \\
 20 & 2.0 & \\
 1.6 & 1.4 & \\
 6 & 0.4 & \\
 7 & 0.5 & \\
 6 & 0.4 & \\
 7 & 0.5 & \\
 6 & 0.4 &
 \end{array}$$

$$\begin{array}{rcl}
 C.W. & 0 = +.113 & +.134 \delta a - 1.50 \delta e + 1.40 \delta \Delta T \\
 +21.8 & +.091 & +.38 - 1.08 + 1.00 \\
 +60.2 & +.034 & -.61 - 2.01 + 1.60 \\
 +78.1 & -.179 & -2.83 - 4.85 + .60 \\
 +66.9 \text{ Le} & +.061 & +2.40 + 2.54 + .70 \\
 +72.3 \text{ Le} & +.201 & +2.99 + 3.29 + .60 \\
 +74.5 & +.361 & -2.01 - 3.77 + .70 \\
 +78.1 & +.171 & -2.85 - 4.87 + .60
 \end{array}$$

$$0 = +.513 + .568a - 6.038e + 15.00 \delta \Delta T$$

Solution for C.E. and C.W. without rights

$$\begin{array}{rcl}
 C.E. & 0 = +.064 & +.818a + .948e + .908 \delta \Delta T \\
 & -.008 & +.14 + .40 \\
 & +.067 & +.26 - .97 \\
 & +.137 & +3.03 - 5.95 \\
 & +.153 & +9.06 - 9.99 \\
 & -.407 & +8.58 - 9.41 \\
 & +.167 & +8.01 - 13.73
 \end{array}$$

$$\begin{array}{rcl}
 C.E. & 0 = +.074 & +.948a + 1.108e + 1.058 \delta \Delta T \\
 & -.023 & +.19 + 1.19 \\
 & -.252 & +3.65 + 11.70 \\
 & -.270 & +11.02 + 10.30 \\
 & -.169 & +23.52 + 10.30 \\
 & +.446 & +10.30 + 23.52 \\
 & -.286 & +23.52 + 10.30
 \end{array}$$

$$\begin{array}{rcl}
 C.W. & 0 = +.078 & +.928a - 1.038e + .968 \delta \Delta T \\
 & +.035 & +.14 - .41 \\
 & -.021 & +.37 + 1.23 \\
 & +.507 & +8.01 + 13.73 \\
 & +.146 & +5.76 + 6.10 \\
 & +.601 & +8.94 + 9.84 \\
 & -.726 & +4.04 + 1.58 \\
 & -.487 & +8.12 + 13.88
 \end{array}$$

$$\begin{array}{rcl}
 C.W. & 0 = -.087 & -1.038a + 1.148e - 1.078 \delta \Delta T \\
 & -.098 & +.17 + 1.17 \\
 & -.068 & +4.04 + 11.70 \\
 & +.868 & +23.52 + 10.30 \\
 & +.155 & +6.45 + 10.82 \\
 & +.661 & +10.82 + 14.21 \\
 & -.1361 & +14.21 + 23.72 \\
 & -.833 & +23.72 + 10.30
 \end{array}$$

$$\begin{array}{rcl}
 0 = +.306 & +66.91 \delta a & +12.21 \delta e + .568 \delta \Delta T \\
 & -.1243 & +12.21 \delta a + 14.755 \delta e - 6.038 \delta \Delta T \\
 & +.513 & +.568 \delta a - 6.038 \delta e + 15.00 \delta \Delta T
 \end{array}$$

$$0 = -1.243 + 12.21 \delta a + 14.755 \delta e - 6.038 \delta \Delta T$$

$$\begin{array}{rcl}
 0 = +.0046 & +\delta a & +.182 \delta e + .0088 \delta \Delta T \\
 & -.1018 & +\delta a + 12.080 \delta e - .494 \delta \Delta T \\
 & +.9161 & +\delta a - 10.768 \delta e + 26.786 \delta \Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +.1064 & -11.898 \delta e & +.502 \delta \Delta T \\
 & -.10179 & +22.848 \delta e - 27.280 \delta \Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +.0089 & -\delta e & +.0422 \delta \Delta T \\
 & -.0446 & +\delta e - 1.1940 \delta \Delta T
 \end{array}$$

$$0 = -.0357 - 1.1518 \delta \Delta T$$

$$\delta \Delta T = -.031 - 13.059 = -13.090 \Delta T$$

$$\delta e = +.008 + 2.40 = +2.48 e$$

$$\delta a = -.005 + 1.200 = +1.195 a$$

Solution for e = .00

$$0 = +.620 + 26.778 \delta \Delta T$$

$$\delta \Delta T = -.028 - 13.059 = -13.082 \Delta T$$

$$\delta a = -.005 + 1.200 = +1.195 a$$

$$\delta e = +.000 + 2.40 = +2.40 e$$

$$\begin{array}{rcl}
 0 = +.306 & -.334 & +.098 & -.017 & = +.104 & -.351 & = +.053 \\
 & -.1243 & -.061 & +.150 & +.157 & +.1367 & -1.304 & +.063 \\
 & +.513 & -.063 & -.048 & -.465 & +.513 & -.516 & -.003
 \end{array}$$

Solution for C. C. and C. W. with weights

$$C.C.O = +.025 + 1.59\delta a + 1.85\delta c + 1.76\delta \Delta T$$

-.031	+.55	+1.61	+1.48
+.173	+.67	-.251	-.131
+.067	+1.49	-.292	-.85
+.056	+3.28	-.360	+1.09
-.146	+3.10	-.240	+1.06
+.060	+2.89	-.495	-.102

$$O = +.145 + 1.85\delta a + 2.16\delta c + 2.06\delta \Delta T$$

-.092	+4.75	+4.36
-.646	+9.36	+4.90
-.131	+5.71	+1.67
-.062	+3.96	-.119
+.160	+3.72	-.116
-.102	+8.47	+1.76

$$O = +.139 + 1.76\delta a + 2.06\delta c + 1.96\delta \Delta T$$

-.084	+4.00
-.338	+2.56
-.038	+.49
+.019	+.36
-.050	+.36
-.021	+.36

$$C.W.O = +.051 + 1.80\delta a - 2.01\delta c + 1.88\delta \Delta T$$

+.035	+.14	-.41	+.38
-.053	+.96	+3.16	-.157
+.182	+2.89	+4.95	-.102
+.072	+2.82	+2.99	+1.18
+.218	+3.24	+3.55	+1.08
-.357	+1.99	+3.72	-.99
-.176	+2.92	+4.99	-.103

$$O = -.170 - 2.01\delta a + 2.25\delta c - 2.10\delta \Delta T$$

-.098	+1.17	-.108
-.174	+10.37	-5.15
+.311	+8.47	-1.75
+.076	+3.17	+1.25
+.238	+3.88	+1.18
-.668	+6.97	-1.85
-.301	+8.53	-1.75

$$O = +.158 + 1.88\delta a - 2.10\delta c + 1.96\delta \Delta T$$

+.091	+1.00
+.086	+2.56
-.064	+1.36
+.030	+.49
+.073	+.36
+.177	+.49
+.062	+.36

$$O = +.376 + 3.033\delta a + 7.02\delta c + 2.12\delta \Delta T$$

$$O = -1.514 + 7.02\delta a + 8.294\delta c + 1.14\delta \Delta T$$

$$O = +.240 + 2.12\delta a + 1.14\delta c + 1.76\delta \Delta T$$

$$O = +.376 + 3.033\delta a + 7.02\delta c + 2.12\delta \Delta T$$

-.1514	+7.02\delta a	+8.294\delta c	+1.14\delta \Delta T
+.240	-2.12\delta a	+1.14\delta c	+1.76\delta \Delta T

$$O = +.0124 + \delta a + .232\delta c + .0699\delta \Delta T$$

-.2157	+ \delta a	+11.815\delta c	+16.23\delta \Delta T
+.1132	+ \delta a	+5.38\delta c	+8.3349\delta \Delta T

$$O = +.2281 - 11.583\delta c - .0924\delta \Delta T$$

-.3389	+11.277\delta c	-8.1726\delta \Delta T
--------	-----------------	------------------------

$$O = +.0197 - \delta c - .0924\delta \Delta T$$

-.0301	+ \delta c	-8.1726\delta \Delta T
--------	------------	------------------------

$$O = -.0104 - 7.327\delta \Delta T$$

$$\delta \Delta T = -.014 - 13.059 = -13.073\Delta T$$

$$\delta c = +.020 + 2.40 = +.260c$$

$$\delta a = -.016 + 1.200 = +1.184a$$

Solution for c = 0

$$O = +.212 + 5.190\delta \Delta T$$

$$\delta \Delta T = -.014 - 13.059 = -13.073\Delta T$$

$$\delta a = -.006 + 1.200 = +1.194a$$

$$\delta c = +.000 + 2.40 = +.240c$$

$$O = +.376 - 4.85 + 1.39 - .030 = +.0515 - .515 = 0.000$$

-.1514	-.112	+1.659	-.016	=	+1.659	-1.642	+0.017
+.240	+.034	+0.023	-.247	+	.297	-.247	+0.050

Solution for C. E. with weights

Without weights

With weights

$$0 = +.074 + .90 \delta a + 1.05 \delta e + \delta \Delta T$$

$$+.036$$

$$-.049$$

$$+.014$$

$$+.184$$

$$-.036$$

$$+.054$$

$$\begin{array}{r} w \\ 1.4 \text{ } 1.3 \\ 2.0 \text{ } 2.0 \\ 1.6 \text{ } 1.5 \\ .7 \text{ } .5 \\ .6 \text{ } .4 \\ .6 \text{ } .4 \\ .6 \text{ } .4 \end{array}$$

$$0 = +.104 + 1.26 \delta a + 1.47 \delta e + 1.40 \delta \Delta T$$

$$+.072$$

$$-.078$$

$$+.010$$

$$+.110$$

$$-.022$$

$$+.032$$

$$0 = +.131 + 1.59 \delta a + 1.85 \delta e + 1.76 \delta \Delta T$$

$$+.053$$

$$+.064$$

$$-.012$$

$$+.199$$

$$-.039$$

$$-.054$$

$$0 = +.153 + 1.85 \delta a + 2.16 \delta e + 2.06 \delta \Delta T$$

$$+.157$$

$$-.239$$

$$+.024$$

$$-.219$$

$$+.042$$

$$+.093$$

$$0 = +.146 + 1.76 \delta a + 2.06 \delta e + 1.96 \delta \Delta T$$

$$+.144$$

$$-.125$$

$$+.007$$

$$+.066$$

$$-.013$$

$$+.019$$

$$0 = +.342 + 13.57 \delta a - 13.92 \delta e + 2.21 \delta \Delta T$$

$$0 = +.011 - 13.92 \delta a + 38.13 \delta e + 12.39 \delta \Delta T$$

$$0 = +.244 + 2.21 \delta a + 12.39 \delta e + 10.09 \delta \Delta T$$

$$0 = +.342 + 13.57 \delta a - 13.92 \delta e + 2.21 \delta \Delta T$$

$$+.011 - 13.92 \delta a + 38.13 \delta e + 12.39 \delta \Delta T$$

$$+.244 + 2.21 \delta a + 12.39 \delta e + 10.09 \delta \Delta T$$

$$0 = +.0232 + \delta a - 1.026 \delta e + 1.629 \delta \Delta T$$

$$+.0708 - \delta a + 2.739 \delta e + .8901 \delta \Delta T$$

$$+.0104 + \delta a + 5.606 \delta e + 4.5656 \delta \Delta T$$

$$0 = +.0260 + 1.713 \delta e + 1.0530 \delta \Delta T$$

$$+.1112 + 8.345 \delta e + 5.4557 \delta \Delta T$$

$$0 = +.0152 + \delta e + .6147 \delta \Delta T$$

$$+.0133 + \delta e + .6538 \delta \Delta T$$

$$0 = +.0019 - .0391 \delta \Delta T$$

$$\delta \Delta T = +.049 \quad -12.876 \quad = -12.827 \Delta T$$

$$\delta e = -.045 \quad +1.60 \quad +.115 \quad c$$

$$\delta a = -.080 \quad +1.090 \quad +1.010 \quad a$$

$$0 = +.342 - 1.079 + .629 + 1.07 = -.001$$

$$+.011 + 1.007 - 1.723 + .602 = -.003$$

$$+.244 - .176 - .560 + .490 = -.002$$

Solution for $c = 00$

$$0 = +.373 + 15.964 \delta \Delta T$$

$$\delta \Delta T = -.023 - 12.876 = -12.899 \Delta T$$

$$\delta a = -.018 + 1.090 = +1.072 \quad a$$

$$\delta e = 000 + 1.60 = +1.60 \quad e$$

Solution for C. W. with weights

Without weights

$$0 = +.225 + .96 \delta a - 1.07 \delta c + \delta \Delta \pi$$

$$+.080$$

$$-.027$$

$$-.310$$

$$-.110$$

$$+.050$$

$$+.240$$

$$+.050$$

$$\overline{w}$$

$$1.4 \quad 1.3$$

$$1.0 \quad 1.0$$

$$1.6 \quad 1.4$$

$$1.6 \quad 0.4$$

$$1.7 \quad 0.5$$

$$1.6 \quad 0.4$$

$$1.7 \quad 0.5$$

$$1.6 \quad 0.4$$

$$0 = +.315 + 1.34 \delta a - 1.50 \delta c + 1.40 \delta \Delta \pi$$

$$+.080$$

$$-.043$$

$$-.186$$

$$-.077$$

$$+.030$$

$$+.168$$

$$+.030$$

$$0 = +422 + 1.80 \delta a - 2.01 \delta c + 1.88 \delta \Delta \pi$$

$$+.030$$

$$+.042$$

$$+.316$$

$$+.129$$

$$+.054$$

$$-.237$$

$$-.051$$

$$0 = -472 + 2.01 \delta a + 2.25 \delta c - 2.10 \delta \Delta \pi$$

$$-.086$$

$$+1.38$$

$$+.541$$

$$-.107$$

$$+.059$$

$$-.444$$

$$-.088$$

$$0 = +441 + 1.88 \delta a - 2.10 \delta c + 1.96 \delta \Delta \pi$$

$$+.080$$

$$-.069$$

$$-.112$$

$$-.054$$

$$+.018$$

$$+.118$$

$$+.018$$

$$0 = +447 + 16.76 \delta a + 20.94 \delta c - 0.09 \delta \Delta \pi$$

$$0 = -489 + 20.94 \delta a + 44.81 \delta c - 11.25 \delta \Delta \pi$$

$$0 = +440 - 0.09 \delta a - 11.25 \delta c + 7.58 \delta \Delta \pi$$

$$0 = +447 + 16.76 \delta a + 20.94 \delta c - 0.09 \delta \Delta \pi$$

$$-489 + 20.94 \delta a + 44.81 \delta c - 11.25 \delta \Delta \pi$$

$$+440 - 0.09 \delta a - 11.25 \delta c + 7.58 \delta \Delta \pi$$

$$0 = +.0267 + \delta a + 1.249 \delta c - .0054 \delta \Delta \pi$$

$$-.0234 + \delta a + 2.140 \delta c - .5372 \delta \Delta \pi$$

$$+4.8889 - \delta a - 12.5000 \delta c + 84.2222 \delta \Delta \pi$$

$$0 = +.0501 - .891 \delta c + .5328 \delta \Delta \pi$$

$$+1.8655 - 12.2860 \delta c + 83.6850 \delta \Delta \pi$$

$$0 = +.0562 - \delta c + .5980 \delta \Delta \pi$$

$$+.0396 - \delta c + .6817 \delta \Delta \pi$$

$$0 = +.0166 - .0831 \delta \Delta \pi$$

$$\delta \Delta \pi = +.200 - 13.370 = -13.170 \Delta \pi$$

$$\delta c = +.176 + .050 + .226 c$$

$$\delta a = -.245 + 1.460 + 12.15 a$$

$$0 = +447 - 4.106 + 3.679 - .018 = +002$$

$$-489 - 5.130 + 7.873 - 2.248 = +.007$$

$$+440 + .022 - 1.977 + 1.514 = -.001$$

Solution for c = 00

$$0 = +.250 + 4.116 \delta \Delta \pi$$

$$\delta \Delta \pi = -.067 - 13.370 = -13.437 \Delta \pi$$

$$\delta a = -.012 + 1.460 = +1.448 a$$

$$\delta c = +.080 + .050 = +.050 c$$

June 17 1883

L.E. Mean $T = 15.8$

$$C = +.31$$

$$a = -.68$$

$$-172 = -6.560$$

$$\begin{array}{r} \delta \\ \times + 29.5 \\ \times + 27.1 \\ \times + 6.8 \\ \times + 15.8 \\ \times + 18.5 \\ + 19.5 \end{array} \quad \begin{array}{r} h \\ 15.4 + .4 \\ 15.5 + .3 \\ 15.6 + .2 \\ 15.7 + .1 \\ 15.7 + .1 \end{array} \quad \begin{array}{r} 0 = -6.58 \\ 6.73 \\ 6.43 \\ 6.43 \\ 6.51 \\ -6.54 \end{array}$$

$$\begin{array}{r} +32a + 1.15c \\ +36 + 1.12 \\ +63 + 1.01 \\ +52 + 1.04 \\ +48 + 1.05 \\ +46a + 1.07c \end{array} \quad \begin{array}{r} -22 + .36 + .14 \\ -24 + .35 + .11 \\ -43 + .31 + .12 \\ -35 + .32 + .03 \\ -33 + .32 + .01 \end{array} \quad \begin{array}{r} -6.44 + .12 \\ 6.62 - .06 \\ 6.55 + .01 \\ 6.46 + .10 \\ 6.52 + .04 \\ -6.518 + .042 \end{array}$$

L.E.

$$\times + 78.1 \quad 15.8 + .0 \quad 0 = -9.82$$

$$-263a + 487c + 1.79 + 1.51 + 3.30 = -6.520 + .040$$

$$\begin{array}{l} LE \quad 0 = -328 - 309a + 380c \\ LM \quad -1.05 - 296a - 3.16c \end{array}$$

$$\begin{array}{l} 0 = +10.14 + 9.55a - 11.74c \\ +3.11 + 8.76a + 9.35c \\ +13.25 + 18.31a - 2.39c \end{array} \quad \begin{array}{l} 0 = -12.46 \\ +3.32 \\ -9.14 \end{array} \quad \begin{array}{l} -a + 14.44c \\ -a + 9.98c \\ +24.42c \end{array}$$

$$\begin{array}{l} 0 = +13.25 + 18.31a - 2.39c \\ -9.14 - 2.39a + 24.42c \end{array}$$

$$\begin{array}{l} 0 = +7.236 + a - 1.305c \\ -6.8117 - a + 10.2176c \\ 0 = -3.0881 + 10.0871c \\ C = +3.061 \\ a = -.684 \end{array}$$

$$\begin{array}{r} 4M \\ -6.44 \\ 6.62 \\ 6.55 \\ 6.46 \\ 6.52 \\ 6.62 \\ 6.59 \\ 6.67 \\ -6.559 \end{array}$$

L.W.

$$\begin{array}{r} \times -19.5 \\ \times -3.6 \\ \times = 4.4 \\ -9.2 \end{array} \quad \begin{array}{r} 16.0 - .2 \\ 16.1 - .3 \\ 16.2 - .4 \end{array} \quad \begin{array}{r} 0 = -5.64 \\ 5.76 \\ 5.84 \\ -5.75 \end{array}$$

$$\begin{array}{r} +96a - 1.06c \\ +77 - 1.00 \\ +77 = 1.00 \\ +83a - 1.02c \end{array} \quad \begin{array}{r} -65 - .33 - .98 \\ -52 - .31 - .83 \\ -52 - .31 - .83 \end{array} \quad \begin{array}{r} -6.62 - .06 \\ 6.59 - .03 \\ 6.67 - .11 \\ -6.627 - .067 \end{array}$$

L.W.

$$\times + 76.2 \quad 16.2 - .4 \quad 0 = -6.80$$

$$-213a - 418c + .45 - .130 + .15 = -6.65 - .090$$

Without weights
L E. and L W.

$$\begin{aligned} a &= -1684 \\ c &= +294 \\ 4T &= +6.578 \end{aligned}$$

With Wright
L. E. and L. W.

$$\begin{aligned} a &= -682 \\ c &= +283 \\ \Delta T &= +6.569 \end{aligned}$$

With rights
L.E. only

$$\begin{aligned} a &= -744 \\ c &= +258 \\ AT &= +6.603 \end{aligned}$$

Without Weights - With Weights
LE and 2 W LE and 2 W

$$\begin{aligned} a &= -683 \\ \Delta T &= +6580 \\ c &= +310 \end{aligned}$$

Mr. Mike Wright
LE + 2 M

$$\begin{aligned} a &= -.677 \\ \Delta T &= +6.558 \\ C &= +310 \end{aligned}$$

22
Matti Mehlis
LE only

$$\begin{aligned} a &= -682 \\ \Delta F &= +6.519 \\ c &= +810 \end{aligned}$$

-219	+338	+119	+670	+12	-218	+325	+107	+668	+10	-238	+297	+059	+666	+08	-219	+636	+14	-217	+634	+11	-218	+630	+06
-246	+329	+083	+666	-07	-246	+317	+071	+664	-09	-268	+289	+021	+662	-11	-246	+633	-05	-244	+631	-07	-246	+627	-09
-431	+297	-134	+644	+01	-430	+286	-141	+642	-01	-469	+261	-208	+640	-03	-430	+615	+03	-427	+613	+01	-430	+609	+03
-356	+306	-050	+653	+10	-355	+294	-066	+651	+08	-387	+268	-219	+638	-05	-355	+622	+11	-352	+621	+10	-355	+616	+05
-328	+309	-019	+656	+05	-327	+297	-030	+654	+03	-357	+271	-086	+652	+01	-328	+625	+06	-325	+623	+04	-327	+617	+0

$$+1799 + 1432 + 3231 + 9.81 - .01 + 1799 + 1378 + 3172 + 974 - .08 + 1957 + 1256 + 3213 + 9.82 + .50 + 1796 + 838 + .07 + 1781 + 834 + .03 + 1794 + 831 + .01$$

With Wrights
L. Nonly

$$\begin{aligned} a &= -5.53 \\ C &= +3.38 \\ AT &= +6.62 \end{aligned}$$

L.N. only
C = 00

$$\begin{aligned} a &= -523 \\ \Delta T &= +6.567 \\ c &= +.310 \end{aligned}$$

$-657 - 312 - 969 + 561 - 03 - 655 - 300 - 955 + 561 - 03 - 531 - 358 - 889 + 573 + 09 - 656 + 592 + 05 - 650 + 591 - 06 - 502 + 606 + 01$
 $- 524 - 294 - 821 + 576 + 00 - 525 - 283 - 808 + 576 + 00 - 426 - 338 - 764 + 586 + 10 - 526 + 605 - 02 - 521 + 604 - 03 - 403 + 616 + 04$
 $- 527 - 294 - 821 + 576 - 08 - 525 - 283 - 808 + 576 - 08 - 426 - 338 - 764 + 586 + 02 - 526 + 605 - 10 - 521 + 604 - 11 - 403 + 616 + 04$

$$+1457 - 1229 + 228 + 681 + 01 + 1453 - 1183 + 270 + 684 + 04 + 1178 - 1413 - 235 + 639 - 41 + 1455 + 804 - 06 + 1442 + 800 - 10 + 1114 + 788 - 47$$

June 17

Without weights

Original Equations

With weights

$$\begin{array}{l}
 L.E. \quad \delta \\
 +19.5 \\
 +78.1 \\
 0 = +0.42 + .46\delta a + 1.07\delta c + \delta\Delta\pi \\
 \quad +.040 - .263 + .487 + \delta\Delta\pi \\
 \\
 L.W. \quad \delta \\
 +9.2 \\
 +76.2 \\
 0 = -.067 + .83\delta a - 1.02\delta c + \delta\Delta\pi \\
 \quad -.090 - .213 - .418 + \delta\Delta\pi \\
 0 = -.075 - 3.47\delta a + .74\delta c + 4.00\delta\Delta\pi
 \end{array}
 \begin{array}{l}
 r \quad v \\
 2.2 \quad 2.2 \\
 .6 \quad .4 \\
 \\
 1.7 \quad 1.7 \\
 .8 \quad .5
 \end{array}$$

$$\begin{array}{l}
 L.E.O = +0.92 + 1.01\delta a + 2.35\delta c + 2.20\delta\Delta\pi \\
 \quad +.024 - 1.58 + 2.92 + .60
 \end{array}$$

$$\begin{array}{l}
 L.W.O = -.114 + 1.41\delta a - 1.73\delta c + 1.70\delta\Delta\pi \\
 \quad -.063 - 1.49\delta a - 2.93\delta c + .70
 \end{array}$$

Solution for L.E. and L.W. without weights

$$\begin{array}{l}
 L.E. \quad 0 = +.019 + .21\delta a + .49\delta c + .46\delta\Delta\pi \\
 \quad \quad \quad - .105 + .692 - .12.81
 \end{array}$$

$$\begin{array}{l}
 L.E.O = +.045 + .49\delta a + 1.14\delta c + 1.07\delta\Delta\pi \\
 \quad \quad \quad +.195 + 23.72
 \end{array}$$

$$\begin{array}{l}
 L.W. \quad 0 = -.056 + .89\delta a - .85\delta c + .83\delta\Delta\pi \\
 \quad \quad \quad +.192 + .454 + .890 \\
 0 = +.050 + 12.36\delta a - 4.27\delta c - 3.47\delta\Delta\pi
 \end{array}$$

$$\begin{array}{l}
 L.W.O = +.068 - .85\delta a + 1.04\delta c - 1.02\delta\Delta\pi \\
 \quad \quad \quad +.376 + 17.47 \\
 0 = +.684 - 4.27\delta a + 13.37\delta c + 7.74\delta\Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = +.050 + 12.36\delta a - 4.27\delta c - 3.47\delta\Delta\pi \\
 \quad +.684 - 4.27\delta a + 13.37\delta c + 7.74\delta\Delta\pi \\
 \quad -.075 - 3.47\delta a + .74\delta c + 4.00\delta\Delta\pi \\
 0 = +.604 + \delta a - 3.45\delta c - .281\delta\Delta\pi \\
 \quad +.160 - \delta a + 10.157\delta c + 1.73\delta\Delta\pi \\
 \quad -.022 - \delta a + .213\delta c + 1.153\delta\Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = +.164 + 9.812\delta c - .108\delta\Delta\pi \\
 \quad +.182 + 9.944\delta c - .980\delta\Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = +.0167 + \delta c - .0110\delta\Delta\pi \\
 \quad +.0183 + \delta c - .0985\delta\Delta\pi
 \end{array}$$

$$0 = -.0016 + .0876\delta\Delta\pi$$

$$\delta\Delta\pi = +.018 + 6.560 = +6.578\Delta\pi$$

$$\delta c = -.016 + .310 = +.294c$$

$$\delta a = -.004 - .680 = -.684a$$

Solution for C = 50

$$\delta = -.018 + 0.872\delta\Delta\pi$$

$$\delta\Delta\pi = +.020 + 6.560 = 6.580\Delta\pi$$

$$\delta a = -.003 - .680 = -.683a$$

$$\delta c = .000 + .310 = +.310c$$

$$\begin{array}{l}
 0 = +.050 - .049 + .068 - .062 = +.118 - .111 = +.007 \\
 \quad +.684 + .017 - .694 + .013 = +.714 - .694 = +.020 \\
 \quad -.075 + .044 - .012 + .072 = +.086 - .687 = -.601
 \end{array}$$

Solution for L.E. and L.W. with weights

$$\begin{aligned} L.E. &= +.093 + 1.02 \delta a + 2.37 \delta c + 222 \delta \Delta T \\ &= -.038 + 2.50 \delta a - 4.61 \delta c - .95 \delta \Delta T \\ \text{Sum} &= +.055 + 3.52 \delta a - 2.24 \delta c + 1.27 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.216 + 2.37 \delta a + 5.52 \delta c + 517 \delta \Delta T & 0 &= +.202 + 2.22 \delta a + 5.17 \delta c + 4.84 \delta \Delta T \\ &= +.070 + 8.53 \delta a + 1.75 \delta c + .014 \delta \Delta T & 0 &= +.216 + 1.27 \delta a + 6.92 \delta c + 5.20 \delta \Delta T \\ &= +.286 - 2.24 \delta a + 14.05 \delta c + 6.92 \delta \Delta T & 0 &= +.216 + 1.27 \delta a + 6.92 \delta c + 5.20 \delta \Delta T \end{aligned}$$

$$\begin{aligned} L.W. &= -.161 + 1.99 \delta a - 2.44 \delta c + 240 \delta \Delta T \\ &= +.094 + 2.22 \delta a + 4.37 \delta c - 1.04 \delta \Delta T \\ \text{Sum} &= -.067 + 4.21 \delta a + 1.93 \delta c + 1.36 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.197 - 2.44 \delta a + 2.99 \delta c - 2.94 \delta \Delta T & 0 &= -.194 + 2.40 \delta a - 2.94 \delta c + 2.89 \delta \Delta T \\ &= +.184 + 8.58 \delta a - 2.05 \delta c - .044 \delta \Delta T & 0 &= -.238 + 1.36 \delta a - 4.99 \delta c + 3.38 \delta \Delta T \\ &= +.381 + 1.93 \delta a + 11.57 \delta c - 4.99 \delta \Delta T & 0 &= -.238 + 1.36 \delta a - 4.99 \delta c + 3.38 \delta \Delta T \end{aligned}$$

$$\text{Synge} \quad 0 = -.012 + 7.73 \delta a - .31 \delta c + 2.63 \delta \Delta T$$

$$0 = +.667 - .31 \delta a + 2.562 \delta c + 1.93 \delta \Delta T \quad 0 = -.022 + 2.63 \delta a + 1.93 \delta c + 8.58 \delta \Delta T$$

$$\begin{aligned} 0 &= -.012 + 7.73 \delta a - .31 \delta c + 2.63 \delta \Delta T \\ &= +.667 - .31 \delta a + 2.562 \delta c + 1.93 \delta \Delta T \\ &= -.022 + 2.63 \delta a + 1.93 \delta c + 8.58 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= -.052 + \delta a - .040 \delta c + .340 \delta \Delta T \\ &= +2.152 - \delta a + 8.2645 \delta c + 6.226 \delta \Delta T \\ &= -.008 + \delta a + .711 \delta c + 3.262 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +2.150 + 8.2605 \delta c + 6.566 \delta \Delta T \\ &= +2.144 + 8.3356 \delta c + 9.488 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.0260 + \delta c + .0795 \delta \Delta T \\ &= +.0257 + \delta c + .1138 \delta \Delta T \end{aligned}$$

$$0 = +.0003 - .0343 \delta \Delta T$$

$$\delta \Delta T = +.009 + 6.560 = +6.569 \Delta T$$

$$\delta c = -.027 + .310 = +.283 c$$

$$\delta a = -.002 - .680 = -.682 a$$

Solution for c = 00

$$0 = -.006 - 2.922 \delta \Delta T$$

$$\delta \Delta T = -.002 + 6.560 = +6.558 \Delta T$$

$$\delta a = +.003 - .680 = -.677 a$$

$$\delta c = +.000 + .310 = +.310 c$$

$$\begin{aligned} 0 &= -.012 - .015 + .008 + .024 = +.032 - .027 \\ &= +.667 + .001 - .692 + .017 = +.685 - .692 \\ &= -.022 - .005 - .052 + .077 = +.077 - .079 \end{aligned}$$

Solution for L.E. with weights

$$\begin{aligned} 0 &= +.055 + 3.52 \delta a - 2.24 \delta c + 1.27 \delta \Delta T \\ &= +.286 - 2.24 \delta a + 14.05 \delta c + 6.92 \delta \Delta T \\ &= +.216 + 1.27 \delta a + 6.92 \delta c + 5.20 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.016 + \delta a - .636 \delta c + .361 \delta \Delta T \\ &= +.128 - \delta a + 6.272 \delta c + 3.089 \delta \Delta T \\ &= +.170 + \delta a + 5.449 \delta c + 4.074 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.144 + 5.636 \delta c + 3.450 \delta \Delta T \\ &= +.298 + 11.721 \delta c + 7.183 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= +.02543 + \delta c + .6121 \delta \Delta T \\ &= +.02546 + \delta c + .6128 \delta \Delta T \end{aligned}$$

$$0 = +.00003 - .0007 \delta \Delta T$$

$$\delta \Delta T = +.043 + 6.560 = +6.603 \Delta T$$

$$\delta c = -.052 + .310 = +.258 c$$

$$\delta a = -.064 - .680 = -.744 a$$

Solution for c = 00

$$0 = +.154 + 3.733 \delta \Delta T$$

$$\delta \Delta T = -.041 + 6.560 = +6.519 \Delta T$$

$$\delta a = -.002 - .680 = -.682 c$$

$$\delta c = +.000 + .310 = +.310 c$$

$$\begin{aligned} 0 &= +.055 - .225 + .116 + .055 \\ &= +.286 + .143 - .731 + .296 \\ &= +.216 - .081 - .360 + .224 \end{aligned}$$

$$\begin{aligned} 0 &= +.226 - .225 \\ &= +.727 - .731 \\ &= +.440 - .441 \end{aligned}$$

Solution for L.W. with weights

$$\begin{aligned} 0 &= -.067 + 4.21 \delta a + 1.93 \delta c + 1.36 \delta \Delta T \\ &= +.381 + 1.93 \delta a + 11.57 \delta c - 4.99 \delta \Delta T \\ &= -.238 + 1.36 \delta a - 4.99 \delta c + 3.38 \delta \Delta T \end{aligned}$$

$$\begin{aligned} \text{Ex } 0 &= -.059 + \delta a + .458 \delta c + .322 \delta \Delta T \\ &= +.1973 + \delta a - 5.999 \delta c - 2.585 \delta \Delta T \\ &= -.1750 + \delta a - 3.670 \delta c + 2.485 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= -.3564 + 6.457 \delta c + 2.907 \delta \Delta T \\ &= +.8723 - 2.329 \delta c - 5.070 \delta \Delta T \end{aligned}$$

$$\begin{aligned} 0 &= -.0532 + \delta c + .4502 \delta \Delta T \\ &= +.1598 - \delta c - 2.769 \delta \Delta T \end{aligned}$$

$$0 = +.1046 - 1.7267 \delta \Delta T$$

$$\delta \Delta T = +.061 + 6.560 = +6.621 \Delta T$$

$$\delta c = +.028 + .310 = +.338 c$$

$$\delta a = +.127 - .680 = -.553 a$$

Solution for c = 00

$$0 = -.0159 + 2.163 \delta \Delta T$$

$$\delta \Delta T = +.007 + 6.560 = +6.567 \Delta T$$

$$\delta a = +.154 - .680 = +.523 a$$

$$\delta c = +.000 + .310 = +.310 c$$

$$\begin{aligned} 0 &= -.067 + .535 + .026 + .083 \\ &= +.381 + .245 + .324 - .304 \\ &= -.238 + .173 - .140 + .206 \end{aligned}$$

$$\begin{aligned} 0 &= +.644 - .067 \\ &= +.950 - .304 \\ &= +.379 - .378 \end{aligned}$$

Ex

June 19 1883

L. E. Mean $\pi = 14.9$

$$c = +.15 \quad -a\pi = -6.500$$

$$a = -.65$$

\times I.	$\frac{s}{-9.7}$	$\frac{h}{14.0}$	$0 =$	-6.14	$+83a$	$+1.01c$	-54	$+15$	-39	-6.53	$-.03$
\times	$+25.$	$\frac{14.7}{14.3}$		$\frac{6.20}{6.17}$	$+68$	$+1.00$	-44	$+15$	-29	$\frac{6.49}{-6.510}$	$\frac{+.01}{-.010}$
	-3.6				$+75a$	$+1.00c$					

\times II.	$+29.5$	$\frac{15.4}{15.5}$	$0 =$	-6.46	$+82a$	$+1.15c$	-21	$+17$	-04	-6.50	$+.00$
\times	$+27.1$	$\frac{15.7}{15.4}$		$\frac{6.43}{6.45}$	$+36$	$+1.12$	-23	$+17$	-06	$\frac{6.49}{-6.495}$	$\frac{+.01}{+.005}$
	$+28.3$				$+84a$	$+1.13c$					

\times III.	$+59.8$	$\frac{14.8}{14.8}$	$0 =$	-7.12	$-49a$	$+1.99c$	$+32$	$+30$	$+62$	-6.500	$+.000$
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L. E.

\times	$+64.9$	$\frac{14.0}{14.3}$	$0 =$	-7.38	$-79a$	$+2.36c$	$+51$	$+35$	$+86$	-6.52	$-.020$
\times	$+66.9$	$\frac{14.8}{14.3}$		-4.66	$+235$	-2.55	-153	-38	-191	6.57	$-.070$
\times	$+74.6$	$\frac{14.8}{14.8}$		-8.22	-184	$+3.77$	$+120$	$+56$	$+176$	6.46	$+.040$
\times	$+77.3$	$\frac{15.1}{15.1}$		-3.27	$+382$	-4.55	-248	-68	-316	6.43	$+.070$
\times	$+67.8$	$\frac{15.2}{15.2}$		-7.59	-100	$+2.64$	$+65$	$+40$	$+105$	6.54	$-.040$

z	$0 = -1.21$	$-154a$	$+1.36c$	$0 = +1.86$	$+2.37a$	$-2.09c$	$0 = -1.64$	$-a$	$+1.85c$
	$+151$	$+160a$	$-3.55c$	$+242$	$+2.56a$	$-5.68c$	-5.36	$-a$	$+12.60c$
	-2.05	$-2.59a$	$+2.77c$	$+5.31$	$+6.71a$	$-7.17c$	-5.68	$-a$	$+7.67c$
	$+2.90$	$+3.07a$	$-5.55c$	$+8.90$	$+9.42a$	$-17.04c$	-16.09	$-a$	$+30.80c$
	-1.42	$-1.75a$	$+1.64c$	$+2.48$	$+3.06a$	$-2.87c$	-2.32	$-a$	$+2.69c$
				$+20.97$	$+24.12a$	$-34.85c$	-31.09		$+55.61c$

$$0 = +20.97 + 24.12a - 34.85c$$

$$-31.09 - 34.85a + 55.61c$$

$$0 = +8.69 + a - 1.445c$$

$$-8.92 - a + 1.596c$$

$$-.023 \quad +.151c$$

$$c = +.15$$

$$a = -.65$$

Wittig & Wright

$$\begin{aligned} a &= -669 \\ c &= +139 \\ \Delta T &= +6.518 \end{aligned}$$

$$\begin{aligned} -535 &+ 140 &-415 &+ 610 &-04 \\ -455 &+ 139 &-316 &+ 620 &+00 \end{aligned}$$

$$\begin{aligned} -214 &+ 160 &-054 &+ 646 &+00 \\ -241 &+ 156 &-085 &+ 643 &+00 \end{aligned}$$

$$+328 \quad +277 \quad +605 \quad +712 \quad +00$$

$$\begin{aligned} +529 &+ 328 &+ 857 &+ 738 &+00 \\ -1572 &- 354 &- 1926 &+ 459 &-07 \\ +1231 &+ 524 &+ 1755 &+ 827 &+05 \\ -2556 &- 632 &- 3188 &+ 333 &+06 \\ +669 &+ 367 &+ 1036 &+ 755 &-04 \end{aligned}$$

Wittig & Wright

$$\begin{aligned} a &= -646 \\ c &= +153 \\ \Delta T &= +6.501 \end{aligned}$$

$$\begin{aligned} -536 &+ 155 &-381 &+ 612 &-02 \\ -439 &+ 153 &-286 &+ 622 &+02 \end{aligned}$$

$$\begin{aligned} -207 &+ 176 &-031 &+ 647 &+01 \\ -233 &+ 171 &-062 &+ 644 &+01 \end{aligned}$$

$$+317 \quad +304 \quad +621 \quad +712 \quad +00$$

$$\begin{aligned} +510 &+ 361 &+ 871 &+ 737 &-01 \\ -1518 &- 390 &- 1908 &+ 459 &-07 \\ +1189 &+ 577 &+ 1766 &+ 827 &+05 \\ -2468 &- 696 &- 3164 &+ 334 &+07 \\ +646 &+ 404 &+ 1050 &+ 755 &-04 \end{aligned}$$

Wittig & Wright

$$\begin{aligned} a &= -654 \\ c &= +150 \\ \Delta T &= +6.505 \end{aligned}$$

$$\begin{aligned} -549 &+ 596 &-03 \\ -445 &+ 606 &+01 \end{aligned}$$

$$\begin{aligned} -209 &+ 630 &+01 \\ -235 &+ 627 &+01 \end{aligned}$$

$$+320 \quad +682 \quad +00$$

$$\begin{aligned} +517 &+ 702 &-01 \\ -1539 &+ 497 &-07 \\ +1203 &+ 771 &+05 \\ -2498 &+ 401 &+06 \\ +654 &+ 716 &-03 \end{aligned}$$

Wittig & Wright 26

$$\begin{aligned} a &= -668 \\ c &= +150 \\ \Delta T &= +6.511 \end{aligned}$$

$$\begin{aligned} -554 &+ 596 &-03 \\ -454 &+ 606 &+01 \end{aligned}$$

$$\begin{aligned} -214 &+ 630 &+01 \\ -240 &+ 627 &+01 \end{aligned}$$

$$+327 \quad +684 \quad +02$$

$$\begin{aligned} +528 &+ 704 &+01 \\ -1570 &+ 494 &-10 \\ +1229 &+ 774 &+08 \\ -2552 &+ 396 &+01 \\ +668 &+ 718 &-01 \end{aligned}$$

June 19
Without rights

Original Equations

With rights

δ	δ	δ	δ	δ	δ	δ	δ	δ	δ	
36	0 = -010	+ .758a	+ 1.008e	+ 8.000	1.4	1.4	L.E. = -014	+ 1.058a	+ 1.408e	+ 1.400
+28.3	+ .005	+ .34	+ 1.13	+ 8.000	1.4	1.4	+ .007	+ .48	+ 1.58	+ 1.40
+59.8	+ .000	- .49	+ 1.99	+ 8.000	1.4	1.4	+ .000	- .44	+ 1.79	+ .90
+64.9	- .020	- .79	+ 2.36	+ 8.000	1.4	1.4	- .018	- .71	+ 2.12	+ .90
+66.9 L.E.	- .070	+ 2.35	- 2.55	+ 8.000	1.4	1.4	- .049	+ 1.64	- 1.78	+ .90
+74.6	+ .040	- 1.84	+ 3.77	+ 8.000	1.4	1.4	+ .028	- 1.29	+ 2.64	+ .90
+77.3 L.E.	+ .070	+ 3.82	- 4.55	+ 8.000	1.4	1.4	+ .042	+ 2.29	- 2.73	+ .60
+67.8	- .040	- 1.00	+ 2.64	+ 8.000	1.4	1.4	- .032	- .80	+ 2.11	+ .80
	0 = -025	+ 3.148a	+ 5.798e	+ 8.000						

Solution for L & without rights

$$L.E. \ 0 = -007 + .568a + .758e + .758\Delta\pi$$

$$+ .002 + .12 + .38$$

$$+ .000 + .24 - .98$$

$$+ .016 + .62 - 1.86$$

$$- .164 + 5.52 - 5.99$$

$$- .074 + 3.39 - 6.74$$

$$+ .267 + 14.59 - 17.38$$

$$+ .040 + 1.00 - 2.64$$

$$0 = +080 + 26048a - 34668e + 3148\Delta\pi$$

$$L.E. \ 0 = -010 + .758a + 1.008e + 1.008\Delta\pi$$

$$+ .006 + .128$$

$$+ .000 + .3.96$$

$$- .047 + 5.57$$

$$+ .178 + 6.50$$

$$+ .151 + 14.21$$

$$- .318 + 20.70$$

$$- .106 + 6.97$$

$$0 = -146 - 34668a + 60198e + 5798\Delta\pi$$

$$0 = +080 + 26048a - 34668e + 3148\Delta\pi$$

$$- 146 - 34668a + 60198e + 5798\Delta\pi$$

$$- 025 + 3.148a + 5.798e + 8.000\Delta\pi$$

$$0 = +003 + 8a - 1.331e + .121\Delta\pi$$

$$- .004 - 8a + 1.737e + .167\Delta\pi$$

$$- .008 + 8a + 1.844e + 2.548\Delta\pi$$

$$0 = -001 + 4068e + 2888\Delta\pi$$

$$- .012 + 3.581e + 2.715\Delta\pi$$

$$0 = -0325 + 7094\Delta\pi$$

$$- 0034 + 7582\Delta\pi$$

$$0 = +0009 - 0488\Delta\pi$$

$$\delta\Delta\pi = +.018 + 6.500 = +6.518\Delta\pi$$

$$\delta e = -.011 + 1.50 = +1.39 e$$

$$\delta a = -.019 - 6.50 = -6.69 a$$

Solution for e = 0

$$0 = -.011 + 2.427\Delta\pi$$

$$\delta\Delta\pi = +.005 + 6.500 = +6.505\Delta\pi$$

$$\delta a = -.004 + .650 = -.654 a$$

$$\delta e = .000 + .150 = +.150 e$$

$$0 = 1080 - 495 + 381 + 056 = +517 - 495 = +022 e$$

$$- 146 + 657 - 662 + 104 = +761 - 808 = -047$$

$$- 025 - 060 - 064 + 144 = +144 - 149 = -005$$

Solution for L. E. with weights

$$\begin{array}{ll}
 0 = -0.15 + 1.10\delta a + 1.47\delta c + 1.47\delta \Delta\pi & 0 = -0.020 + 1.47\delta a + 1.96\delta c + 1.96\delta \Delta\pi \\
 +0.03 + .23 & +0.11 \\
 +0.00 + .19 & +2.50 + 2.21 \\
 +0.13 + .50 & +3.20 + 1.61 \\
 -0.80 + 2.69 & +4.49 + 1.91 \\
 -0.36 + 1.66 & +3.17 - 1.25 \\
 +0.96 + 5.24 & +6.97 + 1.85 \\
 +0.26 + .64 & +7.45 - 1.64 \\
 & -0.68 + 4.45 + 1.69 \\
 0 = +0.07 + 12.25\delta a - 14.34\delta c + 2.08\delta \Delta\pi & 0 = -0.69 - 14.34\delta a + 34.19\delta c + 8.34\delta \Delta\pi \\
 & 0 = -0.41 + 2.08\delta a + 8.34\delta c + 7.52\delta \Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = +0.07 + 12.25\delta a - 14.34\delta c + 2.08\delta \Delta\pi \\
 -0.69 - 14.34\delta a + 34.19\delta c + 8.34\delta \Delta\pi \\
 -0.41 + 2.08\delta a + 8.34\delta c + 7.52\delta \Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = -0.01 + \delta a - 1.171\delta c + 1.698\delta \Delta\pi \\
 -0.05 - \delta a + 2.384\delta c + 3.82\delta \Delta\pi \\
 -0.020 + \delta a + 4.010\delta c + 3.500\delta \Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = -0.06 + 1.218\delta c + 2.280\delta \Delta\pi \\
 -0.025 + 6.394\delta c + 4.082\delta \Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = -0.049 + \delta c + 1.879\delta \Delta\pi \\
 -0.039 + \delta c + 6.840\delta \Delta\pi
 \end{array}$$

$$0 = -0.010 + 1.2415\delta \Delta\pi$$

$$\delta \Delta\pi = +0.01 + 6.500 = +6.501 \Delta\pi$$

$$\delta c = +0.03 + 1.50 = +1.53 c$$

$$\delta a = +0.04 - 6.50 = -6.46 a$$

Solution for $c = 0$

$$0 = -0.19 + 1.802\delta \Delta\pi$$

$$\delta \Delta\pi = +0.11 + 6.500 = +6.511$$

$$\delta a = -0.18 + 6.50 = -6.68$$

$$\delta c = +0.00 + 1.50 = +1.50$$

$$\begin{array}{l}
 0 = +0.07 + 0.49 - 0.43 + 0.02 = +0.58 - 0.43 = +0.15 \\
 -0.69 - 0.57 + 1.03 + 0.08 + 1.11 - 1.26 - 0.15 \\
 -0.41 + 0.08 + 0.25 + 0.07 + 0.40 - 0.41 - 0.01
 \end{array}$$

June 20 1883

L.V. Mean $\Sigma = 15.2$

$$\begin{array}{rcl}
 X & \text{I} & \\
 X & - & \\
 X & & \\
 X & & \\
 \hline
 & & \\
 \hline
 \end{array}
 \begin{array}{r}
 15.6 \\
 22.3 \\
 19.5 \\
 19.1 \\
 \hline
 \end{array}
 \begin{array}{r}
 14.7 \\
 15.9 \\
 16.0 \\
 \hline
 \end{array}
 \begin{array}{r}
 0 = \\
 \\
 \\
 \\
 \hline
 \end{array}
 \begin{array}{r}
 -5.98 \\
 5.97 \\
 5.97 \\
 -5.97 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 X & \text{II} & \\
 X & - & \\
 X & & \\
 \hline
 & & \\
 \hline
 \end{array}
 \begin{array}{r}
 19.0 \\
 18.5 \\
 18.8 \\
 \hline
 \end{array}
 \begin{array}{r}
 13.8 \\
 15.7 \\
 \hline
 \end{array}
 \begin{array}{r}
 0 = \\
 \\
 \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.20 \\
 6.24 \\
 -6.22 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 X & \text{III} & \\
 \hline
 \end{array}
 \begin{array}{r}
 64.9 \\
 \hline
 \end{array}
 \begin{array}{r}
 14.0 \\
 \hline
 \end{array}
 \begin{array}{r}
 0 = \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.82 \\
 \hline
 \end{array}$$

L.V.

$$\begin{array}{rcl}
 X & & \\
 X & & \\
 X & & \\
 \hline
 & & \\
 \hline
 \end{array}
 \begin{array}{r}
 78.1 \\
 78.1 \\
 66.7 \\
 \hline
 \end{array}
 \begin{array}{r}
 14.1 \\
 15.8 \\
 14.3 \\
 \hline
 \end{array}
 \begin{array}{r}
 0 = \\
 \\
 \\
 \hline
 \end{array}
 \begin{array}{r}
 -8.14 \\
 8.14 \\
 5.05 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 a = & -54 & \\
 c = & +05 & \\
 \hline
 & & \\
 \hline
 \end{array}
 \begin{array}{r}
 +.91a + .104c \\
 +.100 + .108 \\
 +.96 + .106 \\
 \hline
 +.96a + .106c \\
 \hline
 \end{array}
 \begin{array}{r}
 -.49 + .05 \\
 -.54 + .05 \\
 -.52 + .05 \\
 \hline
 \end{array}
 \begin{array}{r}
 -44 \\
 -49 \\
 -47 \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.41 \\
 6.46 \\
 6.44 \\
 \hline
 -6.437 \\
 \hline
 \end{array}
 \begin{array}{r}
 -.01 \\
 -.05 \\
 -.04 \\
 \hline
 -.032 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 +.47a + .106c & -.25 + .05 & -20 \\
 +.48 + .105 & -.26 + .05 & -21 \\
 +.48a + .105c & & \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.40 \\
 6.45 \\
 -6.425 \\
 \hline
 \end{array}
 \begin{array}{r}
 +.00 \\
 -.04 \\
 -.020 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 -.79a + .236c & +.43 + .12 & +.55 \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.270 \\
 +.135 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 -.261a + .485c & +.141 + .24 & +.165 \\
 -.263 + .487 & +.142 + .24 & +.166 \\
 +.235 - .255 & -1.27 - .13 & -1.40 \\
 \hline
 \end{array}
 \begin{array}{r}
 -6.490 \\
 6.480 \\
 6.450 \\
 \hline
 -6.450 \\
 \hline
 \end{array}
 \begin{array}{r}
 -.085 \\
 -.075 \\
 -.045 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 I & 0 = & \\
 & -217 - 357a & +3.79c \\
 & -217 - 359a & +3.81c \\
 & +.92 + 1.39a & -3.61c \\
 II & -192 - 3.09a & +3.80c \\
 & -1.92 - 3.11a & +3.82c \\
 & +1.17 + 1.87a & -3.60c \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 0 = & +7.75 + 12.74a & -13.53c \\
 & +7.79 + 12.89a & -13.68c \\
 & +1.28 + 1.93a & -5.02c \\
 & +5.93 + 9.55a & -11.74c \\
 & +5.97 + 9.67a & -11.88c \\
 & +2.19 + 3.50a & -6.73c \\
 & +30.91 + 50.28a & -62.58c \\
 \hline
 \end{array}
 \begin{array}{r}
 -8.22 \\
 -8.27 \\
 -3.32 \\
 -7.30 \\
 -7.33 \\
 -4.21 \\
 -38.65 \\
 \hline
 \end{array}
 \begin{array}{r}
 a + 14.36c \\
 a + 14.52c \\
 a + 13.03c \\
 a + 14.44c \\
 a + 14.59c \\
 a + 12.96c \\
 +83.90c \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 0 = & +30.91 + 50.28a & -62.58c \\
 & -38.65 - 62.58a & +83.90c \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 0 = & +6.13 + a & -1.245c \\
 & -6.18 - a & +1.341c \\
 & -.008 & +.096c \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 c = & +.052 & \\
 a = & -.543 & \\
 \hline
 \end{array}$$

Without weights
L.W.

$$a = -542$$

$$C = +053$$

$$\Delta\pi = +6.419$$

$$\begin{array}{rcl} -493 & + & 55 \\ -542 & + & 57 \\ -520 & + & 56 \end{array} \begin{array}{rcl} -438 & +5.98 & +.00 \\ -485 & +5.93 & -.04 \\ -464 & +5.96 & -.01 \end{array}$$

$$\begin{array}{rcl} -255 & + & 56 \\ -260 & + & 56 \end{array} \begin{array}{rcl} -199 & +6.22 & +.02 \\ -204 & +6.22 & -.02 \end{array}$$

$$+428 + 1.25 + 5.53 + 6.97 +.15$$

$$\begin{array}{rcl} +1415 & +257 & +1672 \\ +1425 & +258 & +1683 \\ -1274 & -135 & -1409 \end{array} \begin{array}{rcl} 8.09 & -.05 & \\ 8.10 & -.04 & \\ +5.01 & -.04 & \end{array}$$

With weights
L.W.

$$a = -515$$

$$C = +066$$

$$\Delta\pi = +6.389$$

$$\begin{array}{rcl} -469 & + & 69 \\ -515 & + & 71 \\ -494 & + & 70 \end{array} \begin{array}{rcl} -400 & +5.99 & +.01 \\ -444 & +5.94 & -.03 \\ -424 & +5.96 & -.01 \end{array}$$

$$\begin{array}{rcl} -242 & + & 70 \\ -247 & + & 69 \end{array} \begin{array}{rcl} -172 & +6.22 & +.02 \\ -178 & +6.21 & -.03 \end{array}$$

$$+407 + 1.56 + 5.63 + 6.95 +.13$$

$$\begin{array}{rcl} +1344 & +220 & +1564 \\ +1354 & +221 & +1575 \\ -1210 & -168 & -1378 \end{array} \begin{array}{rcl} 7.95 & -.19 & \\ 7.96 & -.18 & \\ +5.01 & -.04 & \end{array}$$

Without weights
S.C. = 00

$$a = -546$$

$$\Delta\pi = +6.423$$

$$C = +.050$$

$$\begin{array}{rcl} -497 & +5.93 & +.00 \\ -546 & +5.88 & -.04 \\ -524 & +5.90 & -.02 \end{array}$$

$$\begin{array}{rcl} -257 & +6.17 & +.02 \\ -262 & +6.16 & -.03 \end{array}$$

$$+431 + 6.85 +.15$$

$$\begin{array}{rcl} +1425 & +7.85 & -.05 \\ +1436 & +7.86 & -.04 \\ -1283 & +5.74 & -.04 \end{array}$$

With weights
S.C. = 08

$$a = -535$$

$$\Delta\pi = +6.418$$

$$C = +.050$$

$$\begin{array}{rcl} -487 & +5.93 & +.00 \\ -535 & +5.88 & -.04 \\ -514 & +5.90 & -.02 \end{array}$$

$$\begin{array}{rcl} -251 & +6.17 & +.02 \\ -257 & +6.16 & -.03 \end{array}$$

$$+423 + 6.84 +.14$$

$$\begin{array}{rcl} +1396 & +7.81 & -.09 \\ +1407 & +7.82 & -.08 \\ -1257 & +5.76 & -.02 \end{array}$$

June 20

Without weights

Original Equations

With weights

$$\begin{array}{r}
 19.1 \\
 +18.8 \\
 +64.9 \\
 +78.1 \\
 +78.1 \\
 +66.9 \text{ L.B.} \\
 \hline
 0 = -122 - 224\delta a + 1164\delta c + 600\delta \Delta T
 \end{array}$$

$$\begin{array}{r}
 1.7 \\
 1.4 \\
 .9 \\
 .6 \\
 .6 \\
 .7 \\
 \hline
 1.6 \\
 1.4 \\
 .4 \\
 .4 \\
 .4 \\
 .45
 \end{array}$$

$$\begin{array}{r}
 L.W. = -0.54 + 1.63\delta a + 1.80\delta c + 1.70\delta \Delta T \\
 -0.28 + .67 + 1.47 + 1.40 \\
 +1.22 - .71 + 2.12 + .90 \\
 -0.51 - 1.54 + 2.91 + .60 \\
 -0.45 - 1.58 + 2.92 + .60 \\
 -0.32 + 1.64 - 1.78 + .70
 \end{array}$$

Solution for L.W. without weights

$$\begin{array}{r}
 0 = -0.31 + .92\delta a + 1.02\delta c + .96\delta \Delta T \\
 -.010 + .23 + .50 \\
 -.107 + .62 + .786 \\
 +.222 + 6.81 - 12.66 \\
 +.197 + 6.92 - 12.81 \\
 -.106 + 5.52 - 5.99 \\
 \hline
 0 = +165 + 2102\delta a - 3180\delta c - 224\delta \Delta T
 \end{array}$$

$$\begin{array}{r}
 0 = -.034 + 1.02\delta a + 1.12\delta c + 1.06\delta \Delta T \\
 -.021 + 1.10 \\
 +.319 + 5.57 \\
 -.412 + 23.52 \\
 -.365 + 23.72 \\
 +.115 + 6.50 \\
 \hline
 0 = -.398 - 3180\delta a + 6153\delta c + 11.64\delta \Delta T
 \end{array}$$

$$\begin{array}{r}
 0 = +165 + 2102\delta a - 3180\delta c - 224\delta \Delta T \\
 -.398 - 3180\delta a + 6153\delta c + 11.64\delta \Delta T \\
 -.122 - 224\delta a + 11.64\delta c + 600\delta \Delta T \\
 \hline
 0 = +.008 + \delta a - 1.513\delta c - .107\delta \Delta T \\
 -.013 - \delta a + 1.933\delta c + .366\delta \Delta T \\
 -.055 - \delta a + 5.196\delta c + 2.679\delta \Delta T \\
 \hline
 0 = -.025 + 4.22\delta c + 2.59\delta \Delta T \\
 +.542 - 3.261\delta c - 2.313\delta \Delta T \\
 \hline
 0 = -.0116 + \delta c + .6137\delta \Delta T \\
 +.0129 - \delta c - .7093\delta \Delta T \\
 \hline
 0 = +.0013 - .0956\delta \Delta T \\
 \hline
 \delta \Delta T = +.014 + 6.405 = +6.419 \Delta T \\
 \delta c = +.003 + .050 = +.053 c \\
 \delta a = -.002 - .540 = -.542 a
 \end{array}$$

Solution for c = 0

$$\begin{array}{r}
 0 = -.047 + 2.572\delta \Delta T \\
 \delta \Delta T = +.018 + 6.405 = +6.423 \Delta T \\
 \delta a = -.006 - .540 = -.546 a \\
 \delta c = +.000 + .050 = +.050 c
 \end{array}$$

$$\begin{array}{r}
 0 = +165 - .042 - .095 - .031 = +165 - .168 = +003 \\
 -.398 + .064 + .185 + .163 + 412 - 398 + .014 \\
 -.122 + .004 + .035 + .084 + 123 - 122 + .001
 \end{array}$$

Solution for L. W. with weights

$$\begin{array}{ll}
 0 = \begin{array}{l} -.088 + 2.66\delta a + 2.93\delta c \\ -.019 + .45 + .98 \\ -.087 + .50 + 1.51 \\ +.080 + 2.46 - 4.57 \\ +.071 + 2.50 - 4.61 \\ -.052 + 2.69 - 2.92 \end{array} + 2.77\delta\Delta\pi & 0 = \begin{array}{l} -.097 + 2.93\delta a + 3.24\delta c + 3.06\delta\Delta\pi \\ -.041 + 2.16 + 2.06 \\ +.259 + 4.49 + 1.91 \\ -.148 + 8.47 + 1.75 \\ -.131 + 8.53 + 1.75 \\ +.057 + 3.17 - 1.25 \end{array} \\
 0 = -.095 + 11.26\delta a - 9.70\delta c + 2.33\delta\Delta\pi & 0 = -.101 - 9.70\delta a + 30.06\delta c + 9.28\delta\Delta\pi \\
 0 = -.092 + 2.77\delta a + 3.06\delta c + 2.89\delta\Delta\pi & 0 = -.101 + 2.33\delta a + 9.28\delta c + 6.87\delta\Delta\pi
 \end{array}$$

$$\begin{array}{l}
 0 = -.095 + 11.26\delta a - 9.70\delta c + 2.33\delta\Delta\pi \\
 -.101 - 9.70\delta a + 30.06\delta c + 9.28\delta\Delta\pi \\
 -.101 + 2.33\delta a + 9.28\delta c + 6.87\delta\Delta\pi \\
 0 = -.008 + \delta a - .861\delta c + .207\delta\Delta\pi \\
 -.010 - \delta a + 3.099\delta c + .957\delta\Delta\pi \\
 -.043 + \delta a + 3.983\delta c + 2.948\delta\Delta\pi \\
 0 = -.018 + 2.238\delta c + 1.164\delta\Delta\pi \\
 -.053 + 7.082\delta c + 3.905\delta\Delta\pi \\
 0 = -.0080 + \delta c + .5201\delta\Delta\pi \\
 -.0075 + \delta c + .5511\delta\Delta\pi \\
 0 = -.0005 - .0310\delta\Delta\pi \\
 \delta\Delta\pi = -.016 + 6.405 = +6.389\Delta\pi \\
 \delta c = +.016 + .050 = +.066\ c \\
 \delta a = +.025 - .540 = -.515\ a
 \end{array}$$

Solution for $c = 0$

$$\begin{array}{l}
 0 = -.035 + 2.741\delta\Delta\pi \\
 \delta\Delta\pi = +.013 + 6.405 = +6.418\Delta\pi \\
 \delta a = +.025 - .540 = -.515\ a \\
 \delta c = +.077 + .050 = +.050\ c
 \end{array}$$

$$\begin{array}{lll}
 0 = \begin{array}{l} -.095 + 2.82 - 1.55 - .037 \\ -.101 - 2.42 + .481 - .148 \\ -.101 + 2.58 + .148 - .110 \end{array} = \begin{array}{l} +2.82 - 2.87 = -.005 \\ +.481 - .491 = -.010 \\ +2.06 - .211 = -.005 \end{array}
 \end{array}$$

L. E. Mean $\bar{x} = 16.6$

$$a = -.45 - \Delta T = -6.570$$
$$c = -137$$
$$a = -581$$
$$-47 = -6.638$$

L. E.

Equations for \underline{a} and \underline{c}

For L.W only
 $c = .000$
 $a = -.496$ } $-4\pi = -6.670$

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$$\begin{aligned} &L.E. \text{ and } L.W. \\ &\text{Without night} \\ &a = -438 \\ &c = -049 \\ &\Delta T = +6.559 \end{aligned}$$

$$\begin{aligned} &L.E. \text{ and } L.W. \\ &\text{With night} \\ &a = -456 \\ &c = -058 \\ &\Delta T = +6.543 \end{aligned}$$

$$\begin{aligned} &\text{With night} \\ &\text{L.E. only} \\ &a = -539 \\ &c = -103 \\ &\Delta T = +6.580 \end{aligned}$$

$$\begin{aligned} &L.E. \text{ and } L.W. \\ &\Delta C = 00 \text{ without } W. \\ &a = -439.42 \\ &\Delta T = +6.561 \\ &c = -040 \end{aligned}$$

$$\begin{aligned} &L.E. \text{ and } L.W. \\ &\Delta C = 00 \text{ with night} \\ &a = -467 \\ &\Delta T = +6.548 \\ &c = -040 \end{aligned}$$

$$\begin{aligned} &L.E. \text{ only} \\ &a = -584 \\ &\Delta T = +6.640 \\ &c = -137 \end{aligned}$$

at

$$\begin{aligned} 398-392 &-05144- & 443-612 & +26+24- & 415-60 & -475+6.07+21 \\ 438-431 &-5345- & 484-608 & +03+01- & 456-63 & -519+6.02-03 \\ 420-414 &-5244- & 464+609 & +12+11- & 438-61 & -499+6.04+07 \end{aligned}$$

$$\begin{aligned} 490-107 &-597+598+12- & 399+6.16 & +46+24 & 425+6.12+22 & -531+6.11+11 \\ 539-111 &-650+593-12- & 439+6.12 & +03+01- & 467+6.08-01 & -584+6.06-14 \\ 517-109 &-626+595-02- & 421+6.14 & +13+11- & 448+6.10+09 & -561+6.08-03 \end{aligned}$$

$$\begin{aligned} 48-47 &-6555- & 112+6.45 & -10+11- & 50-76 & -126+6.42-13 \\ 140-138 &-5648- & 194+6.36 & +09+08- & 146-67 & -213+6.33+06 \\ 158-155 &-5547- & 210+6.35 & +12+11- & 164-65 & -229+6.31+08 \\ 276-272 &-4942- & 321+6.24 & +18+16- & 287-59 & -346+6.20+14 \\ 228-224 &-5144- & 275+6.28 & +10+09- & 234-60 & -297+6.23+07 \\ 210-207 &-5144- & 258+6.30 & +15+14- & 219-61 & -280+6.26+11 \end{aligned}$$

$$\begin{aligned} 59-136 &-195+638-17- & 48+6.51 & -09-11- & 51+6.50+00 & -64+6.58-15 \\ 172-118 &-290+6.29+02- & 140+6.42 & +10+08- & 149+6.46+08 & -18+6.45+02 \\ 194-115 &-309+6.27+04- & 158+6.40 & +13+11- & 158+6.39+12 & -210+6.43+05 \\ 240-184 &-344+6.24+18- & 277+6.28 & +18+16- & 294+6.25+15 & -268+6.21+17 \\ 280-187 &-387+6.19+01- & 228+6.33 & +11+09- & 243+6.30+08 & -314+6.34+02 \\ 259-188 &-367+6.21+06- & 211+6.35 & +16+14- & 224+6.32+13 & -280+6.36+07 \end{aligned}$$

$$\begin{aligned} 806+793 &-185158+608+717-14-12+ & 839-219+620+716-15 \\ 152+1133 &-239244 & 894+745 & +07+11+ & 1199-282+917+746+08 \\ 2673-1846 &+223194 & 1423+514 & +15+07- & 1742+264-1478+506+07 \end{aligned}$$

$$\begin{aligned} +992-388+604+718-13+ & 808+737 & -07-11+ & 859+741 & -05+ & 1074+71-12 \\ +1418-502+916+750+12+ & 1154+771 & +14+12+ & 1228+78 & +21+ & 1536+818+13 \\ -2059+469-1590+459+00- & 1677+488 & -29- & 1784+476 & -41- & 2231+441+04 \\ & & +07+05 & & & \end{aligned}$$

a and c from L.E.

$$\begin{aligned} 0 &= +21.77 + 5481a - 7400c \\ &-28.72 - 7440a + 10656c \end{aligned}$$

$$\begin{aligned} 0 &= +39.72 + a - 1.350c \\ &-38.60 - a + 1.432c \\ 0 &= +41.12 + 0.082c \end{aligned}$$

$$c = -137 \quad a = -581$$

a and c from L.W.

$$\begin{aligned} 0 &= +167.86 + 335.08a + 470.29c \\ &+ 233.16 + 470.29a + 668.12c \end{aligned}$$

$$\begin{aligned} 0 &= +4968 + a + 1391c \\ &+ 4968 + a + 1426c \\ &+ 1000 + 0.035c \end{aligned}$$

$$c = +0.29 \quad a = -537$$

L.W. only

$$\begin{aligned} a &= -704 \\ c &= +150 \\ \Delta T &= +6.928 \end{aligned}$$

L.W. only

$$\begin{aligned} \Delta C &= 00 \\ a &= -498 \\ \Delta T &= +6.70 \\ c &= 000 \end{aligned}$$

$$\begin{aligned} 455-488 &+5448- & 394+616 & +23+20- & 474+64 & -410+6.13+20 \\ 485-487 &+5749- & 430+6.13 & +25+22- & 515+67 & -448+6.10+22 \\ 326-323 &+4942- & 274+6.28 & +04+07- & 342+58 & -284+6.26+02 \end{aligned}$$

$$\begin{aligned} 774-165 &-939+599+06- & 456+6.10 & +21+19- & 486+6.06+17- & 518+6.54+22 \\ 841-174 &-1015+591+03- & 496+6.06 & +22+20- & 528+6.02+18- & 563+6.11+23 \\ 558-150 &-708+6.22-02- & 329+6.23 & +03+01- & 350+6.20+00- & 373+6.30+06 \end{aligned}$$

$$\begin{aligned} 232-228 &+5042- & 178+6.38 & +04+01- & 242+60 & -182+6.36+02 \\ 149-146 &+5547- & 091+6.47 & -12-15- & 155+65 & -090+6.45-14 \\ 144-142 &+5648- & 086+6.47 & -05-08- & 150+66 & -084+6.46-06 \end{aligned}$$

$$\begin{aligned} 394-154 &-548+638+04- & 233+6.23 & -07-09- & 247+6.30+00- & 264+6.41+07 \\ 253-170 &-423+650-09- & 149+6.41 & -14-16- & 159+6.39-16- & 169+6.50-09 \\ 245-171 &-416+6.51-01- & 145+6.42 & -06-08- & 154+6.39-09- & 164+6.51-01 \end{aligned}$$

$$\begin{aligned} 83-82 &+6152- & 021+6.54 & -04-07- & 87+72 & -015+6.53-05 \\ 58+86 &+8049+ & 166+6.72 & -15-17+ & 91+95 & +186+6.73-14 \\ 153+151 &+8976+ & 240+6.80 & -22-25+ & 160+106 & +266+6.81-21 \\ 74+73 &+7968+ & 152+6.71 & -24-27+ & 77+93 & +170+6.71-24 \end{aligned}$$

$$\begin{aligned} 241-188 &-329+660+02- & 83+6.48 & -05-07- & 89+6.46-07- & 98+6.58+00 \\ +149-246 &-097+683-04+ & 88+6.45 & -16-18+ & 93+6.44-17+ & 100+6.77-10 \\ +260-273 &-013+6.92-10+ & 154+6.71 & -24-26+ & 163+6.71-24+ & 174+6.84-18 \\ +126-241 &-115+6.81-14+ & 75+6.64 & -25-27+ & 79+6.63-26+ & 85+6.76-19 \end{aligned}$$

$$\begin{aligned} 1905 &-1875 & -25922 & 2134+443 & +06+04- & 1984-307 & -2291+425-12 \\ 1454 &-1431 & -18912 & 1620+494 & +14+12- & 1514-224 & -1738+480+00 \\ 644 &+634 & +160137 & 794+735 & -17-20+ & 670+190 & +860+740-12 \\ 4884 &+4806 & +826708 & 5632+1217 & +13+07 & +5084+978 & +6072+1262+56 \\ 1126 &-1108 & -139119 & 1247+531 & -17-18- & 1172-165 & -1337+521-27 \end{aligned}$$

$$\begin{aligned} -3236 &+794 & 2442 & +449+12- & 1910+465 & +07+05 & 2031+452-06 & 2166+50+13 \\ -2470 &+519 & 1891 & +504+24- & 1457+510 & +15+13 & 1550+500+08 & 1655+502+22 \\ +1044 &-489 & 605 & +755+01+ & 645+720 & -18-20 & 686+723-16 & 732+740-12 \\ +8295 &-2529 & 45766 & +1269+63+ & 4875+1146 & +07+05 & 5207+116+37 & 5553+122+16 \\ -1912 &+126 & -1486 & +544-04- & 1128+548 & -16-14 & 1204+535-24 & 1280+539-09 \end{aligned}$$

June 21

Original Equations

Without weights

With Weights

$$\begin{array}{rcll}
 \delta & & & \\
 -19.2 & 0 = +137 & +.96\delta a & +1.06\delta c + \delta\Delta T \\
 +23.1 & +107 & +.40 & +1.12 & +\delta\Delta T \\
 +74.6 & -060 & -1.84 & -3.77 & +\delta\Delta T \\
 +78.1 & +190 & -2.63 & +4.87 & +\delta\Delta T \\
 +77.2 & +040 & +3.82 & -4.55 & +\delta\Delta T \\
 & & & & \begin{array}{l} 1.7 \quad 1.6 \\ 2.4 \quad 2.4 \\ .4 \quad .5 \\ .6 \quad .4 \\ .6 \quad .3 \end{array}
 \end{array}$$

$$\begin{array}{rcll}
 \delta & & & \\
 0 = +233 & +1.63\delta a & +1.80\delta c & +1.70\delta\Delta T \\
 +257 & +.96 & +2.69 & +2.40 \\
 -042 & -1.29 & +2.64 & +.70 \\
 +114 & -1.58 & +2.92 & +.60 \\
 +024 & +2.29 & -2.73 & +.60
 \end{array}$$

$$\begin{array}{rcll}
 \delta & & & \\
 -19.2 & +153 & +.97\delta a & -1.09\delta c + \delta\Delta T \\
 +23.7 & -053 & +.40 & -1.10 & +\delta\Delta T \\
 +49.4 & -165 & -.13 & -1.58 & +\delta\Delta T \\
 +79.1 & +030 & +4.35 & +5.29 & +\delta\Delta T \\
 +75.0 & +130 & +3.32 & +3.86 & +\delta\Delta T \\
 +72.2 & -160 & -1.47 & -3.27 & +\delta\Delta T \\
 +86.6 & +200 & -11.15 & -16.86 & +\delta\Delta T \\
 +69.4 & -180 & +2.57 & +2.84 & +\delta\Delta T \\
 & & & & \begin{array}{l} 1.7 \quad 1.6 \\ 1.7 \quad 1.7 \\ 1.9 \quad 1.8 \\ .6 \quad .3 \\ .6 \quad .4 \\ .8 \quad .6 \\ .3 \quad .1 \\ .7 \quad .5 \end{array}
 \end{array}$$

$$\begin{array}{rcll}
 \delta & & & \\
 0 = +260 & +1.65\delta a & -1.85\delta c & +1.70\delta\Delta T \\
 -090 & +.68 & -1.87 & +1.70 \\
 -314 & -.25 & -3.00 & +1.90 \\
 +018 & +2.61 & +3.17 & +.60 \\
 +078 & +1.99 & +2.32 & +.60 \\
 -128 & -1.18 & -2.62 & +.80 \\
 +060 & -3.34 & -5.06 & +.30 \\
 -126 & +1.80 & +1.99 & +.70
 \end{array}$$

$$+369 - .43\delta a - 5.64\delta c + 13.00\delta\Delta T$$

Solution for L.E. and L.W. Without weights

a = c = ΔT =

$$\begin{array}{rcll}
 \text{L.E.} & & & \\
 0 = +132 & +.92\delta a & +1.02\delta c & +.96\delta\Delta T \\
 +043 & +.16 & +.45 & \\
 +110 & +3.39 & -.64 & \\
 -500 & +6.92 & -12.81 & \\
 +153 & +14.59 & -17.38 &
 \end{array}$$

$$\begin{array}{rcll}
 \text{L.E.} & & & \\
 0 = +145 & +1.02\delta a & +1.12\delta c & +1.06\delta\Delta T \\
 +120 & & +1.25 & \\
 -226 & & +14.21 & \\
 +925 & & +23.72 & \\
 -182 & & +20.70 &
 \end{array}$$

$$\begin{array}{rcll}
 \text{L.W.} & & & \\
 0 = +148 & +.94\delta a & -1.06\delta c & +.97\delta\Delta T \\
 -021 & +.16 & -.44 & \\
 +021 & +.02 & +.21 & \\
 +130 & +15.92 & +23.01 & \\
 +432 & +11.02 & +12.82 & \\
 +235 & +2.16 & +4.81 & \\
 -2230 & +124.32 & +18.99 & \\
 0 = -463 & +6.60 & +7.30 & \\
 -1.810 & +190.12\delta a & +198.98\delta c & - .43\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 \text{L.W.} & & & \\
 0 = -167 & -1.06\delta a & +1.19\delta c & -1.09\delta\Delta T \\
 +058 & & +1.21 & \\
 +261 & & +2.50 & \\
 +159 & & +27.98 & \\
 +502 & & +14.90 & \\
 +523 & & +10.69 & \\
 -3372 & & +28.26 & \\
 0 = -511 & & +8.07 & \\
 -1.765 & +198.98\delta a & +411.80\delta c & -5.64\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -1.810 & +190.12\delta a & +198.98\delta c & - .43\delta\Delta T \\
 -1.765 & +198.98 & +411.80 & -5.64 \\
 +.369 & -.43 & -5.64 & +13.00
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.010 & +.44\delta a & +10.47\delta c & -.002\delta\Delta T \\
 -.008 & +.02\delta a & +2.070\delta c & -.028\delta\Delta T \\
 +.558 & -.02\delta a & -13.116\delta c & +10.233\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.001 & -1.023\delta c & +.026\delta\Delta T \\
 +.849 & -1.046\delta c & +30.205\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.001 & -\delta c & +.025\delta\Delta T \\
 +.072 & -\delta c & +2.734\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -.078 & -2.709\delta\Delta T \\
 \delta\Delta T = -.0288 + 6.570 = +6.559\delta\Delta T
 \end{array}$$

$$\delta c = -.002 - .040 = -.042\delta c$$

$$\delta a = +.012 - .450 = -.438\delta a$$

Solution for C=0

$$0 = +8.48 + 10.231\delta\Delta T$$

$$\delta\Delta T = -.089 + 6.570 = +6.561\delta\Delta T$$

$$\delta a = +.011 - .450 = -.439\delta a$$

$$\delta c = +0.00 - .040 = -.040\delta c$$

$$\begin{array}{rcll}
 0 = -1.810 & +2.281 & -3.98 & +0.12 = -2.208 + 2.293\delta\Delta T + .081 \\
 -1.765 & +2.388 & -8.24 & +1.62 = -2.589 + 2.250\delta\Delta T - .039 \\
 +.369 & -.405 & +0.11 & -3.74 = -.379 + 3.50\delta\Delta T + .001
 \end{array}$$

Solution for L E and L W. With weights.

L E

$$\begin{array}{l}
 0 = +380 + 2.66 \delta a + 2.93 \delta c + 2.77 \delta \Delta T \quad 0 = +419 + 2.93 \delta a + 3.24 \delta c + 3.06 \delta \Delta T \quad 0 = +396 + 2.77 \delta a + 3.06 \delta c + 2.89 \delta \Delta T \\
 +247 + .92 + 2.58 + 2.30 \quad +691 + 7.24 + 6.46 + 617 + 5.76 \\
 +054 + 1.66 + 3.41 + .90 \quad -111 + 6.97 + 1.85 + 529 + 49 \\
 -180 + 2.50 + 4.61 + .95 \quad +333 + 8.53 + 1.75 + 068 + 36 \\
 +055 + 5.24 + 6.25 + 1.37 \quad -066 + 7.45 + 1.64 + 014 + 36
 \end{array}$$

L W

$$\begin{array}{l}
 0 = +429 + 2.72 \delta a + 3.05 \delta c + 2.80 \delta \Delta T \quad 0 = -481 + 3.05 \delta a + 3.42 \delta c + 3.14 \delta \Delta T \quad 0 = +442 + 2.80 \delta a + 3.14 \delta c + 2.89 \delta \Delta T \\
 -061 + .46 + 1.27 + 1.16 \quad +168 + 3.50 + 3.18 + 153 + 2.89 \\
 +078 + .06 + .75 + .48 \quad +945 + 9.00 + 5.70 + 597 + 3.61 \\
 +047 + 6.81 + 8.27 + 1.57 \quad +057 + 10.05 + 1.90 + 011 + 36 \\
 +155 + 3.96 + 4.62 + 1.19 \quad +181 + 5.38 + 1.39 + 047 + 36 \\
 +151 + 1.39 + 3.09 + .94 \quad +335 + 6.86 + 2.10 + 102 + 64 \\
 -200 + 11.16 + 16.90 + 1.00 \quad -304 + 25.60 + 1.52 + 018 + 09 \\
 -227 + 3.24 + 3.58 + 1.26 \quad -251 + 3.96 + 1.39 + 088 + 49 \\
 +928 + 42.78 \delta a + 24.13 \delta c + 10.15 \delta \Delta T \quad 0 = +1.916 + 24.13 \delta a + 10.120 \delta c + 5.2 \delta \Delta T \quad 0 = +.644 + 10.15 \delta a + .52 \delta c + 2.119 \delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +928 + 42.78 \delta a + 24.13 \delta c + 10.15 \delta \Delta T \\
 +1.916 + 24.13 \delta a + 10.120 \delta c + .52 \delta \Delta T \\
 +.644 + 10.15 \delta a + .52 \delta c + 2.119 \delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +.022 + \delta a + .564 \delta c + 2.37 \delta \Delta T \\
 +.079 + \delta a + 4.194 \delta c + .022 \delta \Delta T \\
 +.063 + \delta a + .051 \delta c + 2.088 \delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = -.057 - 3.630 \delta c + 2.15 \delta \Delta T \\
 +.016 + 4.143 \delta c - 2.066 \delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = -.016 - \delta c + .059 \delta \Delta T \\
 +.004 + \delta c - .499 \delta \Delta T
 \end{array}$$

$$0 = -.012 - .440 \delta \Delta T$$

$$\delta \Delta T = -.027 + 6.570 = +6.543 \Delta T$$

$$\delta c = -.018 - .040 = -.058 c$$

$$\delta a = -.006 - .450 = -.456 a$$

Solution for C=0

$$0 = +.041 + 1.851 \delta \Delta T$$

$$\delta \Delta T = -.022 + 6.570 = +6.548 \Delta T$$

$$\delta a = -.017 - .450 = -.467 a$$

$$\delta c = +.000 - .040 = -.040 c$$

$$\begin{array}{l}
 0 = +928 - .257 - .434 - .274 = +928 - .965 = -.037 \\
 +1.916 - .145 - 1.822 = .014 + 1.916 - 1.981 = -.065 \\
 +.644 - .061 - .009 = .572 + .644 - .642 = +.002
 \end{array}$$

June 21 Solution for L.E. With Weights.

Without weights.

X_W

With Weights.

L.E.

$$\begin{array}{rcll}
 0 = -022 & +96\delta a & +106\delta c & +\delta\Delta T \\
 +011 & +140 & +112 & +\delta\Delta T \\
 -122 & -184 & +377 & +\delta\Delta T \\
 +118 & -263 & +487 & +\delta\Delta T \\
 +048 & +382 & -455 & +\delta\Delta T
 \end{array}
 \begin{array}{r}
 17 \\
 24 \\
 07 \\
 06 \\
 06
 \end{array}
 \begin{array}{r}
 1.6 \\
 2.4 \\
 .5 \\
 .4 \\
 .3
 \end{array}$$

$$\begin{array}{rcll}
 0 = -037 & +163\delta a & +180\delta c & +170\delta\Delta T \\
 +025 & +96 & +269 & +240 \\
 -085 & -129 & +264 & +70 \\
 +041 & -158 & +292 & +60 \\
 +029 & +229 & -273 & +60
 \end{array}$$

$$\begin{array}{rcll}
 0 = -060 & +266\delta a & +293\delta c & +277\delta\Delta T \\
 +024 & +92 & +258 & +230 \\
 +110 & +166 & -341 & -90 \\
 -112 & +250 & -461 & -95 \\
 +066 & +524 & -625 & +137
 \end{array}$$

$$\begin{array}{rcll}
 0 = -067 & +293\delta a & +324\delta c & +306\delta\Delta T \\
 +067 & +724 & +646 & \\
 -224 & +697 & +185 & \\
 +207 & +853 & +175 & \\
 -079 & +745 & -164 &
 \end{array}$$

$$\begin{array}{rcll}
 0 = -063 & +277\delta a & +306\delta c & +289\delta\Delta T \\
 +060 & & & +576 \\
 -060 & & & +149 \\
 +043 & & & +36 \\
 +017 & & & +36
 \end{array}$$

$$0 = +028 +1298\delta a -8.76\delta c +4.59\delta\Delta T$$

$$0 = -096 -8.76\delta a +33.43\delta c +11.48\delta\Delta T$$

$$0 = -003 +4.59\delta a +11.48\delta c +9.86\delta\Delta T$$

$$\begin{array}{rcll}
 0 = +028 & +12.98\delta a & -8.76\delta c & +4.59\delta\Delta T \\
 -096 & -8.76 & +33.43 & +11.48 \\
 -003 & +4.59 & +11.48 & +9.86
 \end{array}$$

$$\begin{array}{rcll}
 0 = +002 & +\delta a & -6.75\delta c & +3540\delta\Delta T \\
 -011 & -\delta a & +3.816\delta c & +1311\delta\Delta T \\
 -001 & +\delta a & +2.501\delta c & +2146\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -009 & +3.141\delta c & +1.665\delta\Delta T \\
 -012 & +6.317\delta c & +3.457\delta\Delta T
 \end{array}$$

$$\begin{array}{rcll}
 0 = -0029 & +\delta c & +5.301\delta\Delta T \\
 -0019 & +\delta c & +5.473\delta\Delta T
 \end{array}$$

$$0 = -0010 -0.0172\delta\Delta T$$

$$\delta\Delta T = -.058 + 6.638 = +6.580 \Delta T$$

$$\delta c = +.034 - .137 = -.103 c$$

$$\delta a = +.042 - .581 = -.539 a$$

Solution for c = 000

$$0 = -.003 + 1.792\delta\Delta T$$

$$\delta\Delta T = +002 + 6.638 = +6.640 \Delta T$$

$$\delta a = -.003 - .581 = -.584 a$$

$$\delta c = +000 - .137 = -.137 c$$

$$\begin{array}{rcll}
 0 = +028 & +.545 & -.298 & -.266 = +.573 - .564 = +009 \\
 -096 & -.368 & +1.137 & -.666 = +1.137 - .130 = +007 \\
 -003 & +.193 & +.390 & -.572 = +.583 - .575 = +008
 \end{array}$$

June 21 Solution for L. M. With weights.

With weights.

L.M.

W

$$\begin{aligned}
 0 &= +170 + 97 \Delta a - 109 \Delta c + 8 \Delta T \\
 &- 010 + 40 - 110 + 8 \Delta T \\
 &- 120 - 13 - 158 + 8 \Delta T \\
 &+ 140 + 435 + 529 + 8 \Delta T \\
 &+ 220 + 332 + 386 + 8 \Delta T \\
 &- 120 - 147 - 327 + 8 \Delta T \\
 &+ 140 - 115 - 1686 + 8 \Delta T \\
 &- 081 + 257 + 284 + 8 \Delta T
 \end{aligned}$$

$$\begin{aligned}
 1.7 &1.6 \\
 1.7 &1.7 \\
 1.9 &1.8 \\
 6 &3 \\
 6 &4 \\
 8 &6 \\
 3 &1 \\
 7 &5
 \end{aligned}$$

$$\begin{aligned}
 0 &= +289 + 165 \Delta a - 185 \Delta c + 170 \Delta T \\
 &- 017 + 68 - 187 + 170 \\
 &- 228 + 25 - 360 + 190 \\
 &+ 084 + 261 + 317 + 60 \\
 &+ 132 + 199 + 232 + 60 \\
 &- 096 - 118 - 262 + 80 \\
 &+ 042 - 334 - 506 + 30 \\
 &- 057 + 180 + 199 + 70
 \end{aligned}$$

$$\begin{aligned}
 0 &= +477 + 272 \Delta a - 305 \Delta c + 280 \Delta T \\
 &- 012 + 46 - 127 + 116 \\
 &+ 057 + 06 + 75 - 48 \\
 &- 219 + 681 + 827 + 657 \\
 &+ 263 + 396 + 462 + 119 \\
 &+ 113 + 139 + 309 - 94 \\
 &- 140 + 1116 + 1690 - 100 \\
 &- 103 + 324 + 358 + 126
 \end{aligned}$$

$$\begin{aligned}
 0 &= -535 - 305 \Delta a + 342 \Delta c - 314 \Delta T \\
 &+ 032 + 350 - 318 \\
 &+ 686 + 900 - 570 \\
 &+ 266 + 1005 + 190 \\
 &+ 306 + 538 + 139 \\
 &+ 252 + 686 - 210 \\
 &- 213 + 2560 - 152 \\
 &- 113 + 386 + 139
 \end{aligned}$$

$$\begin{aligned}
 0 &= +491 + 280 \Delta a - 314 \Delta c + 289 \Delta T \\
 &- 029 + 289 \\
 &- 433 + 361 \\
 &+ 050 + 36 \\
 &+ 079 + 36 \\
 &- 087 + 64 \\
 &+ 013 + 08 \\
 &- 040 + 49
 \end{aligned}$$

$$0 = +874 + 2980 \Delta a + 3289 \Delta c + 556 \Delta T$$

$$0 = +681 + 3289 \Delta a + 6777 \Delta c - 1096 \Delta T$$

$$0 = +054 + 556 \Delta a - 1096 \Delta c + 1133 \Delta T$$

$$\begin{aligned}
 0 &= +874 + 2980 \Delta a + 3289 \Delta c + 556 \Delta T \\
 &+ 681 + 3289 + 6777 - 1096 \\
 &+ 054 + 556 - 1096 + 1133
 \end{aligned}$$

$$\begin{aligned}
 0 &= +0293 + \Delta a + 1104 \Delta c + 187 \Delta T \\
 &+ 0207 + \Delta a + 2061 \Delta c - 333 \Delta T \\
 &+ 0097 + \Delta a - 1971 \Delta c + 2038 \Delta T
 \end{aligned}$$

$$\begin{aligned}
 0 &= +0086 - 957 \Delta c + 520 \Delta T \\
 &+ 0110 + 4032 \Delta c - 2371 \Delta T
 \end{aligned}$$

$$\begin{aligned}
 0 &= +0089 - \Delta c + 543 \Delta T \\
 &+ 0027 + \Delta c - 588 \Delta T
 \end{aligned}$$

$$0 = +0116 - 045 \Delta T$$

$$\Delta T = +258 + 6670 = +6928 \Delta T$$

$$\Delta c = +150 - 000 = +150 \Delta c$$

$$\Delta a = -248 - 496 = -744 \Delta a$$

Solution for $c = .00$

$$0 = -.001 + 1.792 \Delta T$$

$$\Delta T = +000 + 6.670 = +6.670 \Delta T$$

$$\Delta a = -.002 - .496 = -.498 \Delta a$$

$$\Delta c = +000 + .000 = +.000 \Delta c$$

$$\begin{aligned}
 0 &= +874 - 7390 + 4934 + 1434 + 7242 - 7390 \\
 &+ 681 - 8157 + 10166 - 2828 + 16847 - 10980 \\
 &+ 054 - 1379 - 1644 + 2923 + 2977 - 3023
 \end{aligned}$$

$$\begin{aligned}
 0 &= -148 \\
 &- 138 \\
 &- 046
 \end{aligned}$$

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L.C. Mean $\bar{v} = 19.2$ $-h = -.009$ $c = -.06$
 $a = -.39$ $-dm = -6.886$ $c = -.07$
 $a = -.36$ $c = +.02$
 $a = -.23$

4T

X	I	-9.7	14.1 +5.1	0	-6.49	-.04	-6.53	+83a	+1.01c	-28	-.06	-.34	-6.87	+02	-30	-.07	-6.90	-19	+02
X		+2.4	14.7 +4.5		6.93	-.04	6.47	+68a	+1.00c	-23	-.06	-.29	-6.76	+13	-24	-.07	-6.78	-16	+02
X		-11.5	14.7 +4.5		6.44	-.04	6.48	+91a	+1.04c	-31	-.06	-.37	-6.85	+03	-33	-.07	-6.88	-21	+02
X		-22.3	15.9 +3.3		6.41	-.03	6.44	+100a	+1.08c	-34	-.06	-.40	-6.84	+05	-36	-.08	-6.88	-23	+02
X		-19.5	16.0 +3.2		6.30	-.03	6.33	+96a	+1.06c	-33	-.06	-.39	-6.72	+16	-35	-.07	-6.75	-22	+02
		-12.1					-6.45	+88a	+1.04c				-6.808	+078					

X	II	+29.5	15.4 +3.8	0	-6.68	-.03	-6.71	+32a	+1.15c	-11	-.07	-.18	-6.89	+00	-11	-.08	-6.90	-07	+02
X		+27.1	15.5 +3.7		6.77	-.03	6.80	+36a	+1.12c	-12	-.07	-.19	-6.99	+11	-13	-.08	-7.01	-08	+02
X		+6.8	15.6 +3.6		6.40	-.03	6.43	+63a	+1.01c	-21	-.06	-.27	-6.70	+19	-23	-.07	-6.70	-14	+02
X		+15.8	15.7 +3.5		6.44	-.03	6.47	+52a	+1.04c	-18	-.06	-.24	-6.71	+17	-19	-.07	-6.73	-12	+02
X		+18.5	15.7 +3.5		6.46	-.03	6.49	+48a	+1.05c	-16	-.06	-.22	-6.71	+17	-18	-.07	-6.74	-11	+02
X		+21.7	18.3 +.9		6.63	-.01	6.64	+44a	+1.09c	-15	-.06	-.21	-6.85	+04	-16	-.08	-6.88	-10	+02
X		+8.6	19.8 -.6		6.66	+00	6.66	+61a	+1.01c	-21	-.06	-.27	-6.93	+04	-22	-.07	-6.95	-14	+02
		+18.3					-6.60	+48a	+1.07c				-6.826	+060					

X	III	+40.9	14.9 +4.3	0	-7.06	-.04	-7.10	+11a	+1.32c	-04	-.08	-.12	-7.22	-.33	-04	-.09	-7.23	-02	+03
X		+41.2	15.4 +3.8		6.71	-.03	6.74	+102a	+1.33c	-03	-.08	-.11	-6.85	+04	-04	-.09	-6.87	-02	+03
X		+56.9	17.9 +1.3		7.08	-.01	7.09	+36a	+1.83c	+12	-.08	+.04	-7.05	-.17	+13	-.13	-7.09	+08	+04
X		+51.5	17.9 +1.3		6.87	-.01	6.88	+17a	+1.61c	+06	-.10	-.04	-6.92	-.03	+10	-.11	-6.93	+07	+03
X		+68.3	18.5 +.7		7.03	-.01	7.04	+15a	+1.28c	-05	-.08	-.13	-7.17	-.29	-05	-.09	-7.18	-03	+03
X		+33.2	18.7 +.5		6.85	+00	6.85	+25a	+1.19c	-08	-.07	-.15	-7.00	-.11	-09	-.08	-7.02	-06	+02
		+38.4					-6.95	+01a	+1.43c				-7.035	-.149					

-6.875

X	L.C.	+72.3	14.4 +4.8	0	-5.94	-.04	-5.98	+291a	-3.29c	-99	+20	-.79	-6.77	+116					
X		+74.6	14.8 +4.4		6.95	-.04	6.99	+134a	+3.77c	+63	-.28	+40	-6.59	+296					
X		+77.3	15.1 +4.1		5.47	-.04	5.51	+382a	-4.55c	-730	+27	-1.03	-6.54	+346					
X		+72.3	15.3 +3.9		7.15	-.03	7.18	+148a	+3.28c	+50	-.20	+30	-6.88	+006					
X		+78.1	15.8 +3.4		7.21	-.03	7.24	+2.63a	+4.87c	+89	-.29	+60	-6.64	+246					

Equations for a and c

ΣE	$0 = +0.47$	$+2.03a$	$-4.33c$	$0 = +0.951$	$+4.12a$	$-8.79c$	$0 = -2.03$	$-8.79a$	$+16.75c$	$a \text{ and } c \text{ from L.C. and 17.}$	
I	-54	-2.72	$+2.73$	$+1.47$	$+7.40$	-7.43	-1.47	$+7.45$	$0 = +26.05$	$+90.74a$	$-57.48c$
	$+94$	$+2.94$	-5.59	$+2.76$	$+8.64$	-16.43	-5.25	$+31.25$	-20.19	$-57.45a$	$+169.08c$
	-73	-2.36	$+2.24$	$+1.72$	$+5.57$	-5.29	-1.64	$+5.02$			
	-79	-3.61	$+3.83$	$+2.77$	$+12.32$	-13.44	-3.03	$+14.67$	$0 = +28.7$	$+a$	$-96.4c$
II	$+62$	$+2.43$	-4.36	$+1.51$	$+5.90$	-10.59	-2.70	$+19.01$	-23.1	$-a$	$+193.3c$
	-39	-2.32	$+2.70$	$+0.90$	$+5.38$	-6.26	-1.05	$+7.29$	$0 = +0.56$	$+9.69c$	
	$+1.09$	$+3.34$	-5.62	$+3.64$	$+11.16$	-18.77	-6.12	$+31.58$			
	-58	-1.96	$+2.21$	$+1.14$	$+3.84$	-4.33	-1.28	$+4.88$	$C = -0.58$	$a = -342$	
	-62	-3.71	$+3.80$	$+1.92$	$+7.67$	-11.52	-2.36	$+14.44$			
512				18.79	$+74.00$	-103.6	-26.93	$+154.34$			

L.P.

I	0	-.80	-1.45	-1.11		+1.16	+2.10a	+1.61c		+0.89	+1.61a	+1.23
		-82	-2.05	-1.90		+1.68	+4.20	+3.90		+1.56		+3.61
		-99	-2.13	-2.01		+2.11	+4.54	+4.28		+1.99		+4.04
		-95	-2.43	-2.42		+2.31	+5.90	+5.88		+2.30		+5.86

Sum L.C. & L.P. 0 = +26.05 +90.74a -57.48c 0 = -20.19 -57.45a +169.08c

 $c = -.07$
 $a = -.38$ $a = +.02$
 $a = -.23$

X	I	-6.1	-21.4 -2.2	0	-6.65	+02	-6.63	+79a	-1.01c	-27	+04	-21	-6.84	+05	-30	+07	-6.86	+18	+02
X		-84	-21.5 -2.3		6.67	+02	6.65	+82a	-1.01c	-28	+06	-22	-6.87	+02	-31	+07	-6.89	-19	+02
X		-14.1	-21.8 -2.6		6.59	+02	6.57	+87a	-1.02c	-30	+06	-24	-6.81	+07	-33	+07	-6.89	-20	+02
X		-0.9	-22.0 -2.8		6.76	+02	6.74	+72a	-1.00c	-24	+06	-18	-6.92	-.03	-27	+07	-6.90	-16	+02
X		-8.2	-22.2 -3.0		6.61	+03	6.58	+82a	-1.01c	-28	+06	-22	-6.80	+09	-31	+07	-6.80	-19	+02
X		+0.8	-22.3 -3.1		6.68	+03	6.65	+70a	-1.00c	-24	+06	-18	-6.83	+05	-37	+07	-6.83	-16	+02
X		-30.2	-22.9 -3.7		6.50	+03	6.47	+1.12a	-1.16c	-38	+07	-31	-6.78	+11	-42	+07	-6.78	-26	+02
		-9.6					-6.61	+83a	-1.03c				-6.806	+050	-43	+08	-6.82		

X	II	+48.8	21.7 -2.5	0	-7.22	+02	-7.20	-.09a	-1.52c	+03	+09	+12	-7.08	-.19	+03	+11	+26	+02	+03
X		+102	-22.6 -3.4		6.95	+03	6.92	+59a	-1.02c	-20	+06	-14	-7.06	-.18	-22	-07	-7.07	-14	+02
X		+14.6	-23.0 -3.8		6.71	+03	6.68	+53a	-1.03c	-18	+06	-12	-6.80	+08	-20	-07	-6.81	-12	+02
		+24.5					-6.93	+34a	-1.19c				-6.980	-.094					

X		+62.1	21.3 -2.1	0	-7.43	+02	-7.41	-6.2a	-2.14c	+21	+13	+34	-7.07	-.184					
X		+70.1	-21.5 -2.3		7.45	+02	7.43	-1.22a	-2.93c	+41	+17	+58	-6.85	+036					
X		+70.8	-21.7 -2.5		7.62	+02	7.60	-1.30a	-3.04c	+44	+18	+66	-6.94	-.054					
X		+73.1	-21.9 -2.7		7.58	+02	7.56	-1.60a	-3.45c	+54	+21	+75	-6.81	+076					

With rights
L.E. + L.W.

$$C = -078$$

$$a = -370$$

$$\Delta M = +6.812$$

With rights
L.E. and L.W.

$$C = -068$$

$$a = -378$$

$$\Delta M = +6.895$$

With rights
L.E. only

$$C = -104$$

$$a = -426$$

$$\Delta M = +6.953$$

With rights
L.E. + L.W.

$$C = 000$$

$$a = -355$$

$$\Delta M = +6.822$$

$$C = -060$$

$$For C = 00$$

With rights
L.E. + L.W.

$$C = 000$$

$$a = -372$$

$$\Delta M = +6.888$$

$$C = -060$$

$$L.E. only \{ see page 415$$

-307	-079	-386	+6.43	-10	-314	-69	-383	+6.51	-02	-354	-105	-459	+6.49	-04	-295	+6.53	-06	-809	+6.58	-01
-252	-78	-330	+6.48	+01	-257	-68	-325	+6.57	+10	-290	-104	-394	+6.56	+09	-241	+6.58	+05	-253	+6.64	+11
-337	-81	-418	+6.39	-09	-344	-71	-415	+6.48	+00	-388	-108	-496	+6.46	-02	-323	+6.50	-04	-338	+6.55	+01
-370	-84	-454	+6.36	-08	-378	-73	-451	+6.44	+00	-426	-112	-538	+6.42	-02	-355	+6.47	-03	-372	+6.57	+02
-355	-83	-438	+6.37	+04	-362	-72	-434	+6.46	+13	-409	-110	-519	+6.43	+10	-341	+6.48	+09	-357	+6.53	+14

-118	-90	-208	+6.60	-11	-121	-78	-199	+6.70	-01	-136	-120	-256	+6.70	-01	-114	+6.71	-07	-119	+6.77	-01
-133	-87	-220	+6.59	-21	-136	-76	-212	+6.63	-17	-153	-116	-267	+6.68	-12	-128	+6.70	-17	-134	+6.75	+12
-233	-99	-312	+6.50	+07	-238	-69	-307	+6.59	+16	-268	-105	-273	+6.68	+25	-224	+6.60	+11	-234	+6.65	+16
-192	-81	-273	+6.54	+07	-197	-71	-268	+6.63	+16	-222	-108	-330	+6.62	+15	-185	+6.64	+11	-193	+6.69	+16
-178	-82	-260	+6.55	+06	-181	-71	-252	+6.64	+15	-204	-109	-313	+6.64	+15	-170	+6.63	+10	-178	+6.71	+16
-163	-85	-248	+6.56	-08	-166	-74	-240	+6.66	+02	-187	-113	-300	+6.65	+01	-156	+6.67	-03	-164	+6.72	+02
-226	-80	-306	+6.50	-16	-231	-69	-300	+6.60	-06	-260	-105	-365	+6.59	-07	-216	+6.61	-11	-227	+6.66	-06

-041	-103	-144	+6.67	-43	-42	-90	-132	+6.76	-34	-47	-137	-184	+6.77	-34	-39	+6.78	-40	-41	+6.85	-34
-37	-104	-141	+6.67	-07	-38	-90	-128	+6.77	+03	-43	-138	-181	+6.77	+03	-36	+6.79	-03	-37	+6.85	+03
+133	-143	-10	+6.80	-29	+136	-124	+012	+6.91	-18	+153	-190	-037	+6.92	-17	+128	+6.95	-12	+134	+7.02	-15
+63	-126	-63	+6.75	-13	+64	-109	-045	+6.85	-03	+72	-167	-095	+6.86	-02	+60	+6.88	-10	+63	+6.95	-03
-56	-100	-156	+6.66	-38	-57	-87	-144	+6.75	-29	-64	-133	-197	+6.76	-28	-53	+6.77	-35	-56	+6.83	-29
-93	-93	-186	+6.63	-22	-94	-81	-175	+6.72	-13	-106	-124	-230	+6.72	-13	-89	+6.73	-19	-93	+6.79	-13

-1077	+257	-820	+5.99	+01	-1100	+224	-876	+6.02	+04	-1240	+342	-898	+6.06	+08	-1033	+5.79	+01	-1082	+5.81	+03
+681	-294	+387	+7.20	+21	+696	-256	+440	+7.33	+34	+784	-392	+392	+7.34	+35	+653	+7.48	-26	+684	+7.57	+35
-1413	+855	-1058	+5.75	+24	-1444	+309	-1135	+5.76	+25	-1627	+473	-1154	+5.80	+29	-1356	+5.97	+23	-1421	+5.99	+22
+548	-256	+292	+7.10	-08	+559	-223	+336	+7.23	+05	+630	-341	+289	+7.24	+06	+525	+7.35	-03	+550	+7.44	+06
+973	-380	+593	+7.40	+16	+994	-331	+663	+7.56	+32	+1120	-506	+614	+7.57	+33	+934	+7.76	+23	+978	+7.87	+34

With rights
L.W. only

$$C = -0660$$

$$a = -372$$

$$\Delta M = +6.898$$

-292	+79	-213	+6.60	-03	-299	+69	-230	+6.66	+03	-294	+67	-227	+6.67	+04	-280	+6.54	-03	-294	+6.59	+02
-303	+79	-224	+6.59	-06	-310	+69	-241	+6.65	+00	-305	+67	-238	+6.66	+01	-291	+6.53	-06	-305	+6.58	-01
-322	+80	-242	+6.57	+00	-329	+69	-260	+6.64	+07	-324	+67	-257	+6.64	+07	-309	+6.51	+00	-324	+6.56	+05
-266	+78	-188	+6.62	-12	-272	+68	-204	+6.69	-05	-268	+66	-202	+6.70	-04	-256	+6.57	-11	-268	+6.62	-06
-303	+79	-224	+6.59	+01	-310	+69	-241	+6.65	+07	-305	+67	-238	+6.66	+08	-291	+6.53	+01	-305	+6.58	+06
-259	+78	-181	+6.63	-02	-265	+68	-197	+6.70	+05	-260	+66	-194	+6.70	+05	-248	+6.57	-02	-260	+6.65	+04
-414	+90	-324	+6.59	+12	-423	+79	-344	+6.55	+08	-417	+76	-341	+6.56	+09	-398	+6.42	+02	-417	+6.47	+09

+33	+119	+152	+6.66	-54	+34	+103	+137	+7.03	-17	+33	+100	+133	+7.03	-17	+32	+6.85	-26	+33	+6.92	-19
-218	+80	-138	+6.67	-25	-223	+69	-164	+6.74	-18	-219	+67	-152	+6.75	-17	-209	+6.61	-25	-219	+6.67	-19
-196	+81	-115	+6.70	+02	-200	+70	-130	+6.76	+08	-197	+68	-129	+6.77	+09	-188	+6.63	+01	-197	+6.69	+09

+229	+167	+396	+7.21	-20	+234	+146	+380	+7.27	-14	+231	+141	+372	+7.27	-14	+220	+7.04	-24	+231	+7.12	-16
+451	+229	+680	+7.49	+06	+461	+199	+660	+7.56	+13	+454	+193	+647	+7.54	+09	+433	+7.26	+00	+444	+7.34	+08
+481	+237	+718	+7.53	-07	+491	+207	+698	+7.59	-01	+484	+201	+685	+7.58	+18	+462	+7.28	-14	+484	+7.37	+05
+592	+269	+861	+7.67	+11	+605	+235	+840	+7.73	+17	+595	+228	+823	+7.72	+16	+568	+7.39	+04	+575	+7.48	+13

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Fundamental
Original Equations

Without weights

L W

$$\begin{array}{rcl}
 -12.1 & 0 = +0.78 & +.880a + 1.040c + 0.00\Delta T \\
 +15.3 & +0.60 & +.48 \\
 +35.4 & -1.49 & +.01 + 1.07 \\
 +72.32c & +1.16 & +.291 - 3.29 \\
 +74.6 & +2.96 & -1.54 + 3.77 \\
 +77.32c & +3.46 & +3.82 - 4.35 \\
 +72.3 & +0.06 & -1.48 + 3.28 \\
 +75.1 & +2.46 & -2.63 + 4.87
 \end{array}$$

$$\begin{array}{rcl}
 2.2 & 2.1 \\
 2.6 & 2.6 \\
 2.4 & 2.4 \\
 .4 & .4 \\
 .7 & .5 \\
 .4 & .3 \\
 .8 & .6 \\
 .4 & .4
 \end{array}$$

With-Weights

$$\begin{array}{rcl}
 0 = +1.72 & +1.940a & +2.290c + 2.20\Delta T \\
 +1.56 & +1.25 & +2.78 + 2.60 \\
 -3.58 & +.02 & +3.43 + 2.40 \\
 +0.70 & +1.75 & -1.97 + .60 \\
 +2.07 & -1.29 & +2.64 + .70 \\
 +2.08 & +2.29 & -2.73 + .60 \\
 +0.05 & -1.18 & +2.62 + .80 \\
 +1.48 & -1.58 & +2.92 + .60
 \end{array}$$

$$\begin{array}{rcl}
 -9.6 & 0 = +0.50 & +.830a - 1.030c + 0.00\Delta T \\
 +24.5 & -0.94 & +.34 - 1.19 \\
 +62.1 & -1.84 & -.62 - 2.14 \\
 +70.1 & +0.36 & -1.22 - 2.93 \\
 +70.8 & -0.54 & -1.30 - 3.04 \\
 +73.1 & +0.76 & -1.60 - 3.45 \\
 0 = +.829 & -1.420a & -6.160c + 14.000\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 2.6 & 2.5 \\
 1.7 & 1.7 \\
 .8 & .8 \\
 .6 & .6 \\
 .6 & .6 \\
 .5 & .5
 \end{array}$$

$$\begin{array}{rcl}
 0 = +1.30 & +2.160a & -2.680c + 2.60\Delta T \\
 -1.60 & +.58 & -2.02 + 1.70 \\
 -1.66 & +.56 & -1.93 + .90 \\
 +0.29 & -.98 & -2.34 + .80 \\
 -.043 & -1.04 & -2.43 + .80 \\
 +.053 & -1.12 & -2.42 + .70
 \end{array}$$

Solution for L E and L W Without weights.

$$\begin{array}{rcl}
 0 = +0.69 & +.770a & +.920c + .880\Delta T \\
 +.029 & +.23 & +.57 + .48 \\
 -.001 & +.01 & +.01 + .01 \\
 +.338 & +.847 & -.957 + 2.91 \\
 -.545 & +.339 & -.694 - 1.84 \\
 +1.322 & +1.459 & -1.738 + 3.82 \\
 -.009 & +2.19 & -4.85 - 1.48 \\
 -.647 & +6.92 & -12.81 - 2.63
 \end{array}$$

$$\begin{array}{rcl}
 0 = +0.81 & +.920a & +1.080c + 1.040\Delta T \\
 +.064 & +1.14 & +1.07 \\
 -.213 & +2.04 & +1.43 \\
 -.382 & +10.82 & -3.29 \\
 +1.116 & +14.21 & +3.77 \\
 +1.574 & +20.70 & -4.55 \\
 +.020 & +10.76 & +3.28 \\
 +1.198 & +23.72 & +4.87
 \end{array}$$

$$\begin{array}{rcl}
 0 = +0.41 & +.690a & -.850c + .830\Delta T \\
 -.032 & +.12 & -.40 + .34 \\
 +1.14 & +.38 & +1.33 -.62 \\
 -.044 & +1.49 & +3.57 - 1.22 \\
 +0.70 & +1.69 & +3.95 - 1.30 \\
 -.122 & +2.56 & +5.52 - 1.60 \\
 0 = +.588 & +4.350a & -36.990c - 1.420\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = -.052 & -.850a & +1.060c - 1.030\Delta T \\
 +.112 & +1.42 & -1.19 \\
 +.394 & +4.58 & -2.14 \\
 -.105 & +8.58 & -2.93 \\
 +1.64 & +9.24 & -3.04 \\
 -.262 & +11.90 & -3.45 \\
 0 = +.561 & -36.990a & +121.250c - 6.160\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +.583 & +4.350a & -36.990c - 1.420\Delta T \\
 +.561 & -36.990a & +121.250c - 6.160\Delta T \\
 +.829 & -1.420a & -6.160c + 14.000\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +0.13 & +0a & -.550c - .0330\Delta T \\
 +.015 & -.0a & +3.2780c - .1670\Delta T \\
 +.584 & -.0a & -4.3380c + 9.8590\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +0.28 & +2.4280c & -.2000\Delta T \\
 -.599 & +7.6160c & -10.0260\Delta T
 \end{array}$$

$$\begin{array}{rcl}
 0 = +0.12 & +0c & -.0820\Delta T \\
 -.079 & +0c & -1.3160\Delta T
 \end{array}$$

$$0 = +0.91 + 1.2340\Delta T$$

$$\Delta T = -.074 + 6.886 = +6.812 \Delta T$$

$$0c = -.018 - 0.60 = -.078 c$$

$$0a = -.030 - .340 = -.370 a$$

Solution for C = 0

$$0 = +.597 + 9.8260\Delta T$$

$$\Delta T = -.064 + 6.886 = +6.822 \Delta T$$

$$0a = -.015 - .340 = -.355 a$$

$$0c = +.000 - .060 = -.060 c$$

$$\begin{array}{rcl}
 0 = +.583 & -1.305 & +.666 + 1.05 = +1.334 - 1.305 = +.029 \\
 +.561 & +1.110 & -2.182 + 4.56 = +2.127 - 2.182 = -.055 \\
 +.829 & +.043 & +.111 - 1.036 = +.983 - 1.036 = -.053
 \end{array}$$

Solution for L.E. and L.W. with weights

$$\begin{array}{l}
 \text{LE} \\
 0 = +334 + 3.76\delta a + 4.44\delta c + 4.27\delta \Delta T \\
 \begin{array}{r}
 +195 + 1.56 + 3.47 + 3.25 \\
 -007 + 00 + 07 + .05 \\
 +122 + 3.06 - 3.45 + 1.05 \\
 -267 + 1.66 - 3.41 - .90 \\
 +476 + 15.24 - 6.25 + 1.37 \\
 -006 + 1.39 - 3.09 - .94 \\
 -234 + 2.50 - 4.61 - .95
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 0 = +394 + 4.44\delta a + 5.24\delta c + 5.04\delta \Delta T \\
 \begin{array}{r}
 +434 \\
 -1228 \\
 -138 \\
 +546 \\
 -568 \\
 +1013 \\
 +432
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 0 = +378 + 4.27\delta a + 5.04\delta c + 4.84\delta \Delta T \\
 \begin{array}{r}
 +406 \\
 -859 \\
 +1042 \\
 +145 \\
 +125 \\
 +004 \\
 +089
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 \text{LW} \\
 0 = +281 + 4.67\delta a - 3.79\delta c + 5.62\delta \Delta T \\
 \begin{array}{r}
 -093 + .34 - 1.17 + .99 \\
 +093 + .31 + 1.08 - .50 \\
 -028 + .96 + 2.29 - .78 \\
 +045 + 1.08 + 2.53 - .83 \\
 -039 + 1.25 + 2.71 = .78
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 0 = -348 \\
 \begin{array}{r}
 +323 \\
 +320 \\
 -068 \\
 -104 \\
 -128
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 +7.18\delta c - 6.97\delta \Delta T \\
 \begin{array}{r}
 +4.08 \\
 +3.72 \\
 +548 \\
 +5.90 \\
 +586
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 0 = +338 \\
 \begin{array}{r}
 -272 \\
 -149 \\
 -1023 \\
 -034 \\
 -1037
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 0 = +852 + 2778\delta a - 1118\delta c + 1092\delta \Delta T \\
 0 = +088 - 1118\delta a + 9064\delta c + 574\delta \Delta T \\
 0 = +273 + 1092\delta a + 874\delta c + 3180\delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +852 + 2778\delta a - 1118\delta c + 1092\delta \Delta T \\
 +088 - 1118\delta a + 9064\delta c + 574\delta \Delta T \\
 +273 + 1092\delta a + 874\delta c + 3180\delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +0307 + \delta a - 1402\delta c + .3931\delta \Delta T \\
 +0079 - \delta a + 8107\delta c + .5134\delta \Delta T \\
 +0250 + \delta a + .326\delta c + 29120\delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +0386 + 7.705\delta c + 9.065\delta \Delta T \\
 +0329 + 8.633\delta c + 3.4254\delta \Delta T
 \end{array}$$

$$\begin{array}{l}
 0 = +0050 + \delta c + .1175\delta \Delta T \\
 +0038 + \delta c + .3967\delta \Delta T
 \end{array}$$

$$0 = +0012 - 2792\delta \Delta T$$

$$\delta \Delta T = +004 + 6.886 = +6.890 \Delta T$$

$$\delta c = -006 - 060 = -066 c$$

$$\delta a = -035 - 340 = -379 a$$

$$\begin{array}{l}
 0 = +852 - 964 + 061 + 047 = -.024 \\
 +.088 + .388 - 498 + 025 = +.023 \\
 +.273 - .379 - .032 + .137 = -.021
 \end{array}$$

Solution for C=0

$$0 = -.006 + 2.519\delta \Delta T$$

$$\delta \Delta T = +.002 + 6.886 = +6.888$$

$$\delta a = -.032 - 340 = -372$$

$$\delta c = +.080 - 060 = -.060$$

June 23 Solution for L.E. with Weights

L.E.

$$\begin{array}{rcll}
 0 = +078 +188 \delta a +1040 \delta c +220 \delta \Delta T & 2.2 \\
 +060 +48 & +1.07 & + \delta \Delta T & 2.6 \\
 -149 +01 & +1.43 & + \delta \Delta T & 2.4 \\
 +116 +291 & -3.29 & + \delta \Delta T & .6 \\
 +296 +184 & 13.77 & + \delta \Delta T & .7 \\
 +346 +3.82 & -4.55 & + \delta \Delta T & .6 \\
 +006 -1.48 & +3.28 & + \delta \Delta T & .8 \\
 +246 -2.63 & +4.87 & + \delta \Delta T & .6
 \end{array}$$

L.E.

$$\begin{array}{rcll}
 0 = +172 +194 \delta a +229 \delta c +220 \delta \Delta T & \\
 +156 +1.25 & +2.78 & +2.60 & \\
 -358 +02 & +3.43 & +2.40 & \\
 -070 +1.75 & -1.97 & +.60 & \\
 +207 -1.29 & +2.64 & +.70 & \\
 +208 +2.29 & -2.73 & +.60 & \\
 +005 -1.18 & +2.62 & +.80 & \\
 +148 -1.58 & +2.92 & +.60 &
 \end{array}$$

with Weights

$$\begin{array}{rcll}
 0 = +334 +376 \delta a +444 \delta c +427 \delta \Delta T & 0 = +394 +444 \delta a +524 \delta c +504 \delta \Delta T & 0 = +378 +427 \delta a +504 \delta c +484 \delta \Delta T \\
 +155 +156 & +344 & +325 & +434 & +773 & +723 & +406 \\
 -007 +1.00 & +.07 & +.05 & -1228 & +1176 & +823 & -559 \\
 +122 +3.06 & -3.45 & +1.05 & -138 & +388 & -118 & +042 \\
 -267 +166 & -3.41 & -.90 & +546 & +697 & +1.85 & +145 \\
 +467 +524 & -6.25 & +1.37 & -568 & +745 & -1.64 & +125 \\
 -006 +1.39 & -3.09 & -.94 & +013 & +686 & +2.10 & +004 \\
 -234 +2.50 & -4.61 & -.95 & +432 & +853 & +1.75 & +059
 \end{array}$$

$$0 = +613 +1917 \delta a -1283 \delta c +720 \delta \Delta T \quad 0 = -115 -1283 \delta a +5842 \delta c +2338 \delta \Delta T \quad 0 = +330 +720 \delta a +2338 \delta c +1957 \delta \Delta T$$

$$\begin{array}{rcll}
 0 = +613 +1917 \delta a -1283 \delta c +720 \delta \Delta T & \\
 -115 -1283 \delta a +5842 \delta c +2338 \delta \Delta T & \\
 +330 +720 \delta a +2338 \delta c +1957 \delta \Delta T &
 \end{array}$$

$$\begin{array}{rcll}
 0 = +032 +\delta a +669 \delta c +376 \delta \Delta T & \\
 -009 -\delta a +4.577 \delta c +1.522 \delta \Delta T & \\
 +046 +\delta a +3.247 \delta c +2.718 \delta \Delta T &
 \end{array}$$

$$\begin{array}{rcll}
 0 = +023 +3.908 \delta c +2.198 \delta \Delta T & \\
 +037 +7.824 \delta c +4.540 \delta \Delta T &
 \end{array}$$

$$\begin{array}{rcll}
 0 = +0059 +\delta c +5625 \delta \Delta T & \\
 +.0047 +\delta c +.5803 \delta \Delta T &
 \end{array}$$

$$0 = +0012 -0.178 \delta \Delta T$$

$$\delta \Delta T = +067 +6.886 = +6.953$$

$$\delta c = -.044 - .060 = -.104$$

$$\delta a = -.086 - .340 = -.426$$

Solution for $c = 00$

$$0 = +.014 +2.342 \delta \Delta T$$

$$\delta \Delta T = -.025 +6.886 = +6.881$$

$$\delta a = -.030 - .340 = -.370$$

$$\delta c = +000 - .060 = -.060$$

$$\begin{array}{rcll}
 0 = +.613 -1.649 +.564 +.475 = +16.52 -1.649 = +003 \\
 -115 +11.03 -2.570 +1.572 = +26.75 -2.685 = +010 \\
 +.330 - .619 -1.029 +1.311 = +18.41 -1.648 = +007
 \end{array}$$

Solution for L. M. Mich. Heights.

Mich. Heights.

L.M. \sqrt{r}

$$\begin{array}{rclcl}
 0 = +0.50 & +.83 \delta a & -1.03 \delta c & +.5 \delta \tau & 2.6 \\
 -.094 & +.34 & -1.19 & +.5 \delta \tau & 1.7 \\
 -.184 & -.62 & -2.14 & +.5 \delta \tau & .9 \\
 +.036 & -1.22 & -2.93 & +.5 \delta \tau & .8 \\
 -.054 & -1.30 & -3.04 & +.5 \delta \tau & .8 \\
 +.076 & -1.60 & -3.45 & +.5 \delta \tau & .7
 \end{array}$$

$$\begin{array}{rclcl}
 0 = +1.30 & +2.16 \delta a & -2.68 \delta c & +2.60 \delta \tau & \\
 -.160 & +.58 & -2.02 & +.170 & \\
 -.166 & -.56 & -1.93 & +.90 & \\
 +.029 & -.98 & -2.34 & +.80 & \\
 -.043 & -1.04 & -2.43 & +.80 & \\
 +.053 & -1.12 & -2.42 & +.70 &
 \end{array}$$

L.M.

$$\begin{array}{rclcl}
 0 = +2.81 & +4.67 \delta a & -5.79 \delta c & +5.62 \delta \tau & 0 = -3.48 -5.79 \delta a + 7.18 \delta c - 6.97 \delta \tau & 0 = +3.38 +5.62 \delta a - 6.97 \delta c & +6.76 \delta \tau \\
 -.093 & +.34 & -1.17 & +.99 & +3.23 & +4.08 & -3.43 & -2.72 & +2.89 \\
 +.093 & +.31 & -1.08 & -.50 & +3.20 & +3.72 & -1.74 & -1.49 & +.81 \\
 -.028 & +.96 & -2.29 & -.78 & .068 & +5.48 & -1.87 & +.023 & +.64 \\
 +.045 & +1.08 & -2.53 & -.83 & +1.04 & +5.90 & -1.94 & -.034 & +.64 \\
 -.059 & +1.25 & -2.71 & -.78 & -1.28 & +5.86 & -1.69 & +.034 & +.49
 \end{array}$$

$$\begin{array}{rclcl}
 0 = +2.39 & +8.61 \delta a & +1.65 \delta c & +3.72 \delta \tau & 0 = +2.03 +1.65 \delta a + 3.222 \delta c - 17.64 \delta \tau & 0 = -.057 +3.72 \delta a - 17.64 \delta c & +12.23 \delta \tau
 \end{array}$$

$$\begin{array}{rclcl}
 0 = +2.39 & +8.61 \delta a & +1.65 \delta c & +3.72 \delta \tau & \\
 +2.03 & +1.65 \delta a & +3.222 \delta c & -17.64 \delta \tau & \\
 -.057 & +3.72 \delta c & -17.64 \delta c & +12.23 \delta \tau &
 \end{array}$$

$$\begin{array}{rclcl}
 0 = +0.278 & +.5 a & +1.92 \delta c & +4.321 \delta \tau & \\
 +1.230 & +.5 a & +9.527 \delta c & -10.1909 \delta \tau & \\
 -.0153 & +.5 a & -4.742 & +3.2876 \delta \tau &
 \end{array}$$

$$\begin{array}{rclcl}
 0 = -.0952 & -1.9335 \delta c & +11.1230 \delta \tau & & \\
 +1.383 & +24.269 \delta c & -13.9785 \delta \tau & &
 \end{array}$$

$$\begin{array}{rclcl}
 0 = -.004924 & -\delta c & +.575278 \delta \tau & & \\
 +.005699 & +\delta c & -5.75982 \delta \tau & &
 \end{array}$$

$$0 = +.000705 - .000704 \delta \tau$$

$$\delta \tau = +1.108 + 6.886 = +7.994$$

$$\delta c = +.632 - .060 + .572$$

$$\delta a = -.628 - .340 - .968$$

$$\begin{array}{rclcl}
 0 = +2.39 & -5.407 & +1.044 & +4.121 & = -.023 \\
 +2.03 & -1.036 & +20.379 & -19.545 & = +.021 \\
 -.057 & -2.336 & -11.157 & +13.550 & = +.020
 \end{array}$$

Solution for $c = .50$

$$0 = -.043 + 2.856 \delta \tau$$

$$\delta \tau = +.015 + 6.886 = +6.901$$

$$\delta a = -.034 - .340 = -.374$$

$$\delta c = +.000 - .060 = -.060$$

With weights
L.C. only
C = 0.00

$$a = -3.70$$

$$M = +6.881$$

$$C = -0.60$$

$$\begin{aligned} & -307 + 6.57 - 0.2 \\ & -252 + 6.63 + 1.0 \\ & -337 + 6.54 + 0.0 \\ & -370 + 6.51 + 0.1 \\ & -355 + 6.53 + 1.4 \end{aligned}$$

$$\begin{aligned} & -118 + 6.76 - 0.2 \\ & -133 + 6.75 - 1.2 \\ & -233 + 6.65 + 1.6 \\ & -192 + 6.69 + 1.6 \\ & -178 + 6.70 + 1.5 \\ & -163 + 6.72 + 0.2 \\ & -226 + 6.66 - 0.6 \end{aligned}$$

$$\begin{aligned} & -41 + 6.84 - 3.4 \\ & -37 + 6.84 + 0.2 \\ & +133 + 7.01 - 1.6 \\ & +63 + 6.94 - 0.4 \\ & -56 + 6.82 - 3.0 \\ & -92 + 6.79 - 1.3 \end{aligned}$$

$$\begin{aligned} & -107 + 5.80 + 0.2 \\ & +68 + 7.56 + 3.4 \\ & -1413 + 5.47 + 2.3 \\ & +548 + 7.43 + 0.5 \\ & +973 + 7.85 + 3.2 \end{aligned}$$

With weights
L.V. only
C = 0.00

$$a = -3.74$$

$$M = +6.901$$

$$C = -0.60$$

$$\begin{aligned} & -295 + 6.61 + 0.4 \\ & -307 + 6.59 + 0.0 \\ & -325 + 6.58 + 0.7 \\ & -269 + 6.63 - 0.5 \\ & -307 + 6.59 + 0.7 \\ & -262 + 6.64 + 0.5 \\ & -419 + 6.48 + 0.8 \end{aligned}$$

$$\begin{aligned} & +34 + 6.94 - 1.9 \\ & -321 + 6.58 - 2.8 \\ & -198 + 6.70 + 0.8 \end{aligned}$$

$$\begin{aligned} & +232 + 7.13 - 1.5 \\ & +456 + 7.36 + 1.0 \\ & +486 + 7.39 - 0.3 \\ & +578 + 7.50 + 1.6 \end{aligned}$$

June 2
Without weights

Original Equations

With weights

$$\begin{array}{l} L.W. 226 \\ +14.7 \\ +53.2 \\ +71.8 L.B. \end{array} \quad \begin{array}{l} 0 = +.015 + .98 \delta a + 1.08 \delta c + \delta \Delta T \\ - .018 + .40 + 1.07 + \delta \Delta T \\ + .165 - .32 + 1.68 + \delta \Delta T \\ + .045 + 2.93 - 3.21 + \delta \Delta T \end{array}$$

$$\begin{array}{l} r_w \\ .3 \\ .17 \\ .13 \\ .7 \end{array} \quad \begin{array}{l} w \\ .9 \\ 1.7 \\ 1.3 \\ .6 \end{array}$$

$$\begin{array}{l} L.W.O = +.014 + .88 \delta a + .97 \delta c + .90 \delta \Delta T \\ - .081 + .68 + 1.82 + 1.70 \\ + .214 - .42 + 2.18 + 1.30 \\ + .031 + 2.05 - 2.25 + .70 \end{array}$$

$$\begin{array}{l} L.W. 7.6 \\ +53.2 \\ +30.4 \\ +57.0 \\ +71.8 L.B. \\ +64.9 \\ +78.1 \\ +66.9 L.B. \\ +77.3 L.B. \\ +69.0 \\ +61.9 L.B. \end{array} \quad \begin{array}{l} 0 = -.042 + .77 \delta a - 1.02 \delta c + \delta \Delta T \\ - .185 - .35 - 1.72 + \delta \Delta T \\ - .085 + .22 - 1.18 + \delta \Delta T \\ - .075 - .46 - 1.85 + \delta \Delta T \\ - .085 + 2.93 + 3.21 + \delta \Delta T \\ + .055 - .90 - 2.36 + \delta \Delta T \\ + .015 - 2.83 - 4.85 + \delta \Delta T \\ + .255 + 2.40 + 2.54 + \delta \Delta T \\ + .085 + 3.95 + 4.55 + \delta \Delta T \\ + .235 - 1.25 - 2.79 + \delta \Delta T \\ - .155 + 3.58 + 4.06 + \delta \Delta T \end{array}$$

$$\begin{array}{l} r_w \\ 1.7 \\ 1.3 \\ 1.4 \\ .9 \\ .7 \\ .6 \\ .8 \\ .5 \\ .4 \\ .7 \\ .6 \end{array} \quad \begin{array}{l} w \\ 1.7 \\ 1.3 \\ 1.4 \\ .8 \\ .4 \\ .4 \\ .5 \\ .5 \\ .4 \\ .7 \\ .6 \end{array}$$

$$\begin{array}{l} L.W.O = -.071 + 1.31 \delta a - 1.73 \delta c + 1.70 \delta \Delta T \\ - .240 - .96 - 2.24 + 1.30 \\ - .119 + .31 - 1.65 + 1.40 \\ - .067 - .41 - 1.66 + .90 \\ - .004 + 2.05 + 2.25 + .70 \\ + .049 - .81 - 2.12 + .90 \\ + .009 - 1.70 - 2.91 + .60 \\ + .204 + 1.92 + 2.03 + .80 \\ + .051 + 2.37 + 2.73 + .60 \\ + .188 - 1.00 - 2.23 + .80 \\ - .139 + 3.22 + 3.65 + .90 \end{array}$$

$$\begin{array}{l} L.W. +26.5 \\ 0 = +.148 + .24 \delta a + 1.24 \delta c + \delta \Delta T \\ +.453 + 12.29 \delta a + 0.45 \delta c + 16.00 \delta \Delta T \end{array}$$

$$1.7 \quad 1.7$$

$$+.252 + 1.18 \delta a + 2.11 \delta c + 1.70 \delta \Delta T$$

Solution for C.E. and L.W. without weights

$$\begin{array}{l} L.W.O = +.015 + .96 \delta a + 1.06 \delta c + .98 \delta \Delta T \\ - .007 + .16 + .43 \\ - .053 + .10 - .54 \\ + .132 + 8.58 - 9.41 \end{array}$$

$$\begin{array}{l} L.W.O = +.016 + 1.06 \delta a + 1.17 \delta c + 1.08 \delta \Delta T \\ - .019 + 1.14 \\ + .277 + 2.82 \\ - .144 + 10.30 \end{array}$$

$$\begin{array}{l} C.E. 0 = -.032 + .59 \delta a - .79 \delta c + .77 \delta \Delta T \\ + .065 + .12 + .60 \\ - .019 + .05 - .26 \\ + .035 + .21 + .85 \\ - .015 + 8.58 + 9.41 \\ - .049 + .81 + 2.12 \\ - .042 + 8.01 + 13.73 \\ + .612 + 5.76 + 6.10 \\ + .336 + 15.60 + 17.97 \\ - .274 + 1.56 + 3.44 \\ - .555 + 12.82 + 14.53 \end{array}$$

$$\begin{array}{l} C.E.O = +.043 - .79 \delta a + 1.04 \delta c - 1.02 \delta \Delta T \\ + .318 + 2.96 \\ + .100 + 1.39 \\ + .139 + 3.42 \\ - .015 + 10.30 \\ - .130 + 5.57 \\ - .073 + 23.52 \\ + .648 + 6.45 \\ + .387 + 20.70 \\ - .656 + 7.78 \\ - .629 + 16.48 \end{array}$$

$$\begin{array}{l} L.W. 0 = +.036 + .06 \delta a + .30 \delta c + .24 \delta \Delta T \\ 0 = +.165 + 6.39 \delta a + 5.95 \delta c + 12.29 \delta \Delta T \end{array}$$

$$\begin{array}{l} L.W.O = +.184 + .30 \delta a + 1.54 \delta c + 1.24 \delta \Delta T \\ 0 = +.446 + 5.95 \delta a + 16.58 \delta c + 0.45 \delta \Delta T \end{array}$$

$$\begin{array}{l} 0 = +.165 + 6.39 \delta a + 5.95 \delta c + 12.29 \delta \Delta T \\ + .446 + 5.95 \delta a + 16.58 \delta c + 0.45 \delta \Delta T \\ + .453 + 12.29 \delta a + 0.45 \delta c + 16.00 \delta \Delta T \end{array}$$

$$\begin{array}{l} 0 = +.0026 + \delta a + .929 \delta c + .192 \delta \Delta T \\ + .0075 + \delta a + 1.966 \delta c + .007 \delta \Delta T \\ + .0368 + \delta a + .037 \delta c + 1.302 \delta \Delta T \end{array}$$

$$\begin{array}{l} 0 = +.0049 + 1.037 \delta c - .185 \delta \Delta T \\ + .0293 - 1.929 \delta c + 1.295 \delta \Delta T \end{array}$$

$$\begin{array}{l} 0 = +.0040 + \delta c - .179 \delta \Delta T \\ + .0152 - \delta c - .671 \delta \Delta T \end{array}$$

$$0 = +.0192 - .850 \delta \Delta T$$

$$\delta \Delta T = +.023 - 14.325 = -14.302 \Delta T$$

$$\delta c = +.000 - .176 = -.176 c$$

$$\delta a = -.007 + .507 = -.500 a$$

Solution for $\delta c = 0$

$$0 = +.034 + 1.110 \delta \Delta T$$

$$\delta \Delta T = -.031 - 14.325 = -14.356 \Delta T$$

$$\delta a = +.003 + .507 = +.510 a$$

$$\delta c = 0.000 - .176 = -.176 c$$

$$\begin{array}{l} 0 = +.465 - .448 + 0.000 + 2.83 = +.448 - 4.48 \\ + .446 - .417 + 0.000 + 0.10 = +.456 - 4.17 \\ + .453 - .086 + 0.000 + 3.68 = +.821 - 0.86 \end{array}$$

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Solution for C.E. and C.W. with weights

$$C.W. = +.012 + .77\delta a + .85\delta c + .79\delta \Delta T \quad 0 = +.014 + .85\delta a + .94\delta c + .87\delta \Delta T \quad 0 = +.014 + .79\delta a + .87\delta c + .81\delta \Delta T$$

$$\begin{array}{r} -.021 + .46 \\ -.090 + .18 \\ +.064 + 4.20 \end{array} \quad \begin{array}{r} +1.24 \\ -.92 \\ -4.61 \end{array} \quad \begin{array}{r} +1.16 \\ -.55 \\ +1.44 \end{array} \quad \begin{array}{r} -.056 \\ +.166 \\ -.070 \end{array} \quad \begin{array}{r} +3.31 \\ +4.75 \\ +5.06 \end{array} \quad \begin{array}{r} +3.09 \\ +2.83 \\ -1.58 \end{array} \quad \begin{array}{r} -.053 \\ +.278 \\ +.022 \end{array} \quad \begin{array}{r} +2.89 \\ +1.69 \\ +.49 \end{array}$$

$$C.E. = -.093 + 1.72\delta a - 2.27\delta c + 2.23\delta \Delta T \quad 0 = +.123 - 2.27\delta a + 2.99\delta c - 2.94\delta \Delta T \quad 0 = -.121 + 2.23\delta a - 2.94\delta c + 2.89\delta \Delta T$$

$$\begin{array}{r} +.110 + .21 \\ -.037 + .10 \\ +.027 + .17 \\ -.028 + 4.20 \\ -.040 + .66 \\ -.015 + 2.89 \\ +.392 + 3.69 \\ +.121 + 5.62 \\ -.188 + 1.00 \\ -.448 + 10.37 \end{array} \quad \begin{array}{r} +1.03 \\ -.51 \\ +.68 \\ +4.61 \\ +1.72 \\ +4.95 \\ +3.90 \\ +6.97 \\ +2.23 \\ +11.75 \end{array} \quad \begin{array}{r} -.60 \\ +.43 \\ -.37 \\ +1.44 \\ -.73 \\ -1.02 \\ +1.54 \\ +1.42 \\ -.80 \\ +2.90 \end{array} \quad \begin{array}{r} +.538 \\ +.196 \\ +.111 \\ -.009 \\ -.104 \\ -.026 \\ +.414 \\ +.139 \\ -.419 \\ -.507 \end{array} \quad \begin{array}{r} +5.02 \\ +2.72 \\ +2.76 \\ +5.06 \\ +4.49 \\ +8.47 \\ +4.12 \\ +7.45 \\ +4.97 \\ +13.32 \end{array} \quad \begin{array}{r} -2.91 \\ -.231 \\ -1.49 \\ +1.58 \\ -1.91 \\ -1.75 \\ +1.62 \\ +1.64 \\ -1.78 \\ +3.28 \end{array} \quad \begin{array}{r} -.312 \\ -.167 \\ -.060 \\ -.003 \\ +.044 \\ +.005 \\ +.163 \\ +.031 \\ +.150 \\ -.125 \end{array} \quad \begin{array}{r} +1.69 \\ +1.96 \\ +.81 \\ +.49 \\ +.81 \\ +.36 \\ +.64 \\ +.36 \\ +.64 \\ +.81 \end{array}$$

$$C.W. = +.103 + .17\delta a + .87\delta c + .70\delta \Delta T \quad 0 = +.532 + .87\delta a + 4.45\delta c + 3.59\delta \Delta T \quad 0 = +.428 + .70\delta a + 3.59\delta c + 2.89\delta \Delta T$$

$$0 = -.111 + 3.64\delta a + 31.99\delta c + 9.98\delta \Delta T \quad 0 = +.342 + 3.19\delta a + 79.88\delta c + 1.83\delta \Delta T \quad 0 = +.294 + 9.98\delta a + 1.83\delta c + 20.23\delta \Delta T$$

$$0 = -.111 + 3.64\delta a + 31.99\delta c + 9.98\delta \Delta T$$

$$+1.342 + 3.19\delta a + 79.88\delta c + 1.83\delta \Delta T$$

$$+2.94 + 9.98\delta a + 1.83\delta c + 20.23\delta \Delta T$$

$$0 = -.0030 + \delta a + 1.878\delta c + .2741\delta \Delta T$$

$$+.0042 + \delta a + 2.500\delta c + .0572\delta \Delta T$$

$$+.0295 + \delta a + 0.182\delta c + 2.0271\delta \Delta T$$

$$0 = -.0072 - 1.622\delta c + 2.169\delta \Delta T$$

$$-.0253 + 2.318\delta c - 1.9699\delta \Delta T$$

$$0 = -.0044 - \delta c + .1337\delta \Delta T$$

$$-.0109 + \delta c - .8498\delta \Delta T$$

$$0 = -.0153 - .7161\delta \Delta T$$

$$\delta \Delta T = -.021 - 14.325 = -14.346 \Delta T$$

$$\delta c = +.007 - .176 = -.169 c$$

$$\delta a = +.002 + .507 = +.509 a$$

Solution for c = 00

$$0 = +.032 + 1.842\delta \Delta T$$

$$\delta \Delta T = -.017 - 14.325 = -14.342 \Delta T$$

$$\delta a = +.005 + .507 = +.512 a$$

$$\delta c = 000 - .176 = -.176 c$$

$$0 = -.111 + .043 + .224 - .210 = +.297 - .321$$

$$+1.342 + .064 + .489 - .038 = +1.895 - .038$$

$$+2.94 + .020 + .013 - .425 = +3.327 - .425$$

E4

June 2

Solution for C.E. with weights

Without weights

With weights

$$\begin{aligned}
 0 &= +.110 + .77\delta a - .102\delta c + \delta\Delta T \\
 &-.145 \\
 &+.000 \\
 &-.040 \\
 &+.050 \\
 &+.070 \\
 &-.010 \\
 &+.300 \\
 &+.170 \\
 &+.240 \\
 &-.090
 \end{aligned}$$

$$\begin{array}{r}
 \sqrt{w} \quad w \\
 1.7 \quad 1.7 \\
 1.3 \quad 1.3 \\
 1.4 \quad 1.4 \\
 1.4 \quad 1.4 \\
 .8 \quad .8 \\
 .4 \quad .4 \\
 .7 \quad .7 \\
 .4 \quad .4 \\
 .5 \quad .5 \\
 .4 \quad .4 \\
 .7 \quad .7 \\
 .6 \quad .6
 \end{array}$$

$$\begin{aligned}
 0 &= +.187 + 1.31\delta a - 1.73\delta c + 1.70\delta\Delta T \\
 &-.188 \\
 &+.000 \\
 &-.036 \\
 &+.035 \\
 &+.063 \\
 &-.006 \\
 &+.240 \\
 &+.102 \\
 &+.190 \\
 &-.081
 \end{aligned}$$

$$\begin{aligned}
 0 &= +.245 + 1.72\delta a - 2.27\delta c + 2.23\delta\Delta T \\
 &+.086 \\
 &+.000 \\
 &+.015 \\
 &+.072 \\
 &-.051 \\
 &+.010 \\
 &+.461 \\
 &+.242 \\
 &+.190 \\
 &-.261
 \end{aligned}$$

$$\begin{aligned}
 0 &= -.324 - 2.27\delta a + 2.99\delta c - 2.94\delta\Delta T \\
 &+.421 \\
 &+.000 \\
 &+.060 \\
 &+.079 \\
 &-.134 \\
 &+.017 \\
 &+.488 \\
 &+.278 \\
 &+.424 \\
 &-.296
 \end{aligned}$$

$$\begin{aligned}
 0 &= +.318 + 2.23\delta a - 2.94\delta c + 2.89\delta\Delta T \\
 &-.244 \\
 &+.000 \\
 &+.032 \\
 &+.025 \\
 &+.057 \\
 &-.004 \\
 &+.192 \\
 &+.061 \\
 &+.152 \\
 &-.073
 \end{aligned}$$

$$0 = +.629 + 3.063\delta a + 3.456\delta c + 6.44\delta\Delta T$$

$$0 = +.165 + 3.456\delta a + 6.137\delta c - 6.97\delta\Delta T$$

$$0 = +.452 + 6.44\delta a - 6.97\delta c + 11.46\delta\Delta T$$

$$\begin{aligned}
 0 &= +.629 + 3.063\delta a + 3.456\delta c + 6.44\delta\Delta T \\
 &+.165 + 3.456\delta a + 6.137\delta c - 6.97\delta\Delta T \\
 &+.452 + 6.44\delta a - 6.97\delta c + 11.46\delta\Delta T
 \end{aligned}$$

$$\begin{aligned}
 0 &= +.0205 + \delta a + 1.128\delta c + 2.10\delta\Delta T \\
 &+.0048 + \delta a + 1.776\delta c - 2.02\delta\Delta T \\
 &+.0718 + \delta a - 1.082\delta c + 1.780\delta\Delta T
 \end{aligned}$$

$$\begin{aligned}
 0 &= +.0157 - .648\delta c + 4.12\delta\Delta T \\
 &-.0670 + 2.858\delta c - 1.982\delta\Delta T
 \end{aligned}$$

$$\begin{aligned}
 0 &= +.0242 - \delta c + 6.358\delta\Delta T \\
 &-.0237 + \delta c - 6.935\delta\Delta T
 \end{aligned}$$

$$0 = +.0005 - .0577\delta\Delta T$$

$$\delta\Delta T = +.0091 - 14.410 = -14.401 \Delta T$$

$$\delta c = +.030 - .284 = -.254 c$$

$$\delta a = -.056 + .673 = +.617 a$$

Solution for C = 00

$$0 = +.051 + 1.570\delta\Delta T$$

$$\delta\Delta T = -.033 - 14.410 = -14.443 \Delta T$$

$$\delta a = -.013 + .673 = +.660 a$$

$$\delta c = 000 - .284 = -.284 c$$

$$\begin{aligned}
 0 &= +.629 - 1.715 + 1.037 + .058 = +1.724 - 1.715 = +009 \\
 &+.165 - 1.935 + 1.841 - .063 = +2.006 - 1.998 = +008 \\
 &+.452 - .361 - .209 + .103 = +.555 - .570 = -.015
 \end{aligned}$$

Solution for C. W. with rights

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$$0 = -.065 + .98\delta a + 1.08\delta c + \delta \Delta T$$

$$\begin{array}{r} -.072 \\ +.140 \\ -.065 \end{array}$$

$$r_{\Delta T}$$

$$\begin{array}{r} .3 \\ 1.7 \\ 1.3 \\ .7 \end{array} \begin{array}{r} 0.9 \\ 1.7 \\ 1.3 \\ 0.6 \end{array}$$

$$0 = -.069 + .88\delta a + .97\delta c + .90\delta \Delta T$$

$$\begin{array}{r} -.122 \\ +.182 \\ -.046 \end{array}$$

$$0 = -.052 + .77\delta a + .85\delta c + .79\delta \Delta T$$

$$\begin{array}{r} -.083 \\ -.076 \\ -.094 \end{array}$$

$$0 = -.057 + .85\delta a + .94\delta c + .87\delta \Delta T$$

$$\begin{array}{r} -.222 \\ +.397 \\ +.103 \end{array}$$

$$0 = -.053 + .79\delta a + .87\delta c + .81\delta \Delta T$$

$$\begin{array}{r} -.207 \\ +.237 \\ -.032 \end{array}$$

$$0 = -.305 + 5.61\delta a - 3.44\delta c + 2.84\delta \Delta T$$

$$0 = +.221 - 3.44\delta a + 14.06\delta c + 5.21\delta \Delta T$$

$$0 = -.055 + 2.84\delta a + 5.21\delta c + 5.88\delta \Delta T$$

$$0 = -.305 + 5.61\delta a - 3.44\delta c + 2.84\delta \Delta T$$

$$+.221 - 3.44\delta a + 14.06\delta c + 5.21\delta \Delta T$$

$$-.055 + 2.84\delta a + 5.21\delta c + 5.88\delta \Delta T$$

$$0 = -.0544 + \delta a - .613\delta c + 5.062\delta \Delta T$$

$$+.0642 - \delta a + 4.087\delta c + 1.5145\delta \Delta T$$

$$-.0194 + \delta a + 1.834\delta c + 2.0704\delta \Delta T$$

$$0 = +.0098 + 3.474\delta c + 2.0207\delta \Delta T$$

$$+.0448 + 5.921\delta c + 3.5849\delta \Delta T$$

$$0 = +.0028 + \delta c + 5.817\delta \Delta T$$

$$+.0076 + \delta c + 6.054\delta \Delta T$$

$$0 = -.0048 - 0.237\delta \Delta T$$

$$\delta \Delta T = -202 - 14.345 = -14.547 \Delta T$$

$$\delta c = +.115 - .189 = -.084 \delta c$$

$$\delta a = +.227 + 4.56 = +.683 \delta a$$

Solution for c = 00

$$0 = +.049 + 1.976\delta \Delta T$$

$$\delta \Delta T = -.025 - 14.345 = -14.370 \Delta T$$

$$\delta a = +.064 + 4.56 = +.520 \delta a$$

$$\delta c = .000 - .189 = -.189 \delta c$$

$$0 = -.305 + 1.273 - .396 - .574 = +1.273 - 1.275 = -.002$$

$$+.221 - .781 + 1.617 - 1.052 = +1.838 - 1.833 = +005$$

$$-.055 + .645 + .599 - 1.188 = +1.244 - 1.243 = +001$$

The following fundamental equations for the determination of a and c were omitted in their proper places.

June 1

Some equations

$$6E. \quad 0 = +14.58 + 57a + 1.01c$$

$$6M. \quad \begin{aligned} 0 &= +14.57 + 81a - 1.02c \\ 0 &= +15.12 + 18a - 1.20c \end{aligned}$$

Polar equations.

$$6E. \quad \begin{aligned} 0 &= +14.67 - 1.40a + 2.99c \\ &+ 13.65 + 10.35a - 13.13c \end{aligned}$$

$$6M. \quad 0 = +16.35 - 1.74a - 3.42c$$

June 2

$$6M. \quad 0 =$$

June 1 1883

With weights
C.E. and C.W

With weights
C.E. only

With weights
C.E. & C.W
Sc = 40

With weights
C.E. only
Sc = 40

Residuals from final solution by weights

T-R.f
corrected
for rate
C.E.

+14.53 +62a +1.00 c +220 +215 +435 -1451 +04 +111 +86 +197 -14.55 +00 +219 +2.00 +419 -14.54 +01 +1.94 +2.00 +394 -14.54 +01 +14.59 +.52 +1.02 +185 +219 +404 -1454 +05 +93 +88 +181 -14.56 +03 +184 +2.04 +3.88 -14.57 +02 +1.63 +2.04 +367 -14.56 +03

+14.67 -1.40a +2.99c -497 +6.43 +146 -14.80 -13 -251 +257 +006 -14.74 -07 -494 +598 +1.04 -14.85 -18 -438 +598 +160 -14.77 -10 +18.65 +10.35 -13.13 +3.674 -2823 +8.51 -14.10 -45 +1859 -1129 +725 -14.02 -37 +3653 -2626 +10.27 -13.93 -88 +3239 -2626 +613 -14.32 -67

With weights
C.W only

a = +.393
c = +.200
ΔT = -14.970

With weights
C.W only

a = +.393
c = +.200
ΔT = -14.968

C.W
+14.87 +.81a -1.02c +288 -219 +069 -1488 -01 +318 -204 +114 -14.86 +01 +286 -204 +082 -14.87 +00 +318 -204 +114 -14.85 +02

+15.04 +.27a -1.14 +96 -2.45 -149 -15.10 -06 +106 -228 -122 -15.09 -05 +95 -228 -133 -15.09 -05 +106 -228 -122 -15.09 -05 +15.21 +.10 -1.27 +36 -2.73 -237 -15.19 +02 +39 -254 -2.15 -15.18 +03 +35 -254 -2.19 -15.17 +04 +39 -254 -2.15 -15.18 +03

+16.35 -1.74 -3.42 -618 -7.35 -1353 -16.30 +05 -684 -684 -13.68 -16.34 +01 -614 -684 -12.98 -16.25 +10 -684 -684 -13.68 -16.34 +01

June 2 1883

With weights
C and G.W

$$\begin{aligned} a &= +.548 \\ c &= -.214 \\ \Delta\pi &= -14.351 \end{aligned}$$

With weights
C.W. only

$$\begin{aligned} a &= +.683 \\ c &= -.076 \\ \Delta\pi &= -14.545 \end{aligned}$$

With weights
C.G. and G.W
 $\delta c = 0$

$$\begin{aligned} a &= +.518 \\ c &= -.176 \\ \Delta\pi &= -14.340 \end{aligned}$$

With weights
C.W. only
 $\delta c = 0$

$$\begin{aligned} a &= +.530 \\ c &= -.189 \\ \Delta\pi &= -14.369 \end{aligned}$$

Residuals from final solution by weights

+4.01 -6.03	+1403	+98a	+1.08c	+537	-231	+3.06	-14.04	-.01	+6.69	-83	+586	-13.96	+0.7	+508	-190	+3.18	-14.03	+0.8	+574	-204	+1.70	-14.05	-.02
	+1426	+52a	+1.02c	+285	-218	+0.67	-14.28	-.02	+3.55	-77	+2.78	-14.27	-.01	+269	-179	+0.90	-14.25	+0.1	+2.29	-193	+0.86	-14.29	-.03
	+1431	+27	+1.14	+148	-244	+0.96	-14.26	+0.5	+1.84	-87	+0.97	-14.45	-.14	+140	-201	+0.61	-14.40	-.09	+1.63	-215	+1.12	-14.44	-.13
	+1431	+42	+1.06	+230	-227	+0.03	-14.35	-.04	+2.87	-80	+2.07	-14.34	-.03	+218	-187	+0.31	-14.31	+0.0	+1.80	-200	+0.40	-14.34	-.03
-10 -2-67	+1508	-44a	+1.82c	-231	-289	-6.0	-14.87	+1.1	-3.10	-138	-4.38	-14.78	+1.0	-228	-320	-5.48	-14.89	+1.9	-1.68	-244	-7.2	-15.54	+0.6
	+1481	-20	+1.55	-110	-232	-3.42	-14.69	+1.2	-1.37	-118	-2.55	-14.80	+0.1	-104	-372	-4.76	-14.82	-.01	-7.6	-293	-3.69	-14.77	+0.4
	+1233	+2.93a	-3.21c	+1606	+687	+2.293	-12.56	+0.6	+2.01	+344	+2.345	-12.20	+13	+1519	+5.65	+2.084	-12.26	+0.7	+11.19	+6.07	+17.26	-12.21	+1.2

With weights
C.G. only

$$\begin{aligned} a &= +.544 \\ c &= -.200 \\ \Delta\pi &= -14.314 \end{aligned}$$

With weights
C.G. only
 $\delta c = 0$

$$\begin{aligned} a &= +.652 \\ c &= -.280 \\ \Delta\pi &= -14.432 \end{aligned}$$

+02	+1364	+80a	-1.01c	+438	+216	+6.54	-13.70	-.06	+4.35	+202	+6.37	-13.68	-.04	+414	+178	+5.92	-13.75	-.11	+5.22	+283	+8.05	-13.63	+0.1
	+1379	+64	-1.00	+351	+214	+5.65	-13.79	+0.0	+3.48	+200	+5.48	-13.77	+0.2	+332	+176	+5.08	-13.83	-.04	+4.17	+280	+6.94	-13.74	+0.5
	+1370	+88	-1.04	+482	+223	+7.05	-13.65	+0.5	+4.79	+208	+6.87	-13.63	+0.7	+456	+183	+6.39	-13.70	+0.0	+5.74	+291	+8.65	-13.57	+1.3
-05 +03	+1397	-.11a	-1.46c	-60	+312	+2.52	-14.10	-.13	-60	+2.92	+2.32	-14.08	-.11	-157	+2.57	+2.00	-14.14	-.17	-72	+4.09	+3.37	-14.10	-.13
	+1406	-.59	-1.99	-223	+426	+2.03	-14.15	-.09	-321	+3.98	+0.77	-14.24	-.18	-306	+3.50	+0.44	-14.30	-.24	-3.85	+8.67	+1.72	-14.26	-.20
+01	+1394	+38a	-1.08c	+208	+231	+4.39	-14.91	+0.3	+2.07	+216	+4.23	-13.89	+0.5	+197	+190	+3.87	-13.95	-.01	+2.48	+3.02	+5.50	-13.88	+0.6
	1389	+07	-1.29	+38	+276	+3.14	-14.04	-.15	+3.8	+2.58	+2.76	-14.02	-.13	+36	+227	+2.63	-14.08	-.19	+4.6	+2.61	+3.07	-14.12	-.23
	+1416	-.46a	-1.85c	-252	+3.96	+1.44	-14.24	-.05	-2.50	+3.70	+1.20	-14.19	-.03	-238	+2.26	-0.12	-14.35	-.19	-3.00	+5.18	+2.18	-14.21	-.05
	1340	+2.93a	+3.21c	+1606	-687	+9.19	-13.43	-.03	+15.94	-642	+9.52	-13.66	+0.4	+1518	-5.65	+9.53	-13.39	+0.1	+19.10	-8.99	+10.21	-13.43	-.03
	1442	-.90	-2.36	-473	+505	+0.12	-14.34	+0.8	-4.90	+4.72	-0.18	-14.53	+0.9	-466	+4.15	-0.51	-14.39	+0.3	-5.87	+6.61	+0.74	-14.51	+0.8
	1492	-2.83	-4.85	-1551	+1038	-.513	-14.86	+0.6	-15.40	+9.70	-5.70	-14.88	+0.4	-1466	+8.54	-6.12	-14.95	-.03	-1.845	+13.58	-4.87	-14.92	+0.0
	1381	+2.40	+2.54	+1315	-5.44	+7.71	-13.58	+2.3	+13.06	-508	+7.98	-13.52	+2.9	+1243	-4.47	+7.96	-13.55	+2.6	+15.65	-7.11	+8.54	-13.58	+2.0
	1321	+3.95	+4.55	+2165	-9.74	+11.91	-13.16	+0.5	+21.49	-910	+12.99	-13.08	+1.3	+2046	-8.07	+12.45	-13.10	+1.1	+23.75	-12.74	+13.01	-13.13	+0.8
	1470	-1.25	-2.79	-685	+5.97	-0.88	-14.44	+2.6	-6.80	+5.58	-1.22	-14.44	+2.6	-647	+4.91	-1.56	-14.50	+2.0	-8.15	+7.81	-0.34	-14.47	+2.3
	1306	+3.58	+4.06	+1962	-8.67	+10.93	-13.26	-.20	+19.48	-812	+11.36	-13.18	-.12	+1854	-7.16	+11.38	-13.20	-.14	+23.34	-11.37	+11.97	-13.24	-.16
C.W.	1427	+49a	+1.04	+268	-223	+0.45	-14.31	-.04						+254	-1.83	+0.71	-14.27	+0.0					
	1504	-.28	+1.64	-153	-3.57	-5.04	-14.86	+1.8						-145	-2.89	-4.34	-14.77	+2.7					
	1439	+52	+1.03	+255	-2.20	+0.66	-14.28	+1.1						+269	-1.81	+0.88	-14.25	+1.4					

June 5 1883		Residuals from final solution by weights		Residuals from final solution by weights		Residuals from final solution by weights		Residuals from final solution by weights	
With weights C.E. & W		With weights C.E. only		With weights C.E. & W Se=00		With weights C.E. only Se=00		With weights C.E. only Se=00	
a = +1.175 b = +.266 AT = -13.069		a = +.996 b = +.147 AT = -12.811		a = +1.181 b = +.240 AT = -13.064		a = +1.058 b = +.160 AT = -12.892			
C.E.									
+11.68	+ .98a + 1.08c	+1152 + 287	+1439 - 11.63 + .05	+9.76 + 116 + 1092 - 11.72 - .04 + 1157	+259 + 14.16 - 11.65 + .03 + 1037 + 1.73 + 1210 - 11.68 + .00	+12			
11.94	+ .81 + 1.02	+ .952 + 271	+12.23 - 11.85 + .09	+8.07 + 109 + 9.16 - 11.70 - .04 + 957	+245 + 12.02 - 11.86 + .08 + 856 + 1.63 + 1019 - 11.81 + .07	+12			
+12.15	+ .52a + 1.02c	+ .611 + 271	+8.82 - 12.19 - .04 + 5.18 + 109 + 1.27 - 12.18 - .03 + 614	+245 + 8.59 - 12.20 - .05 + 550 + 1.63 + 713 - 12.18 - .03	+12				
12.47	+ .27 + 1.14	+ .317 + 303	+6.20 - 12.45 + .02 + 2.69 + 122 + 1.391 - 12.42 + .05 + 319	+274 + 5.73 - 12.47 + .00 + 2.85 + 1.82 + 467 - 12.43 + .04	12				
12.30	+ .42 + 1.06	+ .494 + 282	+7.76 - 12.29 + .07 + 4.18 + 113 + 1.531 - 12.28 + .02 + 496	+254 + 7.50 - 12.31 - .01 + 444 + 1.70 + 614 - 12.28 + .02	12				
12.41	+ .28 + 1.13	+ .729 + 301	+4.30 - 12.41 - .03 + 2.79 + 121 + 4.00 - 12.41 + .00 + 331	+271 + 6.02 - 12.46 - .05 + 296 + 1.81 + 477 - 12.42 - .01	12				
12.89	- .44a + 1.82c	- .577 + 484	- .033 - 13.10 - .28 + 4.36 + 195 - .241 - 13.03 - .16 - 520 + 4.37 - 0.83 - 13.15 - .26 - 465 + 2.91 - 1.74 - 13.07 - .18	+13					
12.75	- .20 + 1.55	- .235 + 412	+1.77 - 12.89 - .14 - 1.99 + 166.033 - 12.75 - .03 - 236 + 372 + 1.36 - 12.93 - .18 - 212 + 2.48 + 0.36 - 12.86 - .11	13					
13.60	- .90 + 2.36	- .1058 + 628	-4.30 - 13.50 + .10 - 8.96 + 252 - 6.41 - 13.46 + .14 - 10.63 + 5.66 - 4.97 - 13.56 + .04 - 952 + 2.78 - 0.74 - 13.57 + .03	13					
14.24	- 1.74a + 3.42c	- 2.044 + 910	-11.34 - 14.20 + .04 - 17.33 + 366 - 13.67 - 14.18 + .06 - 2055 + 8.21 - 12.34 - 14.30 - .06 - 1841 + 5.47 - 12.94 - 14.19 + .05	+13					
10.31	+3.01 - 3.32	+3.537 - 883 + 26.54	-10.41 - 10 + 29.78 - 3.55 + 2.648 - 10.17 + 14 + 35.55 - 7.97 + 2.758 - 10.31 + .00 + 3185 - 5.31 + 26.54 - 10.28 + .057	12					
10.18	+2.93 - 3.21	+3.443 - 854 + 25.89	-10.48 - 30 + 29.18 - 3.43 + 2.575 - 10.24 - .06 + 3460 - 7.70 + 2.690 - 10.37 - .19 + 3100 - 5.14 + 25.86 - 10.31 - .13	12					
15.23	-2.83 + 4.85	-3.325 + 1290 - 20.35	-15.10 + .13 - 28.19 + 519 - 23.00 - 15.11 + .12 - 3342 + 11.64 - 2.178 - 15.24 - .01 - 2994 + 7.76 - 22.18 - 15.11 + .12	12					

With weights
C.W. only

$$a = +1.263$$

$$b = +.185$$

$$AT = -13.236$$

With weights
C.W. only
Se=00

$$a = +1.421$$

$$b = +.050$$

$$AT = -13.439$$

C.W.									
12.26	+ .98a - 1.08c	+1152 - 287	+8.65 - 12.20 + .06 + 1.238 - 200 + 10.38 - 12.20 + .06 + 1166	-259 + 9.67 - 12.18 + .00 + 1401 - 54 + 387 - 12.09 + .07	+16				
12.23	+ .94 - 1.06	+1104 - 282	+8.22 - 12.25 - .02 + 1.187 - 196 + 9.91 - 12.24 - .01 + 1110	-254 + 8.56 - 12.21 + .02 + 1336 - 53 + 1283 - 12.16 + .07	+16				
12.95	+ .38a - 1.08c	+446 - 287	+1.59 - 12.91 + .04 + 4.80 - 200 + 2.80 - 12.96 - .01 + 449 - 259 + 1.90 - 12.87 + .08 + 540 - 54 + 486 - 12.95 + .00	+16					
14.22	- .59a - 1.99c	- 693 - 529 - 12.22	-14.29 - .07 - 7.45 - 368 - 1.113 - 14.35 - .13 - 697 - 478 - 1.175 - 14.24 - .02 - 838 - 100 - 938 - 14.38 - .16	+16					
14.14	- .55 - 1.93	- 646 - 513 - 1.57	-14.23 - .09 - 6.95 - 357 - 10.52 - 14.27 - .15 - 650 - 463 - 1.113 - 14.18 - .04 - 782 - 96 - 878 - 14.22 - .18	+16					
14.66	- .70 - 2.12	- 522 - 564 - 13.86	-14.46 + .20 - 8.84 - 392 - 12.76 - 14.51 + .15 - 827 - 509 - 13.36 - 14.40 + .26 - 975 - 106 - 1101 - 14.54 + .12	+16					
17.43	- 2.83a - 4.85c	- 3325 - 1290 - 4.615	-17.68 - .25 - 3574 - 897 - 4471 - 17.71 - .28 - 3342 - 1164 - 4.506 - 17.57 - .14 - 4021 - 242 - 4263 - 17.70 - .27	+16					
9.63	+2.40 + 2.54	+2.820 + 676 + 3.496	-9.57 + .06 + 3031 + 470 + 3501 - 9.74 - .11 + 2834 + 610 + 3444 - 9.62 + .01 + 3410 + 127 + 3537 - 9.70 - .27	16					
8.88	+2.79 + 3.29	+3.513 + 875 + 4.388	-8.68 + .20 + 3776 + 609 + 4385 - 8.85 + .03 + 3531 + 740 + 4321 - 8.74 + .14 + 4049 + 164 + 4413 - 8.83 - .15	16					
16.73	- 2.01 - 3.77	- 2362 - 1023 - 3.365	-16.43 + .30 - 2539 - 697 - 3236 - 16.47 + .26 - 2374 - 505 - 3209 - 16.34 + .39 - 2856 - 188 - 3044 - 16.48 + .25	16					
17.82	- 2.85 - 4.87	- 3356 - 1295 - 4.657	-17.72 + .11 - 3600 - 901 - 4501 - 17.74 + .08 - 3366 - 1169 - 4535 - 17.60 + .22 - 4050 - 244 - 4294 - 17.73 + .07	+16					

June 4 1883

With weights
C.E. and C.W.

Residuals from

With weights
C.E. only

final solution by weights

With weights
C.E. and C.W.
 $\Sigma C = 00$

by weights

With weights
C.E. only
 $\Sigma C = 00$

by weights

C.E.

+1222 + .98a + 1.08c	+ 871 + 294 + 1.165 - 12.21 + .01 + 795 + 223 + 10.18 - 12.25 - .03 + 879 + 281 + 1.160 - 12.24 - .02 + 862 + 281 + 1.143 - 12.21 + .01
1233 + .81 + 1.02	+ 720 + 277 + .997 - 12.38 - .05 + 657 + 210 + 867 - 12.40 - .07 + 727 + 265 + .992 - 12.40 - .07 + 713 + 265 + .978 - 12.37 + .06
+1266 + .52a + 1.02c	+ 467 + 277 + .739 - 12.64 + .02 + 422 + 210 + 632 - 12.63 + .03 + 466 + 265 + .731 - 12.67 - .01 + 468 + 265 + .733 - 12.62 + .04
1289 + .27 + 1.14	+ 240 + 310 + .550 - 12.82 + .07 + 219 + 235 + 484 - 12.81 + .08 + 242 + 296 + .538 - 12.86 + .03 + 238 + 296 + .534 - 12.82 + .07
1267 + .42 + 1.02	+ 378 + 277 + .650 - 12.72 - .05 + 341 + 210 + 551 - 12.71 - .04 + 377 + 265 + .642 - 12.76 - .09 + 370 + 265 + .636 - 12.81 - .04
+1321 - .44a + 1.82c	- 391 + 495 + .104 - 13.27 - .06 - 357 + 575 + .018 - 13.25 - .04 - 395 + 473 + .078 - 13.32 - .11 - 387 + 473 + .086 - 13.26 - .05
1308 - .20 + 1.55	- 178 + 422 + .244 - 13.13 - .05 - 162 + 319 + 1.57 - 13.11 - .03 - 179 + 403 + .224 - 13.17 - .09 - 176 + 403 + .227 - 13.12 - .04
1345 - .90 + 2.36	- 800 + 642 - 1.58 - 13.53 - .08 - 730 + 486 - 2.44 - 13.51 - .06 - 807 + 614 - 1.93 - 13.59 - .14 - 792 + 614 - 1.78 - 13.53 - .08
+1301 + .07a + 1.29c	+ 62 + 351 + .413 - 12.96 + .05 + 57 + 266 + 3.23 - 12.94 + .07 + 63 + 335 + 3.98 - 13.00 + .01 + 62 + 335 + 3.97 - 12.95 + .06
1260 + .55 + 1.01	+ 489 + 275 + .764 - 12.61 - .01 + 446 + 208 + 6.54 - 12.61 - .01 + 493 + 263 + .756 - 12.64 - .04 + 484 + 263 + 7.47 - 12.60 + .00
1271 + .48 + 1.03	+ 427 + 280 + 7.07 - 12.67 + .04 + 389 + 212 + 6.01 - 12.66 + .05 + 430 + 268 + 6.98 - 12.70 + .01 + 422 + 268 + 6.90 - 12.66 + .05
+1403 - 1.74a + 3.42c	- 1547 + 930 - .617 - 13.99 + .04 - 1411 + 704 - 7.07 - 13.97 + .06 - 1561 + 889 - 6.72 - 14.07 - .04 - 1531 + 889 - 6.42 - 13.99 + .04
1176 + 3.01 - 3.32	+ 2676 - 903 + 1.773 - 11.60 + .16 + 2441 - 684 + 1.757 - 11.51 + .25 + 2700 - 863 + 1.837 - 11.56 + .20 + 2649 - 863 + 1.786 - 11.56 + .20
1149 + 2.93 - 3.21	+ 2605 - 873 + 1.732 - 11.64 - .15 + 2376 - 661 + 1.715 - 11.55 - .06 + 2628 - 835 + 1.793 - 11.60 - .11 + 2578 - 835 + 1.743 - 11.61 - .12
1069 + 4.51 - 5.29	+ 4009 - 1439 + 2.570 - 10.80 - .11 + 3658 - 1090 + 2.568 - 10.70 - .01 + 4045 - 1375 + 2.670 - 10.72 - .04 + 3969 - 1375 + 2.594 - 10.75 - .06

With weights
C.W. onlya = +1.070
C = +.096
 $\Delta T = -13.681$ With weights
C.W. only
 $\Sigma C = 00$ a = +.895
C = +.260
 $\Delta T = -13.406$

C.W.

+1302 + .80a - 1.01c	+ 711 - 275 + 4.36 - 12.94 + .08 + 856 - 97 + 7.59 - 12.92 + .10 + 718 - 263 + 4.55 - 12.94 + .08 + 716 - 263 + 4.53 - 12.95 + .07
1273 + .88 - 1.04	+ 582 - 283 + 4.99 - 12.88 - .15 + 942 - 100 + 8.42 - 12.84 - .14 + 789 - 270 + 5.19 - 12.88 - .15 + 788 - 270 + 5.18 - 12.89 - .16
1282 + .98 - 1.08	+ 571 - 294 + 5.77 - 12.80 + .02 + 1049 - 104 + 9.45 - 12.74 + .08 + 879 - 281 + 5.98 - 12.80 + .02 + 877 - 281 + 5.96 - 12.81 + .01
+1312 + .64a - 1.00c	+ 569 - 272 + 2.92 - 13.08 + .04 + 685 - 96 + 5.89 - 13.09 + .03 + 574 - 260 + 3.14 - 13.08 + .04 + 573 - 260 + 3.13 - 13.09 + .03
1336 + .41 - 1.06	+ 264 - 288 - 0.24 - 13.40 - .04 + 439 - 102 + 3.57 - 13.34 + .02 + 368 - 276 + 0.92 - 13.30 + .06 + 367 - 276 + 0.91 - 13.32 + .04
+1491 - .90a - 2.36c	- 800 - 642 - 1.442 - 14.82 + .09 - 963 - 227 - 1.190 - 14.87 + .04 - 807 - 614 - 1.421 - 14.82 + .09 - 806 - 614 - 1.420 - 14.83 + .08
1395 - .11 - 1.46	- 98 - 397 - 4.95 - 13.87 + .08 - 118 - 140 - 2.58 - 13.94 + .01 - 99 - 380 - 4.79 - 13.88 + .07 - 98 - 350 - 4.78 - 13.88 + .07
1445 - .59 - 1.77	- 524 - 541 - 1.065 - 14.44 + .01 - 631 - 191 - 8.24 - 14.50 - .05 - 529 - 517 - 1.046 - 14.44 + .01 - 528 - 517 - 1.045 - 14.45 + .00
1431 - .55 - 1.93	- 489 - 525 - 1.014 - 14.39 - .08 - 588 - 185 - 7.73 - 14.45 - .14 - 493 - 502 - 9.95 - 14.39 - .08 - 492 - 502 - 9.94 - 14.40 - .09
+1744 - 2.83a - 4.85c	- 2516 - 1319 - 3.835 - 17.21 + .23 - 3028 - 466 - 3.494 - 17.17 + .27 - 2538 - 1261 - 3.799 - 17.20 + .24 - 2543 - 1261 - 3.804 - 17.21 + .24
1080 + 2.40 + 2.54	+ 2134 + 691 + 2.825 - 10.55 + .25 + 2568 + 244 + 2.812 - 10.87 - .07 + 2153 + 660 + 2.813 - 10.58 + .22 + 2148 + 660 + 2.808 - 10.60 + .20
1583 - 2.01 - 3.77	- 1787 - 1025 - 2.812 - 16.19 - .36 - 2161 - 362 - 2.513 - 16.19 - .36 - 1803 - 980 - 2.733 - 16.18 - .35 - 1799 - 980 - 2.729 - 16.18 - .35
1742 - 2.65 - 4.89	- 2534 - 1325 - 3.859 - 17.23 + .19 - 3049 - 168 - 3.517 - 17.20 + .22 - 2566 - 1266 - 3.822 - 17.22 + .20 - 2551 - 1266 - 3.817 - 17.22 + .20
1653 - 2.33 - 4.18	- 2071 - 1187 - 3.208 - 16.58 - .05 - 2493 - 401 - 2.894 - 16.58 - .05 - 2090 - 1087 - 3.177 - 16.57 - .04 - 2085 - 1087 - 3.172 - 16.58 - .05

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June 17 1883

With weights
L.E. and L.W.

Residuals

$$a = -.680$$

$$c = +.276$$

$$\Delta T = +6.571$$

With weights
L.E. only

from final solution by weights.

$$a = -.723$$

$$c = +.277$$

$$\Delta T = +6.574$$

With weights
L.E. and L.W.
 $\Delta c = 0$

$$a = -.671$$

$$c = +.310$$

$$\Delta T = +6.557$$

With weights
L.E. only
 $\Delta c = 0$

$$a = -.681$$

$$c = +.310$$

$$\Delta T = +6.519$$

$$\begin{array}{l} -6.58 + .32a + 1.15c - 248 + 317 + .099 + 6.67 + .09 - 231 + 318 + .087 + 6.66 + .08 - 215 + 356 + 1.41 + 6.70 + .12 - 218 + 356 + 1.38 + 6.66 + .08 \\ -6.73 + .36 + 1.12 - 245 + 309 + .064 + 6.64 - .09 - 260 + 310 + .050 + 6.62 - .11 - 242 + 347 + 1.05 + 6.66 - .07 - 245 + 347 + 1.02 + 6.66 - .11 \\ -6.43 + .63 + 1.01 - 428 + 279 - 149 + 6.42 - .01 - 455 + 280 - 175 + 6.40 - .03 - 423 + 313 - 110 + 6.45 + .02 - 429 + 313 - 116 + 6.40 - .03 \\ -6.40 + .52 + 1.04 - 354 + 287 - 067 + 6.50 + .07 - 376 + 288 - 088 + 6.49 + .06 - 349 + 322 - 027 + 6.53 + .10 - 354 + 322 - 032 + 6.49 + .06 \\ -6.51 + .48 + 1.05 - 326 + 290 - 036 + 6.54 + .03 - 347 + 291 - 056 + 6.52 + .01 - 322 + 326 + 004 + 6.56 + .05 - 327 + 326 - 001 + 6.52 + .01 \end{array}$$

$$-9.82 - 2.63a + 4.87c + 1788 + 1344 + 3.132 + 9.80 - .82 + 19.01 + 1349 + 3250 + 9.82 + .00 + 17.65 + 15.10 + 3.275 + 9.83 + .01 + 17.91 + 15.10 + 3.301 + 9.82 + .00$$

With weights
L.W. only

$$a = -.693$$

$$c = +.315$$

$$\Delta T = +6.643$$

With weights
L.W. only
 $\Delta c = 0$

$$a = -.687$$

$$c = +.310$$

$$\Delta T = +6.631$$

L.W.

$$\begin{array}{l} -5.64 + .96a - 1.06c - 653 - 292 - 945 + 5.63 - .01 - 665 - 334 - 999 + 5.64 + .00 - 644 - 329 - 873 + 5.68 + .04 - 652 - 329 - 988 + 5.65 + .07 \\ 5.76 + .77 - 1.00 - 524 - 276 - 800 + 5.77 + .01 - 534 - 315 - 849 + 5.79 + .03 - 517 - 310 - 827 + 5.73 - .03 - 529 - 310 - 839 + 5.79 + .03 \\ 5.84 + .77 - 1.00 - 524 - 276 - 800 + 5.77 - .07 - 534 - 315 - 849 + 5.79 - .05 - 517 - 310 - 827 + 5.73 - .11 - 529 - 310 - 834 + 5.79 - .05 \end{array}$$

$$-6.80 - 2.13a - 4.18c + 1448 - 1154 + 2.94 + 6.86 + .06 + 1476 - 1317 + 1.59 + 6.80 + .00 + 1429 - 1296 + 1.33 + 6.69 - .11 + 1463 - 1296 + 1.67 + 6.80 + .00$$

June 19 1883

With weights L.E.	Residuals from final solution by weights
a = - .588	a = - .646
c = + .194	c = + .150
$\Delta W = +6.437$	$\Delta W = +6.505$

L.E.

$$-614 + .83a + 1.01c = -488 + 1.96 - .292 + 6.14 + .00$$

$$6.20 + .68 + 1.00 = -400 + 1.94 - .206 + 6.23 + .03$$

$$-536 + 1.52 - .384 + 6.12 - .02$$

$$-439 + 1.50 - .289 + 6.22 + .02$$

$$-646 + .82a + 1.15c = -188 + 2.23 + 0.35 + 6.47 + .01$$

$$6.43 + .36 + 1.12 = -212 + 2.17 + .025 + 6.44 + .01$$

$$-207 + 1.72 - .035 + 6.47 + .01$$

$$-232 + 1.68 - .064 + 6.44 + .01$$

$$-9.12 - .49a + 1.99c = +288 + 3.86 + .674 + 7.11 - .01$$

$$+316 + 2.99 + .615 + 7.12 + .00$$

$$-7.38 - .79a + 2.36c = +464 + 4.58 + 9.22 + 7.36 - .02$$

$$4.66 + 2.35 - 2.55 = -1382 - 4.95 - 1.877 + 4.56 - .10$$

$$8.22 - 1.84 + 3.77 = +1082 + 7.31 + 1.813 + 8.25 + .03$$

$$3.27 + 3.82 - 4.55 = -2246 - 8.83 - 3.129 + 3.31 + .04$$

$$7.59 - 1.00 + 2.64 = +588 + 5.12 + 1.100 + 7.54 - .05$$

$$+510 + 3.54 + 8.64 + 7.27 - .01$$

$$-1518 - 3.82 - 1.900 + 4.60 - .06$$

$$+1189 + 5.66 + 1.755 + 8.26 + .04$$

$$-2468 - 6.82 - 3.150 + 3.34 - .078$$

$$+646 + 2.96 + 1.042 + 7.53 - .04$$

With weights
L.W.

June 20 1883

Residuals from final solution by weights

$$a = -496$$

$$c = +077$$

$$\Delta\pi = +6.367$$

With weights
L.W.
SC = 00

$$a = -538.28$$

$$c = +050$$

$$\Delta\pi = +6.416$$

$$\begin{array}{r} \text{L.W.} \\ -5.98 + .91a + 1.04c - 4.51 + 80 - 3.71 + 6.00 +.02 \\ 5.97 + 1.00 + 1.08 - 4.96 + 83 - 4.13 + 5.95 -.02 \\ 5.97 + .96 + 1.06 - 4.76 + 82 - 3.94 + 5.97 +.00 \end{array}$$

$$\begin{array}{r} -6.20 + .47a + 1.06c - 2.33 + 82 - 1.51 + 6.22 +.02 \\ 6.24 + .48 + 1.05 - 2.38 + 81 - 1.57 + 6.21 -.03 \end{array}$$

$$-6.82 - .79a + 2.36c + 3.92 + 182 + 5.74 + 6.94 +.12$$

$$\begin{array}{r} -8.14 - 2.61a + 4.85c + 12.94 + 3.73 + 1.667 + 8.03 -.11 \\ 8.14 - 2.63 + 4.87 + 13.04 + 3.75 + 1.679 + 8.05 -.09 \\ 5.05 + 2.35 - 2.55 - 11.66 - 1.76 - 1.362 + 5.00 -.05 \end{array}$$

$$\begin{array}{r} -4.80 4.90 + 52 - 4.38 + 5.98 +.00 \\ -5.28 5.38 + 54 - 4.84 + 5.93 -.04 \\ -5.07 5.16 + 53 - 4.63 + 5.95 -.02 \end{array}$$

$$\begin{array}{r} -2.48 2.58 + 53 - 2.00 + 6.22 +.02 \\ -2.53 2.58 + 52 - 2.06 + 6.21 -.03 \end{array}$$

$$+4.17 + 4.25 + 118 + 5.43 + 6.96 +.14$$

$$\begin{array}{r} +13.78 + 14.04 + 2.42 + 1.646 + 8.06 -.08 \\ +13.89 + 14.15 + 2.43 + 1.658 + 8.07 -.07 \\ -12.41 - 12.41 - 1.28 - 1.392 + 5.02 -.03 \end{array}$$

		With weights L.E. and L.W.	With weights L.E. only	With weights L.E. and L.W. SE = 00	With weights L.E. only SE = 00	
June 21 1883		Residuals from final solution by weights				
		$a = -488$ $c = -073$ $\Delta T = +6.554$	$a = -574$ $c = -131$ $\Delta T = +6.632$	$a = -503$ $c = -040$ $\Delta T = +6.561$	$a = -580$ $c = -137$ $\Delta T = +6.638$	

L.E.

-5.86 + 91a + 1.04c	-444 - 76 - 520 + 6.03 + 17	-522 - 136 - 658 + 5.97 + 11	-458 - 42 - 500 + 6.06 + 20	-528 - 142 - 670 + 5.97 + 11	-148 - 72 - 592 + 5.97 + 11	-14
6.05 + 1.00 + 1.08	-488 - 79 - 567 + 5.99 - 06	-574 - 141 - 715 + 5.92 - 13	-503 - 43 - 546 + 6.01 - 04	-580 - 148 - 712 + 5.92 - 13	-154 - 78 - 600 + 5.92 - 13	-14
5.97 + .96 + 1.06	-468 - 77 - 545 + 6.01 + 04	-551 - 139 - 690 + 5.94 - 03	-468 - 42 - 510 + 6.05 + 08	-557 - 132 - 684 + 5.95 + 07	-145 - 70 - 594 + 5.95 + 07	-03

-655 + .11a + 1.32c	-54 - 96 - 150 + 6.40 - 15	-63 - 173 - 236 + 6.40 - 15	-55 - 53 - 108 + 6.45 - 10	-64 - 181 - 245 + 6.39 - 16	-158 - 344 + 6.29 + 02	
6.27 + 32 + 1.15	-156 - 84 - 240 + 6.31 + 04	-184 - 151 - 335 + 6.30 + 03	-161 - 46 - 207 + 6.35 + 08	-186 - 158 - 344 + 6.29 + 02	-153 - 362 + 6.28 + 05	
6.23 + .36 + 1.12	-176 - 82 - 258 + 6.30 + 07	-207 - 147 - 354 + 6.28 + 05	-181 - 45 - 226 + 6.34 + 11	-209 - 183 - 362 + 6.28 + 05	-138 - 513 + 6.14 + 08	
6.06 + .63 + 1.01	-307 - 74 - 381 + 6.17 + 11	-362 - 132 - 494 + 6.14 + 04	-217 - 40 - 357 + 6.20 + 14	-365 - 192 - 544 + 6.19 + 01	-142 - 444 + 6.22 + 07	
6.18 + .52 + 1.04	-254 - 76 - 330 + 6.22 + 04	-298 - 136 - 434 + 6.20 + 02	-262 - 42 - 304 + 6.26 + 08	-302 - 144 - 422 + 6.22 + 07		
6.15 + .48 + 1.05	-234 - 77 - 311 + 6.24 + 09	-275 - 138 - 413 + 6.22 + 07	-241 - 42 - 283 + 6.28 + 13	-278 -		

-7.31 - 1.84a + 3.77	+878 - 275 + 6.23 + 7.18 - 13 + 10.56	-494 + 5.62 + 7.19 - 12 + 9.26	-151 + 7.75 + 7.34 + 03 + 10.67	-516 + 5.51 + 7.19 - 12	-667 + 8.58 + 7.50 + 12	
7.38 - 2.63 + 4.87	+1283 - 355 + 9.28 + 7.48 + 10 + 15.10	-638 + 8.72 + 7.50 + 12 + 13.23	-195 + 1.128 + 7.69 + 31 + 15.25	-667 + 8.58 + 7.50 + 12	-623 - 15.93 + 5.04 + 05	
4.99 + 3.82 - 4.55	-1864 + 332 - 15.32 + 5.02 + 03	-2193 + 5.96 - 15.97 + 5.04 + 05	-1921 + 1.82 - 6.789 + 4.82 - 17 - 22.16			

With weights
L.W. only

$$a = -810$$

$$c = +180$$

$$\Delta T = +7.006$$

With weights
L.W. only
SE = 00

$$a = -552$$

$$c = +000$$

$$\Delta T = +6.651$$

$$+6.703$$

L.W.

-5.93 + 1.04a - 1.10c	-508 + 80 - 428 + 6.13 + 20	-842 - 198 - 1010 + 5.97 + 04	-523 + 44 - 4.79 + 6.08 + 15	-574 - 500 - 574 + 6.08 + 15 + 18	-624 + 6.03 + 15 + 18	
5.88 + 1.13 - 1.16	-551 + 85 - 466 + 6.09 + 21	-915 - 209 - 1124 + 5.88 + 00	-568 + 46 - 5.22 + 6.04 + 16	-624 - 574 + 6.08 + 15 + 18	-624 + 6.03 + 15 + 18	
6.24 + .75 - 1.00	-366 + 73 - 293 + 6.26 + 02	-608 - 180 - 788 + 6.22 - 02	-377 + 40 - 3.37 + 6.22 - 02	-624 - 574 + 6.08 + 15 + 18	-624 + 6.03 + 15 + 18	

-634 + .53a - 1.03c	-259 + 75 - 184 + 6.37 + 03	-429 - 185 - 614 + 6.39 + 05	-267 + 41 - 2.26 + 6.34 + 00	-293 - 500 - 293 + 6.36 + 02 + 06	-198 - 588 + 6.46 - 13 - 08	
6.59 + .34 - 1.13	-166 + 82 - 084 + 6.47 - 12	-275 - 203 - 488 + 6.52 - 08	-177 + 45 - 1.26 + 6.44 - 15	-182 - 500 - 182 + 6.47 - 05 - 01	-182 - 500 - 182 + 6.47 - 05 - 01	
6.52 + .33 - 1.14	-161 + 82 - 079 + 6.47 - 05	-267 - 205 - 472 + 6.53 + 01	-166 + 46 - 1.20 + 6.44 - 08			

-658 + 0.19a - 1.25	-93 + 91 - 802 + 6.55 - 03	-154 - 225 - 379 + 6.63 + 05	-96 + 50 - 0.46 + 6.52 - 06	-1059 - 500 - 1059 + 6.55 - 03 + 01	-110 - 588 + 6.46 - 13 - 08	
6.87 - 20 - 1.64	+98 + 120 + 218 + 6.77 - 10	+162 - 295 - 53 + 6.87 + 00 + 101	+66 + 1.67 + 6.73 - 14 + 11.04	-110 - 588 + 6.46 - 13 - 08	-110 - 588 + 6.46 - 13 - 08	
7.02 - 35 - 1.82	+191 + 133 + 304 + 6.86 - 16	+284 - 328 - 044 + 6.96 - 06 + 176	+93 + 2.49 + 6.81 - 21 + 14.32	-110 - 588 + 6.46 - 13 - 08	-110 - 588 + 6.46 - 13 - 08	
6.95 - 17 - 1.61	+83 + 118 + 201 + 6.75 - 20	+138 - 290 - 152 + 6.85 - 10 + 86	+64 + 1.50 + 6.91 - 24 + 9.87	-110 - 588 + 6.46 - 13 - 08	-110 - 588 + 6.46 - 13 - 08	

-4.37 + 4.35a + 5.29c	-2123 - 386 - 2509 + 4.04 - 33	-3524 + 952 - 2572 + 4.43 + 106	-2188 - 212 - 2400 + 4.16 - 21	-2461 - 500 - 2401 + 4.25 - 12 - 15	-1833 - 14.82 + 02 + 00	
4.80 + 3.32a + 3.86	-1620 - 282 - 1902 + 4.42 - 18	-2689 + 695 - 1994 + 5.01 + 21	-1670 - 159 - 1824 + 4.74 - 06	-1833 - 14.82 + 02 + 00	-1833 - 14.82 + 02 + 00	
7.52 - 1.47 - 3.27	+717 + 239 + 456 + 7.51 - 01	+1191 - 589 + 602 + 7.61 + 09	+739 + 1.81 + 8.70 + 7.43 - 09 + 8.11	-1833 - 14.82 + 02 + 00	-1833 - 14.82 + 02 + 00	
12.06 - 11.15 - 1.86	+5440 + 1230 + 6.70 + 13.22 + 116	+4031 - 3035 + 5.96 + 13.00 + 44	+5608 + 6.74 + 6.82 + 12.84 + 9.78 + 6.84	-1833 - 14.82 + 02 + 00	-1833 - 14.82 + 02 + 00	
5.48 + 2.57 + 2.84	-1254 - 207 - 1.461 + 5.09 - 39	-2082 + 5.11 - 15.71 + 5.43 - 05	-12.93 - 1.14 - 1.407 + 5.15 - 33	-1479 - 500 - 1479 + 5.24 - 24 - 25	-1479 - 500 - 1479 + 5.24 - 24 - 25	

June 23 1883				Residuals from final solution by weights				Residuals from final solution by weights				Residuals from final solution by weights				Residuals from final solution by weights			
L.E.				L.E.				L.E.				L.E.				L.E.			
With weights L & order LW				With weights L & order LW				With weights L & order LW				With weights L & order LW				With weights L & order LW			
a = -393 c = -866 ΔT = +6.908				a = -569 c = -216 ΔT = +7.159				a = -390 c = -860 ΔT = +6.906				a = -390 c = -860 ΔT = +6.901				a = -390 c = -860 ΔT = +6.901			
-6.53	+83a	+1.01e	-326-67	-393+6.51-02	-472-218	-690+6.47-06	-324-61	-385+6.52-01	-324-61	-385+6.52	-01	-324-61	-385+6.52	-01	-324-61	-385+6.52	-01	-324-61	-385+6.52
6.47	+68	+1.00	-267-66	-333+6.57+10	-387-216	-603+6.58+08	-265-60	-325+6.58+11	-265-60	-325+6.58	+11	-265-60	-325+6.58	+11	-265-60	-325+6.58	+11	-265-60	-325+6.58
6.48	+91	+1.04	-358-69	-427+6.48+00	-518-225	-743+6.42-06	-355-62	-417+6.49+01	-355-62	-417+6.48	+00	-355-62	-417+6.49	+01	-355-62	-417+6.48	+00	-355-62	-417+6.49
6.44	+1.00	+1.08	-393-71	-464+6.44+00	-569-233	-802+6.36-08	-390-65	-455+6.43+01	-390-65	-455+6.45	+01	-390-65	-455+6.43	+01	-390-65	-455+6.45	+01	-390-65	-455+6.43
6.33	+96	+1.06	-377-70	-447+6.46+13	-546-229	-775+6.38+05	-374-64	-438+6.47+14	-374-64	-438+6.46	+14	-374-64	-438+6.47	+14	-374-64	-438+6.46	+14	-374-64	-438+6.47
-6.71	+32a	+1.15e	-126-76	-202+6.71+00	-182-248	-430+6.74+02	-125-69	-194+6.71+00	-125-69	-194+6.71	+00	-125-69	-194+6.71	+00	-125-69	-194+6.71	+00	-125-69	-194+6.71
6.80	+36	+1.12	-141-74	-215+6.67-11	-205-242	-447+6.71-09	-140-67	-207+6.70-10	-140-67	-207+6.69	-11	-140-67	-207+6.70	-10	-140-67	-207+6.69	-11	-140-67	-207+6.70
6.43	+63	+1.01	-248-67	-315+6.59+16	-358-218	-576+6.58+15	-246-61	-307+6.60+17	-246-61	-307+6.59	+16	-246-61	-307+6.60	+17	-246-61	-307+6.59	+16	-246-61	-307+6.60
6.47	+52	+1.04	-204-69	-273+6.63+16	-296-225	-521+6.64+17	-203-62	-265+6.64+17	-203-62	-265+6.64	+17	-203-62	-265+6.64	+17	-203-62	-265+6.64	+17	-203-62	-265+6.64
6.49	+48	+1.05	-189-69	-258+6.65+16	-273-227	-500+6.66+17	-187-63	-250+6.65+16	-187-63	-250+6.65	+16	-187-63	-250+6.65	+16	-187-63	-250+6.65	+16	-187-63	-250+6.65
6.64	+44	+1.09	-173-72	-245+6.66+02	-250-235	-485+6.67+03	-172-65	-237+6.67+03	-172-65	-237+6.66	+03	-172-65	-237+6.67	+03	-172-65	-237+6.66	+03	-172-65	-237+6.67
6.66	+61	+1.01	-240-67	-307+6.60-06	-347-218	-565+6.59-07	-238-61	-299+6.61-05	-238-61	-299+6.60	-05	-238-61	-299+6.61	-05	-238-61	-299+6.60	-05	-238-61	-299+6.61
-7.10	+11a	+1.32e	-43-87	-130+6.78-32	-63-285	-348+6.81-29	-43-79	-122+6.78-32	-43-79	-122+6.78	-32	-43-79	-122+6.78	-32	-43-79	-122+6.78	-32	-43-79	-122+6.78
6.74	+10	+1.33	-39-88	-127+6.78+04	-57-287	-344+6.81+07	-39-80	-119+6.79+05	-39-80	-119+6.78	+05	-39-80	-119+6.79	+05	-39-80	-119+6.78	+05	-39-80	-119+6.79
7.09	+36	+1.83	+141-121	+020+6.93-16	+205-395	+190+6.97-12	+140-110	+030+6.94-15	+140-110	+030+6.93	-16	+140-110	+030+6.94	-15	+140-110	+030+6.93	-16	+140-110	+030+6.94
6.88	+17	+1.61	+67-106	+039+6.87-01	+97-348	+251+6.91+03	+66-97	+031+6.88+00	+66-97	+031+6.87	-01	+66-97	+031+6.88	+00	+66-97	+031+6.87	-01	+66-97	+031+6.88
7.04	+15	+1.28	+59-84	+143+6.77-27	+85-276	+361+6.80-24	+58-77	+135+6.77-27	+58-77	+135+6.78	-27	+58-77	+135+6.77	-27	+58-77	+135+6.78	-27	+58-77	+135+6.77
6.85	+25	+1.19	+98-79	+177+6.73-12	+142-257	+399+6.76-09	+98-71	+169+6.74-11	+98-71	+169+6.73	-12	+98-71	+169+6.74	-11	+98-71	+169+6.73	-12	+98-71	+169+6.74
-5.98	+2.91a	-3.29e	-1144+217	-927+5.98+00	-1656+711	-945+6.21+23	-1135+197	-938+5.97-01	-1135+197	-938+5.96	-02	-1135+197	-938+5.97	-01	-1135+197	-938+5.96	-02	-1135+197	-938+5.97
6.99	+1.84	+3.77	+723-244	+444+7.38+39	+1047-814	+233+7.39+40	+718-226	+492+7.40+41	+718-226	+492+7.39	+40	+718-226	+492+7.40	+41	+718-226	+492+7.39	+40	+718-226	+492+7.40
5.51	+3.82	+4.55	-1501+360	-1201+5.78+28	-2174+983	-1191+5.97+48	-1490+273	-1217+5.69+18	-1490+273	-1217+5.68	+17	-1490+273	-1217+5.69	+18	-1490+273	-1217+5.68	+17	-1490+273	-1217+5.69
7.18	+1.48	+3.28	+582-216	+366+7.27+09	+842-708	+134+7.29+11	+577-197	+380+7.29+11	+577-197	+380+7.28	+10	+577-197	+380+7.29	+11	+577-197	+380+7.28	+10	+577-197	+380+7.29
7.24	+2.63	+4.87	+1034-321	+713+7.62+38	+1496-7052	+944+7.60+36	+1026-292	+784+7.64+40	+1026-292	+784+7.63	+39	+1026-292	+784+7.64	+40	+1026-292	+784+7.63	+39	+1026-292	+784+7.64
L.W.				L.W.				L.W.				L.W.				L.W.			
With weights LW only				With weights LW only				With weights LW only				With weights LW only				With weights LW only			
a = -821 c = +419 ΔT = +7.727				a = -355 c = -860 ΔT = +6.859				a = -355 c = -860 ΔT = +6.859				a = -355 c = -860 ΔT = +6.859				a = -355 c = -860 ΔT = +6.859			
-6.63	+7.9a	-1.01e	-310+67	-243+6.66+03	-649-423	-1072+6.65+02	-308+61	-247+6.66+03	-280+61	-219+6.64	+01	-280+61	-219+6.66	+03	-280+61	-219+6.64	+01	-280+61	-219+6.66
6.65	+82	+1.01	-322+67	-255+6.65+00	-673-423	-1096+6.63-02	-320+61	-259+6.65+00	-291+61	-230+6.62	-02	-291+61	-230+6.65	+00	-291+61	-230+6.62	-02	-291+61	-230+6.65
6.57	+89	+1.02	-342+67	-275+6.63+06	-714-427	-1141+6.59+02	-339+61	-278+6.63+06	-309+61	-248+6.61	+06	-309+61	-248+6.63	+06	-309+61	-248+6.61	+06	-309+61	-248+6.63
6.74	+72	+1.00	-283+66	-217+6.67-05	-591-419	-1010+6.82-02	-281+60	-221+6.68-06	-256+60	-196+6.66	-06	-256+60	-196+6.68	-06	-256+60	-196+6.66	-06	-256+60	-196+6.68
6.58	+82	+1.01	-322+67	-255+6.65+07	-673-423	-1096+6.63+05	-320+61	-259+6.65+07	-291+61	-230+6.63	+05	-291+61	-230+6.65	+07	-291+61	-230+6.63	+05	-291+61	-230+6.65
6.65	+70	+1.00	-275+66	-209+6.70+05	-575-419	-994+6.73+08	-273+60	-213+6.69+04	-248+60	-188+6.67	+08	-248+60	-188+6.69	+04	-248+60	-188+6.67	+08	-248+60	-188+6.69
6.47	+1.12	+1.16	-440+77	-363+6.54+37	-920-486	-1406+6.32-15	-437+70	-367+6.54+07	-398+70	-328+6.53	+07	-398+70	-328+6.54	+07	-398+70	-328+6.53	+07	-398+70	-328+6.54
-7.20	+0.9a	-1.52e	+35+100	+135+7.04-16	+74-637	-563+7.16-04	+35+91	+126+7.03-17	+32+91	+123+6.98	-04	+32+91	+126+7.03	-17	+32+91	+123+6.98	-04	+32+91	+123+7.03
6.92	+59	+1.02	-232+67	-165+6.74-18	-484-427	-911+6.82-10	-230+61	-169+6.74-18	-209+61	-148+6.71	-10	-209+61	-148+6.74	-18	-209+61	-148+6.71	-10	-209+61	-148+6.74
6.68	+53	+1.03	-208+68	-140+6.77+09	-435-432	-867+6.86+18	-207+62	-145+6.76+08	-188+62	-126+6.73	+18	-188+62	-145+6.76	+08	-188+62	-145+6.73	+18	-188+62	-145+6.76
-7.41	+62a	-2.14e	+244+141	+385+7.29-12	+509-897	-388+7.34-07	+242+128	+370+7.28-13	+220+128	+348+7.21	-07	+220+128	+370+7.28	-13	+220+128	+348+7.21	-07	+220+128	+370+7.28
7.43	+1.22	+2.93	+479+193	+672+7.58+15	+1032-1228	-226+7.50+07	+476+176	+652+7.56+13	+403+176	+609+7.47	+07	+403+176	+652+7.56	+13	+403+176	+609+7.47	+07	+403+176	+652+7.56
7.60	+1.30	+3.04	+511+201	+712+7.62+02	+1067-1274	-207+7.52-08	+507+182	+689+7.60+00	+462+182	+644+7.50	-08	+462+182	+689+7.60	+00	+462+182	+644+7.50	-08	+462+182	+689+7.60
7.56	+1.60	+3.45	+629+228	+857+7.76+20	+1314-1446	-132+7.60+04	+624+207	+831+7.74+18	+568+207	+775+7.63	+04	+568+207	+831+7.74	+18	+568+207	+775+7.63	+04	+568+207	+831+7.74

With assumed
values of a and a'
and b and b'

$$a = -647$$

$$c = -242$$

$$\Delta T = +7.216$$

-01	-537	-244	-781	+6.43	-10
+11	-439	-242	-681	+6.53	+06
+00	-588	-252	-840	+6.38	-10
+01	-647	-261	-908	+6.31	-13
+13	-621	-257	-878	+6.34	+01

+00	-207	-278	-485	+6.73	+02
-11	-233	-271	-504	+6.71	-09
+16	-408	-244	-652	+6.56	+13
+17	-336	-252	-588	+6.63	+16
+16	-311	-254	-565	+6.65	+16
+02	-285	-264	-549	+6.67	+03
-06	-395	-244	-639	+6.58	-08

-32	-71	-319	-390	+6.83	-27
+04	-65	-322	-387	+6.83	+09
-16	+233	-443	-210	+7.01	-08
-01	+110	-390	-280	+6.94	+06
-27	-97	-310	-407	+6.81	-23
-12	-162	-288	-450	+6.77	-08

-02	-1883	+796	-1087	+6.13	+15
+40	+1190	-912	+278	+7.49	+50
+17	-2472	+1101	-1377	+5.84	+33
+10	+958	-794	+164	+7.38	+20
+39	+1702	-1179	+523	+7.74	+50

$$a' = -592$$

$$c' = +103$$

$$\Delta T = +7.216$$

+01	-468	-104	-572	+6.64	+01
-02	-485	-104	-589	+6.63	-02
+04	-515	-105	-620	+6.60	+03
-08	-426	-103	-529	+6.69	-05
+05	-485	-104	-587	+6.63	+05
+02	-414	-103	-517	+6.70	+05
+06	-663	-119	-782	+6.83	+16

-22	+53	-157	-104	+7.11	-09
-21	-349	-105	-454	+6.76	-16
+05	-314	-106	-420	+6.80	+12

-20	+367	-220	+147	+7.36	-05
+04	+722	-302	+420	+7.64	+21
-10	+770	-313	+457	+7.67	+07
+07	+947	-355	+592	+7.81	+25

Collection of results for a c and ΔT

Cambridge Observations

From Solution for a c and ΔT

	June 1			June 2			June 4			June 5		
	a	c	ΔT	a	c	ΔT	a	c	ΔT	a	c	ΔT
from equations between a and c to E and W	+380	+200	-14,970.970	+507	-176	-14,325.325	+890	+258	-13,375.375	+1,200	+240	-13,059.059
from equations between a and c to E only				+672	-284	-14,410				+1,460	+050	-12,876 cm
from equations between a and c to W only				+456	-189	-14,345.378				+1,086	+164	-13,370 cm
Solutions for a, c and ΔT												
Least Square Solution without weights to E and W	+395	+217	-14,916.916	+500	-176	-14,302.302	+907	+263	-13,379.379	+1,195	+248	-13,090.090
L.S. Solution without weights to E and W $\Sigma c = 0$	+376	+200	-14,930.930	+510	-176	-14,356.356	+900	+260	-13,382.382	+1,195	+240	-13,082.082
L.S. Solution with weights to E and W	+355	+215	-14,949.949	+548	-214	-14,351.351	+889	+272	-13,375.375	+1,175	+266	-13,069.069
L.S. Solution with weights to E only	+149	+086	-14,746	+544	-200	-14,314	+811	+206	-13,265	+996	+107	-12,811
L.S. Solution with weights to W only	+393	+200	-14,970.888	+683	-076	-14,545.430	+1,070	+096	-13,681.473	+1,263	+185	-13,236.024
L.S. Solution with weights to E and W $\Sigma c = 0$	+353	+200	-14,954.954	+518	-176	-14,340.340	+897	+260	-13,397.397	+1,181	+240	-13,064.064
L.S. Solution with weights to E only $\Sigma c = 0$	+313	+200	-14,930	+530	-189	-14,369	+880	+260	-13,349	+1,058	+160	-12,892
L.S. Solution with weights to W only $\Sigma c = 0$	+393	+200	-14,968.949	+652	-280	-14,432.400	+895	+260	-13,406.378	+1,421	+050	-13,439.166

	ΔT	a	c
I From solution between a and c Means	at 13.1	14.9	14.6
II Means without weights		14.7	14.6
III Means with weights		14.6	14.6
Means I + II by weights		14.6	14.6

Collection of results for a c and ΔT Montreal Observations.

	1883 June 17			June 19			June 20		
L.S. Solution from Equations between a and c L.E. and L.W.	a	c	ΔT	a	c	ΔT	a	c	ΔT
	-684	+306	+6.560.560						
L.S. Solution from Equations between a and c L.E. only.	—	—	—	-650	+150	+6.500.500	—	—	—
L.S. Solution from Equations between a and c L.W. only.	—	—	—	—	—	—	-543	+052	+6.405.405
Least Square Solution without weights L.E. and L.W.	-684	+294	+6.578.578	-667	+139	+6.518.518	-542	+053	+6.419.419
L.S. Solution without weights L.E. and L.W. $\rho c = 0$	-683	+310	+6.580.580	-654	+150	+6.505.505	-546	+050	+6.423.423
L.S. Solution with weights L.E. and L.W.	-680	+276	+6.571.571	—	—	—	—	—	—
L.S. Solution with weights L.E. only.	-723	+277	+6.574	-588	+194	+6.437.437	—	—	—
L.S. Solution with weights L.W. only.	-693	+315	+6.643.608	—	—	—	-496	+077	+6.367.367
L.S. Solution with weights L.E. and L.W. $\rho c = 0$	-671	+310	+6.557.557	—	—	—	—	—	—
L.S. Solution with weights L.E. only $\rho c = 0$	-681	+310	+6.579	-646	+150	+6.505.505	—	—	—
L.S. Solution with weights L.W. only $\rho c = 0$	-687	+310	+6.631.575	—	—	—	-538	+050	+6.416.416
ΔT	at 15.8			14.9			15.2		
from solution between I a and c means = weight 1	+6.560			+6.500			+6.405		
II Means without weights	+6.579			+6.511			+6.421		
III Means with weights = weight 3	+6.578			+6.471			+6.392		
Means I and III by weights	+6.574			+6.478			+6.395		

June 21

$$\begin{array}{r} -a \quad c \quad \Delta T \quad \checkmark \\ -448 \quad -035 \quad +6.570 \quad 570 \end{array}$$

$$-581 \quad -137 \quad \left\{ \begin{array}{l} +6.638 \\ +6.670 \quad 654 \end{array} \right.$$

$$-476 \quad 000 \quad \left\{ \begin{array}{l} +6.670 \quad 654 \end{array} \right.$$

$$-438 \quad -049 \quad +6.559 \quad 559$$

$$-439 \quad -040 \quad +6.561 \quad 561$$

$$-488 \quad -073 \quad +6.554 \quad 554$$

$$-574 \quad -131 \quad \left\{ \begin{array}{l} +6.632 \\ +7.006 \quad 819 \end{array} \right.$$

$$-810 \quad +180 \quad \left\{ \begin{array}{l} +7.006 \quad 819 \end{array} \right.$$

$$-503 \quad -040 \quad +6.561 \quad 561$$

$$-580 \quad -137 \quad \left\{ \begin{array}{l} +6.638 \\ +6.651 \quad 644 \end{array} \right.$$

$$-552 \quad +000 \quad \left\{ \begin{array}{l} +6.651 \quad 644 \end{array} \right.$$

June 23.

$$\begin{array}{r} -a \quad c \quad \Delta T \quad \checkmark \\ -340 \quad -060 \quad +6.886 \quad 886 \end{array}$$

$$-370 \quad -078 \quad +6.812 \quad 812$$

$$-355 \quad -060 \quad +6.822 \quad 822$$

$$-393 \quad -066 \quad +6.908 \quad 908$$

$$-569 \quad -216 \quad \left\{ \begin{array}{l} +7.159 \\ +7.727 \quad 443 \end{array} \right.$$

$$-821 \quad +419 \quad \left\{ \begin{array}{l} +7.727 \quad 443 \end{array} \right.$$

$$-390 \quad -060 \quad +6.906 \quad 906$$

$$-390 \quad -060 \quad \left\{ \begin{array}{l} +6.901 \\ +6.859 \quad 880 \end{array} \right.$$

$$-355 \quad -060 \quad \left\{ \begin{array}{l} +6.859 \quad 880 \end{array} \right.$$

$$\begin{array}{r} \sim \\ 19.2 \end{array}$$

$$+6.612$$

$$+6.560$$

$$+6.586$$

$$+6.592$$

$$+6.886$$

$$+6.817$$

$$+6.898$$

$$+6.895$$

1889phae.proj.1753.

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