1970phan.proj.1567

KG
11366
v. 563

Zone Observations & Reductions

C 1

From November 10, 1870 to December 13, 1870

Charles W. Sever, University Bookstore, Cambridge.

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1970phdt..proj..156T

6,

From Nov 10 to Dec 13 1870

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1870phae.proj.1567

ns

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$(\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											

For explanation of form of reductions see at the end of "C 42"

Value of the Inclination (i) for Nov. 10 1870 to Dec. 13 1870 = − 4° 40′

Constant for Declinations

log tan i = 8.91185
log 15 = 1.17609
log 15 tan i = 0.08794

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Zone 1

Date$_1$ = 1870 Nov 11 n = +.24 C = +.00 Observer W A R Recorder A. M.

Zone 50° to 51°

Date$_2$ = (Nov. 10) Observer Recorder

Run

Star.	α 23^h 1^m 38^s	55.2	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	23 1 38	55.2		3^m 28.0	44.3	52.3	56.4	0.2	4.0	2772	5544	1079	3 4 44.65
	3 0 56.0	50 50.1	8.9							−126.29		11.00	3 4 4.44
	K												− 126.58 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
										T$_m$ 18 5.0		−2 6.23	− .02
	a_1												1 38.85
										1 m 5			− 2.33
										1 49.46			1 36.88
	3 9	21.7		5 3.0	15.0	22.8	26.5	30.6	34.4	1293	2586	1046	5 1820
	2 26.0	50 16.5	9.0							−126.29		10.87	5 1499
	K												− 126.58 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_2												3 8.70
										3 1979			− 2.35
													3 6.41
	6 6	60.1		7 58.8	14.3	22.0	25.8	29.9	33.9	1259	2518	1080	8 1455
	5 23.5	50 55.0	9.0							−126.29		11.02	8 1416
	K												− 126.58 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_1												6 7.87
										6 18.97			− 2.40
													6 5.53
	7 39	44.2		9 28.2	45.3	52.8	56.9	0.6	4.6	2802	5604	1074	9 4532
	5 55.8	50 44.1	9.3							−126.29		10.96	9 4508
	K												− 126.58 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_2												6 38.79
										7 49.95			− 2.40
													7 36.45
	10 58	35.4		12 53.0	9.3	16.8	20.7	24.8	28.6	1002	2004	1071	13 993
	2 6.7	50 35.3	9.0							−126.30		10.92	13 9.14
	K												− 126.57 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_1												11 2.84
										11 14.09			− 2.45
													11 0.46
	14 34	42.6		16 27.8	44.5	52.3	56.2	0.2	4.0	2772	5544	1076	16 4465
	13 53.8	50 42.4	9.0							−126.30		10.98	16 4446
	K												− 126.57 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_2												14 38.16
										14 49.48			− 2.50
													14 35.73
	16 48	20.4		18 38.5	53.6	1.3	5.0	9.0	13.0	3219	6438	1065	18 6351
	16 39	50 15.1	stet							−126.30		10.87	− 126.57 0
	K	50 14.1	9.0										+ .29
	((δ) − D) $\frac{\kappa'}{100}$												− .02
												−2 6.23	16 47.21
	a_1												− 2.51
										16 58.62			16 44.77
	19 1	17.3		20 45.2	7.0	14.5	18.4	22.3	26.0	882	1764	1064	21 700
	18 16.6	50 12.0	−9.0							126.30		10.85	21 6.79
	K												− 126.57 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_2												19 0.49
										19 11.96			− 2.53
													18 58.03
	20 49	−1.3		22 38.4	55.1	2.8	6.8	10.7	14.6	3300	6600	1058	24 5542
	20 4.4	49 56.0								−126.30		10.79	22 5521
													− 126.57 0
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.23	− .02
	a_1												20 48.91
										21 0.43			− 2.56
													20 46.43
	22 28	21.8		24 26.0	34.4	42.1	46.0	50.0	53.7	2262	4524	1066	24 34.56
	21 43.8	50 16.5	8.8							−126.30		10.87	24 34.37
	K												− 126.57 1
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
												−2 6.24	− .02
	a_2												22 28.07
										22 39.40			− 2.57
													22 25.50

(1)

The values in black are the appropriate places for 1871.
The values in red are the Durchmusterung places for 1855.0

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Nov. 10 -1 Ref. 52.32 R. Rms. +17

Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ'
	163	0 57.8	55.6	1154	0 57.70	+6.8	12.69		55	50	45 11.13 +8.90
	+164				55 57.70	586 50.65	.24		56 10.35	55 45.05	− 7
d	1.214484				2	50 24 58.33	12.59				+ 15
	9.804428					+ 12.80	− 25				+ 8.52
((δ) − D) $\frac{d'}{100}$	1.10706						+31		For 1875.0		+ .30
							−12.66				−27.46
δ₁		1 49.16		56 29.62					56? 29.6		524 52.57 +1 32.05
+13.28											
+1 37.05											
	190	4 34.6	30.2	648	4 32.40	+04	9.34		55	50	21 33.00 +9.46
	+120				59 32.40	23 15.95	.07		7 59' 23".20		− 4
d	1.079178					50 21 23.63	9.27-.07				+ .76
	9.804473					+ 9.37	9.20				+ 8.44
((δ) − D) $\frac{d'}{100}$	0.971851										+ .30
											−27.42
+13.38 δ₂		3 19.79		22 52.24							21 15.04
+1 37.20									22 52.2		
	155	0 55.8	49.7	1055	0 52.75	+06	12.07		20	51	0 15.15
	+154				20 52.75	1 55.60	.25			20 40.89	− 6 +9.63
d	1.187752					51 0 3.28	11.80-25+31				+ .15
	9.799887					+ 11.87	11.86				+ 9.14
((δ) − D) $\frac{d'}{100}$	1.074337										+ 40
											−27.41
+13.44 δ₂		6 18.97		1 34.92							50 59 57.34
+1 37.55									1 32.9		9 31
	171	1 20.7	14.9	356	1 17.80	+08	13.31		30	50	4 51.45
	+169				33 17.80	51 49 30.55	.20			3.3 4.72	− 8 +9.81
d	1.227789				1	50 48 38.23	12.59-20+69				+ .56
	9.805340 74					9 +13.22	13.08				+ 8.93
((δ) − D) $\frac{d'}{100}$	1.12117					13.08					+ 40
	11651										−27.38
+13.50 δ₂		7 49.95		51 11.44							48 9 33.74
+1 37.70									57 11.4		
	143	0 14.2	8.0	222	0 11.10	+05	11.83		45	50	35 55.89
	+141				45 11.10	37 37.25	.14			45 0.15	− 5 +9.04
d	1.149222					50 35 44.93	11.12-15+8				+ .03
	9.802591					+ 10.96	10.95				+ 8.71
((δ) − D) $\frac{d'}{100}$	1.039745										+ .35
											−27.18
δ₁											35 37.75
									37 15.9		
	167	3 30.6	25.9	865	3 28.25	+08	13.00		30	50	47 40.70
	+167				38 28.25	49 20.10	.21			33 15.34	− 8 +9.85
d	1.222272					50 47 27.78	12.59-22+54				+ .60
	9.800674					+ 12.92	12.91				+ 8.93
((δ) − D) $\frac{d'}{100}$	1.111140										+ .40
											−27.17
+13.75 δ₂		14 49.48		49 1.73							47 23.38
+1 38.35									49 1.7		
	157	0 46.2	41.9	881	0 44.05	+06	11.76		0	50	20 23.70
	+150				0 44.05	22 4.30	.28			0 32.33	− 6 +8.78
d	1.176091					50 20 11.98	11.80-8				+ 12
	9.805047					+ 11.72	11.72				+ 8.42
((δ) − D) $\frac{d'}{100}$	1.069071										+ 30
											−27.05
+13.85 δ₁		16 58.62		21 43.93							20 54.8
+1 38.50									21 43.9		
	218	3 58.3	54.4	1130	3 56.50	+12	16.92		0	50	17 16.43
	+216				3 56.50	18 5.185	.10			3 39.89	− 13 +9.22
d	1.334445					50 16 59.53	16.53-10+48				+ .66
	9.805550					+ 16.90	16.91				+ 8.39
((δ) − D) $\frac{d'}{100}$	1.227891										+ 30
											−26.95
+13.93 δ₂		19 11.96		18 37.40							16 58.70
+1 38.70									18 37.4		
	167	4 59.2	56.8	1160	4 57.50	+08	13.00		15	50	1 11.25
	+168				19 58.00	2 50.35	+.00			19 44.76	− 8 +9.15
d	1.225531					50 0 58.83	12.59+1+64				+ 85
	9.807792					+ 13.22	13.24				+ 808
((δ) − D) $\frac{d'}{100}$	1.12117										+ 30
											−26.90
+14.00 δ₁		21 0.43		2 32.30					2 32.3		0 53.50
+1 38.80											
	84	4 38.1	33.7	718	4 35.90	+02	6.54		55	50	21 26.69
	+84				59 35.90	23 12.45	.05			57 29.32	− 2 +9.46
d	0.924128					50 21 20.13	6.30-4+32				+ .78
	9.805489					+ 6.56	6.58				+ 8.40
((δ) − D) $\frac{d'}{100}$	0.817711										+ .30
											−26.83
+14.04 δ₂		22 39.60		22 48.27							21 9.32
+1 38.95									22 48.3		

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Date$_1$ = 1870 Nov 10 — Observer W.A.R. — Recorder A.M. — June 50°–51°

Date$_2$ = — Observer — Recorder — Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	23 47	3.7		25 44.0	53.0	0.8	4.7	8.6	12.5	21.96	63.92	10.59	25 53.23
	23 45.8	50 52.9	8.0							−126.30		10.80	25 53.12
	κ 2.5												−126.57
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
													− 2
	c_1											−2 6.24	23 46.82
										23 58.40			− 2.58
													23 44.30
25	25 29	22.9		27 20.3	35.8	43.7	47.2	57.3	55.1	23.31	46.62	10.66	27 3.96
✓ 24	κ 4.5	50 17.6	9.0							−126.30		10.88	27 35.74
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .29
													− 2
	α_2											6.24	25 29.44
										25 41.04			− 2.61
													25 26.89
27	27 15	7.5		29 7.0	21.2	29.0	32.8	36.5	40.5	16.00	32.00	10.82	29 21.18
✓ 26	κ 3.2	50 2.2	8.7							−126.30			−126.57
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
													− 2
	α_1											6.24	27 14.88
										27 26.54			− 2.62
													27 12.32
31	31 34.4	12.9		33 22.7	41.1	48.6	52.6	56.2	59.9	25.84	51.68	10.84	33 41.00
✓ 30	κ 4.8	49 55.7	9.1							−126.30			33 14.84
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .29
													− 2
	α_2											6.24	31 34.54
										31 46.30			− 2.67
													31 31.93
33	33 18.4	37.6		35 6.3	23.5	31.5	35.4	39.1	43.2	17.21	34.54	10.93	35 23.61
✓ 32	κ 3.2	50 32.3	9.0							−126.30			−126.57
	((δ) − D) $\frac{\kappa'}{100}$												+ .29
													− 2
	α_1											6.24	33 17.31
										33 29.08			− 2.71
													33 14.66
34	34 58.4	58.3		36 45.5	3.8	11.7	15.3	19.0	23.0	7.05	14.56	10.82	37 3.54
✓ 34	κ 1.7	50 53.0	8.0							−126.29		11.12	−126.57
	((δ) − D) $\frac{\kappa'}{100}$												+ .30
													− 2
	α_2											6.23	34 57.25
										35 9.03			− 2.74
													34 54.57
35	35 34	58.9		37 32.8	40.2	48.5	52.5	56.2	0.3	25.87	51.54	10.82	37 40.72
✓ 34	κ 4.0	53.6	9.0							−126.30		11.02	37 40.52
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .29
													− 2
	α_1											6.24	37 34.22
										35 46.00			− 2.76
													35 31.52
37	37 20	33.4		39 10.2	26.8	34.5	38.5	42.2	46.1	18.81	37.62	10.92	39 26.92
✓ 36	κ 3.4	28.1	9.0							−126.30			39 26.70
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .29
													− 2
	α_2											6.24	37 26.70
										37 32.27			− 2.75
													37 17.41
40	40 43.B	50.5		42 27.1	49.3	57.0	1.0	4.7	8.7	30.07	60.14	10.98	42 49.38
✓ 39	κ 5.0	49.2	8.4							−126.30			42 49.16
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .29
													− 2
	α_1											6.24	40 42.86
										40 54.81			− 2.79
													40 40.13
42	42 21.4	62.0		44 19.0	37.6	45.0	49.0	53.0	57.1	24.17	48.34	10.81	44 37.53
43 41 [41]	κ +1 1.3									−126.29		11.03	44 37.31
	((δ) − D) $\frac{\kappa'}{100}$												−126.57
													+ .30
													− 2
	α_2											6.23	42 31.04
										42 42.99			− 2.82
													42 28.26

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	90	2′ 9.3	5.7	150	2′ 7.50	+02	7.01		15	50	3 5568	
	+9.1				17 7.50	5 40.85	.10			17′ 0″.35	− 2	+8.77
d	0.959904					50 3 48.53	7.08 − 1 + 8				+ 36	
	9.80 746					+ 7.15	7.15				+ 8.13	
((δ) − D) $\frac{d'}{100}$	0.854444										+ 30	
											−26.76	
+14.10 δ_1		23 58.40		5 16.69					1 4		3 37.69	
+1 39.00									5 16.7			
	155	3 21.0	16.1	37.1	3 18.55	+06	12.07		55	50	22 49.51	
	+15.4				58 18.55	24 29.80	.09			58 6.52	− 6	+9.33
d	1.187752					50 22 37.48	11.80 − 9 + 32				+ 56	
	9.80 458					+ 12.03	12.03				+ 8.48	
((δ) − D) $\frac{d'}{100}$	1.080 04										+ 35	
											−26.74	
+14.15 δ_2		25 41.04		24 11.25							22 32.10	
+1 39.15									24 11.2			
	147	3 44.3	40.7	85.0	3 42.50	+05	11.06		10	50	7 24.68	
	+14.2				13 42.50	9 5.85	.03			13 31.35	− 5	+9.08
d	1.15229					50 7 13.53	11.02 − 3 + 16				+ 63	
	9.80 701					+ 11.15	11.15				+ 8.20	
((δ) − D) $\frac{d'}{100}$	1.04724										+ 30	
											−26.64	
+14.22 δ_1		27 26.54		8 46.37							7 7.12	
+1 39.25									8 46.4			
	184	0 52.1	46.3	98.4	0 49.20	+08	14.33		20.	50	0 2108	
	+18.1				20 49.20	1 59.15	.06			20 35.02	− 9	+8.42
d	1.25768					50 0 6.83	14.16 − 6 + 08				+ 14	
	9.80 807					+ 14.25	14.18				+ 807	
((δ) − D) $\frac{d'}{100}$	1.15369										+ 30	
											−26.46	
+14.37 δ_2		31 46.30		1 42.54							0 3.04	
+1 39.50									1 42.5			
	172	3 48.7	44.5	93.2	3 46.60	+08	15.39		46	50	37 2284	
	+17.3				43 46.60	39 1.76	.16			43 33.16	− 8	+9.65
d	1.23805					50 37 9.43	13.38 − 18 + 24				+ 65	
	9.80 244					+ 13.44	13.44				+ 8.73	
((δ) − D) $\frac{d'}{100}$	1.12843										+ 35	
											−26.48	
+14.42 δ_1		33 29.08		38 45.64							37 6.04	
+1 39.60									38 45.6			
	183	3 3.0	1.2	4.2	3 2.10	+09	14.25		20	50	58 781	
	+18.0				23 2.10	59 46.25	.29			22 48.23	− 9	+9.94
d	1.25527					50 57 53.93	14.16 − 29				+ 51	
	9.79918					+ 13.88	13.87				+ 9.12	
((δ) − D) $\frac{d'}{100}$	1.14239										+ 40	
											−26.47	
+14.46 δ_2		35 9.03		59 30.98							57 51.28	
+1 39.70									59 31.0			
	174	2 7.3	2.7	10.0	2 5.00	+01	5.36		20	50	58 5697	
	+17				22 5.00	0 43.35	.12			21 59.06	− 2	+9.87
d	0.886649					50 58 51.03	5.52 − 12 + 54				+ 36	
	9.79903					+ 5.94	5.94				+ 9.13	
((δ) − D) $\frac{d'}{100}$	0.77346										+ 40	
											−26.38	
+14.48 δ_1		35 46.80		0 20.16							58 40.46	
+1 39.70									0 20.2			
	196	3 14.2	9.8	24.0	3 12.00	+08	12.92		45	50	32 5687	
	+16.5				48 12.00	34 36.35	.14			47 59.13	− 7	+9.45
d	1.21748					50 32 44.03	12.59 − 12 + 40				+ 54	
	9.80 305					+ 12.84	12.87				+ 8.63	
((δ) − D) $\frac{d'}{100}$	1.10847										+ 35	
											−26.33	
+14.56 δ_2		37 32.27		34 19.79							32 39.99	
+1 39.80									34 19.8			
	222	0 54.8	49.2	104.0	4 52.00	+12	17.28		30	50	50 21.12	
	+22.1				60 52.00	51 56.35	.30			30 34.87	− 13	+9.38
d	1.344439					50 50 4.03	17.32 − 27 + 8				+ 15	
	9.80 043					+ 17.09	17.13				+ 8.96	
((δ) − D) $\frac{d'}{100}$	1.23276										+ 40	
											−26.20	
+14.68 δ_1		40 54.81		51 44.25							50 4.30	
+1 39.95									51 44.2			
	186	4 45.9	42.0	87.9	2 43.95	+08	14.48		10	51	6 26.15	
	+18.3				1 24 43.95	8 41.40	.31			14 29.86	− 9	+10.02
d	1.26245					57 6 12.08	13.86 − 1 + 24				+ 46	
	9.79 793					+ 14.07	14.09				+ 9.25	
((δ) − D) $\frac{d'}{100}$	1.14832										+ 40	
											−26.17	
+14.73 δ_2		42 42.99		7 50.00					7 50.0		6 10.00	
+1 40.00												

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Date$_1$ = 1870 Nov 10 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	23h 46m 44s	4.5		48m 33.1s	50.3	58.0	1.8	5.7	9.5	20.53 −126.31	6.106	1.059 1.080	48 50.47
	23 45 κ 36.8	49 59.2											48 50.216 −126.58 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											−2 6.24	45 43.95
	a_1									46 56.10			43 41.20
✓	51 37	7.1	8.4	53 22.8	39.0	46.6	50.2	54.0	58.0	24.78 −126.31	4.956	1.060 1.082	53 38.96 53 38.74
	50 κ 44.3	50 1.8											−126.58 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.24	53 32.43 − 2.93
	a_2									51 44.67			51 29.61 89
✓	52 59.2	6.9	7.2	54 52.5	6.1	13.5	17.3	21.3	25.0	8.32 −126.31	1.664	1.060 1.082	55 06.04 55 05.82
	52 κ 1.4	50 1.6											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	53 59.51 − 2.92
	a_1									53 11.77			52 56.65
✓	53 38	33.9	8.9	55 36.5	44.5	52.3	56.2	59.8	3.5	27.63 −126.31	5.526	1.070 1.092	55 44.56 55 44.34
	52 κ 50.2	50 58.6 49 58.7											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	53 38.03 − 2.91
	a_2									53 50.32			53 35.18
✓	56 4	1.2	7.8	57 48.1	10.3	17.5	21.7	25.3	29.4	10.42 −126.31	20.84	1.058 1.079	58 10.26 58 10.05
	55 κ 10.5	50 40.1											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	56 3.74 − 2.96
	a_1									56 16.06			56 0.84
✓	58 2	18.9	8.5	59 54.0	8.5	16.1	20.0	23.8	27.8	9.62 −126.31	1.924	1.065 1.086	60 08.59 60 8.38
	57 κ 13.4	52 13.6											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	58 2.07 − 2.99
	a_2									58 14.44			57 59.14
	0h 0m 0s R	29.6		2 52.3	15.0	22.7	26.8	30.4	34.4	12.93 −126.31	2.586	1.069 1.090	52 15.49 53 14.96
	0 κ 18.7	52 24.3	9.0										−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	1 8.65 − 3.01
	a_1									1 26.10			1 5.70
✓	2 31 R	6.7	8.9	4 23.4	36.0	43.3	47.1	51.0	55.2	23.20 −126.31	4.652	1.060 1.082	4 35.92 4 35.70
	2 40.0 κ	52 1.4											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	2 29.39 − 3.01
	a_2									2 41.89			2 26.44
✓	3 11	42.1	8.6	5 20.2	30.1	37.8	41.4	45.2	49.3	20.38 −126.31	4.076	1.074 1.095	5 30.02 5 29.81
	2 κ 34.5	50 00											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	3 23.50 − 3.02
	a_1									3 36.02			3 20.54
✓	3 26	52.4	8.4	6 33.1	43.8	51.3	55.0	58.9	3.0	27.20 −126.31	5.440	1.078 1.099	6 43.62 6 43.62
	3 48.3 κ	50 2.5											−126.582 + .29 − 2
	((δ) − D) $\frac{\kappa'}{100}$											6.25	4 37.10 − 3.03
	a_2									4 49.87			4 34.19 34

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	172 +17.2	1′ 10.8	5.8	166	1′ 8.30	+08	13.39		15	15 57.78	5 1.24
d	1.235553					16 40.05	.02				− .8
	9.80 7431					50 4 47.73	13.38 − 2 + 16				+ .19
((δ) − D) $\frac{d'}{100}$	1.13078					+ 13.51	13.52				+ 8.16
		m s	′ ″								+ .30
		46 56.10	6 23.91						6′ 23.9″		− 26.0
+14.90 δ_1									46 56.4		4 43.81
+1 40.10											
	162 +15.9	4 9.5	3.9	134	4 6.70	+07	12.61		10	13 57.22	57 8.81
d	1.201 40				14 16.70	8 41.65	.03				− 7
	9.80 701					50 6 49.33	11.80 − 3 + 71				+ .70
((δ) − D) $\frac{d'}{100}$	1.09635					+ 12.48	12.48				+ 8.18
											+ .30
											− 25.7
+15.06 δ_2		51 44.67		8 25.42					8 25.4		6 45.22
+1 40.20									7 45.4		
	136 +13.3	4 21.3	15.7	370	4 18.50	+29	7.59		10	14 8.05	6 37.48 +10″ = 40.58
d	1.123 85					8 24.85	.02				− 5
	9.80 716					50 6 37.53	10.24 − 3 + 24				+ 13
((δ) − D) $\frac{d'}{100}$	1.01895					+ 10.45	10.45				+ 8.19
											+ .30
											− 25.50
+15.12 δ_1		53 11.77		8 11.90					8 11.9		6 27.65
+1 40.25											
	80 +7.8	1 49.2	43.7	92.9	4 46.41	+02	6.23		15	16 40.30	4 15.71
d	0.892 09				16 46.41	1.90	.01				− 2
	9.88 746					50 4 9.58	5.82 − 7 + 70				+ .31
((δ) − D) $\frac{d'}{100}$	0.78 449					+ 6.13	6.15				+ 8.14
											+ .30
											− 25.50
+15.14 δ_2		53 50.32		5 39.19					5 39.2 ?		3 58.94
+1 40.25											
	222 +21.9	0 29.2	26.9	56.1	0 28.05	+12	13.28		25	25 10.82	55 43.25
d	1.340 444				25 28.05	57 20.30	.01				− .13
	9.80 882					50 55 27.98	16.53 − 1 + 71				+ .08
((δ) − D) $\frac{d'}{100}$	1.23720					+ 17.27	17.23				+ 9.06
											+ .40
		56 16.06									− 25.5
+15.22 δ_1		3 19.5	16.2	57 9.41					57 9.4 ?		55 29.16
+1 40.25											
	145 +14.4	2 39.5	36.2	75.7	2 37.85	+05	11.29		0	2 26.89	50 19 9.44
d	1.158 36				2 37.85	20 10.50	.01				− 5
	9.80 519					50 18 18.18	11.02 − 8 + 32				+ 44
((δ) − D) $\frac{d'}{100}$	1.05149					+ 11.26	11.26				+ 8.41
				19 53.44							+ 35
		58 14.44		30 39.66							− 25.4
+15.30 δ_2									19 53.4		18 53.99 − 40″
+1 40.25									20 23.4		15 13.59
	227 +22.7	2 1.1	53.7	186.8	2 58.40	+14	17.67		30	52 40.70	28 15.32
d	1.356 03			58.40		29 49.95	.18				− 14
	9.80 382					50 28 57.63	17.32 − 18 + 56				+ 51
((δ) − D) $\frac{d'}{100}$	1.24779					+ 17.69	17.70				+ 8.57
				30 39.66							+ 35
		1 21.10		8 0.71							− 25.1
+15.40 δ_1									29 39.7		28 59.41
+1 40.25											
	126 +12.3	4 31.7	26.3	58.0	4 29.00	+05	9.81		10	14 19.34	6 36.69
d	1.089 91				14 29.00	8 19.35	.02				− 4
	9.80 716					50 6 27.03	9.45 − 3 + 24				+ 42
((δ) − D) $\frac{d'}{100}$	0.98501					+ 9.66	9.66				+ 8.19
				8 0.71							+ 30
				6 38							− 28.7
+15.45 δ_2		2 41.89							8 0.71		− 25.1
+1 40.25											6 20.46
	99 +9.6	0 52.5	46.8	99.3	0 49.65	+03	7.70		15	15 42.20	5 13.92
d	0.982 27				15 49.65	6 58.70	.10				− 3
	9.80 731					50 5 6.38	7.08 − 10 + 47				+ 48
((δ) − D) $\frac{d'}{100}$	0.87752					+ 7.54	7.45				+ 8.18
											+ 30
		3 36.02		6 38.00							− 26.1
+15.48 δ_1									6 38.00		4 57.75
+1 40.25											
	108 +10.3	3 39.2	34.7	73.9	3 36.95	+03	8.33		10	13 28.98	8 ~~7.16~~ 27.16
d	1.012 84				13 36.95	9 11.40	.14				7 − 3
	9.80 686					50 4 5.08	7.87 − 14 + 24				+ 9
((δ) − D) $\frac{d'}{100}$	0.90764					+ 8.08	7.97				+ 8.21
											+ 30
											− 25.0
+15.53 δ_2		4 49.87		8 51.50					8 51.5		7 ~~1.25~~ 11.25
+1′ 40.25									9 21.50		

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Date$_1$ = 1870 Nov 10 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder Ru

Star.	α	δ	Mag.	$T_δ$	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	9	46.3		7m 52.2	13.2	20.8	24.8	28.8	32.8	120.4	24.08	10.75	13.38
5 16.9		50 41.0								−126.31		10.96	8 13.02
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_1												−2 6.25	6 6.71
										6 19.29			6.8 3.06
	7 53	57.2		4 42.2	0.6	8.4	12.2	15.9	20.4	115.3	11.50	10.76	10 07.2
✓ 7	4.8	50 48.9	8.1							−126.30		11.00	10 0.50
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .30
													− 2
a_2										7 51.18		6.24	7 54.30
										8 6.82			3.88
	10 51	21.6		12 51.1	54.0	7.7	15.0	19.3	23.2	3592	7184	10.66	7 17.18
10	14.4	50 14.3	8.7									10.87	Reject.
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_1													
	12 8.2	−1.3		14 8.2	14.3	22.0	26.0	29.8	33.8	128.9	25.78	10.57 17	17.61
✓ 11	17.7	49 53.4	7.5							−126.31		10.79	14 14.39
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_2												6.25	7.12 8.08
										12 20.82			3.46
													12 5.04 3.10
	13 26	−2.6		15 13.4	32.4	40.2	43.7	47.7	51.6	215.6	43.12	10.57 15	32.05
✓ 12	35.2	49 52.1	8.3							−126.31		10.78	15 32.34
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_1												6.25	13 26.03
										13 38.80			2.46
													13 22.98
	16 17	63.2		18 4.5	23.7	31.5	35.3	39.1	43.2	172.8	34.56	10.60 18	23.76
✓ 18	26.8	52 57.9	8.8 3							−126.31		11.03	18 23.53
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_2												6.25	16 17.22
										16 30.08 30.09			2.50
													16 14.14
	18 22	57.6		20 13.5	28.6	36.8	40.5	44.6	48.5	198.8	39.76	10.77 20	28.99
✓ 17	31.9	50 46.3	9.1							−126.31		10.99	20 28.73
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_1												6.25	18 22.46
										18 35.34 35			2.53
													16 19.93
	20 42	44.0		22 31.0	48.5	56.5	0.2	4.2	8.3	297	59.54	10.74 22	46.80
✓ 19	57.6	49 39.6	8.9							−126.32		10.96	22 48.08
κ													−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_2												6.25	20 42.26
										20 55.22			2.56
													20 39.70
	22 13	53.1		24 2.3	19.6	~~27.3~~	~~31.0~~	~~34.9~~	~~39.0~~	151.8	30.36	10.78 24	19.60
✓ 21	21.6	52 35.7	9.1							−126.30		11.00	24 19.60
		29.8											−126.58 2
((δ) − D) $\frac{\kappa'}{100}$													+ .29
													− 2
a_1												6.26	22 13.34
										22 26.02			3.22
													22 9.90 10.12
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_2													

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	s 210	0 21.8	15.2	270	0 1450	+12	16.33		35	50	45 53.64
	+208			35 87.00	35 1450	47 29.85	127			35 2.40	− .12 +9.20
d	1.318706					50 45 37.53	15.74 -26 +62				+ 05
((δ) − D) $\frac{d'}{100}$	9.801105					+16.11	16.10				+ 8.87
	1.207105										+ .40
											− 23.37
+1558 δ_1		m 6 19.29		47 18.09					47 18.09		23.0
+1 40.25											45 37.84
	184	2 18.2	13.7	319	2 1595	+09	14.33		25	50	53 54.21
	+183			25 31.	27 15.95	55 32 40	127			27 1.82	− 9 +9.71
d	1.262245					50 53 40.08	14.16 -27 +24				+ .38
((δ) − D) $\frac{d'}{100}$	9.799981					+14.13	14.13				+ 9.02
	1.150220										+ .40
											− 27.34
+1564 δ_2				55 19.22					55 19.22		24.9
+1 40.20											53 39.02
	29	4 46.8	42.5	893	4 4465	+00	2.58		0		
					4 446.5	18 3.70	.01				
d						50 16 11.38					
((δ) − D) $\frac{d'}{100}$						+					
δ_1											
	61	2 27.7	23.8	517	2 2585	+01	4.75		20.	49	58 3.06
	+6.2			22 25.85		0 22.50	.00			22 20.96	− 1 +8.76
d	0.792239					49 58 30.18	473 − 0 + 16				+ .41
((δ) − D) $\frac{d'}{100}$	9.80 834					+ 4.88	− 4.89				+ 8.06
	0.68870										+ .30
											− 27.06
+15.78 δ_2		12 20.82		59 59.47					59 59.47		24.45
+1 40.15											58 19.32
	190	3 57.5	55.7	1152	5 5760	+10	14.79		20	49	57 13.32
	+18.9			23 57.60		58 50.75	+.01			23 42.72	− .10 +8.93
d	1.276646					49 56 58.43	14.16 +1 +71				+ .68
((δ) − D) $\frac{d'}{100}$	9.80852					+14.89	14.88				+ 8.05
	1.172932										+ .30
											− 27.11
+15.82 δ_1		13 38.80		58 37.85					58 37.85		24.5
+1 40.10											56 57.75
	192	3 11.6	5.3	169	8 8455	+10	14.95		15	50	3 2.20
	+19.0			18 8.45		4 39.90	.21			17 53.84	− .10 +8.85
d	1.278750					50 2 47.58	14.83 -2				+ .53
((δ) − D) $\frac{d'}{100}$	9.799840					+14.62	14.61				+ 8.12 9.26
	1.165092										+ .30 40
											− 27.04
+15.95 δ_2		16 30.08		4 27.89 58 37.85					27.89		24.4
+1 40.00									4 26.65		2 46.65 47.89
	157	4 55.0	49.5	1045	4 5225	52 6	11.76		40	50 76	15.67
	+15.3			44	52.25	37 56.10	.21		25	44 40.43	51 6 +9.87
d	1.184469			29		50 56 3.78	11.80 -22 +24				+ .83 10.10
((δ) − D) $\frac{d'}{100}$	9.802599					51 +11.89	11.82				+ 8.79 93
	1.075222										+ 35 40
											− 27.01
+16.01 δ_1		18 35.34		52 41.42					52 41.42		24.3
+1 39.95									37 44.15		51 43
											36 1.20 147
	175	1 18.7	12.3	210	1 1550	+08	13.63		35	50	44 54.16
	+176			36 15.50		46 32.85	.20			36 1.87	− 9 +9.36
d	1.245351					50 44 40.53	13.38 -21 +46				+ .20
((δ) − D) $\frac{d'}{100}$	9.80 120					+13.63	13.63				+ 8.85
	1.134652										+ 40
											− 23.8
+16.10 δ_2		20 55.22		46 19.57					46 19.57		44 39.72
+1 39.85											
	173	1 8.8	3.3	121	1 605	+08	13.47		45	50	35 32.43
	+17 x3			46 6.05		36 42.30	.25			45 52.85	− 8 +9.16
d	1.233 805					50 34 49.98	13.38 -26 + 8				+ .19
((δ) − D) $\frac{d'}{100}$	9.80 274					+13.29	13.20				+ 8.70
	1.123 868										+ .35
	893										− 24.0
+16.14 δ_1		22 26.26		36 28.39					28.39		34 48.43
+1 39.80									36 28.2		59
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Nov 13 — Observer W A R — Recorder A. M.
n = +30 e = .00 50°

Date$_2$ = — Observer — Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23 L	7m 22s.55	52.3	8.0	7m 22s.5	31.7	38.8	42.4	46.3	50.2	209.4	41.88	11 00	7m 30s.88
	5 23.0									-127.59		10.99	30.89
	4K 40.4	50 47.2	8.3										-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												-2 7.59	5 28.30
													− 2.31
	a_1									5m 34s.41			5 20.99
	15 47	34.7	8.2	17	35.5	57.0	58.7	2.4	6.5	10.6	309.2	61.84	10 93
	14 59.4	50 2.94	8.1							-127.60		10.92	50.92
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	15 43.32
													− 2.44
	a_2									15 54.67			15 40.87
	16 48	20.4	7.5	18	48.0	55.0	2.8	6.5	10.5	14.4	329.9	65.84	10 87
	16 8.9	50 15.7	7.4							-127.60			18 34.97
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	16 47.37
													− 2.45
	a_1									16 58.76			16 44.91
	19 1	17.3 88		20	52.7	8.3	16.0	19.8	23.7	28.7	96.5	19.30	10 86
	18 16.6	50 12.0	9.0							-127.60		10.85	21 8.45
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	19 0.85
													− 2.47
	a_2									19 12.30			18 58.37
	20 49	−1.3	9.0	22	42.8	57.2	4.7	8.2	12.3	16.6	339.0	67.80	1079
	20 4.4	49 56.0								-127.60			22 57.01
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	20 49.41
													− 2.49
	a_1									21 0.91			20 46.91
	22 28	21.8	8.5	24	21.5	36.0	43.8	47.7	51.6	55.5	234.1	46.82	10 88
	21 43.8	50 16.5								-127.60		10.87	24 36.04
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	22 28.46
													− 2.51
	a_2									22 39.97			22 25.93
	25 12	4.4	8.6	27	2.7	19.2	27.7	31.8	35.4	38.3	152.4	30.48	10 81
	24 26.7	49 59.1					26.7	30.8	34.4	38.3	148.4	29.68	27 19.67
	K										-127.60		19.98
	((δ) − D) $\frac{\kappa'}{100}$												-127.94
													+ .36
													− 2
												7.61	25 11.48
													− 2.54
	a_1									25 23.09			25 8.93
	26 27	17.0	8.4	28	22.3	35.8	42.7	46.3	50.3	54.2	271.8	54.36	10 86
	25 41.6	50 1.7	8.4			34.8	42.7	46.3	50.3		-127.60		28 3.500
	K												4.81
	((δ) − D) $\frac{\kappa'}{100}$												-127.94
													+ .36
													− 2
												7.61	26 27.21
													− 2.56
	a_2									26 38.83			26 24.64
	27 49	52.3	8.2	29	38.7	1.3	9.3	13.2	17.3	21.5	62.6	12.52	11 00
	27 8.4	50 47.0	9.0							-127.59		10.99	30 1.58
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .37
													− 2
												7.60	27 53.94
													− 2.59
	a_1									28 8.54			27 51.34
	29 31	33.2	8.0	31	27.2	39.1	47.0	51.0	54.7	58.7	250.5	50.10	10 92
	28 45.9	50 27.9	7.0							-127.60		10.92	31 39.18
	K												-127.94
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
												7.61	29 31.58
													− 2.60
	a_2									29 43.25			29 28.94

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Runs Nov. 13 Rev. −1 49.20 Rs. Rys. +.15

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	84 +8.4	3′ 42.9	40′.8	837	3 41.85	+.02	6.46		35 25	50 (38′) 35.35	52 42 20.81
d	0.92428				38 41.85	54 6.50	.11				− 2 +9.24
	9.80166				2	50 42 19.30	6.30 −11 +31				+ .55
((δ) − D) $\frac{d'}{100}$	0.81388					52 + 6.54	6.50				+ 8.36
											+ .35
											−27.75
+13.42 δ_1									1′ 11		42 7.30
+1 37.45									53 44.8		52
	155 +15.4	1 38.7	31.9	706	1 35.30	+.06	12.07		45	50	34 37.83
d	1.18952				46 35.30	36 13.05				46 23.34	− 6 +8.77
	9.80290					50 34 25.85	11.80 −15 +31				+ 24
((δ) − D) $\frac{d'}{100}$	1.07836					+ 11.98	−11.96				+ 8.24
											+ .35
											− 27.50
+13.80 δ_2					51						34 19.10
+1 38.40									35 57.5		
	70 +7.0	0 44.2	42.3	865	0 43.25	+.01	5.45		55	50	20 23.36 5
d	0.84510				25 43.25	27 5.10	.04			55 37.77	− 2 +8.51
	9.80428					50 25 17.90	5.52 −4				+ .10
((δ) − D) $\frac{d'}{100}$	0.73732					+ 5.46	5.48				+ 8.08
											+ .35
											−27.43
+13.85 δ_1											35 20 4.44 5
+1 38.50									21 42.9		
	186 +15.7	3 57.8	50.4	1052	3 52.60	+.08	12.15		0	50	17 20.83
d	1.19590				3 52.60	18 55.75	.07			3 40.31	− 7 +8.76
	9.80550					50 17 8.55	11.80 −7 +56				+ 59
((δ) − D) $\frac{d'}{100}$	1.08934					+ 12.28	12.29				+ 7.94
											+ 30
											−27.38
+13.93 δ_2											17 2.21
+1 38.70									18 40.9		
	144 +14.2	0 2.5	53.9	1184	−0 59.20	+.05	11.21		20	50	1 13.12
d	1.15229				19 59.20	2 49.15	.00			19 48.01	− 5 +7.88
	9.80792					50 1 1.95	11.02 +1 +16				− 2
((δ) − D) $\frac{d'}{100}$	1.04815					+ 11.17	11.19				+ 765
											+ 30
											−27.24
+14.00 δ_1											0 53.76
+1 38.80									2 32.6		
	165 +14.5	4 44.1	39.2	833	4 41.65	+.05	11.29		55	50	21 30.83
d	1.16137				59 41.65	23 6.70	.08			59 30.32	− 5 +8.96
	9.80489					50 21 19.50	11.02 −9 +40				+ 70
((δ) − D) $\frac{d'}{100}$	1.05420					+ 11.33	11.33				+ 801
											+ 30
											−27.23
+14.04 δ_2									22		21 12.56
+1 38.95									22 57.5		
	165 +17.0 164	1 47.4	43.7	911	1 45.55	+.07	12.84		15	50	4 28.49
d	1.21484				16 45.55	6 2.80	.02			16 32.19	− 7 +8.22
	9.80746					50 4 15.60	13.38 −2				+ 27
((δ) − D) $\frac{d'}{100}$	1.11024					+ 12.89	13.36				+ 772
											+ 30
											−27.09
+14.16 δ_1											4 9.62
+1 39.10									5 48.7		
	135 +12.5	4 17.0	13.3	2 803	4 1.75	+.05	10.51		0	50	16 55.78
d	1.09691				4 1.75	18 33.20	.06			4 5.19	− 4 +8.81
	9.80550					50 16 46.60	9.45 −5 +56				+ 63
((δ) − D) $\frac{d'}{100}$	0.99035					+ 9.78	9.96				+ 7.92
											+ 30
											−27.09
+14.19 δ_2											16 37.50
+1 39.20									18 16.7		
	126 +12.8	3 55.8	48.2	1040	3 52.00	+.05	9.81		25	50	52 19.04
d	1.10721				28 52.00	53 56.35	.13			28 42.10	− 5 +9.48
	9.80012					50 52 9.15	9.45 −17 +62				+ 59
((δ) − D) $\frac{d'}{100}$	0.99527					+ 9.80	9.90				+ 8.54
											+ 40
											− 27.11
+14.20 δ_1											52 1.41
+1 39.30									53 40.7		
	119 +12.0	4 13.2	7.7	209	4 10.45	+.04	9.86		45	50	38 0.04
d	1.07918				48 10.45	50 33 37.90	.10			49 1.11	− 4 +9.43
	9.80320					32 50.70	9.45 −11				+ 6348 8.98
((δ) − D) $\frac{d'}{100}$	0.97032					+ 9.34	9.34				+ 8.19
											+ 35
											− 2700
+14.28 δ_2											31 42.17
+1 39.40									34 21.4		2 02

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Date$_1$ = 1870 Nov 13 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	32 35	48.3	9.0	32	27.0	~~38.3~~ 35.7	~~42.5~~ 38.3	~~46.4~~ 42.5	46.4	216.29	32.58		Rejected star not known.
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	32 35	43	9.0	34	30.4	43.9	51.6	53.6	57.8	3.3	274.2	54.84	10.80	4403
	21 49.7	50 43.0	9.0								−127.59		10.80	34 44.01
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_2												−2 7.60	32 36.45
														− 2.64
										32	48.11			32 33.86
	33 49.	49.2	8.9	35	46.0	56.5	4.3	8.3	12.0	16.0	337.1	67.42	10.88	3644
	23 32	50 45.9	9.0								−127.59		10.98	35 56.44
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_1												7.60	33 48.85
														− 2.66
										34	0.60			33 46.18
	35 34	58.9	9.2	37	23.0	42.0	49.8	53.7	57.5	1.7	264.1	52.94	11.02	37 41.92
	24 48.0	50 53.6	9.0								−127.59			37 41.92
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_2												7.60	35 34.33
														− 2.68
										35	46.12			35 31.64
	39 43	2.8	9.2	41	40.0	50.2	57.7	1.7	5.6	9.3	304.5	60.90	10.81	4150.09
	3 — — —										−127.60		10.80	41 50.10
	38 56.4 κ	49 51.5												−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .36
														− 2
	a_1												7.61	39 42.50
														− 2.69
										39	54.46			39 39.80
	40 54	11.0	9.0	42	53.8	2.0	9.6	13.4	17.1	21.2	63.3	12.66	10.84	0182
	40 7.8	50 57.9	8.8								−127.60		10.83	43 1.83
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .36
														− 2
	a_2												7.61	40 54.23
														− 2.72
										41	6.20			40 51.50
	43 56	54.3	6.5	45	46.7	3.8	11.6	15.6	19.5	23.5	14.0	14.80	11.00	0380
	43 9.2	50 49.0	6.8								−127.59			46 3.80
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_1												7.60	43 56.21
														− 2.77
										44	8.21			43 53.43
	45 6	48.4	8.7	46	58.0	13.8	21.5	~~26.2~~ 25.2	~~30.3~~ 29.3	~~34.3~~ 34.3	126.1	25.22	10.98	1424
	44 18.9	50 43.1	8.4								−127.59			47 13.84
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_2												7.60	45 6.25
														− 2.78
										45	18.29			45 3.46
	47 44	4.5	9.2	48	32.3	51.8	57.7	3.2	7.0	11.0	31.29	6.254	10.81	5153
	45 58.8	49 59.7									−127.60		10.80	48 51.74
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .36
														− 2
	a_1												7.61	46 44.14
														− 2.78
										46	56.25			46 41.35
	48 49	60.7	8.4	50	41.0	57.3	5.0	9.0	12.8	17.3	341.4	68.28	11.03	5725
	48 2.1	50 55.4	8.4								−127.59		11.02	50 57.26
	κ													−127.995
	((δ) − D) $\frac{\kappa'}{100}$													+ .37
														− 2
	a_2												7.60	48 49.67
														− 2.83
										49	1.79			48 46.83

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d		1 ~~20.8~~	~~15.3~~	~~36.1~~	~~18.05~~				~~55~~ 30		
((δ) — D) $\frac{d'}{100}$											
δ_1											
d	135 +13.6 1.13354	2 51.2	45.2	96.4	2 48.20 32 48.20	+05 50 0.15 50 48 12.95 +10.52	10.51 .01 10.24		30 49 45.3	32′ 37.96 50	48 23.47 − 5. + 42 + 8.47 + 40 − 26.93 48 5.78 +9.24
((δ) — D) $\frac{d'}{100}$	9.80674 1.02222										
+14.38 δ_2 +1 39.55											
d	105 +10.4 1.01703	6 40.1	32.9	73.0	0 36.50 30 36.50	08 52 11.85 50 50 24.65 +8.04	8.18 .13 7.87 −13 +31 8.05		30 51 54.4	30 28.45 50	50 32.69 − 3 + 9 + 8.46 + 40 − 26.89 50 14.75 +8.95
((δ) — D) $\frac{d'}{100}$	9.80643 0.90540										
+14.42 δ_1 +1 39.65											
d	160 +18.9 1.27646	2 19.3	12.2	31.5	2 15.75 22 15.75	+10 0 32.60 50 58 45.40 +14.57	14.79 .31 14.16 −29 +69 14.56		20 0 22.1	22 1.19 50	58 59.97 − .10 + 34 + 8.66 + 40 − 26.88 58 42.39 +9.30
((δ) — D) $\frac{d'}{100}$	9.79903 1.16343										
+14.48 δ_2 +1 39.70											
d	102 +10.1 1.00432	4 26.1	20.4	46.5	4 23.25 24 23.25	+03 58 25.10 49 56 37.90 +7.96	7.94 .01 7.87 −1 +8 7.94		20 58 7.7	24 15.31 49	56 45.86 − 3 + 66 + 7.64 + 30 ~~− 26.59~~ ~~− 26.71~~ 56 27.84 +8.57
((δ) — D) $\frac{d'}{100}$	0.90078										
+14.66 δ_1 +1 39.90											
d	82 +8.0 0.90309	0 9.8	3.7	13.5	0 6.75 10 6.75	+02 12 41.60 50 10 54.40 +6.27	6.38 .02 14.16 −6 14.10		10 12 22.2	9 52.65 50	11 0.47 − 2 + 2 + 7.84 + 30 − 26.55 10 42.26 +8.14
((δ) — D) $\frac{d'}{100}$	9.80641 0.79744										
+14.70 δ_2 +1 39.95											
d	171 +17.1 1.23300	2 0.2	54.2	114.4	1 57.20 ~~24~~ 57.20 26	+08 55 51.15 50 54 43.95 +13.18	13.31 .25 13.38 −25 +8 13.21		~~20~~ ? 25 55 48.1	27 6 43.99 50	~~58~~ 59 17.13 − 8 + 15 + 8.67 + 40 − 26.53 59 0.04 +9.44
((δ) — D) $\frac{d'}{100}$	9.79887 1.11981										
+14.78 δ_1 +1 40.05											
d	158 ~~+16~~ 158 1.19866	~~x3~~ 8.7	2.1	10.8	5.40 34.3 5.40	+07 48 42.95 50 48 55.15 +12.23	12.30 .19 12.59 −22 +16 12.53		30 49 31.0	33 52.87 50	47.8 7.98 − 7 + 61 + 8.46 + 40 − 26.46 48 50.92 +9.40
((δ) — D) $\frac{d'}{100}$	9.80089 1.08749										
+14.83 δ_2 +1 40.05											
d	145 +14.4 1.15836	1 10.5	3.6	14.1	1 8.05 16 8.05	+05 6 40.30 50 4 53.10 +11.34	11.29 .01 11.02 −2 +32 11.32		15 6 27.4	15 58.73 50	5 4.41 − 5 + 17 + 8.73 + 30 − 26.30 4 47.26 +9.15
((δ) — D) $\frac{d'}{100}$	9.80731 1.05361										
+14.90 δ_1 +1 40.10											
d	168 +16.3 1.21219	0 48.6	40.8	89.4	0 44.70 20 44.70	+07 2 3.65 51 0 16.45 +12.56	12.69 .26 12.32 −0 +24 12.56		20 / ~~52.0~~	20 32.14 51	0 29.01 − 7 + 10 + 8.67 + 40 − 26.30 0 11.81 +9.10
((δ) — D) $\frac{d'}{100}$	9.79887 1.09900										
+14.96 δ_2 +1 40.15											

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Date$_1$ = 1870 Nov 13 Observer M.A.R. Date$_2$ = Observer
50° Recorder A.M. Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_2	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	23 52 59	6.9	7.0	54	54.8	7.2	15.0	18.8	22.7	91.4	18.08	10.82	m s
	52 114 κ	50 1 6								-127.64		10.82	55 7.46
	((δ) — D) $\frac{\kappa'}{100}$												-127.945
	a_1												+ .36
													− 2
										53 11.82		−2 7.61	52 59.56
	54 16	5.6	9.2	56	11.5	~~24.8~~	~~32.7~~	35.7	39.2	43.0	173.4	34.68	10.82
	53 285 κ	50 0.3	9.0			23.8	31.7			-127.60		10.71	56 24.26
	((δ) — D) $\frac{\kappa'}{100}$												-127.945
	a_2												+ .36
												7.61	− 2
										28			54 18.27
										54			54 18.39
	56 4	1.2	9.0	57	53.3	11.4	19.0	22.9	~~26.8~~	31.7	113.8	22.76	10.99
	~~6 5 15.5~~ 56 15.4 κ	~~50 41.1~~ 49 55.9								-127.60		10.99	58 1.57
	((δ) — D) $\frac{\kappa'}{100}$												-127.945
	a_1												+ .36
													− 2
												7.61	56 23.97
										16.30			−2.88
										56			56 1.08
	23 58 2	18.9	8.8	59	53.2	10.0	17.7	21.4	26.0	30.2	105.3	21.06	10.86
	57 134 κ	50 1.36	8.5							-127.60		10.86	60 1.019
	((δ) — D) $\frac{\kappa'}{100}$												1020
	a_2												-127.945
													+ .36
													− 2
												7.61	58 2.60
													− 2.91
										58 14.98			57 59.68
	~~23~~ 59 33	39.1	8.5	1	27.0	40.8	48.6	52.3	56.1	0.3	25 5.1	51.62	10.94
	~~58 446~~ 38 44.6	~~50 33.8~~ 33.8	8.4							-127.60			1 40.68
	((δ) — D) $\frac{\kappa'}{100}$												4068
	a_1												-127.945
													+ .36
													− 2
												7.61	58 33.08
													− 2.93
										59 45.48			59 30.14
	1 9	2.6	9.0	2	57.5	16.5	~~25.0~~	~~29.0~~	~~32.0~~	~~35.9~~	134.4	26.88	10.90
	0 15.7 κ	50 2.43	9.0				24.0	28.0	31.0	34.9	-127.60		3 16.77
	((δ) — D) $\frac{\kappa'}{100}$												-127.945
	a_2												+ .36
													− 2
												7.61	1 8.38
										1 20.87			− 2.95
	1 54	41.3	8.2	5	0.2	17.3	~~26.4~~	~~30.2~~	~~34.0~~	~~37.0~~	134.9	28.98	10.95
	~~+ 39~~ 2 20.1 κ	50 36.8	8.8				25.4	29.2	33.0	37.0	-127.59		10.94 5 18.45
	((δ) — D) $\frac{\kappa'}{100}$												-127.945
	a_1												+ .37
													− 2
												7.60	2 9.85
										3 22.35			− 2.94
													3 6.91
	4 39	7.8	8.9	6	33.0	45.2	53.0	56.7	0.3	4.6	219.1	54.94	10.83
	3 183 κ	50 2.5	8.9							-127.60		10.82	6 45.12
	((δ) — D) $\frac{\kappa'}{100}$												-127.946
	a_2												+ .36
													− 2
												7.62	4 37.52
										4 50.04			− 2.98
													4 34.52
	6 7	46.3	8.0	8	4.0	14.8	22.4	~~27.1~~	~~30.9~~	~~35.0~~	127.2	25.44	10.97
	5 169 κ	50 4.10	8.0				26.1	29.9	34.0	-127.59		10.96	8 15.07
	((δ) — D) $\frac{\kappa'}{100}$												-127.946
	a_1												+ .37
													− 2
												7.61	6 6.89
										6 19.43			− 3.02
													6 3.85
	7 59	52.8	9.0	9	50.0	6.8	14.7	18.7	22.9	~~25.4~~	88.1	17.62	11.00
	7 8.9 κ	50 4.7	9.1							-127.59		10.99	10 7.02
	((δ) — D) $\frac{\kappa'}{100}$												6.63
	a_2												-127.946
													+ .37
													− 2
												7.61	7 54.04
										8 11.63			− 3.04
													7 50.98

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	124	4′23.9	17.″1	410	4 20.50	+02	9.65		10′	50	6 50.39
	+12.4				14 20.50	8 27.85	02			14′ 10.″75	− 4 +8.65
d	1.09342					50 6 40.65	9.45 −2 +32				+ 64
	9.80701					+9.74	9.75				+ 7.75
((δ) — D) $\frac{d'}{100}$	0.98837										+ .30
											− 26.00
+15.12 δ_1									8 13.″2		6 33.04
+1 40.20											
	183	0 29.2	25.0	542	0 37.10	+05	10.35		15	50	5 43.79
	+12.4				15 27.10	7 21.25	.02			15 17.03	− 5 +8.05
d	1.09342					50 5 34.05	9.45 −2 +64				+ 7
	9.80716					+9.74	10.07				+ 7.73
((δ) — D) $\frac{d'}{100}$	0.98852										+ .30
											− 26.00
+15.18 δ_2											5 25.84
+1 40.25									7 6.1		
	187	0 32.0	25.7	574	0 28.70	+09	14.09		20	50	0 46.85
	+18.53				20 28.70	2 19.65	.00			20 14.15	− 9 +7.93
d	1.26245					50 0 32.45	14.16 −7 +40				+ 7
	9.80792					+14.40	14.55				+ 7.65
((δ) — D) $\frac{d'}{100}$	1.15831										+ .30
											− 25.90
+15.22 δ_1									2 9.1		0 28.88
+1 40.25											
	168	2 44.6	38.3	831	2 41.55	+08	13.08		0	50	18 32.90
	+17.0				2 41.55	20 6.80	.04			2 28.25	− 8 +8.63
d	1.23045					50 18 19.60	13.38 −8				+ 40
	9.80534					+ 13.30	13.20				+ 7.96
((δ) — D) $\frac{d'}{100}$	1.12373										+ .35
											− 25.90
+15.30 δ_2											18 15.63
+1 40.25									19 55.9		
	138	2 18.7	12.2	309	2 15.45	+05	10.74		40	50	38 56.34
	+13.7				42 15.45	40 32.90	.14			42 4.81	− 5 +8.93
d	1.13672					50 38 45.70	10.24 −14 +54				+ 34
	9.80213					+ 10.64	10.64				+ 8.29
((δ) — D) $\frac{d'}{100}$	1.02679										+ 35
											− 25.90
+15.34 δ_1											38 39.37
+1 40.25									40 19.6		
	190	2 1.2	58.2	1174	1 58.70	+00	11.79		50	50	29 16.86
	+19.3 18.5				51 58.70	30 49.65	.15			51 43.67	− 9 +8.70
d	1.26717					50 29 2.45	14.95 −16 +24				+ 30
	9.80366					+ 14.41	15.03				+ 8.14
((δ) — D) $\frac{d'}{100}$	1.15877										+ 35
											− 25.90
+15.40 δ_2											28 59.86
+1 40.25									30 40.1		
	171	4 2.1	56.0	1181	3 59.05	+08	13.31		35	50	42 15.44
	+17.82				38 59.05	43 49.30	.18			38 45.26	− 8 +9.23
d	1.23553					50 42 2.10	13.38 −20 +61				+ .60
	9.80166					+ 13.34	13.79				+ 8.36
((δ) — D) $\frac{d'}{100}$	1.12513										+ 35
											− 25.90 97
+15.48 δ_1											41 58.37
+1 40.25									43 39.2		
	122	3 44.7	38.8	835	3 41.75	+04	9.50		10	50	7 28.90
	+12.1				13 41.75	96.60	.02			13 32.25	− 4 +8.58
d	1.08279					50 4 19.40	9.45 −3 +8				+ 55
	9.80701					+ 9.50	9.50				+ 7.77
((δ) — D) $\frac{d'}{100}$	0.97774										+ .30
											− 25.60
+15.52 δ_2											7 11.88
+1 40.25									8 52.13		
	108	0 15.7	8.2	239	0 11.95	+03	8.41		35	50	45 57.33
	+11 +10.5				35 11.95	47 36.40	.12			35 3.35	− 3 +8.76
d	1.02119					50 45 49.20	8.66 −14 +8				+ 3
	9.80105					+ 8.13	8.60				+ 8.41
((δ) — D) $\frac{d'}{100}$	0.91018										+ 35
											− 25.60
+15.58 δ_1											45 40.47
+1 40.25									47 20.74		
	168	3 34.2	28.1	623	3 31.15	+08	13.08		25	50	52 42.82
	+16.6				28 31.15	54 17.20	.24			28 18.33	− 8 +9.38
d	1.22011					50 52 30.00	12.39 −23 +46				+ 52
	9.79996					+12.82	12.82				+ 8.54
((δ) — D) $\frac{d'}{100}$	1.10801										+ .40
											− 25.40
+15.65 δ_2											52 26.80
+1 40.20									54 1.00		

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Date$_1$ = 1870 Nov 13 — Observer W. A. R. / Recorder A. M. — Date$_2$ = — Observer / Recorder — Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	10 54	43.4	6.4	12 50.8	1.0	8.9	12.9	16.5	20.5	57.8	11.96	10.96	13 1.00
	10 32	50 38.1	6.5							−127.60		10.95	1.01
	κ												−127.96
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
	a_1											−2 7.62	10 53.41
													− 3.07
										11 6.07			10 50.32
	12 57	1.9	8.0	14 57.4	58	13.5	17.1	21.2	26.0	83.6	16.72	10.80	15 5.92
	12 84	49 56.6	8.3							−127.60		10.80	−127.96
	κ												+ .36
	((δ) − D) $\frac{\kappa'}{100}$												− 2
	a_2											7.62	12 58.32
													− 3.06
										13 11.05			12 55.24
	14 17	63.2	8.0	18 14.8	26.0	33.7	36.8	40.6	44.7	179.4	35.96	11.04	25.32
	15 26.8	50 57.9	8.3		25.0	32.7				−127.60		11.03	18 24.93
	κ												−127.96
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
	a_1											7.62	16 17.33
													− 3.10
										16 30.16			16 14.21
	19 22	34.0	8.8	21 19.2	30.2	37.3	41.1	45.0	49.0	202.9	40.58	10.93	21 29.99
	18 31.9	50 28.7	8.2		29.5					−127.60		10.92	29.96
	κ												−127.96
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
	a_2											7.62	19 22.06
													− 3.16
										19 34.93			19 18.88
	20 54	12.0	9.0	22 52.0	2.1	10.0	13.7	17.7	21.7	65.2	13.04	10.84	22 0
	20 3.0	50 6.7	9.0							−127.60		10.83	23 2.21
	κ												−127.96
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
	a_1											7.62	20 54.61
													− 3.15
										21 7.53			20 51.44
	22 13	35.1	8.8	24 8.7	21.0	29.8	33.7	36.8	40.7	160.0	32.00	10.92	24 2.47
	21 21.6	50 29.8	9.1			28.8	32.7			−127.60		10.92	2.108
	κ												−127.96
	((δ) − D) $\frac{\kappa'}{100}$												+ .36
													− 2
	a_2											7.62	22 13.48
													− 3.18
										22 26.42			22 10.28
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												

Trouble with chronograph, seconds beats on this date. See sheet.

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	102	1′ 16.1	9.8	25.9	4′ 12.95	+03	7.94		35	50	4h 56.11
d	+10.2	3			3 8	43 35.40	.12			39′ 5.04	− 3 + 9.29
	1.00860				12.95	50 4h 48.20	7.87 − 12 + 16				+ 63
	9.80166					+ 7.91	− 7.91				+ 8.34
((δ) − D) $\frac{d'}{100}$	0.89820										+ 35
											− 25.20
+15.75 δ_1											4h 40.20
+1 40.15									4′ 11″ 20.35		
	144	4 15.6	11.9	27.5	4 13.75	+05	11.21		15	50	1 58.80
d	+4.5				19 1.375	3 34.60	.01			19 2.34	− 5 + 8.56
	1.16137					50 1 47.40	11.02 − 1 + 40				+ 63
	9.80777					+ 11.40	− 11.41				+ 7.68
((δ) − D) $\frac{d'}{100}$	1.05708										+ 30
											− 25.10
+15.81 δ_2											1 42.26
+1 40.10									3 22.36		
	112	3 6.2	58.9	12.5	8 2.50	+03	8.72		15	57	3 6.54
d	+10.37				18 2.25	.4 45.80	.19			17 54.47	− 3 + 8.42
	1.00432					50 2 58.60	7.70 − 1 + 39				+ 45
	9.80762					+ 7.94	− 8.08				+ 7.70
((δ) − D) $\frac{d'}{100}$	0.89988										+ 30
											− 24.90
+15.95 δ_1											2 50.06
+1 40.00									4 30.06		
	110	2 19.3	12.0	31.3	2 15.65	+03	8.56		45	50	33 52.67
d	+10.45				47 1.565	35 32.70	.10			47 7.56	− 3 + 8.86
	1.02119					50 33 45.50	7.87 − 9 + 31				+ 34
	9.80290					+ 8.17	− 8.09				+ 8.20
((δ) − D) $\frac{d'}{100}$	0.91203										+ 35
											− 24.80
+16.05 δ_2											33 37.73
+1 39.90									35 17.63		
	101	4 12.9	8.6	20.5	4 10.25	+03	7.74		5	50	11 57.89
d	+10.2				9 10.25	13 38.10	.03			9 2.25	− 3 + 8.75
	1.00860					50 11 50.90	7.87 − 3 + 16				+ 63
	9.80625					+ 7.99	− 8.00				+ 7.85
((δ) − D) $\frac{d'}{100}$	0.90279										+ 30
											− 24.60
+16.09 δ_1											11 43.04
+1 39.85									13 22.89		
	123	1 10.2	2.5	12.7	1 6.35	+04	9.55		45	50	35 4.44
d	+12.84				46	36 42.00	.12			45 58.40	− 4 + 8.61
	1.09342					50 34 54.80	9.45 − 12 + 62				+ 16
	9.80274					+ 9.64	− 9.95				+ 8.14
((δ) − D) $\frac{d'}{100}$	0.98410										+ 35
											− 24.60
+16.14 δ_2											34 48.45
+1 39.80									36 28.3		
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Nov 15 — Observer W. & R. — Date$_2$ = — Observer

n = +.30 C = .00 50° — Recorder H.M. — Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	5m 32s	4.2	—	10m 19.0s	24.0	36.7	40.8	44.8	48.5	199.8	39.96	10.81	29.15
										−128.36		10.80	29.16
													−128.59
													+ .36
													− 2
												−2 8.25	8 20.80
													− 2.29
													8 18.62
15	43	34.7	8.3	17	35.2	51.7	0.0	3.6	7.4	11.5	3142	62.84	10.93	51.91
1.4	59.4	50	48.0							−128.34		10.92	17 51.72
													−128.59
													+ .36
													− 2
												8.25	15 43.58
													− 2.39
										15 55.08			15 41.28
19	11	43.9	9.0	21	5.8	19.1	27.0	31.0	34.7	38.8	1506	30.12	10.96	19.16
1.4	26.7	50	8.6							−128.33		10.96	21 19.16
			9.0										−128.59
													+ .36
													− 2
												8.25	19 10.83
													− 2.43
										19 22.40			19 8.48
22	8	39.3	8.2	25	22.3	34.8	42.3	46.3	50.0	54.1	2275	45.50	10.94	34.56
~~2 22.1~~		~~50 1.40~~	7.7							−128.32		10.94	23 34.56
22 40.8		50 52.9											−128.59
													+ .36
													− 2
												8.25	23 26.24
													− 2.48
										2:3 37.89			23 23.83
Reject A Star not known				26	43.0	50.0	57.5	1.2	4.9	8.8	2324	60.48	10.94	
Comp. to 22m 8s 2										−128.31		10.94	26 49.54
													−128.59
													+ .37
													− 2
												8.24	24 41.23
													− 2.51
													24 38.79
24	41	24.4	9.2	28	23.1	35.7	43.0	46.9	50.9	55.0	2312	46.24	10.88	35.37
~~23 55.6~~		50 +9.7	9.0							−128.32		10.88	28 35.36
25 41.6		11.7											−128.59
													+ .36
													− 2
												8.25	26 27.04
													− 2.52
										26 38.77			26 24.57
26	27	17.0	8.4	29	45.6	49.8	~~58.4~~	~~6.2~~	~~10.2~~	14.0	3068	69.36	10.80	58.50
25	41.6	50	11.7			58.4	6.2	10.2	14.0	18.0	−128.32		10.85	29 58.51
			8.4										−128.59
													+ .36
													− 2
												8.25	27 30.19
										28 1.97			27 47.73
27	43	52.3	9.4	29	50.0	~~57.7~~	6.2	10.3	14.2	18.2	5111	101.22	10.99	30 3.28
Double 27	4.5	50 47.0	9.0	30	48.0	58.4					−128.31			58.47
					2.2									−128.59
													+ .37
													− 2
												8.24	27 50.16
													2.54
										28 1.90			27 47.69
Ref. Star not known				31	38.7	50.6	58.3	2.1	6.0	10.0	8270	81.40	10.99	3 50.41
Comp. Sta 2h 43m										−128.30			31 50.41
28 56.4		50 42.9											−128.59
													+ .37
													− 2
												8.24	29 42.11
													− 2.57
										29 53.88			29 39.70
32	35	48.3	9.2	34	35.0	44.3	52.0	56.0	0.0	4.0	2763	55.26	10.98	44.28
31	49.7	50	43.0							−128.30		10.98	34 44.28
			9.0										−128.59
													+ .37
													− 2
												8.24	32 35.98
													2.60
										32 47.82			32 33.44

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	140	0 14.3	−2.3	13.0	2.0 6.00	+0.3	7.89		20′	19′	49 55 1.07
d	+10.2	0 5.7	−2.3	3.4	2.0 1.70	2 46.65	.01		20.		− 3 +8.22
$((\delta) - D)\frac{d'}{100}$	1.00860					49 54 53.03	7.87 −1 +16				+ .80
	9.80882					+ 8.04	8.02				+ 7.95
	0.90536										+ .30
δ_1											− 28.10
											27.8
									1 11		34 41.49
	165	0 33.2	25.8	59.0	0 29.50	+0.7	12.85		40		34 38.22
d	+16.7				40 29.50	42.1885	.16			40 16.52	− 8 +8.89
$((\delta) - D)\frac{d'}{100}$	1.22272					50 34 25.23	12.59 −15 +54				+ 6
	9.80290					+ 1.297	12.98				+ 8.56
	1.11356										+ .35
+13.80 δ_2											− 27.70
+1.38.40											34 19.41
	129	1 12.1	5.3	17.4	1 8.70	+0.5	10.35		30		43 56.41
d	+13.4				31 8.70	51 39.65	.16			30 53.31	− 5 +9.16
$((\delta) - D)\frac{d'}{100}$	1.12710					50 43 46.03	10.24 −16 +31				+ .14
	9.80136					+ 10.38	10.39				+ 8.72
	1.01640										+ .35
+13.92 δ_1											− 27.70
+1.38.70											43 37.87
	115	0 57.8	50.6	108.4	5.420	+0.3	8.95		35		39 7.58
d	+12.3				35 54.20	46 54.16	.12			35 44.64	− 4 +9.08
$((\delta) - D)\frac{d'}{100}$	1.08991				70	50 39 0.53	9.45 −13 +24				+ .12
	9.80213					+ 9.55	9.56				+ 8.65
	0.97998										+ .35
+14.06 δ_2											− 27.50
+1.38.90											38 51.16 .561
	70	1 38.2	31.3	69.7	1 34.85	+0.1			40 30.1		16
d	+6.5				16 34.85	6 13.50			15	50	58 24.87
$((\delta) - D)\frac{d'}{100}$	0.81291					50 58 19.88					− 2 +9.59
	9.79918					+ 5.01					+ .21
	0.70003										+ 9.00
+14.10 δ_1											+ .40
+1.39.10											−27.50
											58 6.78
	123	0 49.2	41.2	90.4	0 45.20	+0.4	9.58		40		34 19.10
d	+12.3				40 45.20	42 3.15	.06			40 35.57	− 4 +8.97
$((\delta) - D)\frac{d'}{100}$	1.08991					50 34 9.53	9.45 −8 +24				+ .10
	9.80290					+ 9.57	9.61				+ 8.56
	0.98075										+ .35
+14.18 δ_2											−27.50
+1.39.10											34 0.57
	128	3 12.3	5.7	18.0	3.900	+0.5	9.92		35 39.7		
Ex +10.8					58 9.00	24 39.35	.68		55	50	16 54.18
d	1.03342					50 16 9.53	7.87 −4 +64			58 10.53	− 3 +9.04
$((\delta) - D)\frac{d'}{100}$	9.80550					+ 8.45	8.47				+ .53
	0.92686										+ 8.24
+14.28 δ_1											+ .30
+1.39.30											− 27.80
											.30
											16 35.72
	122	2 48.7	42.1	90.8	2 45.40	+0.6	9.50		18 15.1		
d	+10.5				22 45.40	0 2.95	.17		20	50	52 17.44
$((\delta) - D)\frac{d'}{100}$	1.02119					50 52 9.33	7.87 −14 +39			22 37.28	− 3 +9.61
	9.80012					+ 8.11	8.12				+ .36
	0.90925										+ 8.88
+14.24 δ_2											+ .40
+1.39.30											− 27.50
											.40
									53 39.0		51 59.65
	119	2 48.7	42.1	90.8	2 45.40	+0.4	7.		20	50	52 18.37
d	+11.9				22 45.40	0 2.95					− 4 +9.60
$((\delta) - D)\frac{d'}{100}$	1.06819					50 52 9.33	8.66 −16 +52			22 46.36	+ .36
	9.80012					+ 9.04	9.04				+ 8.88
	0.95625										+ .40
+14.28 δ_1											− 27.50
+1.39.40											.40
											52 0.67
	93	1 42.5	35.6	78.1	1 39.05	+0.2	7.24		25	50	48 22.88
d	+9.3				26 39.05	56 9.30	.12			26 31.85	− 3 +9.40
$((\delta) - D)\frac{d'}{100}$	0.96848					50 48 15.68	7.08 −12 +24				+ 22
	9.80074					+ 7.20	7.20				+ 8.81
	0.85716										+ .40
+14.38 δ_2											− 27.20
+1.39.55											48 5.08
									49 44.6		

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20 3

Date$_1$ = 1870 Nov 15 — Observer W. A. R. / Recorder A. M. — Date$_2$ = — Observer / Recorder — Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	33 49	49.2	9.2	35 48.0	57.0	5.0	9.0	13.0	17.0	341.0	68.20	10 9	57.32
↓	33 8.2	50 45.9	9.0							−128.31		10.98	35 57.22
													−128.65 59
													+ .36
													− 2
												−2 8.25	33 48.91
													− 2.61 +14
										34 0.78			33 48.36 +18
	34 58	58.0	8.5	36 53.8	6.0	13.5	17.6	21.3	25.2	836	16.72	11 0 2	5 10
↓	34 11.7	50 58.0	8.0							−128.30		11.0 2	37 5.72
													−128.65 60
													+ .37
													− 2
												8.25	34 57.42
													− 263 +14
										35 9.30			34 54.84 +18
	~~34 6~~	~~11.6~~	~~8.8~~	58 —	12.0	19.8	23.7	27.3	31.6	114.4	22.88	109	1191
	5 6 4	45.4	9.6							−128.24		10.96	58 1192
↓	~~55~~ 1.5	50 40.1	7.8										−128.65 60
													+ .36
													− 2
												8.26	56 3.65 +15
													− 292
										56 15196			56 0.74
oh	Reg. Star not known.			13 7.0	9.9	13.5	17.5	21.3	25.0	87.2	17.44		

κ

((δ) — D) $\frac{\kappa'}{100}$

α_1

κ

((δ) — D) $\frac{\kappa'}{100}$

α_2

κ

((δ) — D) $\frac{\kappa'}{100}$

α_1

κ

((δ) — D) $\frac{\kappa'}{100}$

α_2

κ

((δ) — D) $\frac{\kappa'}{100}$

α_1

κ

((δ) — D) $\frac{\kappa'}{100}$

α_2

κ

((δ) — D) $\frac{\kappa'}{100}$

α_1

κ

((δ) — D) $\frac{\kappa'}{100}$

α_2

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	90	4′ 33.4	27.8	61.7	4′ 30.85	7.02	7.01		30′	50	50 31.02
	+9.2				30.85	17.50	12		20	34′ 23.″73	− 3 +9.62
d	0.96379				24	23.88	7.08−12+16				+ .58
((δ) − D) $\frac{d'}{100}$	9.80194					50 + 7.14 − 7.12					+ 8.67
	0.85370										+ .40
											− 27.20
δ_1	+1442								51′ 58.″1		40 13.44
	+139.65										50
	142	1 24.5	23.3	58	1 26.40	+9.5	11.06		15	50	58 37.50
	+11.9				16 26.40	6 21.95	21			16 17.23	− 4. +9.54
d	1.04555					50 58 28.33	8.46−18+69				+ .18
((δ) − D) $\frac{d'}{100}$	9.49903					+ 9.17 − 9.17					+ 9.00
	0.96252										+ .40
											− 27.20
δ_2	+1446								59 59.5		58 19.84
	+139.70										
		4 53.2	48.8	1040	4 52.00				25		
					24 52.00	52 56.35					
d						50 45 2.73					
((δ) − D) $\frac{d'}{100}$											
δ_1	+1522										
	2.9	3 36.1	28.2	623	8 8.15	.00			50		
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Nov 16 Observer W. A. R. Date$_2$ = Observer
n = +36 c = .00 Recorder A. M. Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
0	h m s	° ′ ″		m s	s	s	s	s	s	m s	s	s	m s
Rej. Star not Known.				55.0	2.6	10.2	14.2	18.0	22.1	67.1	13.42		
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_1										m s			
0	10 57	43.4	7.0	12	49.0	1.7	9.5	13.4	17.2	21.0	62.8	12.56	1096	2.00
↓ 10	3.2	50 38.1	6.5								−128.28		10.95	13 1.61
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
a_2														− 2
													−2 8.28	10 53.33
														− 3.02
										11				10 50.31
	12 57	1.9	8.8	14	57.0	6.4	14.0	17.9	21.6	25.6	85.5	17.10	1080	6.30
↓ 12	8.41	49 56.6	8.3								−128.29		10.80	15 6.30
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
a_1														− 2
													8.29	12 58.01
														− 3.02
										13 10.80				12 54.99
	16 17	63.2	8.6	18	14.7	25.7	33.3	37.1	41.4	45.1	182.6	36.52	1104	2.546
↓ 15	26.8	50 57.0	8.6								−128.28		11.03	18 2.549
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
a_2														− 2
													8.28	16 17.21
														− 3.08
										16 30.08				16 14.13
Rej. Star not Known.				21	14.8	26.8	34.6	38.3	42.2	46.2	188.1	37.62		
κ														
((δ) − D) $\frac{\kappa'}{100}$														
a_1														
	20 54	12.0	9.0	22	47.0	2.9	10.7	14.6	18.2	32.1	68.5	13.70	1084	2.86
↓ 20	3.0	50 6.7	9.0								−128.29		10.83	23 2.87
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
a_2														− 2
													8.29	20 54.59
														− 3.11
										21 7.56				20 51.47
	22 13	35.1	9.0	24	7.0	21.8	29.4	33.5	37.5	41.5	163.7	32.74	1093	2.181
↓ 21	21.6	50 29.8	9.1								−128.28		10.92	24 2.182
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
a_1														− 2
													8.28	22 13.54
														− 3.13
										22 26.55				22 10.41
	25 25	61.3	8.8	27	24.5	34.8	42.8	46.7	50.7	54.7	229.7	45.94	1103	3.491
↓ 24	34.9	50 56.0	9.1								−128.28		11.02	27 3.492
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
a_2														− 2
													8.28	25 26.64
														− 3.18
										25 39.78				25 23.46
	27 5	17.1	8.8	29	1.5	13.8	21.2	25.2	29.0	33.0	122.2	24.44	1086	13.58
↓ 26	14.1	50 11.8	8.4								−128.29		10.85	29 13.59
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
a_1														− 2
													8.29	27 5.30
														− 3.17
										27 18.44				27 2.13
Rej. Star not Known.				30	26.7	41.4	49.0	52.8	56.6	0.7	260.5	52.10		
κ														
((δ) − D) $\frac{\kappa'}{100}$														
a_2														

4)

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Nov. 16 — 7' 56.42 R. +.13

Runs

23

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	7.6	1' 4.7	−2.7	2.0	1' 1.00	+02			20'		
d	0.79981				21 1.00	1 47.35					
((δ) − D) $\frac{d'}{100}$					50 53 50.93						
δ_1									1 11		
	12.7	2 8.7	2.2	10.9	2 5.45	+05	9.89		30	50	42 56.25
	4126				32 5.45	50 42.90	.14			31 55.69	− 5 +9.36
d	1.10037					50 42 46.48	9.45 −15 +46				+ .27
((δ) − D) $\frac{d'}{100}$	9.88151					+ 9.77	−9.76				+ 8.79
	0.98982										+ .35
δ_2	+15.75										− 25.70
	+1 40.15								44 20.06		42 39.91
	9.4	3 2.8	−2.4	0.4	3 0.20	+02	7.32		10	50	1 59.04
	+9.3				13 0.20	9 48.15	.00			12 52.89	− 3 +8.71
d	0.96848					50 1 57.73	7.08 −1 +24				+ .39
((δ) − D) $\frac{d'}{100}$	9.80777					+ 7.31	−7.31				+ 8.05
	0.86419										+ .30
δ_1	+15.81										− 25.50
	+1 40.10										1 42.25
	11.0	1 53.6	49.9	10.55	1 5.270	+03	8.56		3 10	51	3 7.44
	+10.8				11 5.2.75	10 55.60	.19		22.35	44444	− 3 +9.78
d	1.03342					51 2 59.18	7.70 −1 +62				+ .25
((δ) − D) $\frac{d'}{100}$	9.79840					+ 8.31	−8.31				+ 9.16
	0.91976										+ .40
δ_2	+15.95										− 25.50
	+1 40.00										2 51.77
	12.0	4 7.0	2.0	9.0	4 4.50	+04			4 31.77 50		
d	9.80489				54 4.50	28 43.85					
((δ) − D) $\frac{d'}{100}$					50 20 47.93						
δ_1											
	15.9	3 6.8	2.1	8.9	3 1.45	+04	12.38		0	50	11 58.94
	+5.9				3 1.45	19 43.90	.05			2 27.99	− 7 +8.88
d	1.20140					50 11 46.48	11.80 −5 +71				+ .40
((δ) − D) $\frac{d'}{100}$	9.80625					+ 12.46	−12.46				+ 8.25
	1.09559										+ .30
δ_2	+16.09										− 25.10
	+1 39.85								13 22.57		11 42.72
	14.8	0 −0.2	−6.2	−6.4	−0 3.20	+06	11.52		40	50	35 6.64
	+14.8				39 56.80	42 51.55	.14			39 45.31	− 6 +8.94
d	1.17026					50 34 55.13	11.02 −15 +62				± 2
((δ) − D) $\frac{d'}{100}$	9.80274					+ 11.51	−11.49				+ 8.67
	1.06094										+ .35
δ_1	+16.14										− 25.10 48
	+1 39.80										34 50.82
	10.3	4 9.8	3.8	7.36	4 6.50	+03	8.02		36 30.3 10	51	0 53.14
	+10.4				14 6.80	8 41.55	.16			13 58.80	− 3 +10.01
d	1.01703					51 0 45.13	7.70 −1 +31				+ .53
((δ) − D) $\frac{d'}{100}$	9.79887					+ 8.01	−8.00				+ 9.11
	0.90384										+ .40
δ_2	+16.27										− 24.30
	+1 39.65										25.60
									2 17.8		0 38.15
	12.3	2 58.5 −37.0		11.25	2 5.625	+02	9.54		53	50	17 5.15
	+12.4				57 5.6.25	24 52.10	.06			57 46.78	− 4 +8.98
d	1.08279					50 16 55.68	9.45 −6 +8				+ .38
((δ) − D) $\frac{d'}{100}$	9.80550					+ 9.47	−9.47				+ 8.34
	0.97623										+ .30
δ_1	+16.31										− 24.80
	+1 39.55										16 49.33
									18 28.9		
	14.7	2 7.8	2.1	9.9	2 4.95	+06			5		
d	9.80686				7 4.95	15 43.40					
((δ) − D) $\frac{d'}{100}$					50 7 46.98						
δ_2											

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Date$_1$ = 1870 Nov 16 — Observer W. A. R. — Recorder A. Mc

Date$_2$ = — Observer — Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T_-
1	29 55	−1.2	9.2	31 53.0	3.5	11.0	14.8	18.7	22.6	70.6	14.12	10.79	3.33
✓	29 3.0	49 8.4	9.0							−128.29		10.79	32 8.33
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
α_1												−2 8.29	29 55.04
										30 8.25			− 3.19
													29 51.85
2	31 16	33.6	8.0	33 14.3	24.1	31.8	35.8	39.8	43.8	175.3	35.06	10.93	24.19
✓	30 23.9	50 28.3	7.7							−128.28		10.92	33 24.14
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
α_2												8.28	31 25.286
										31 29.10			− 3.23
													31 12.63
3	32 47	3.4	9.1	34 42.6	55.2	3.0	6.8	10.7	14.7	330.4	66.08	10.87	55.27
✓	31 54.7	47 58.1	8.9							−128.29		10.80	34 56.28
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
α_1												8.29	34 46.99
										33 0.26			− 3.23
													33 43.76
4	33 44	16.6	8.7	35 42.0	52.4	0.2	4.2	7.9	11.9	316.6	63.32	10.86	52.46
✓	32 52.0	50 11.3	8.7							−128.29		10.85	35 52.47
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
α_2												8.29	34 44.18
										33 57.47			− 3.25
													34 40.93
5	36 19	64.5	8.2	38 17.6	27.7	35.7	39.5	43.2	47.2	192.0	38.60	11.04	27.76
✓	35 26.2	50 59.2	8.4							−128.29		11.04	38 27.56
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
α_1												8.29	36 19.27
										36 32.68			− 3.26
													36 16.01
6	39 1	57.1	9.0	40 55.9	9.7	17.2	21.1	25.1	29.1	102.2	20.44	10.99	9.85
✓	38 8.0	50 45.8	9.0							−128.28		10.99	41 9.45
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
α_2												8.28	39 1.17
										39 14.60			− 3.32
													38 57.85
7	40 42	44.5	8.3	42 39.0	49.9	57.8	1.6	5.5	9.6	304.4	60.88	10.96	49.92
✓	39 48.9	50 39.2	7.8							−128.28		10.96	42 49.92
K			Saw double										−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
α_1												8.28	40 41.64
										40 55.12			− 3.30
													40 38.31
✓				42 41.0	50.1	57.8	1.7	5.5	9.6	304.7	60.94	10.96	49.98
K										−128.28		10.96	42 49.98
((δ) − D) $\frac{\kappa'}{100}$													−128.70
													+ .44
													− 2
α_2												8.28	40 41.70
										40 55.18			− 3.33
													40 38.37
8	42 44	3.3	8.9	44 42.6	52.8	0.5	4.2	8.1	12.2	317.4	63.56	10.90	52.75
✓	41 50.1	50 25.0	8.9							−128.28		10.90	44 52.66
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
α_1												8.28	42 44.38
										42 57.87			− 3.35
													42 41.03
9	44 19	29.7	8.5	46 18.1	28.0	35.8	39.9	43.8	47.5	194.3	39.00	10.90	28.09
✓	43 25.1	50 24.4	8.3							−128.29		10.90	46 28.10
K													−128.70
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
α_2												8.29	44 19.81
										44 33.37			− 3.36
													44 16.45

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Runs

	$T_m - T$	δ	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ'
	105		1 7.1	2.0	9.1	1 4.55	+03	8.18		13—	49	58 55.49
	+10.3					16 4.55	6 43.80	.00			N' 56.43	− 3 +8.44
d	1.01284						49 58 47.38	7.87 +1 +24				+ .14
	9.80822						+ 5.11	8.62				+ 8.03
((δ) − D) $\frac{d'}{100}$	0.90900											+ .30
												− 24.60
+16.40 δ_1										0. 18.7		58 39.33
+1 39.40										0 +47		
	98		1 32.7	27.0	59.7	1 29.85	+03	7.63		40	50	33 29.70
	+9.8					41 29.85	41 18.50	.00			41 22.23	− 3 +9.13
d	0.99123						50 33 22.08	7.08+9 +63				+ .19
	9.80305						+ 7.62	7.62				+ 8.62
((δ) − D) $\frac{d'}{100}$	0.88222											+ .35
												− 24.60
+16.47 δ_2										34 53.58		33 14.23
+1 39.35												
	126		1 44.8	39.0	83.8	1 41.90	+05	9.81		10	50	3 20.01
	+12.7					11 41.90	11 6.45	.01			11 31.90	− 5 +8.56
d	1.10380						50 3 1003	9.45−1 +56				+ .22
	9.80762						+ 9.98	10.00				+ 8.09
((δ) − D) $\frac{d'}{100}$	0.99936											+ .30
												− 24.40
+16.50												3 4.17
+1 39.25 δ_1										4 43.42		
	104		3 24.5 − 20.3		44.8	3 22.40	+03	8.10		55—	50	16 34.78
	40.5					58 22.40	24 25.95	.05			58 14.17	− 3 +9.09
d	1.02119						50 16 29.53	7.87−4 +40				+ 44
	9.80565						+ 8.22	8.23				+ 8.33
((δ) − D) $\frac{d'}{100}$	0.91448											+ .35
												− 24.30
+16.54 δ_2												16 22.54
+1 39.15										18 1.69		
	101		0 41.4	36.0	77.4	0 8.895	+03	7.86		10	50	4 20.67
	+10.0					10 38.90	12 9.40	.17			10 31.26	− 3 +8.46
d	1.00000						51 41 12.98	7.70 −1				+ 8
	9.79825						+ 7.69	7.69				+ 8.11
((δ) − D) $\frac{d'}{100}$	0.88619											+ .30
												− 24.20
+16.67 δ_1												4 4.93
+1 39.00										5 43.93		
	138	(8)	54.7	49.6	104.3	52.15	+05	10.24		20	50	54 10.28
	+13.6					24 52.15	57 × 56.20	.20			20 41.64	− 5 +9.47
d	1.13354						50 53 49 59.78	10.24−17 +46				+ 64.12 +9.99
	9.79981						+ 10.50	10.51				+ 9.00
((δ) − D) $\frac{d'}{100}$	1.02129											+ .40
												− 24.20
+16.75 δ_2										51 34.9		53 55.55
+1 38.80										55 39.35		49 56.07
	108		0 41.8	36.1	77.9	0 38.95	+03	8.41		30	50	45 1.42 44 2.42
	+12.9					30 38.90	52 9.40	.13			30 30.51	− 3 +9.24
d	1.03743					.86	50 44 12.98	7.87−12 +69				+ 8
	9.80120						+ 8.45	8.44				+ 8.84
((δ) − D) $\frac{d'}{100}$	0.92657											+ .35
												− 24.00
+16.81 δ_1										4545.31		44 46.66 6.75
+1 38.65										46 45.81		
	91		0 41.8	36.1	77.9	0 38.95	+02	7.09		30	50	44 18.78
	+9.0					30 38.90	52 9.40	.14			30. 31.98	− 3 +9.22
d	0.95424					4015	50 44 12.98	7.08−11 +0				+ 8
	9.80120						+ 6.99	6.97				+ 8.82
((δ) − D) $\frac{d'}{100}$	0.76338											+ .35
	84											− 24.00
+16.81 δ_1												44 8.400
+1 38.65										45 42.65		
										46 22.05		
	102		4 24.0	20.0	44.0	4 22.00	+03	7.94		40	50	30 37.80
	+10.1					44 22.00	38 26.35	.01			44 14.13	− 3 +9.46
d	1.00432						50 30 29.93	7.87−8 +8				+ .57
	9.80351						+ 7.87	7.87				+ 8.47
((δ) − D) $\frac{d'}{100}$	0.89577											+ .35
												− 23.90
+16.86 δ_1												30 23.36
+1 38.50												48
										32 1.9		
	99		0 14.9	8.0	23.9	0 11.45	+03	7.71		45—	50	29 47.27
	+10.0					45 11.45	37 36.90	.08			45 3.66	− 3 +8.91
d	1.00000						50 29 40 37.48	7.87−8				+ 3
	9.80351						+ 4.79	7.79				+ 8.56
((δ) − D) $\frac{d'}{100}$	0.89145											+ .35
												− 23.80
+16.92 δ_2												29 32.38
+1 38.40										31 10.8		23

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Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
44	1m 45s 5.3	10.0	8.6	47m	46.5s	0.9	8.4	12.2	16.0	20.0	57.5	11.50	10 83	m 0 67
↓	44	58.2	50 4,4	8.8							−128.29		10.83	48 0.67
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
														− 2
a_1													-2 8.29	45 52.38
											46 5.97			− 3.36
														45 49.02
46	57	7.5	9.3	48	49.5	2.0	9.9	13.7	17.7	21.4	64.7	1.94	10 82	212
↓ 45	57.7	50 2,2	8.9								−128.29		10.82	49 2.12
κ														−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
														− 2
a_2													8.29	46 53.83
														− 3.37
														46 50.46
49	33	42.0	8.3	51	~~57.5~~	42.0	49.7	53.7	57.3	1.4	47 7.45		10 96	4186
↓ 48	38.2	50 36,9	8.8		32.3						264.1	5 2.82	10.95	51 41.86
κ											−128.28			−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
														− 2
a_1													8.28	49 43.59
														− 3.42
														49 30.17
51	27	−0.5	8.9	53	23.6	35.0	42.8	46.7	50.3	54.3	49 47.28		10 80	3502
↓ 50	32.0	49 8,2	9.1								229.1	4 5.82	10.79	53 3.503
κ											−128.29			−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
														− 2
a_2													8.29	51 26.74
														− 3.41
														51 23.33
52	52	54.6	8.4	54	50.8	2.1	10.0	13.7	17.7	21.7	51 40.46		11 07	203
↓ 51	57.7	50 49,3	8.4								65.2	13.04	11.00	53 2.04
κ											−128.28			−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .44
														− 2
a_1													8.28	52 53.76
														− 3.46
														52 50.30
54	20	20.9	8.4	56	16.6	28.2	35.9	39.8	43.7	47.7	53 7.54		10 88	2818
↓ 53	24,5	50 23,6	8.3								196.3	39.26	10.87	56 28.19
κ											−128.29			−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
														− 2
a_2													8.29	54 1490
														− 3.45
														54 16.45
56	9	24.7	9.0	57	57.8	17.7	25.2	29.2	33.0	37.0	54 33.70		10 80	1752
↓ 55	13.9	50 22,4	9.2								142.1	28.42	10.90	58 17.52
κ											−128.29			−128.70
((δ) − D) $\frac{\kappa'}{100}$														+ .43
														− 2
a_1													8.29	56 09.23
														− 3.47
														56 5.76
											56 23.08			
κ														
((δ) − D) $\frac{\kappa'}{100}$														
a_2														
κ														
((δ) − D) $\frac{\kappa'}{100}$														
a_1														
κ														
((δ) − D) $\frac{\kappa'}{100}$														
a_2														

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	144	0′ 16.2	9.8	260	0′ 13.00	+05	11.21		5	50	9 5407
d	+1.42				5	17 35.35	.04		5′	1.86	− 5
	1.15229					3893	11.02 −4 +16				+ 3
((δ) − D) $\frac{d'}{100}$	9.80656					+11.14	11.14				+ 8.20
	1.04679										+ .30
											−23.70
+16.95 δ_1									11	"	9 34.85
+1 38.25									13.1		
	125	2 30.8	24.9	557	2 2785	+04	9.73		5	50	7 3397
d	+2.16				7 27.85	15 20.50	.02		7	1.75	− 5
	1.10037					24.08	9.45 −3 +48				+ 32
((δ) − D) $\frac{d'}{100}$	9.80701					+9.84	9.90				+ 817
	0.99532										+ .30
											−23.60
+16.99 δ_2											7 19.11
+1 38.15									8 57.3		
	95	3 0.7	56.6	1175	2 5875	+03	+7.24		30	50	42 062
	−.96				32 58.75	49 49.60	+.11			33 6.19	− 3
d	0.98227					41 53.18	7.08 −10 +46				+ .39
	9.80166					+7.44	7.44				+ 8.79
((δ) − D) $\frac{d'}{100}$	0.87187										+ .35
											−23.50
+17.11 δ_1											41 46.62
+1 37.90									43 24.5		
	114	0 15.2	40.3	883	0 4275	+03	8.85		15	49	59 18.16
d	+1.14				7 42.75	7 5.60	.00			15 33.77	− 3
	1.05690					49 59 9.18	8.86 −11 +32				+ 9
((δ) − D) $\frac{d'}{100}$	9.80822					+8.98	8.98				+ 803
	0.95306										+ .30
											−23.30
+17.13 δ_2											59 3.25
+1 37.75									0 41.0		
	113	0 24.1	18.2	423	0 2115	+03	8.80		20	50	55 3942
	+1.12				20 21.15	2 27.20	.17			20 12.50	− 3
d	1.04922					50 55 30.78	8.66 −17 +16				+ 5
	9.79950					+8.69	8.65				+ 902
((δ) − D) $\frac{d'}{100}$	0.93666										+ .40
											−23.30
+17.24 δ_1											55 25.56
+1 37.60									57 3.2		
	116	4 4.8	0.0	48	4 240	+04	9.03		50	50	20 5859
	+11.6				54 2.40	28 45.96	.07			53 53.32	− 4
d	1.06446					50 20 49.53	8.66 −6 +48				+ 52
	9.80489					+9.06	9.08				+ 8.39
((δ) − D) $\frac{d'}{100}$	0.95729										+ .30
											−23.10
+17.25 δ_2											20 44.66
+1 37.45									22 22.1		
	176	2 38.7	33.1	718	2 3540	+09	13.94		45	50	27
	+1.7				47 35.90	+35 12.45	.14			47 23.10	8 2982
d	1.24797					50 27 46.03	13.38 −13 +50				− 9
	9.80382					+13.79	13.80				+ 34
((δ) − D) $\frac{d'}{100}$	1.13973										+ 8.55
											+ .35
+17.32 δ_1											−23.00
+1 37.25											27 5597
									28 53.2		27 15.97
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											

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n = +.32 C = .00

Star.	α	δ	Mag.	T_a	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1 K	23h 3m 9s	21.7	9.2	5m 6.5	17.1	25.0	28.8	32.5	36.3	139.7	27.94	10.88	17 06
	2 26.0	50 16.5	9.0							−128.38		10.87	6 17.07
((δ) − D) $\frac{\kappa'}{100}$													−126.74
													+ .38
													− .2
a_1												−2 8.38	8.3 8.69
										3m 19.88	5		− 2.19
													3 6.50
4 K	4 57	46.9	8.5	6 55.6	7.5	15.2	19.3	23.0	27.1	392.1	18.42	10.98	7 7.44
	4 16.5	50 41.8	8.7							−128.37		10.97	7.45
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_2												8.37	4 50.08
										5 10.29			− 2.21
													4 56.84
6 K	6 39	42.9	9.5	9 32.2	42.2	55.0	57.0	2.4	7.0	291.1	58.22	10.96	9 47.26
	6 56.8	50 44.1	9.3							−128.37		10.95	9 47.27
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_1												8.37	7 38.90
													− 2.24
										7 50.16			7 36.66
7 K	8 38	48.3	8.7	10 36.0	46.6	57.6	58.4	2.4	6.3	288.3	57.66	10.98	10 46.68
	7 55.2	50 43.2	8.7							−128.37		10.98	10 46.68
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_2												8.37	8 38.31
													− 2.26
										8 49.55			8 36.05
9 K	10 7	8.7	9.5	12 2.2	15.7	23.4	27.0	30.8	34.7	131.6	26.32	10.83	12 15.49
	9 24.0	50 38	9.0							−128.38		10.82	12 15.50
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .38
													− .2
a_1												8.38	10 7.12
													− 2.27
										10 18.48			10 4.85
10 K	11 27	7.4	8.3	13 26.0	37.6	45.1	49.0	53.0	56.9	241.6	48.32	10.82	13 37.50
	10 45.9	50 2.2	8.0							−128.38		10.82	13 37.50
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .38
													− .2
a_2												8.38	11 29.12
													− 2.28
										11 40.52			11 26.84
12 K	12 50	40.4	9.3	14 45.0	58.6	6.5	10.1	14.2	18.0	341.4	69.48	10.95	14 58.53
	12 6.7	50 35.3	9.0							−128.37		10.94	14 58.54
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_1												8.37	12 50.17
													− 2.31
										13 1.56			12 47.86
13 K	14 38	47.6	9.0	16 30.7	46.7	57.2	58.2	2.2	6.0	287.3	57.46	10.98	16 46.48
	13 53.8	50 42.4	9.0							−128.37		10.98	16 46.48
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_2												8.37	14 38.11
													− 2.33
										14 49.53			14 35.78
14 K	15 43	34.7	8.0	17 45.5	57.9	59.5	3.2	7.3	11.2	313.1	62.62	10.93	17 57.69
	14 59.4	50 29.4	8.0							−128.37		10.92	17 57.70
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .39
													− .2
a_1												8.37	15 43.33
													− 2.34
										15 54.77			15 40.99
16 K	17 20	10.9	9.0	19 14.6	28.1	36.0	39.7	43.7	47.7	193.2	38.64	10.83	19 27.80
	16 35.7	50 5.6	9.1							−128.38		10.83	19 27.81
((δ) − D) $\frac{\kappa'}{100}$													−128.74
													+ .38
													− .2
a_2												8.38	17 19.43
													− 2.36
										17 30.95			17 17.07

(5)

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Nov. 17 −7 R_{α} 54.73 R_{δ} +.12

Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	106	3′ 28.2	26.3	54.5	3′ 24.25	+0.3	8.25		50		21 34.65
	+10.6				58 27.25	29 21.10	.106			53′ 18.76	− 3
d	1.025531					50 21 26.37	7.87−6+48				+ 41
	9.80489					+ 8.28	8.29				+ 8.45
((δ) − D) $\frac{d'}{100}$	0.91814										+ .35
											− 28.10
+13.38 δ_1											21 15.73
+1 37.20									22	52.9	
	115	3 13.1	11.6	24.7	3 12.35	+.4	9.27		25		46 30.48
	+11.9				28 12.35	54 36.00	.16			28 3.14	− 4
d	1.07559					50 46 41.27	8.66−14+69				+ 38
	9.80089					+ 9.21	9.21				+ 8.41
((δ) − D) $\frac{d'}{100}$	0.96442										+ .40
											− 28.10
+13.42 δ_2											46 32.03
+1 37.40									48	9.4	
	150	0 14.9	12.6	27.5	0 13.75	+.6	11.68		25		49 51.55
	+5.1				25 13.75	57 34.60	.17			25 2.05	− 6
d	1.17898					50 49 39.87	11.80−18+8				+ 5
	9.80043					+ 11.68	11.70				+ 8.96
((δ) − D) $\frac{d'}{100}$	1.06735										+ .40
											− 28.10
+13.50 δ_1											49 32.77
+1 37.70									51	10.5	
	106	1 19.8	18.0	37.8	1 18.90	+.8	8.25		25		48 48.00
	+10.7				26 18.90	56 29.45	.73			26 10.62	− 3
d	1.02938					50 48 34.72	7.87−13+54				+ .16
	9.80058					+ 8.28	8.28				+ 8.94
((δ) − D) $\frac{d'}{100}$	0.91790										+ .40
											− 28.10
+13.50 δ_2											48 24.37
+1 37.80									50	2.2	
	135	1 19.5	18.2	37.7	1 18.85	+.5	10.51		5		8 45.21
	+13.3				6 18.85	16 29.50	.03			6 8.40	− 5
d	1.12385					50 8 34.77	10.24−3+24				+ .16
	9.80671					+ 10.47	10.45				+ 8.22
((δ) − D) $\frac{d'}{100}$	1.01850										+ .30
											− 28.00
+13.63 δ_1											8 25.84
+1 37.90									10	3.7	
	116	2 43.1	42.5	85.6	2 42.80	+.4	9.03		5		7 19.85
	+11.5				7 42.80	15 5.55	.02			7 33.76	− 3
d	1.06070					50 7 10.82	8.66−2+40				+ 32
	9.80701					+ 9.03	9.04				+ 8.21
((δ) − D) $\frac{d'}{100}$	0.95565										+ .30
											− 27.90 28.60
+13.68 δ_2											7 0.65
+1 38.05									8	38.7	
	136	4 33.3	32.1	65.4	4 32.70	+.6	10.59		30		40 31.40
	+13.5				34 32.70	48 15.65	.15			34 22.21	− 5
d	1.13033					50 40 20.92	10.24−14+39				+ 54
	9.80197					+ 10.48	10.49				+ 8.80
((δ) − D) $\frac{d'}{100}$	1.02024										+ .35
											− 28.00
+13.70 δ_1											40 13.04
+1 38.15									41	54.2	
	166	2 24.0	21.0	47.0	2 22.50	+.8	12.46		25		47 [illegible] 54
	+15.8				27 22.50	55 23.85	.21			27 11.28	− 7
d	1.19866					50 47 31.12	11.80−21+63				+ 29
	9.80089					+ 12.23	12.22				+ 8.92
((δ) − D) $\frac{d'}{100}$	1.08749										+ .40
											− 28.00
+13.75 δ_2											47 24.89
+1 38.35									49	2.2 7.2	
	64	0 23.8	22.8	46.6	0 23.30	+.1	4.98		40		34 35.14
	+6.2				40 23.30	42 25.05	.06			40 15.47	− 1
d	0.79239					50 34 30.32	4.73−6+16				+ 5
	9.80298					+ 4.82	4.83				+ 8.69
((δ) − D) $\frac{d'}{100}$	0.68323										+ .35
											− 27.90
+13.80 δ_1											34 16.32
+1 38.40									35	54.7	
	115	4 30.9	30.5	61.4	4 30.70	+.3	8.95		0		10 33.27
	+13.2				4 30.70	18 17.65	.02			4 20.34	− 5
d	1.12057					50 10 22.92	10.24−4+16				+ 54
	9.80656					+ 10.35	10.36				+ 8.26
((δ) − D) $\frac{d'}{100}$	1.01507										+ .30
											− 27.80
+13.88 δ_2											10 14.52
+1 38.55									11	53.1	

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Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	23 47	3.7	8.7	25 44.3	55.3	3.1	6.8	10.7	14.7	330.6	66.12	10.87	55.31
										−128.38		10.80	25 55.32
													−128.74
													+ .38
													− 2
												−2 8.38	23 46.94
													− 2.44
										23 58.60			23 44.50
24	25 12	4.4	8.0	27 6.5	19.8	27.4	31.4	35.1	39.0	152.7	30.54	10.87	19.73
										−128.38		10.80	27 19.74
													−128.74
													+ .38
													− 2
												8.38	25 11.36
													− 2.45
										25 23.07			25 8.91
25	26 27	17.0	8.4	28 24.0	35.7	43.1	46.8	50.9	54.9	231.1	46.22	10.86	35.36
										−128.38		10.80	28 35.37
													−128.74
													+ .38
													− 2
												8.38	26 26.99
													− 2.47
										26 38.71			26 24.52
27	27 57	53	9.5	29 49.0	59.2	7.0	11.1	14.8	18.8	170.9	34.18	10.99	59.19
		50	9.0							−128.37		10.99	29 59.19
		53											−128.74
													+ .39
													− 22
												8.37	27 50.82
													− 2.49
										28 2.57			27 48.33
28	29 31	33.2	7.7	31 35.5	39.9	47.7	51.7	55.5	59.0	253.8	50.76	10.92	39.84
										−128.36		10.92	31 39.84
													−128.73
													+ .39
													− 2
												8.36	29 31.48
													− 2.51
										29 43.25			29 28.97
30	31 10	16.0	9.0	33 3.6	18.6	26.5	30.3	34.0	38.0	147.4	29.48	10.85	18.63
										−128.37		10.85	33 18.63
													−128.73
													+ .38
													− 2
												8.37	31 10.26
													− 2.52
										31 22.10			31 7.74
31	32 35	48.3	9.0	34 28.8	44.7	52.3	56.1	0.0	4.0	277.4	55.42	10.98	44.44
										−128.36		10.98	34 44.44
													−128.73
													+ .39
													− 2
												8.36	32 36.08
													− 2.55
										32 47.91			32 33.53
33	33 49	49.2	8.9	35 44.5	57.0	5.3	8.8	12.8	16.8	340.8	68.14	10.98	57.98
										−128.36		10.98	35 57.16
													−128.73
													+ .39
													− 2
												8.36	33 48.80
													− 2.57
										34 0.65			33 46.23
34	34 58	58.3	8.5	36 57.0	5.8	13.8	17.5	21.5	25.5	544.9	108.82	11.02	5.96
										−128.36		11.02	37 5.80
													−128.73
													+ .39
													− 2
												8.36	34 37.42
													− 2.58
										35 9.32			34 54.86
35	36 24	42.8	8.0	38 16.9	31.4	39.0	43.0	46.8	51.0	241.4	42.24	10.96	31.28
										−128.36		10.95	38 31.29
													−128.73
													+ .39
													− 2
												8.36	36 22.93
													− 2.60
										36 34.85			36 20.33

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	110	14.3	3.0	7.3	1 3.65	+03	8.56		10	50	3 58.61
	+11.0				11 3.65	11 44.70	.01		10′	55.00	− 3
d	1.04139					50 3 49.97	8.66-1				+ 13
	9.80746					+ 864	8.65				+ 8.13
((δ) − D) $\frac{d'}{100}$	0.93679										+ 30
											−27.60
+1410 δ_1											3 39.54
+1 39.05									5′ 18.6		
	123	6 37.8	36.9	74.7	0 37.35	+03	10.35		10	50	4 26.44
	+12.2				10 37.35	12 11.00	.01			10 26.97	− 5
d	1.12057					50 4 16.27	10.24-2+16				+ 7
	9.80746					+10.37	10.38				+ 8.15
((δ) − D) $\frac{d'}{100}$	1.01597										+ 30
											−27.60
+1416 δ_2											4 7.51
+1 39.10									5 46.6		
	114	3 10.1	10.2	20.3	3 10.15	+03	8.88		53	50	16 52.39
	+11.4				58 10.15	24 38.20	.05			58 1.21	− 3
d	1.05690					50 16 43.47	8.66-14+32				+ 38
	9.80550					+8.925	8.94				+ 8.37
((δ) − D) $\frac{d'}{100}$	0.95034										+ 35
											−27.60
+1419 δ_1											16 33.86
+1 39.20									18 13.1		
	~~98~~	1 2.8	0.7	3.5	1 1.75	+02	+2.63		40	50	33 39.80
	+10.2				41 1.75	41 46.60	.09			40 53.86	− 3
d	1.02860					50 33 51.87	7.87-14+16				+ .12
	9.80290					+7.93	7.89				+ 8.67
((δ) − D) $\frac{d'}{100}$	0.89944										+ 35
											−27.60
+1422 δ_2											33 41.31
+1 39.30									35 20.6		
	94	2 0.3	−0.5	−0.2	2 − 0.10	+07	3.43		40	50	32 57.06
	+13				41 59.90	40 48.45	.03			41 56.57	− 1
d	0.63347					50 32 53.72	3.16-4+24				+ .24
	9.80305					+ 3.34	3.36				+ 8.65
((δ) − D) $\frac{d'}{100}$	0.52446										+ 35
											−27.50
+1428 δ_1											32 38.79
+1 39.40									34 18.2		
	150	0 13.4	12.3	25.7	0 12.85	+06	11.65		0	50	14 53.51
	+15.0				0 12.85	22 35.50	.06			0 1.11	− 6
d	1.17609					50 14 40.77	11.80-6				+ 2
	9.80580					+11.74	11.74				+ 8.33
((δ) − D) $\frac{d'}{100}$	1.06983										+ 30
											−27.40
+1436 δ_2											14 33.70
+1 39.50									16 13.2		
	159	1 45.8	43.2	89.0	1 44.50	+07	12.38		25	50	18 21.19
	+15.6				26 44.50	56 3.85	.21			26 32.45	− 7
d	1.19312					50 48 9.12	11.80-21+46				+ 20
	9.80074					+12.07	12.05				+ 8.94
((δ) − D) $\frac{d'}{100}$	1.08180										+ 40
											−27.50
+1438 δ_1											48 3.26
+1 39.55									49 42.8		
	125	4 33.2	32.1	65.3	4 32.65	+04	9.73		20	50	50 30.78 9
	+12.7				24 32.65	58 15.70	.16			24 22.83	− 5
d	1.10380					50 50 38.98	9.46-17+54				+ 54
	9.80043					+ 9.82	9.82				+ 8.97
((δ) − D) $\frac{d'}{100}$	0.99217										+ 40
											−27.40
+1442 δ_2											50 13.245
+1 39.65									51 52.9		
	88	1 52.7	51.2	103.9	1 51.95	+02	6.85		15	50	58 8.46
	+8.8				16 51.95	5 56.40	.14			16 45.16	− 2
d	0.94448					50 58 1.67	6.30-13+62				+ 23
	9.99918					+ 6.79	6.79				+ 9.13
((δ) − D) $\frac{d'}{100}$	0.83160										+ 40
											−27.40
+1446 δ_1											57 50.80
+1 39.70									59 30.5		
	145	2 26.2	25.7	51.9	2 25.95	+04	11.29		30	50	42 38.84
	+14.4				32 25.95	50 22.40	.16			32 14.78	− 5
d	1.15836					50 42 27.67	11.02-16+31				+ 29
	9.80166					+11.17	11.17				+ 8.84
((δ) − D) $\frac{d'}{100}$	1.04796										+ 35
											−27.30
+1452 δ_2											42 20.97
+1 39.75									44 0.7		

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Date$_1$ = 1870 Nov 17 — Observer W.A.R — Recorder A.M.C — Date$_2$ = — Observer — Recorder

Star. α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23h 38m 44s	3'.6	9.0	40m	40.0	53.2	0.1	4.5	8.4	12.5	319.5	63.90	10.81
↓ 37 57.2	49 58.3									−128.37		10.80
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												−2 8.37
										38 56.74		
39 43	2.8	8.4	41	52.1	57.0	6.8	10.7	14.5	18.5	349.3	69.90	10.87
↓ 39 4.6	49 58.8									−128.37		10.80
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_2												8.37
										40 2.76		
45 6	48.4	8.8	47	1.6	14.6	22.3	26.4	30.2	34.2	127.54	25.54	10.98
↓ 44.1 18.9	50 43.1	8.4								−128.36		10.48
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												8.36
										45 18.33		
46 44	4.5	9.5	48	38.8	52.5	0.0	4.0	7.9	11.8	316.2	63.24	10.81
↓ 45 56.8	49 59.2									−128.37		10.80
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_2												8.37
										46 56.26		
48 49	60.7	8.8	50	40.6	57.8	5.6	10.0	13.5	17.8	344.7	68.94	11.03
↓ 48 2.1	50 55.4	8.4								−128.36		11.02
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												8.36
										49 1.76		
50 [illegible]	46.4	9.0	52.	2.0	15.0	22.8	26.8	30.6	34.6	129.8	25.96	10.97
↓ 49 18.8	50 41.1	8.7								−128.36		10.96
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_2												8.36
										50 18.89		
51 57	41.2	7.0	53	34.2	0.2	8.0	11.8	15.7	19.8	55.5	11.10	10.95
↓ 51 2.6	50 34.9	Var.								−128.36		10.94
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												8.36
										52 4.09		
53 38	33.9	4.0	55	33.6	46.2	54.0	57.9	1.9	5.7	285.7	57.14	10.93
↓ 52 47.2	50 28.6	8.9								−128.36		10.92
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_2												8.36
										53 50.20		
54 19	57.5	8.5	56	22.3	27.3	35.1	39.1	42.8	46.7	191.0	38.20	11.02
↓ 53 31.2	50 52.2	8.8								−128.36		11.01
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												8.36
										54 31.17		
56 4	4.54 [illegible]	8.2	58	0.0	12.1	20.0	23.8	27.7	31.6	115.2	23.04	10.96
↓ 55 15.5	50 46.1	7.8								−128.36		10.96
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_2												8.36
										56 16.11		

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	132	1′ 38.0	37.0	750	1 34.50	+05	10.28		10″	50	3 2.42	
	+13.1				11 37.50	11 10.85	.01			11′ 27.20	− 5	+8.57
d	1.11724					50 3 16.12	10.24 −2 +8				+ .19	
	9.88762					+ 10.30	−10.30				+ 8.13	
((δ) − D) $\frac{d'}{100}$	1.01283										+ .30	
											− 27.20	
+14.62 δ_1											3 8.79 7.79	
+139.85									4 47.64			
	69	0 48.2	46.0	942	0 47.10	+01	5.37		10	50	4 12.02	
	+7.0				10 47.10	12 1.25	.00			10 41.57	− 2	+8.53
d	0.84510					50 4 6.52	−5.53				+ .10	
	9.80746					+ 5.50					+ 8.15	
((δ) − D) $\frac{d'}{100}$	0.74050										+ .30	
											− 27.10	
+14.66 δ_2											3 53.45	
+139.90									5 33.4			
	130	1 56.3	56.0	1123	1 56.15	+05	10.12		25	50	48 7.53	
	+13.0				26 56.15	55 52.20	.17			26 46.09	− 5	+9.52
d	1.11394					50 47 5.47	10.24 −18				+ .23	
	9.80074					+ 10.06	−10.06				+ 8.94	
((δ) − D) $\frac{d'}{100}$	1.00262										+ .40	
											− 27.00	
+14.83 δ_1											47 56.05	
+140.05									49 30.1			
	197	0 3.2	1.7	49	0 2.45	+06	10.67		10	50	5 1.85	
	+13.6				10 12.45	12 45.90	.01			9 57.74	− 5	+8.41
d	1.13354					50 4 51.17	10.24 −1 +48				+ 0	
	9.80731					+ 10.68	−10.71				+ 8.16	
((δ) − D) $\frac{d'}{100}$	1.02879										+ .30	
											− 26.80	
+14.90 δ_2											4 43.46	
+140.10									6 23.46			
	172	4 42.4	40.9	833	4 41.65	+08	13.39		10	51	0 25.30	
	+17.2				14 41.65	8 6.70	.28			14 28.03	− 8	+10.04
d	1.23805					51 0 11.97	13.38 −0 +24				+ .56	
	9.79887					+ 13.33	−13.62				+ 9.16	
((δ) − D) $\frac{d'}{100}$	1.12486										+ .40	
											− 26.90	
+14.96 δ_1											0 8.44	
+140.15									1 48.6			
	130	3 40.2	39.2	794	3 39.70	+05	10.12		25	50	46 23.99	
	+13.0				28 39.70	54 8.65	.16			28 29.63	− 5	+9.70
d	1.11394					50 46 13.92	10.24 −17				+ .44	
	9.80105					+ 10.07	−10.17				+ 8.91	
((δ) − D) $\frac{d'}{100}$	1.00293										+ .40	
											− 26.80	
+15.01 δ_2											46 6.89	
+140.20									47 47.1			
	60	4 52.5 −30.3		1028	4 51.40	+01	4.67		30	50	40 6.88	
	+6.0				34 51.40	47 56.95	.06			34 46.73	− 1	+9.73
d	0.77815					50 40 2.22	4.73 −6				+ .59	
	9.80197					+ 4.66	−4.67				+ 8.80	
((δ) − D) $\frac{d'}{100}$	0.66806										+ .35	
											− 26.70	
+15.07 δ_1											39 49.91	
+140.20									41 30.1			
	126	1 13.3	11.9	252	4 12.60	+04	9.81		40	50	33 50.82	
	+12.6				41 12.60	41 35.75	.11			41 2.80	− 5	+9.11
d	1.10037					50 33 41.02	9.45 −11 +46				+ .14	
	9.80290					+ 9.80	−9.80				+ 8.67	
((δ) − D) $\frac{d'}{100}$	0.99121										+ .35	
											− 26.70	
+15.14 δ_2											33 33.23	
+140.25									35 13.5			
	50	2 29.0	27.2	562	0 28.10	+04	3.89		15	50	57 29.30	
	+4.9				17 28.10	5 20.25	.07			17 24.31	− 1	+9.80
d	0.69020					50 57 25.52	3.96 −6 +69				+ .30	
	9.79934					+ 3.78	−3.79				+ 9.11	
((δ) − D) $\frac{d'}{100}$	0.57748										+ .40	
											− 26.70	
+15.16 δ_1											57 12.40	
+140.25									58 52.6 ?			
	121	4 57.0	53.0	1070	4 53.50	+04	9.42		25	50	45 9.49	
	+12.1				29 53.50	52 54.85	.18			29 44.13	− 4	+9.84
d	1.08279					50 45 0.12	9.45 −16 +8				+ .59	
	9.80120					+ 9.37	−9.37				+ 8.89	
((δ) − D) $\frac{d'}{100}$	0.97193										+ .40	
											− 26.60	
+15.22 δ_2											44 52.73	
+140.25									46 23.0			

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34 5

Date$_1$ = 1870 Nov 17 50° Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder

Star. α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T	Ru…
73 ~~58~~ 7 / 57 18.1	48.8 / 50 43.5	8.9 / 8.2	59^m 54.6^s	15.0	22.8	26.7	30.6	34.6	1207 / −128.35	2594	1098 / 10.98	^{m} ^{s} 1496 / 0 14.96	
κ												−128.72 / + .39	
((δ) − D) κ'/100											−2 8.35	− 2 / 58 6.61	+15
c_1									58^m 19.05^s			− 2.86 / 58 3.75	+14
59 33 / 58 44.6	39.1 / 50 32.8	8.8 / 8.4	0^h 1^m 29.6	41.7	49.1	53.2	57.0	1.0	2620 / −128.35	5240	1094 / 10.94	4146 / 1 41.46	
κ												−128.72 / + .39	
((δ) − D) κ'/100											8.35	− 2 / 59 33.11	
c_2									59 45.58			− 2.87 / 59 30.24	+15 / +14
0^h 1^m 9 / 0 18.7	29.6 / 50 24.3	9.0 / 9.0	3 1.0	17.1	24.9	28.6	32.4	36.4	1394 / −128.35	2788	1091 / 10.90	1697 / 3 16.98	
κ												−128.72 / + .39	
((δ) − D) κ'/100											8.35	− 2 / 1 8.63	
a_1									1 21.15			− 2.88 / 1 5.75	+15 / +14
2 31 / 1 40.0	6.7 / 50 1.4	8.8 / 8.9	4 25.5	38.0	45.7	49.6	53.2	57.3	2438 / −128.35	4876	1082 / 10.82	3794 / 4 37.94	
κ												−128.72 / + .38	
((δ) − D) κ'/100											8.36	− 2 / 2 29.58	
a_2									2 42.15			− 2.88 / 2 26.70	+15 / +14
Comp. to 2^m 31^s (same δ) / 2 34.5	~~X~~	8.5	5 ~~12.9~~ or 19.5 (19.5 is right δ.)	32.0	40.0	43.7	47.3	51.6 bad	2140 / −128.36	4280	10.82	~~5 21.48~~	1. / 9.
κ												~~−128.72 / + .38~~	1.1
((δ) − D) κ'/100											8.36	~~− 2 / 3 23.62~~	+154 8
a_1												~~− 2.90 / 3 20.72~~	+140.2 / 98 / 0.9
4 39 / 3 48.3	7.8 / 50 2.5	8.8 / 8.9	6 31.9	45.9	53.6	57.3	1.2	5.2	2832 / −128.36	5664	1083 / 10.82	4581 / 6 45.82	
κ												−128.72 / + .38	
((δ) − D) κ'/100											8.36	− 2 / 4 37.46	
a_2									4 50.06			− 2.92 / 4 34.54	+153 / +14
10 54 / 10 3.2	43.4 / 50 38.1	7.0 / 6.5	12 50.6	1.8	9.7	13.3	17.3	21.3	634 / −128.35	1268	1096 / 10.95	172 / 13 1.73	
κ												−128.72 / + .39	
((δ) − D) κ'/100											8.35	− 2 / 10 53.38	
a_1									11 6.13			− 3.00 / 10 50.38	+15 / +14
12 59 / 12 8.4	1.9 / 49 56.6	8.8 / 8.3	14 53.5	6.4	14.1	18.0	21.8	25.7	860 / −128.36	1720	1080 / 10.80	640 / 15 6.40	
κ												−128.72 / + .38	
((δ) − D) κ'/100											8.36	− 2 / 12 58.04	
a_2									13 10.85			− 3.00 / 12 55.04	+15 / +14
16 17 / 15 26.8	63.2 / 50 57.9	8.8 / 8.6 3	18 14.8	25.7	33.5	37.4	41.3	45.2	1831 / −128.35	3662	1104 / 11.03	2558 / 18 25.59	
κ												−128.72 / + .39	
((δ) − D) κ'/100											8.35	− 2 / 16 17.24	
a_1									16 30.12			− 3.07 / 16 14.17	+15 / +14
19 17 / 18 27.1	21.0 / 50 15.7	8.9 / 9.0	21 11.1	26.7	34.8	38.5	42.3	46.5	1888 / −128.36	3776	1088 / 10.87	2688 / 21 26.89	
κ												−128.72 / + .38	
((δ) − D) κ'/100											8.36	− 2 / 19 18.53	+16
a_2									19 31.49			− 3.08 / 19 15.45	+1

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d	154	1′ 15.3	13.0	28.3	1′ 14.15	+06	11.99		25.1	50	48 41.38
	+15.4				26 14.15	56 3420	.21			26 2.25	− 6 +9.42
	1.18752					50 48 3947	11.80-21+31				+ .14
((δ) − D) $\frac{d'}{100}$	9.80058					+ 1191	11.90				+ 8.94
	1.07604										+ .40
+1530 δ_1											− 26.50
+1 40.25											48 34.30
									50 14.55 4.6		3
d	121	1 8.4	7.5	15.9	1 7.95	+04	9.42		33	50	38 54.91
	+11.9				36 7.95	46 4040	.13			35 58.72	− 4 +9.20
	1.07555					50 38 4567	8.66-12+69				+ 13
((δ) − D) $\frac{d'}{100}$	9.80213					+ 9.24	9.23				+ 8.76
	0.96562										+ .35
+1534 δ_2											− 26.40
+1 40.25											38 37.71
									40 18.0		
d	161	0 51.3	49.7	101.0	0 45.50	+07	12.54		45	50	29 15.59
	+16.0				45 50.50	36 87.85	.13			45 38.04	− 7 +8.98
	1.20412					50 29 3.12	12.59-13				+ .10
((δ) − D) $\frac{d'}{100}$	9.80366					+ 12.47	12.46				+ 8.60
	1.09572										+ .35
+1540 δ_1											− 26.30
+1 40.25											28 58.27
									30 38.5		
d	125	3 28.1	27.0	55.1	8 27.55	+04	9.73		5	58	6 35.81
	+12.4				8 27.55	14 2080	.02			8 17.80	− 4 +8.87
	1.09342					50 6 2807	9.45-2+32				+ 12
((δ) − D) $\frac{d'}{100}$	9.80716					+ 9.74	9.75				+ 6.19
	0.98852										+ .30
+15.45 δ_2											− 26.20
+1 40.25											6 18.48
									7 58.73		
1.28103	~~10~~	4 46.8	46.7	93.5	4675	+10	11.8		5	52	9 27.15 5 15.68
9.80671	~~24~~ + ~~15.8~~ 11.5				(~~4~~) 46.75	(~~47~~) 13 1.60				(5) 34.34	− 10 − 3
d 1.14568					9	50 (~~8~~) 6.87	11.80-3+64				− ~~4~~ 10 − .10
+154 8 ((δ) − D) $\frac{d'}{100}$	9.80701					+ ~~4.96~~ 8.81	12.41		50° 9′		+ 8.24 + 8.24
+1 40.25 0.95070									+ ~~8.54~~	+ 8.41	+ .30 + .30
9.80671 δ_1											− 26.10 − 26.10
0.95535											9 4.04 8 57.99
											4
d	140	2 37.8	37.2	75.0	2 37.50	+05	10.90		5	50	7 27.03
	+13.9				7 37.50	15 10,85	.02			7 26.58	− 5 +8.77
	1.14301					50 7 16.12	10.24-3+71				+ 31
((δ) − D) $\frac{d'}{100}$	9.80701					+ 10.91	10.92				+ 8.21
	1.03796										+ .30
+1532 δ_2											− 26.10
+1 40.25											7 9.70
									8 49.95		
d	102	2 9.8	8.0	17.8	2 8.90	+03	7.94		30	50	42 53.32
	+11.1				32 8.90	50 3945	.12			32 0.29	− 3 +9.41
	1.04532					50 42 4472	8.66-13+8				+ 25
((δ) − D) $\frac{d'}{100}$	9.80151					+ 8.60	8.61				+ 8.84
	0.93477										+ .35
+15.75 δ_1											− 25.90
+1 40.15											42 36.83
									44 16.98		
d	129	3 6.8	6.2	13.0	3 6.50	+04	10.04		10	50	1 57.27
	+12.9				13 6.50	9 41.85	.10			12 52.35	− 4 +8.73
	1.11059					50 1 4712	9.45-1+71				+ 37
((δ) − D) $\frac{d'}{100}$	9.80777					+ 10.15	10.15				+ 8.10
	1.00630										+ .30
+1581 δ_2											− 25.70
+1 40.10											1 40.30
									3 20.40		
d	109	1 58.4	56.9	115.3	1 57.65	+03	8.49		10	51	3 4.28
	+10.8				11 57.65	10 50.70	.18			11 49.34	− 3 +9.82
	1.03342					51 2 5597	7.70-1+62				+ 24
((δ) − D) $\frac{d'}{100}$	9.79840					+ 8.34	8.31				+ 9.21
	0.91976										+ 40
+15.95 δ_1											− 25.60
+1 40.00											2 48.50
									4 28.50		
d	~~22~~ 156	4 11.4	10.9	22.3	4 11.15	+07	12.15		50	50	20 54.8 1
	+15.8				64 11.15	28 3720	.09			53 58.79	− 7 +9.21
	1.19866					50 20 4247	11.80-8+64				+ 50
((δ) − D) $\frac{d'}{100}$	9.80489					+ 12.34	12.36				+ 8.43
	1.09149										+ 35
+1604 δ_2											− 25.40
+1 39.90											20 38.62
									22 18.52		

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Date$_1$ = 1870 Nov 17 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_s	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
0	h m s	′ ″		m s	s	s	s	s	s				m s
↓	20 37	12.0	—	22 49.5	5.0	10.7	14.5	18.3	22.3	688	137.6	10.84	292
	20 8.0	50 6.1	9.0							−128.36		10.83	23 2.93
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
												−2 8.36	20 54.57
	c_1												−3.09
													20 51.48
										21 7.57			
↓	22 13	36.1	8.9	24 9.7	22.0	29.8	33.6	37.5	41.3	1542	308.4	10.93	2201
	21 21.6	50 29.8	9.1							−128.36		10.93	24 2.91
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
													22 13.55
	c_2											8.36	−3.11
										22 26.58			22 10.44
↓	25 25	61.3	7.8	27 25.1	35.0	42.7	46.7	50.5	54.6	2295	459.0	11.03	3487
	24 34.7	60 56.0	7.1							−128.35		11.02	27 3488
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− .2
												8.35	25 26.53
	α_1												−3.17
										25 39.63			25 23.36
↓	27 5	17.1	8.1	29 1.0	13.7	21.4	25.5	29.1	33.1	1228	245.6	10.85	1370
	26 14.1	50 11.8	8.4							−128.36		10.85	29 1371
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
												8.36	26 7 5.35
	α_2												−3.17
										27 18.49			27 2.34 18
↓	28 33	8.3	9.5	30 26.5	41.3	49.0	53.0	56.6	0.7	2606	521.2	10.82	4129
	27 41.3	50 3.0	9.0							128.36		10.82	30 4130
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
												8.36	28 32.94
	α_1												−3.18
										28 46.12			28 29.76
↓	29 55	−1.2	9.3	31 47.9	3.3	11.0	14.9	18.9	22.8	709	141.8	10.79	339
	29 3.0	49 54.4	9.0							−128.36			32 2.39
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
												8.36	29 55.03
	α_2												−3.19
										30 8.24			29 51.84
↓	31 16	33.9	8.0	33 14.0	24.2	31.9	36.0	39.8	43.8	1757	351.4	10.93	2421
	30 23.9	50 28.3	7.7							−128.35		10.92	33 24.22
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− .2
												8.35	31 15.87
	α_1												−3.23
										31 29.11			31 12.64
↓	32 47	3.4	9.0	34 46.0	55.3	3.1	6.9	10.8	14.9	3310	662.0	10.81	3539
	31 54.7	49 ~~59.0~~ 58.1	8.9							−128.36		10.80	34 6640
	κ												−128.72
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− .2
												8.36	32 47.04
	α_2												−3.23
										33 0.31			32 43.81
↓	33 44	16.7	8.7	35 43.5	52.6	0.4	4.1	8.1	11.9	3171	634.2	10.86	3256
	32 52.0	50 11.3	8.7							−128.34		10.85	35 6257
	κ												−128.71
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− .2
												8.34	33 44.23
	α_1												−3.23
										33 57.52 ~~57.26~~			33 40.98
↓	36 19	64.5	8.4	38 17.9	27.6	35.2	39.2	43.3	47.3	1926	385.2	11.05	2747
	35 26.2	50 57.2	8.4							−128.34		11.04	38 27.48
	κ												−128.71
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− .2
												8.34	36 19.14
	α_2												−3.20
										36 32.51			36 15.54

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	135	3′ 6.8	7.2	14.0	3′ 7.00	+05	10.51		0′	2′ 56.48	11 57.12
d	+13.4				3 7.00	19 41.35	.04				− 5
	1.12710					50 11 46.62	11.24 −4 +32				+ .37
((δ) − D) $\frac{d'}{100}$	9.80625					+ 10.50	11.52				+ 8.24
	1.02129										+ .30
+1609 δ_1											−25.30
+1 39.85									1 13 20.56		11 47.71 40.71
	123	0 0.3	57.8	120.1	0 00.5	+04	9.58		40	50 39 57.56	35 ~~11~~ ~~3.13~~
d	+12.2				40 0.08	47~~8~~ 48.30	.12				− 4
	1.08636					50 ~~10~~ 53.57	9.45 −12 +16				+ 0
((δ) − D) $\frac{d'}{100}$	9.80641					34 + 9.56	9.49				+ 8.~~24~~ 73
	0.98071										+ .30
+16.14 δ_2											−25.20
+1 39.80									36 26.77		~~10~~ 45.46 34 46.97
	99	4 10.0	9.6	19.6	4 9.90	+03	9.71		10	51 14 2.25	5 ~~11~~ 1.34
d	+9.8				14 9.90	8 38.55	.16				− 3
	0.99123 ✓					51 0 48.82	6.93 −11 + 62				+ .26
((δ) − D) $\frac{d'}{100}$	9.79892					+ 7.55	7.55				+ 9.16
	0.87789										+ .40
+16.27 δ_1											− 25.10
+1 39.65									2 ~~57~~ 15.41		0 ~~1~~6.06
	127	3 3.1	1.2	4.3	3 2.15	+05	9.89		55	50 58 7.80	3 17 1.41
d	+12.7				58 2.15	24 46.20	.06				− 5
	1.10380					50 16 51.47	9.45 −6 + 56				+ .36
((δ) − D) $\frac{d'}{100}$	9.80550					+ 9.94	9.95				+ 8.38
	0.99724										+ .35
+16.31 δ_2											−24.80
+1 39.55									18 25.1		16 45.65
	148	2 9.8	9.8	19.6	2 9.80	+06	11.52		5	50 6 58.17	7 55.41
d	+14.8				7 9.80	15 38.55	.03				− 6
	1.17026					50 4 43.82	11.02 −3 + 64				+ .26
((δ) − D) $\frac{d'}{100}$	9.80686					+ 11.62	11.63				+ 8.31
	1.06506										+ .30
+1636 δ_1											−24.80
+1 39.50									9 18.8		7 39.35
29.76	154	1 14.3	12.2	26.5	1 13.25	+02	11.99		15	49 16 1.04	58 52.57
d	+15.5				16 13.25	6 35.10	.00				− 6
	1.19033					49 58 40.37	11.80 +1 +40				+ .14
((δ) − D) $\frac{d'}{100}$	9.80822					+ 12.20	12.21				+ 8.07
	1.08649										+ .30
+1640 δ_2											−24.80
+1 39.40									0 15.6		58 36.22
	102	1 34.5	33.2	68.7	1 33.85	+03	7.34		40	50 41 25.91	33 27.71
d	+10.2				41 33.85	41 14.50	.04				− 3
	1.00860					50 33 19.77	7.87 −9 + 16				+ .19
((δ) − D) $\frac{d'}{100}$	9.80305					+ 7.94	7.94				+ 8.67
	0.89959										+ .35
+1647 δ_1											−24.80
+1 39.35									34 51.44		33 12.09
	159	1 47.3	47.2	94.5	1 47.25	+06	11.91		10	50 11 35.15	3 18.48
d	+15.4				11 47.25	11 1.10	.01				− ~~6~~
	1.18752					50 3 6.37	11.80 −2 +32				+ .22
((δ) − D) $\frac{d'}{100}$	9.80762					+ 12.11	12.10				+ 8.13
	1.08308										+ .30
+1650 δ_2											−24.60
+1 39.25									4 41.72		3 2.47
	91	3 26.3	25.0	51.3	3 25.65	+03	7.09		~~45~~ 55	50 ~~26~~ 4 18.52	16 ~~26~~ 35.07
d	+9.1				58 25.65	~~32~~ 22.40	.04				− 2
	0.95904					50 ~~26~~ 26.97	7.08 −3 + 8				+ 41
((δ) − D) $\frac{d'}{100}$	9.80412					+ 7.10	7.13				+ 8.53
	0.85110										+ .35
+1654 δ_1											−24.60
+1 39.15									17 ~~57~~ 58.89		~~26~~ 19.74 16
	97	0 43.2	42.0	85.2	4 42.60	+03	7.55		10	51 10 35.22	4 18.41
d	+9.6				10 42.60	12 5.75	.12				− 3
	0.98227					51 4 11.02	6.93 −1 + 46				+ 8
((δ) − D) $\frac{d'}{100}$	9.79825					+ 7.39	7.38				+ 9.23
	0.86846										+ .40
+1667											− 24.80
+1 39.00 δ_2									5 42.59		4 3.59

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50° to 51°

Date$_1$ = 1870 Nov 17 Observer W. A. R. Recorder A. M.

Date$_2$ = Observer Recorder

Run

Star. α	50° δ 51°	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
0h 37m 10s	14.0	9.5	39	10.6	19.8	27.3	31.6	35.3	34.3	15.23	3066	10.85	m 1.981 s
36 17.0	50 8.7	9.4							−128.35		10.84	8.9 1.982
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .38
												− 2
a_1											−2 8.35	37 11.47
									37 24.85			−3.28
												37 8.19
39 1	57.1	9.1	40	57.5	9.7	17.9	21.3	25.4	24.4	10.37	2074	10.99	9.75
38 8.0	50 45.8	9.0							−128.34		10.99	41 4.76
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												− 2
a_2											8.34	39 1.41
									39 14.84			−3.32
												38 58.09
40 42	44.5	8.0	42	39.1	50.1	57.8	1.8	5.7	9.7	3051	6102	10.96	50.06
39 48.7	50 39.2	7.5							−128.34		10.96	42 50.06
double κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												− 2
a_1											8.34	40 41.72
									40 55.21			−3.32
												40 38.40
			42	42.7	50.2	57.8	1.8	5.8	9.7	3053	6106	10.96	50.10
									−128.34		10.96	42 50.10
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												− 2
a_2											8.34	40 41.76
									40 55.25			−3.32
												40 38.44
42 44	30.3	9.0	44	43.0	52.8	0.6	4.6	8.6	12.5	3191	6382	10.91	52.91
41 50.1	50 25.0	8.9							−128.34		10.90	44 52.92
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												2
a_1											8.34	42 44.58
												−3.33
									42 58.11			42 41.25
44 19	29.7	8.5	46	16.6	28.0	35.9	39.7	43.7	47.7	1950	3900	10.91	28.09
43 25.1	50 24.4	8.3							−128.34		10.90	46 28.10
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												2
a_2											8.34	44 19.76
									44 33.33			−3.33
												44 16.41
51 27	−0.5	9.5	53	20.0	35.0	42.9	46.7	50.5	54.5	2296	4592	1080	35.12
50 32.0	49 54.2	9.2							−128.35		10.79	53 35.13
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .38
												− 2
a_1											8.35	51 26.78
									51 40.51			−3.40
												51 23.38
52 52	54.6	8.4	54	46.9	2.0	10.0	14.0	17.8	21.9	6571	13142	11.01	2.13
51 57.7	50 47.3	8.4							−128.34		11.00	55 2.14
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .39
												− 2
a_2											8.34	52 53.80
									53 7.59			−3.45
												52 50.35
54 20	20.5	8.8	56	15.7	28.1	36.0	39.7	43.7	47.6	1951	3902	10.88	27.74
53 24.5	50 18.6	8.3							−128.35		10.87	56 28.15
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .38
												− 2
a_1											8.35	54 19.80
									54 33.61			−3.44
												54 16.36
54 59	20.5	7.8	56	54.7	57.3	5.1	8.9	12.8	16.7	3408	6816	10.88	54.26
53 54.2	50 15.2	6.9							−128.35		10.87	56 54.39
κ												−128.71
((δ) − D) $\frac{\kappa'}{100}$												+ .38
												− 2
a_2											8.35	54 48.94
									55 2.77			−3.44
												54 45.50

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	9.2 +9.2	1 40.5	39.6	793	1 39.65	+02	7.16		6	1′ 32.241	13 2118
d	0.96379				1 39.45	21 8.70	.04			50	− 3
$((\delta) - D)\frac{d'}{100}$	9.80610					50 13 13.99	7.08-3+16				+ 20
	0.85803					+ 7.21	7.21				+ 8.32
+1666 δ_1											+ 30
+138.95											− 24.40
									14′ 44.52″		13 5.57
	10.2 +10.2	4 55.2	54.0	1092	4 54.60	+03	7.14		20	50	50 6.91
d	1.00860				24 54.60	57 53.75	.14			24′ 46.71	− 3 +9.93
$((\delta) - D)\frac{d'}{100}$	9.80043					50 49 59.02	7.87-14+16				+ 59
	0.89697					+ 7.89	7.89				+ 8.97
+16.75 δ_2											+ 40
+138.80											− 24.30
									5′ 31.34		49 52.54
	11.0 +11.0	0 43.5	43.6	871	0 43.55	+03	8.56		30	50	44 18.59
d	1.04139				30 43.55	52 4.80	.13			30′ 35.02	− 3 +9.27
$((\delta) - D)\frac{d'}{100}$	9.80136					50 44 10.07	8.66-13				+ 8
	0.93069					+ 8.52	8.53				+ 8.87
+1681 δ_1											+ 35
+138.65											− 24.20
									45′ 42.31		44 3.66
	9.5 +9.4	0 43.5	43.6	871	0 43.55	+03			30	50	44 17.35
d	0.99313				30 43.55	52 4.80	7.08-11+31			30′ 36.27	− 3 +9.27
$((\delta) - D)\frac{d'}{100}$	9.80136					50 44 10.07	7.28				+ 8
	0.86243					+ 7.28					+ 8.89
+16.81 δ_2											+ 35
+138.65											− 24.20
									45′ 41.07		44 2.42
	9.8 +9.9	4 26.7	26.1	528	4 26.40	+03	7.63		40	50	30 34.93
d	0.99564				44 26.40	38 21.95	.08			44′ 18.70	− 3 +9.47
$((\delta) - D)\frac{d'}{100}$	9.80351					50 30 27.22	7.08-8+70				+ 53
	0.88709					+ 7.71	7.70				+ 8.62
+16.86 δ_1											+ 35
+138.50											− 24.10
									31′ 58.8		30 20.30
	11.4 +11.5	0 16.0	16.3	343	0 17.15	+03	8.88		45	50	29 45.43
d	1.06070				45 17.15	37 31.20	.09			45′ 8.18	− 4 +9.16
$((\delta) - D)\frac{d'}{100}$	9.80351					50 29 38.47	8.66-9+40				+ 4
	0.95215					+ 8.96	8.97				+ 8.81
+16.92 δ_2											+ 35
+138.40											− 24.10
									31′ 8.9		29 30.49
	15.0 +15.1					+02	11.68 .00				
d	1.17898						11.80+8				
$((\delta) - D)\frac{d'}{100}$							11.88				
+17.13 δ_1											
+137.75											
									59′ 42.0″		
	15.1 +15.2					+06	11.76 .23				
d	1.18184						11.80-23+16				
$((\delta) - D)\frac{d'}{100}$							11.73				
+17.24 δ_2											
+137.60											
									22′ 21.2″		
	12.4 +12.4					+04	9.65 .07				
d	1.09342						9.45-7+32				
$((\delta) - D)\frac{d'}{100}$							9.70				
+17.25 δ_1											
+137.45											
	2.6 +2.6					+00	2.02 .01				
d	0.41497						1.58-1+48				
$((\delta) - D)\frac{d'}{100}$							2.115				
+17.27 δ_2											
+137.40											

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Date$_1$ = 1870 Nov 17 Observer W.A.R Recorder A.M. Date$_2$ = Observer Recorder Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	m	T
01	56	9	27.7	9.6	58	4.6	17.8	25.3	29.4	33.2	39.1	1448	28.96	10.90	8.06	5
	55	13.9	50	22.4	9.2									10.90	58	406
	κ															128.71
	$((\delta) - D)\frac{\kappa'}{100}$							Reject.						-2 8.84		+ 39
	α_1															− 2
											56	23.58			56	9.72
																3.46
															56	6.26
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_2															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_1															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_2															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_1															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_2															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_1															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_2															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_1															
	κ															
	$((\delta) - D)\frac{\kappa'}{100}$															
	α_2															

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	s.										
d	+13.5 4.13033						10.24 - 11 + 40 10.53				
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Nov 19 Observer W. A. R. Date$_2$ = Observer
n = +.32 c = .00 Recorder W. A. R. Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
2 L	38 30	16.7	8.5	41 34.2	45.0	52.8	56.7	0.5	4.5	2795	5590	1 08	45 04
	38 30.25	16.7	7.8							−128.58		10.85	41 05
													41 −128.94
													+ .38
													− .2
												−2 8.58	39 36.47
										39 52.78			− 4.23
													39 32.24
	43 19	26.0	8.4	46 18.3	28.7	36.5	40.1	44.0	48.2	1975	3950	10 89	28.61
	43 13.9	26.0	8.1							−128.56		10.89	46 28.61
													−128.93
													+ .37
													− .2
												8.56	44 20.05
										44 36.49			− 4.25
													44 15.80
	45 22	28.7	8.2	48 33.0	37.2	45.0	49.0	52.8	56.8	2408	4816	10 91	37.25
	45 22.7	28.7	8.0							−128.56		10.90	48 37.26
													−128.93
													+ .37
													− .2
												8.56	46 28.70
										46 45.19			− 4.27
													46 24.43
	49 31	47.6	8.8	52 44.0	47.7	53.3	57.3	3.3	7.2	2928	5856	10 98	47.58
	49 31.6	47.6	8.9							−128.56		10.98	52 47.58
													−128.93
													+ .39
													− .2
												8.56	50 39.02
										50 55.66			− 4.29
													50 34.73
	53 44	22.9	8.6	56 51.2	0.9	8.5	12.3	16.2	20.2	581	1162	10 88	0.74
	53 44.1	22.9	8.7							−128.53		10.88	57 0.74
													−128.92
													+ .39
													− .2
												8.55	54 52.19
										55 8.83			− 4.31
													54 47.88
	58 10	35.8	9.3	3 18.2	26.4	34.1	38.3	42.2	46.0	1870	3740	10 93	26.47
	58 10.8	35.8	7.0							−128.55		10.93	31 26.47
													−128.92
													+ .39
													− .2
												8.55	29 54 17.92
										59 34.70			− 4.33
													29 13.59
3 L	20 39	1.2	7.5	23 48.5	56.7	4.3	8.3	12.0	16.0	3373	6746	10 79	56.67
	20 39.9	1.2	7.0							−128.55		10.79	23 56.67
													−128.91
													+ .38
													− .2
												8.55	21 48.12
										22 5.23			− 4.41
													21 43.71
	23 38	5.2	9.2	26 42.0	56.3	3.8	7.8	11.7	15.6	3852	7704	10 81	56.23
	23 38.7	5.2	9.0							−128.55		10.81	26 56.23
													−128.91
													+ .38
													− .2
												8.55	24 47.68
										25 4.86			− 4.42
													24 43.26
	30 50	20.7	7.9	34 0.0	8.0	15.9	19.8	23.5	27.5	947	1894	10 87	8.06
	30 50.8	20.7	7.8							−128.53		10.87	34 8.07
													−128.90
													+ .39
													− .2
												8.53	31 59.54
										32 16.93			− 4.44
													31 55.10
	34 4	4.7	7.6	38 11.2	22.7	30.4	34.3	38.1	42.1	1676	3352	10 87	22.71
	34 4.4	4.7	7.3							−128.53		10.87	38 22.71
													−128.90
													+ .39
													− .2
												8.53	36 14.18
										35 31.58			− 4.44
													36 9.74

((δ) — D) $\frac{\kappa'}{100}$

a_1

a_2

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	108	3 56.3	57.6	1079	3 53.95	+03	8.41		50		21 9.54
	+10.8				52 52.45	28 54.40	05			53' 45.48	− 3 +9.18
d	1.03342					50 21 1.10	7.87-4+64				+ 47
	9.80489					+8.44	8.47				+ 839
((δ) − D) $\frac{d'}{100}$	0.92625										+ .35
											− 14.70
+20.54 δ_1											21 4.02
+1 16.85											
	104	0 15.6	12.2	268	0 13.40	+03	8.10		45		29 48.67
	+10.3		3.		45 18.40	37 34.95	07			45 5.38	− 3 +8.89
d	1.01264				4	50 29 48.65	7.87-7+24				+ 2
	9.80351					+8.02	8.04				+ 8.55
((δ) − D) $\frac{d'}{100}$	0.90429										+ .35
											− 14.30
+20.69 δ_2											29 43.26
+1 15.50											
	42	X/2 7.2	4.0	112	1 5.60	00	3.27		40		33/2 52.79
	+4.3				4 × 5.60	4X0 42.75	03			41 2.23	− .1 +9.07
d	0.63347				2	50 33.2 49.45	3.16-3+24				+ .13
	9.80290					+3.34	3.37				+ 8.60
((δ) − D) $\frac{d'}{100}$	0.52431										+ .35
											− 14.20
+20.76 δ_1											33/2 47.66
+1 14.90					40.45						51
	97	3 42.4	11.0	839	3 4.95	00	2.88		40		31 15.03 17.38
	+3.6		38.0		41.95	59.34 6.40	05		20	43 39.15	− 1 +9.35
d	0.55630				23 40.45	50 31 46.80	2.37-3+46				+ 44
	9.80336 027					51 + 2.80	2.80				+ 8.57 93
((δ) − D) $\frac{d'}{100}$	0.44760					51 14.60 78					+ .35
	451										− 13.60 70
+20.93 δ_2											31 11.65 51 13.39
+1 13.65									52 27.0		11 13.15
	97	3 12.0	11.0	230	3 11.50	+03	7.55		45		26 50.96
	+9.5				48 11.50	34 36.85	06			48 4.07	− 3 +9.18
d	0.97772					50 26 43.55	7.08-5+40				+ 38
	9.80397					+ 1.41	7.43				+ 8.48
((δ) − D) $\frac{d'}{100}$	0.86963										+ .35
											− 13.20
+20.95 δ_1											26 46.94
+1 12.40									27 5.93		
	82	0 10.6	6.6	172	0 8.60	+02	6.38		35		39 52.89
	+8.3				35 8.60	47 39.75	07			35 2.14	− 2 +9.05
d	0.91908					50 39 46.45	6.30-8+24				+ 1
	9.80197					+ 6.44	6.46				+ 8.71
((δ) − D) $\frac{d'}{100}$	0.80899										+ .35
											− 12.80
+21.11 δ_2											39 49.14
+1 11.05									41 0.2		
	82	3 3.0	1.3	43	8 2.15	+02	6.38		10		1 59.35
	+8.2				13 3.15	19 46.20	00			12 55.69	− 2 +8.69
d	0.91381					50 1 52.90	6.30+0+16				+ 36
	9.80777					+ 6.45	6.46				+ 805
((δ) − D) $\frac{d'}{100}$	0.80952										+ .30
											− 10.40
+21.52 δ_1											1 58.64 57.64
+1 3.75									3 1.4		
	143	1 39.6	36.7	763	1 38.15	+05	11.13		5		8 28.12
	+14.2				6 38.15	16 70.20	02			6 26.99	− 5 +8.60
d	1.15534					50 8 16.90	11.02-2+16				+ 19
	9.80686					+ 11.22	11.16				+ 8.16
((δ) − D) $\frac{d'}{100}$	1.05014										+ .30
											− 10.00
+21.60 δ_2											8 26.72
+1 2.75									9 29.5		
	80	1 17.7	15.6	333	1 16.65	+02	6.23		50		23 44.72
	+8.1				51 16.65	31 31.70	04			51 10.31	− 2 +8.92
d	0.90849					50 23 38.40	6.30-4+8				+ 16
	9.80443					+ 6.32	6.34				+ 8.43
((δ) − D) $\frac{d'}{100}$	0.80086										+ .35
											− 9.30
+21.83 δ_1											23 44.34
+1 0.25									24 44.6		
	115	2 23.5 20.2		437	2 21.85	+02	8.95		5		7 42.23
	+11.5				7 21.85	15 26.50	02			7 12.80	− 4 +8.68
d	1.06070					50 7 33.20	8.66-1+40				+ 28
	9.80686					+ 9.03	9.05				+ 8.14
((δ) − D) $\frac{d'}{100}$	0.95550										+ .30
											− 8.80
+21.84 δ_2											7 43.11 42.11
+59.10									8 41.2		

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Date$_1$ = 1870 Nov 19 Observer W. A. R. Recorder — Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
32	37 39	16.7	6.5	40	49.1	57.0	4.7	8.5	12.4	16.4	3390	6780	10 86	56 94
	37 39.5	50 16.7	6.0							−128.54		23.88	40 56.95
	κ												−128.90
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− 2
	a_1											−2	8.54
													38 48.41
										39	5.89		− 4.46
													38 43.95
	40 25	54.5	9.2	40	30.8	46.7	54.5	58.4	2.4	6.3	2883	5766	11 03	47 05
	40 25.3	50 54.5	9.0							−128.53		14.00	43 46.66
	κ												−128.90
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_2											8.53	41 38.13
													− 4.48
										41	55.80		41 33.65
	44 3	−5.2	8.4	47	12.6	22.7	30.3	34.2	38.0	41.8	1670	3340	10 78	22 62
	44 3.3	49 54.8	8.5							−128.53		11.77	47 22.63
	κ												−128.90
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_1											8.53	45 14.10
													− 4.49
										45	31.60		45 09.61
	46 32	25.9	9.2	49	40.5	52.8	0.6	4.6	8.4	12.2	3186	6372	10 89	52 83
	46 32.6	50 25.9	9.0							−128.52		10.89	49 02.83
	κ												−128.89
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_2											8.52	47 44.31
													− 4.48
										48	1.48		47 39.83
	49 2.4	28.5	9.4	52	16.5	23.2	31.0	34.9	38.8	42.7	1706	3412	10 90	23 22
	49 2.4	50 28.5	9.3							−128.52		10.90	52 23.22
	κ												−128.89
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_1											8.52	50 14.70
													− 4.49
										50	32.42		50 10.21
	52 20	11.8	8.5	55	27.8	40.3	48.0	51.8	56.0	59.8	2569	5138	10 84	40 84
	52 20.7	50 11.8	8.6							−128.53		10.83	53 40.35
	κ												−128.89
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− 2
	a_2											8.53	53 31.82
													− 4.49
										53	49.53		53 27.33
	54 47	21.5	8.6	57	55.3	7.0	14.8	18.7	22.4	26.3	892	1784	10 88	6 96
	54 47.2	50 21.5	8.6							−128.53		10.87	8 6.97
	κ												−128.89
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− 2
	a_1											8.53	55 58.44
													− 4.50
										56	16.23		55 53.94
4	0 12	−4.6	8.4	3	20.3	32.2	40.0	43.8	47.5	51.4	2149	4298	10 78	32 20
	0 12.2	49 55.4	8.6							−128.52		10.77	3 32.21
	κ												−128.88
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− 2
	a_2											8.52	1 23.69
													− 4.49
										1	41.48		1 19.20
	3 2	6.1	8.1	6	11.7	22.9	30.5	34.6	38.3	42.1	1684	3368	10 82	28 86
	3 2.9	50 6.1	8.0							−128.52		10.81	6 32.87
	κ												−128.88
	((δ) − D) $\frac{\kappa'}{100}$												+ .38
													− 2
	a_1											8.52	4 14.35
													− 4.50
										4	32.22		4 9.85
	5 25	22.1	8.8	8	30.7	45.3	53.1	56.8	0.8	4.8	2808	5616	10 88	45 28
	5 24.9	50 22.1	9.1							−128.51		10.87	8 45.28
	κ												−128.88
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_2											8.51	6 36.78
													− 4.51
										6	54.74		6 32.27

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	5 / 75	0 / 11.9	8.4	20.3	0 / 10.15	02	6.15		53		
	+78				55 10.15	27 38.20	.03			55′ 50 4.02	19 51.00
d	0.89209					50 19 44.90	5.52 − 3 + 64				− 2 +8.71
	9.80504					+ 6.10	−6.13				+ 2
((δ) − D) $\frac{d'}{100}$	0.78507										+ 8.36
											+ .35
											− 8.50
+21.94 δ_1											19 51.21
+57.80									20	49.0″	
	159	2 31.3	27.4	58.7	2 29.35	07	12.38		15		57 37.94
	+15.9				17 29.35	5 19.00	.19			17 17.09	− 7 +9.67
d	1.20140					50 57 25.70	11.80 − 23 + 69				+ .30
	9.79934					+ 12.24	−12.26				+ 9.04
((δ) − D) $\frac{d'}{100}$	1.08778										+ .40
											− 8.20
+22.15 δ_2											57 39.41
+56.85									58	36.3	
	101	2 38.5	36.3	74.8	2 37.40	+03	7.86		13		57 25.53
	+10.0				17 37.40	5 10.95	.01			17 29.51	− 3 +9.72
d	1.07000					49 57 17.65	7.87 + 2				+ 31
	9.80852					+ 7.88	−7.89				+ 9.04
((δ) − D) $\frac{d'}{100}$	0.89646										+ .40
											− 7.80
+21.99 δ_1											57 27.45
+55.55									58	22.0	
	123	1 36.0	33.9	69.9	1 34.95	+07	9.58		45		28 29.69
	+12.3				46	36 13.40	.04			46 25.35	− 4 +9.03
d	1.08991					50 28 20.10	9.45 − 9 + 24				+ .19
	9.80582					+ 9.54	−9.60				+ 8.53
((δ) − D) $\frac{d'}{100}$	0.98167										+ .35
											− 7.50
+22.15 δ_2											28 31.22
+54.60									19	2.58	
	67	3 55.5	50.0	109.1	3 54.55	+02	5.22		40.		31 57.2 7.52
	+6.7				43 52.75	38 53.30	.05			43 49.32	− 2 +9.37
d	0.82607					50 31 33.80	4.73 − 5 + 55				+ 47
	9.80336					+ 3.22	−3.23				+ 8.57
((δ) − D) $\frac{d'}{100}$	0.71737										+ .35
											− 7.30
+2221 δ_1											31 77.9 9.59
+53.70									32	8.3 7.5	
	125	0 50.0	42.1	97.1	0 48.55	+04	9.73		0		14 16.29
	+12.5				0 48.55	21 59.80	.04			0 38.74	− 4 +8.61
d	1.09691					50 14 6.50	9.45 − 4 + 40				+ .10
	9.80595					+ 9.79	−9.81				+ 8.25
((δ) − D) $\frac{d'}{100}$	0.99080										+ .30
											− 6.90
+2220 δ_2											14 18.00
+52.45									15	10.4	
	117	1 5.1	2.7	7.8	1 3.90	+04	9.11		50		24 02.28
	+~~11.7~~ 11.7				51 3.40	31 44.45	.03			50 54.76	− 4 +8.89
d	1.06819					50 23 51.15	8.66 − 7 + 55				+ .13
	9.80443					+ 9.13	−9.14				+ 8.45
((δ) − D) $\frac{d'}{100}$	0.96056										+ .35
											− 6.60
+2229 δ_1											24 2.57
+51.55									24	54.1	
	119	2 20.7	17.9	38.8	2 19.40	+04	9.27		~~13.9~~ 15		57 45.02
	+11.9				17 19.40	5 28.95	.02			17 10.01	− 4 +8.51
d	1.07555					49 57 35.65	8.66 + 1 + 72				+ .28
	9.80837					+ 9.37	−9.39				+ 7.97
((δ) − D) $\frac{d'}{100}$	0.97186										+ .30
											− 6.20
+2228 δ_2											57 47.33
+49.50									58	36.8	
	112	1 39.3	36.1	75.4	1 37.70	+03	8.72		5		8 26.14
	+11.2				6 37.70	16 10.65	.02			6 28.90	− 3 +8.61
d	1.04922					50 8 17.35	8.66 − 2 + 16				+ .19
	9.80686					+ 8.79	−8.80				+ 8.15
((δ) − D) $\frac{d'}{100}$	0.94402										+ .30
											− 5.80
+2237 δ_1											8 30.75 28.95
+48.40									9	17.3	
	146	0 48.3	48.0	96.3	0 48.15	+06	11.38		50		24 18.30
	+14.6				50 48.15	1 32 02.0	.08			50 36.75	− 6 +8.84
d	1.16435					50 24 6.90	11.02 − 9 + 47				+ .10
	9.82443					+ 11.40	−11.40				+ 8.45
((δ) − D) $\frac{d'}{100}$	1.05672										+ .35
											− 5.50
+22.47 δ_2											24 21.64
+47.50									25	9.1	

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Date$_1$ = 1870 Nov. 27. Observer W. A. R. Recorder A. M.
n = +.27 C = .02 50° Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	4h 59s	46.9	8.8	6m 55.5s	7.0s	14.9	18.9	22.7	26.8	903	1806	10.98	7.08
↓ 4	16.5	50 41.8	8.7							−128.04		10.97	7 7.09
κ													−128.35
((δ) − D) $\frac{\kappa'}{100}$													+ .33
a_1													− .2
												−2 8.04	4 59.05
										5m 10.5s			−1.96
													4 59.09
7	39	49.2	9.2	9	46.7	54.3	58.5	2.3	6.2	2880	5760	10.98	47.02
↓ 6	55.8	50 44.1	9.3							−128.04		10.98	9 46.02
κ													−128.35
((δ) − D) $\frac{\kappa'}{100}$													+ .33
a_2													− .2
												8.04	7 38.58
													−2.00
										7 50.08			7 36.58
8	38	48.3	8.7	10	46.1	53.9	57.9	1.7	5.7	2853	5706	10.98	46.08
↓ 7	55.2	50 43.2	8.7							−128.04		10.98	10 46.08
κ													−128.35
((δ) − D) $\frac{\kappa'}{100}$													+ .33
a_1													− .2
												8.04	8 38.04
													−2.01
										8 49.53			8 36.03
10	7	8.9	9.5	12	2.4	15.0	23.0	26.6	30.4	34.3	1293	2586	10.82	15.03
↓ 9	24.0	50 3.8	9.0								−128.04		10.82	12 15.04
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .32
a_2														− .2
												8.05	10 6.99
													−2.03
										10 18.59			10 4.96
11	29	7.4	7.8	13	24.6	37.0	44.7	48.3	52.3	56.1	2384	4768	10.82	36.80
↓ 10	46.9	50 2.2	8.0								−128.05		10.82	13 36.86
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .32
a_1														− .2
												8.05	11 28.81
													−2.04
										11 40.45			11 26.77
12	50	40.4	9.0	14	42.7	57.9	5.8	9.7	13.7	17.6	3447	6894	10.95	57.99
↓ 12	6.7	50 35.3	9.0								−128.04		10.94	14 57.00
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .33
a_2														− .2
												8.04	12 49.96
													−2.07
										13 1.59			12 47.89
14	34	47.6	9.0	16	33.2	46.0	54.0	57.8	1.7	5.8	2853	5706	10.98	46.08
↓ 13	53.8	50 42.4	9.0								−128.04		10.98	16 46.08
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .33
a_1														− .2
												8.04	14 38.04
													−2.09
										14 49.70			14 35.95
15	43	34.7	8.0	17	37.8	51.0	59.0	2.9	6.8	10.7	3104	6208	10.93	51.13
↓ 14	59.4	50 29.4	8.0								−128.04		10.92	17 51.16
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .33
a_2														− .2
												8.04	15 43.12
													−2.10
										15 54.82			15 41.02
17	20	10.9	8.9	19	13.1	27.7	35.3	39.0	43.0	47.0	1920	3840	10.84	27.36
↓ 16	35.7	50 3.6	9.1								−128.05		10.83	19 27.87
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .32
a_1														− .2
												8.05	17 19.52
													−2.12
										17 31.28			17 17.40
19	1	17.3	8.9	21	57.5	8.6	16.1	20.1	23.9	27.8	965	1930	10.86	8.44
↓ 18	16.6	50 12.0	9.0		doubt						−128.05		10.85	21 8.45
κ														−128.35
((δ) − D) $\frac{\kappa'}{100}$														+ .32
a_2														− .2
												8.05	20 0.40
													−2.15
										19 12.18			19 58.25

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Nov. 27 -j Reg.m 5540 R. Reg.h +.09

47.

Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ'
	115	3	11.9	6.1	180	3 90	+03	8.95	25	50	46 52.93
	+11.6				28 9.00	54 39 35	.15		28'	0".42	− 4 + 9.21
d	1.06446					50.46 4395	8.66-14+46				+ .28
	9.80089					+ 8.98	8.98				+ 8.57
((δ) − D) $\frac{d'}{100}$	0.95329										+ 40
											−28.80
+13.42 δ_1											46 33.34
+1 37.40									1	"	
									48	10.7	
	132	0	11.3	6.2	175	0 875	+05	10.28	25	50	49 54.33
	+13.1				25 8.75	57 39 60	.12		24	58.61	− 5 + 8.98
d	1.11727					50 49 4420	10.24-18+8				+ 1
	9.80043					+1013	10.14				+ 8.62
((δ) − D) $\frac{d'}{100}$	1.00564										+ 40
											−28.80
+13.50 δ_2											49 34.51
+1 37.70									51	12.2	
	135	1	19.1	15.0	34.1	1 1705	+05	10.51	25	50	48 46.34
	+13.5				26 17.05	56 31 30	.18		26	6.60	− 5 + 9.07
d	1.13033					50 48 3590	11.24-18+39				+ .12
	9.80058					+1044	10.45				+ 8.60
((δ) − D) $\frac{d'}{100}$	1.01885										+ 40
											−28.70
+13.50 δ_1											48 26.71
+1 37.80									50	4.5	
	126	1	16.5	9.0	25.5	1 1775	+05	9.81	5	50	8 50.09
	+12.3				6 12.75	16 35.60	.03		6	2.55	− 5 + 8.26
d	1.10037					50 8 40.20	9.45-3+18				+ .11
	9.80671					+989	9.91				+ 7.90
((δ) − D) $\frac{d'}{100}$	0.99502										+ 30
											−28.60
+13.63 δ_2											8 29.75
+1 37.90									10	7.6	
	124	2	42.4	37.7	80.1	2 4005	+04	9.65	5	50	7 22.56
	+12.3				40.05	15 8.30	.02		7	20.39	− 4 + 8.39
d	1.08991					50 7 1290	9.45-3+24				+ .24
	9.80701					+966	9.66				+ 7.89
((δ) − D) $\frac{d'}{100}$	0.98486										+ 30
											−28.60
+13.68 δ_1											7 2.35
+1 38.05									8	40.4	
	152	4	32.3	28.0	60.3	4 3015	+06	11.63	30	50	40 34.67
	+12.5				84 30.15	48 18.20	.16		34	18.28	− 6 + 9.17
d	+15.13					50 40 2280	11.80-17+24				+ 41
	1.18469					+1187	11.87				+ 8.47
((δ) − D) $\frac{d'}{100}$	9.80197										+ 35
	1.07460										−28.70
+13.70 δ_2											40 15.14
+1 38.15									41	53.3	
	128	2	19.6	15.1	84.7	2 1735	+05	9.97	25	50	47 45.58
	+19.8 12.9				27 17.35	55 31.00	.12		27	7.37	− 5 + 9.15
d	1.11059					50 47 3560	9.45-16+69				+ .21
	9.80074					+998	9.98				+ 8.59
((δ) − D) $\frac{d'}{100}$	0.99927										+ 40
											−28.70
+13.75 δ_1											47 26.03
+1 38.35									49	4.4	50
	132	0	27.2	21.9	49.1	0 2455	+05	10.28	40		34 38.82
	+13.4				40 24.55	42 23.80	.13		40	14.13	− 5 + 8.70
d	1.12710					50 34 2840	10.24-13+31				+ 4
	9.80290					+1042	10.42				+ 8.36
((δ) − D) $\frac{d'}{100}$	1.01794										+ 35
											−28.70
+13.80 δ_2											34 18.82
+1 38.40									35	57.2	
	146	4	29.1	25.0	54.1	4 2705	+06	11.36	0	50	10 37.27
	+14.5				4 27.05	18 21.30	.04		4	15.07	− 6 + 8.60
d	1.16137					50 10 2590	11.02-4+40				+ 41
	9.80656					+1042	11.38				+ 7.95
((δ) − D) $\frac{d'}{100}$	1.05587					11.37					+ 30
											−28.60
+13.88 δ_1											10 17.27
+1 38.55									11	55.8	
	161	2	42.8	40.3	83.1	2 4405	+07	12.57	55	50	17 21.42
	+16.0				87 44.05	25 4.30	−.02		57	31.54	− 7 + 8.59
d	1.20412					50 17 8990	12.57-8				+ 24
	9.80550					+1252	12.57				+ 8.07
((δ) − D) $\frac{d'}{100}$	1.09756										+ 25
											−28.50
+13.93 δ_2											17 1.51
+1 38.70									18	40.2	

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Date$_1$ = 1870 Nov 27 — Observer W.A.R. — Recorder A.M. — Date$_2$ = — Observer — Recorder — Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	20 49	−1.3	9.0	22 41.7	57.0	4.7	8.5	12.2	16.1	8385	6770	10.79	56.01
1	20 4.4	49 56.0								−128.05		10.79	22 56.91
	κ												−128.35
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.05	20 48.86
	α_1									21 0.69			− 2.17
													20 46.69
22	28	21.8	8.8	24 19.2	36.0	43.9	47.8	51.7	55.7	2351	4702	10.87	3614
1	21 43.8	50 16.5	8.8							−128.04		10.87	24 3615
	κ												−128.34
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.04	22 28.11
	α_2									22 39.96			− 2.19
													22 25.92
23	47	3.7	8.1	25 39.3	54.9	2.3	6.3	10.1	14.1	3277	6554	10.80	5473
1	23 25	49 58.4								−128.04		10.80	25 5474
	κ												−128.34
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.04	23 46.70
	α_1									23 58.60			− 2.20
													23 44.50
25	12	4.4	7.9	27 5.7	19.0	26.9	30.7	34.6	38.6	1498	2996	10.81	1815
1	24 26.7	49 59.1								−128.04		10.80	27 19.16
	κ												−128.34
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.04	25 11.12
	α_2									25 23.06			− 2.22
													25 8.90
26	27	17.0	8.0	28 24.6	35.0	42.6	46.4	50.3	54.3	2286	4572	10.86	3486
1	25 41.6	50 11.7	8.4							−128.04		10.85	28 3487
	κ												−128.34
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.04	26 26.83
	α_1									26 38.78			− 2.24
													26 24.59
27	~~5.2~~ 57	34.1	9.5	29 44.8	58.6	6.2	10.2	14.0	18.0	3470	6940	10.93	5847
1	27 ~~4.5~~ 5.3	50 ~~47.0~~ 28.8	9.3							−128.03		10.92	29 5848
	κ												−128.34
													+ .33
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.03	27 50.45
	α_2									28 2.41			− 2.26
													27 48.19
24	31	32.8	6.8	31 24.9	39.2	47.0	51.0	54.7	58.7	2506	5012	10.92	3920
1	28 45.7	50 27.9	7.0							−128.03		10.87	31 39.20
	κ												−128.34
													+ .33
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.03	29 31.17
	α_1									29 43.17			− 2.28
													29 28.89
31	10	15.0	8.9	33 2.1	18.2	26.0	29.9	33.7	37.7	1455	2910	10.85	1825
1	30 24.9	50 7.7	8.8							−128.04		10.85	33 18.28
	κ												−128.34
													+ .32
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.04	31 10.21
	α_3									31 22.17			− 2.30
													31 7.91
32	35	48.3	8.8	34 24.6	43.9	51.6	55.6	59.5	3.4	2740	5480	10.98	4382
1	31 49.7	50 43.0	9.0							−128.03		10.58	34 43.82
	κ												−128.34
													+ .33
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.03	32 35.~~70~~
	α_1									32 47.84			− 2.~~37~~
													32 33.46
33	49	49.2	8.9	35 41.9	56.7	4.4	8.3	12.1	16.0	3375	6750	10.98	5657
1	33 3.2	50 45.9								−128.03		10.98	35 56.52
	κ												−128.34
													+ .33
													− 2
	((δ) − D) $\frac{\kappa'}{100}$											8.03	33 48.49
	α_2									34 0.57			− 2.34
													33 ~~46.15~~ 46.15

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	153	3 53.8	48.4	1022	3 51.0	+06	11.91		10	50	1 1381
	+5.2				18 54.10	8 57.25	.00			13′ 39.13	− 6 +8.36
d	1.18184					50 1 1.85	11.80+1 +16				+ .34
((δ) − D) $\frac{d'}{100}$	9.80792					+ 11.96	11.97				+ 7.78
	1.07770										+ .30
+14.00 δ_1											− 28.50
+1 38.80									1 2 32.5		0 53.67
	168	3 37.1	31.6	687	3 34.35	+08	13.06		50	50	21 31.88
	+17.0				53 34.35	29 14.00	.04			21.07	− 8 +8.73
d	1.23045					50 21 18.60	13.38 −10				+ .32
((δ) − D) $\frac{d'}{100}$	9.80489					+ 13.28	−13.28				+ 8.14
	1.12328										+ .35
+14.04 δ_2											−28.50
+1 38.95									22 5.1		21 12.11
	156	1 6.9	1.1	80	1 4.00	+07	12.15		10	50	4 1.05
	+15.4				11 4.00	11 44.35	.02			11 57.90	− 6 +8.19
d	1.18752					50 3 48.95	11.80−2 +32				+ .10
((δ) − D) $\frac{d'}{100}$	9.80746					+ 12.10	−12.10				+ 7.85
	1.08292										+ .30
+14.10 δ_1											− 28.40
+1 39.05									5 19.89		3 40.84
	133	0 36.0	31.1	671	0 38.55	+05	10.36		10	50	4 30.01
	+13.5				10 38.55	12 14.80	.01			11 22.93	− 5 +8.15
d	1.13033					50 4 19.40	10.24−2 +40				+ .5
((δ) − D) $\frac{d'}{100}$	9.80746					+ 10.61	−10.62				+ 7.85
	1.02573										+ .30
+14.16 δ_2											−28.40
+1 39.10									5 48.9		4 9.76
	104	3 9.5	2.9	124	2 6.20	+03	8.10		55	50	16 54.81
	+10.3				58 6.20	24 42.15	.04			57 58.13	− 3 +8.66
d	1.01284					50 16 46.75	7.87 −11 +24				+ .28
((δ) − D) $\frac{d'}{100}$	9.80550					+ 8.06	−8.07				+ 8.06
	0.90628										+ .35
+14.19 δ_1											−28.40
+1 39.30									18 14.3		16 35.07
	198	1 2.8 −2.7	+01	1	00.05	+05	10.74		40	50	34 3.56
	+13.7				41 0.05	41 48.30	.16			40 49.47	− 5 +8.75
d	1.13272					50 33 52.90	10.24−13 +47				+ 9
((δ) − D) $\frac{d'}{100}$	9.80290					+ 10.66	10.58				+ 8.36
	1.02756										+ .35
+14.22 δ_2											−28.40
+1 39.30									35 23.2		33 43.91
	143	2 5.0	0.3	58	2 0.65	+05	11.13		40	50	33 1.43
	+14.3				42 2.65	40 45.70	.13			41 51.52	− 5 +8.82
d	1.15534					50 32 50.30	11.02 −13 +24				+ .18
((δ) − D) $\frac{d'}{100}$	9.80305					+ 11.13	−11.13				+ 8.34
	1.04633										+ .35
+14.28 δ_1											− 28.40
+1 39.40									34 21.2		32 41.85
	161	0 12.1	8.7	188	0 10.40	+07	12.54		0	50	14 55.23
	+16.2				0 10.40	22 38.95	.06			59	− 7 +8.27
d	1.20952					50 14 48.55	12.59−6 +16				+ 2
((δ) − D) $\frac{d'}{100}$	9.80580					+ 12.68	−12.69				+ 8.02
	1.10326										+ .30
+14.36 δ_2											− 28.30
+1 39.50									16 14.7		14 35.20
	173	1 40.8	36.6	774	1 38.70	+05	11.13		25	50	48 25.24
	+14.2				26 38.70	56 9.65	.19			26 27.71	− 5 +9.37
d	1.15229					50 48 14.25	11.02 −19 +16				+ 42
((δ) − D) $\frac{d'}{100}$	9.80074					+ 10.99	−10.99				+ 8.60
	1.04097										+ .30
+14.38 δ_1											− 28.40
+1 39.55									49 45.8		48 6.21
	148	4 35.0	28.8	638	4 31.90	+06	11.52		20	50	50 32.34
	+14.6				24 31.90	58 16.45	.20			24 20.61	− 6 +9.38
d	1.16435					50 50 21.05	11.02 −19 +16				+ .41
((δ) − D) $\frac{d'}{100}$	9.80043					+ 11.29	11.29				+ 8.63
	1.05272										+ .40
+14.42 δ_2											− 28.40
+1 39.60									51 52.9		50 13.32

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Date$_1$ = 1870 Nov 27 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	34 57	58.3	8.3	36	52.7	5.2	13.0	17.0	21.0	24.9	811	1622	110 2
	34 11.7	50 53.0	8.0								−128.03		11.02
	K												37 5.20
													−128.34
													+ .33
													− 2
												−2	8.03
													34 57.17
													− 2.36
	a_1									35	9.27		34 54.81
36	34 42.8		7.2	38	16.7	30.7	38.7	42.4	46.3	50.3	2084	4168	10 96
	35 37.8	50 37.5	7.3								−128.03		10.95
	K												38 30.73
													−128.34
													+ .33
													− 2
													8.03
													36 22.70
													− 2.38
	a_2									36	34.85		36 20.33
38	44 3.6		9.2	40	33.7	52.6	0.2	4.0	7.7	11.9	3144	6368	1081
	37 57.2	49 58.3									−128.03		10.80
	K												40 62.88
													−128.34
													+ .32
													− 2
													8.04
													38 44.84
													− 2.40
	a_1									38	57.06		38 42.44
39	43 2.8		7.9	41	46.7	58.4	6.1	10.0	13.9	18.0	3464	6928	10.81
	39 4.6	49 58.8									−128.04		10.80
	K												41 58.48
													−128.34
													+ .32
													− 2
													8.04
													39 50.44
													− 2.41
	a_2									40	2.69		39 48.03
40	35 31.0		8.0	42	32.9	42.2	50.1	54.0	58.0	2.0	2663	5326	1091
	39 48.5	50 25.7	7.4								−128.03		10.91
	K												42 42.35
													−128.34
													+ .33
													− 2
													8.03
													40 34.32
													− 2.43
	a_1									40	46.57		40 31.89
43	56 54.3		6.5	45	50.7	4.0	11.7	15.6	19.4	23.5	742	1484	1100
	43 9.2	50 49.0	6.8								−128.03		11.00
	K												43 3.84
													−128.34
													+ .33
													− 2
													8.03
													43 55.87
													− 2.47
	a_2									44	8.12		43 53.34
45	0.6 48.4		8.9	47	5.2	13.9	21.8	25.4	29.6	33.6	1243	2486	10 95
	44 18.9	50 43.1	8.4								−128.03		10.88
	K												47 13.88
													−128.34
													+ .33
													− 2
													8.03
													45 5.85
													− 2.49
	a_1									45	18.19		45 3.36
46	44 4.5		9.3	48	36.9	52.0	59.6	3.4	7.2	11.0	3132	6264	10 81
	45 56.8	49 59.2									−128.04		10.80
	K												48 6.784
													−128.34
													+ .32
													− 2
													8.04
													46 43.80
													− 2.49
	a_2									46	56.21		46 41.31
48	49 60.7		8.7	50	42.3	57.5	5.1	9.0	13.0	17.0	3416	6832	11 03
	48 2.1	49 58.4									−128.03		11.02
	K												50 57.30
													−128.34
													+ .33
													− 2
													8.03
													48 49.27
													− 2.54
	a_1									49	1.69		48 46.73
50	7 17.		8.9	51	58.6	14.6	22.3	26.2	30.4	34.0	1275	2550	10 85
	49 18.8	50 41.1	9.0								−128.03		10.85
	K												52 14.65
													−128.34
													+ .33
													− 2
													8.03
													50 6.62
													− 2.55
	a_2									50	19.08		50 4.07

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	1 25	1′53.7	48.0	1017	1′ 5085	+04	9.73		15~	50	58 11.74	
	+12.5				16 5085	5 5750	.19			16′ 41″.20	− 4	+9.31
d	1.69691					50 58 2.10	9.45−19+39				+ .16	
	9.79918					+ 9.64	9.65				+ 8.79	
(δ) − D) $\frac{d'}{100}$	0.98403										+ 1.10	
											− 28.40	
+1446 δ_1									32.4		57 62.65	
+1 39.70									57 42.4			
	140	2 24.1	18.8	429	2 2145	+05	10.90		1′30	50	42 42.35	
	+4.0				32 21.45	50 26.90	.16			32 10.89	− 5	+9.02
d	1.14683					50 42 3150	11.02−15+0				+ .22	
	9.80151					+ 10.85	10.86				+ 8.50	
(δ) − D) $\frac{d'}{100}$	1.03558										+ .35	
											− 28.30	
+1452 δ_2									44 2.8		42 23.07	
+1 39.75												
	189	1 41.7	35.5	774	1 3870	+10	14.72		10	50	3 29.35	
	+19.2				11 3870	11 9.65	.02			11 23.61	− 10	+8.17
d	1.28330					50 3 1425	14.95−2+16				+ .14	
	9.80762					+ 15.10	15.09				+ 7.83	
(δ) − D) $\frac{d'}{100}$	1.17886										+ .30	
											− 28.10	
+1462 δ_1									4 49.3		3 9.42	
+1 39.85												
	117	0 59.0	43.4	929	0 4645	+04	9.11		10	50	4 15.74	
	+11.8				10 46.45	12 1.90	.01			10 37.16	− 4	+8.18
d	1.07188					50 4 6.50	8.66−1+64				+ 7	
	9.80746					+ 9.27	9.29				+ 7.85	
(δ) − D) $\frac{d'}{100}$	0.96728										+ .30	
											− 28.10	
+1466 δ_2									5 35.8		3 55.85	
+1 39.90												
	93	4 12.5	12.8	805	4 1525	+03	7.24		40	50	30 9502	
	+9.4				44 15.25	38 33.10	.01			44 7.94	− 2	+9.01
d	0.97313					50 30 3770	7.08−8+31				+ .39	
	9.80336					+ 7.32	7.31				+ 8.29	
(δ) − D) $\frac{d'}{100}$	0.86443										+ .35	
											− 28.10	
+1468 δ_1									32 5.8		30 25.93	
+1 39.90												
	131	0 48.0	41.8	898	0 4490	+05	10.20		20	50	54 18.01	
	+12.9				20 44.90	2 345	.19			20 34.94	− 5	+9.12
d	1.11059					50 54 805	9.45−18+69				+ 6	
	9.79981					+ 9.96	9.96				+ 8.71	
(δ) − D) $\frac{d'}{100}$	0.99834										+ .40	
											− 28.10	
+1478 δ_2									55 39.1		53 59.03	
+1 40.05												
	87	1 52.8	46.7	995	1 4975	+02	6.77		25~	50	48 9.93	
	+8.7				26 49.75	55 58.60	.01			26 43.02	− 2	+9.14
d	0.93952					50 48 3.20	6.20−11+54				+ .16	
	9.80074					+ 6.73	6.73				+ 8.60	
(δ) − D) $\frac{d'}{100}$	0.82820										+ .40	
											− 28.00	
+1483 δ_1									49 31.1		47 51.07	
+1 40.05												
	157	0 1.9	56.1	1180	0 5900	+06	11.76		10	50	5 5.66	
	+14.9				9 59.00	12 49.35	.02			9 47.29	− 6	+8.09
d	1.17819					50 4 5395	11.02−2+71				± 1	
	9.80731					+ 11.71	11.71				+ 7.86	
(δ) − D) $\frac{d'}{100}$	1.06844										+ .30	
											− 27.80	
+1490 δ_2									6 26.0		4 45.85	
+1 40.10												
	152	4 39.0	33.4	724	4 3620	+06	11.83		10	51	0 28.31	
	+15.0				14 36.20	8 12.15	.25			14 24.73	− 6	+9.57
d	1.17609					51 0 1.75	11.02−24+69				+ .42	
	9.79887					+ 11.56	11.47				+ 8.81	
(δ) − D) $\frac{d'}{100}$	1.06290										+ .40	
											− 28.00	
+1496 δ_1									1 50.03		0 9.88	
+1 40.15												
	160	3 40.2	31.5	719	3 3595	+07	12.46		25~	50	46 29.39	
	+16.0				28 35.95	54 12.40	.18			28 23.44	− 7	+9.22
d	1.20412					50 46 1700	12.59−8				+ .32	
	9.80105					+ 12.39	12.51				+ 8.57	
(δ) − D) $\frac{d'}{100}$	1.09311										+ .40	
											− 27.90	
+1501 δ_2									47 58.9		46 10.71	
+1 40.20												

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Date$_1$ = 1870 Nov 27 (50) Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
23	1 57 51	57 41.2 50	4.5 Var.	53 46.7	57.7	7.4	11.2	15.0	19.0	35 23 −128.02	4046	10 95 10.94	59.57 53 59.52 −128.33 + .33 − 2
	3.6	34.7											51 51.50
	κ									57 4.00		−2 8.02	57 − 2.57 +15.0
	((δ) − D) $\frac{\kappa'}{100}$												58 48.93 +1 40
	a_1												
	53 38	33.9	8.4	55 31.9	45.4	53.3	57.0	1.0	5.0	2817 −128.02	5634	1093 10.92	4541 55 45.42 −128.33 + .33 − 2
	52 49.2	50 28.6	8.9										53 37.40
	κ									53 49.95		8.02	− 2.59 +15.
	((δ) − D) $\frac{\kappa'}{100}$												53 34.81 +1 40
	a_2												
	54 19	57.5	8.5	56 5.1	26.8	34.6	38.4	42.3	46.3	3884 −128.02	3768	1102 11.01	2710 56 26.67 −128.33 + .33 − 2
	53 31.2	50 52.2	8.8										54 18.65
	κ									54 31.20		8.02	− 2.61 +15.1
	((δ) − D) $\frac{\kappa'}{100}$												54 16.04 +1 40
	a_1												
	56 4	45.4	8.0	58 0.8	11.3	19.1	23.0	27.0	31.0	1114 −128.02	2228	1097 10.96	1191 58 11.32 −128.33 + .33 − 2
	55 15.5	50 40.1	7.8										56 3.30
	κ									56 15.90		8.02	− 2.62 +15.2
	((δ) − D) $\frac{\kappa'}{100}$												56 0.68 +1 40
	a_2												
	58 7	48.8	8.7	0 0.6	14.3	22.0	26.0	30.0	34.0	1263 −128.02	2526	1098 10.98	1428 0 14.28 −128.33 + .33 − 2
	57 18.1	50 43.5	8.2										58 6.26
	κ									58 18.91		8.02	− 2.65 +15.3
	((δ) − D) $\frac{\kappa'}{100}$												58 3.61 +1 40
	a_1												
	59 33	39.1	9.5	1 27.7	40.9	48.7	52.6	56.5	0.4	2591 −128.02	5182	1095 10.94	4087 1 40.87 −128.33 + .33 − 2
	58 44.6	50 33.8	8.4										59 32.86
	κ									59 45.54		8.02	− 2.66 +15.3
	((δ) − D) $\frac{\kappa'}{100}$												59 30.20 +1 40
	a_2												
02	1 m 9 s 0	29.6	9.0	3 2.6	16.7	24.3	28.1	32.0	36.0	1371 −128.02	2742	1091 10.90	1651 3 16.52 −128.33 + .33 − 2
	18.7	50 24.3	9.0										1 8.50
	κ									1 21.22		8.02	− 2.68 +15.4
	((δ) − D) $\frac{\kappa'}{100}$												1 5.82 +1 40
	a_1												
	2 31 1	6.7	8.8	4 22.6	32.2	45.1	48.9	52.9	56.7	2408 −128.03	4816	1082 10.82	3734 4 37.34 −128.33 + .32 − 2
	40.0	50 1.4	8.9										2 29.32
	κ									2 42.07		8.03	− 2.69 +15.4
	((δ) − D) $\frac{\kappa'}{100}$												2 26.62 +1 40
	a_2												
	3 34 2	10.1	8.5	5 30.4	40.7	48.5	52.3	56.3	0.3	2581 −128.03	5162	1083 10.83	40.59 5 40.79 −128.33 + .32 − 2
	43.0	50 4.8	9.0										3 32.76
	κ									3 45.53		8.03	− 2.71 +15.
	((δ) − D) $\frac{\kappa'}{100}$												3 30.05 +1 40
	a_1												
	4 39 3	7.8	9.0	6 36.1	53.2	0.9	4.7	8.6	12.2	3196 −128.03	6392	1082 10.82	5310 6 53.10 −128.33 + .32 − 2
	48.3	50 2.5	8.9										4 45.07
	κ									4 57.88		8.03	− 2.72
	((δ) − D) $\frac{\kappa'}{100}$												4 42.35
	a_2												

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	130	4 53.1	49.9	1050	4 52.50	+05	10.12		30	50	40 10 38
d	+12.8				34 52.50	47 55 85	.14			34′ 42″.56	− 5
	1.16721					50 40 0.45	9.45−14+63				+ 45
((δ) − D) $\frac{d'}{100}$	9.80197					+ 9.93	9.94				+ 8.47
	0.99712										+ 35
											−27.90
+15.07 δ_1									41	31.9	39 51.70
+1 40.20											
	135	1 11.3	5.6	169	1 54.5	+05	10.51		40	50	33 55.00
d	+13.5				41 8.45	41 39.90	.13			41 57.95	− 5
	1.13033					50 33 44.50	10.24−13+39				+ .10
((δ) − D) $\frac{d'}{100}$	9.80290					+ 10.50	10.50				+ 8.24
	1.02117										+ 35
											−27.80
+15.14 δ_2									35	16.2	33 36.94
+1 40.25											
	2302	2 3.4	58.2	1216	2 0.80	+13	16.90		15	50	58 8.81
d	+21.6				17 0.80	5 47.55	.32			16 44.16	− .13
	1.32445					50 57 52.15	16.53−35+46				+ .18
((δ) − D) $\frac{d'}{100}$	9.79918					+ 16.66	16.64				+ 8.49
	1.12157										+ .40
											−27.80
+15.16 δ_1									59	30.5	57 50.25
+1 40.25											
	108	4 47.0	44.3	943	4 46.65	+03	8.41		25	50	45 14.67
d	+10.8				29 46.65	53 1.70	.13			29 38.28	− 3
	1.03342					50 45 6.30	7.87−12+62				+ 43
((δ) − D) $\frac{d'}{100}$	9.80120					+ 8.37	8.37				+ 8.55
	0.92256										+ .35
											−27.70
+15.22 δ_2									46	36.5	44 56.27
+1 40.25											
	137	1 9.2	5.3	145	1 47.25	+05	10.67		25	50	48 56.30
d	+10.7				26 7.25	56 41.10	.14			25 53.65	− 5
	1.13672					50 48 45.70	10.24−18+52				+ .10
((δ) − D) $\frac{d'}{100}$	9.80058					+ 10.60	10.60				+ 8.60
	1.02524										+ .40
											−27.70
+15.30 δ_1									50	17.9	48 37.65
+1 40.25											
	132	1 7.2	2.0	92	1 4.60	+05	10.28		35	50	38 58.60
d	+13.2				36 4.60	46 43.75	.14			35 54.34	− 5
	1.12057					50 38 48.35	10.24−14+16				+ .10
((δ) − D) $\frac{d'}{100}$	9.80213					+ 10.25	10.26				+ 8.43
	1.01064										+ 35
											−27.60
+15.34 δ_2									40	20.1	38 39.83
+1 40.25											
	141	0 48.2	42.5	907	0 45.35	+05	10.18		45	50	29 18.43
d	+13.9				45 45.35	37.00	.11			45 34.52	− 5
	1.14301					50 29 7.60	10.24−11+70				+ 7
((δ) − D) $\frac{d'}{100}$	9.80366					+ 10.83	10.83				+ 8.28
	1.03461										+ 35
											−27.50
+15.40 δ_1									30	39.8	28 59.58
+1 40.25											
	152	3 27.0	22.1	491	3 24.55	+06	11.83		5	50	6 40.42
d	+15.3				8 24.55	14 23.80	.03			8 12.54	− 6
	1.18469					50 6 28.40	11.80−3+24				+ .31
((δ) − D) $\frac{d'}{100}$	9.80716					+ 12.02	12.01				+ 7.88
	1.07979										+ 30
											−27.40
+15.45 δ_2									8	1.70	6 21.46
+1 40.25											
	103	0 3.5 − 59.3		1228	6 1.40	+03	8.02		5	50	4 59.71
d	+10.4				6	17 16.95	.03			4 53.24	− 3
	1.01703					50 9 51.55	7.87−3+32				+ 0
((δ) − D) $\frac{d'}{100}$	980656					+ 8.16	8.16				+ 7.93
	0.91153										+ 30
											−27.40
+15.48 δ_1									11	20.76	9 40.51
+1 40.25											
	181	3 54.8	50.3	1051	3 52.55	+04	13.31		5	50	6 13.75
d	+17.0				8 52.55	13 55.80	0.4			8 39.21	− 8
	1.23045					50 6 0.40	13.38−4				+ 35
((δ) − D) $\frac{d'}{100}$	9.80716					+ 13.35	13.34				+ 4.88
	1.12555										+ 30
											−27.30
δ_2											5 54.98
									7	25.15	

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Date$_1$ = 1870 Nov 27 7 50° Observer W. A. R. Recorder A. M.

Date$_2$ = Observer Recorder

Run:

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	m s	° ′ ″		m s	m s	m s	m s	m s	m s				m s
	6 7.5	46.3	7.8	8 2.7	14.6	22.3	26.3	30.3	34.0	1275	2550	10.97	14.53
	5 16.9	50 41.0	8.0							−128.02		10.96	8 1454
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .33
													− 2
												−2 8.02	6 6.52
	c_1												− 2.75
										m s			+15
										6 19.35			6 3.77 +1 40
	7 53	54.2	8.0	9 47.6	2.1	9.9	14.0	17.9	21.9	658	1316	11.00	2.16
	7 4.8	50 48.9	8.1							−128.02		11.00	10 2.16
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .33
													− 2
												8.02	7 54.11
	a_2												−2.78
										8 7.80			7 51.36 +156 +140
	10 54	43.4	6.3	12 57.8	1.1	9.0	12.9	16.8	20.7	605	1210	10.96	1.14
	10 3.2	50 38.1	6.5							−128.02		10.96	13 1.15
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .33
													− 2
												8.02	10 53.13
	a_1												−2.81
										11 6.07			10 50.32 +157 +140
	12 8	−1.3	8.0	13 3.0	16.1	23.8	27.7	31.3	35.2	1341	2682	10.79	1608
	11 17.7	49 53.4	7.5	14						−128.03		10.79	14 16.03
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.03	13 8.00
	a_2												−2.79
										12 48 20.96			14 5.21 +15 +1 4
	12 57	1.9	8.2	14 55.5	6.0	13.8	17.6	21.1	25.0	835	1670	10.80	590
	12 8.4	49 56.6	8.3							−128.03		10.79	15 591
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.03	12 57.88
	a_1												−2.82
Nearly same δ as 12 55										13 10.87			12 55.06 +158 +140
			9.0	16 17.9	34.4	42.0	46.0	50.1	54.0	2265	4530	10.79	16 3461
	κ									−128.03			−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.03	14 2648
	a_2												−2.83
													14 23.65
	16 17	63.2	7.9	18 10.8	25.0	32.9	36.8	40.9	44.9	1805	3610	11.02	2506
	15 26.8	50 57.9	8.1							−128.02		11.03	18 25.07
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .33
													− 2
												8.02	16 17.05
	a_1												−2.88
										16 30.12			16 14.17 +15 +1 4
	19 15	71.0	8.2	21 6.1	26.6	34.2	38.0	42.0	46.0	1868	3736	10.87	2648
	18 27.1	50 15.7	9.0							−128.03		10.87	21 36.49
	κ												−128.33
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.03	19 18.46
	a_2												−2.90
										19 31.60			19 15.56 +160 +1 3
	20 54	12.0	8.7	22 53.8	2.4	10.0	14.0	17.9	21.8	661	1322	10.84	236
	20 3.0	50 6.7	9.0							−128.02		10.83	23 2.39
	κ												−128.32
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.02	20 54.37
	a_1												−2.92
										21 7.54			20 51.45 +160 +1 3
	22 15	35.1	8.5	24 6.2	21.2	29.0	33.0	37.0	40.8	1610	3220	10.93	2127
	21 2.6	50 29.8	9.1							−128.02		10.92	24 21.28
	κ												−128.32
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
												8.02	22 13.26
	a_2												−2.94
										22 26.46			22 10.32 +16 +1 39

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	5										
	119	4′ 4.8	−0.5	4.3	4′ 2.15	+04	9.27		25	50	45 59.94
	+11.8				29 2.15	53 46.20	15		28′	53.01	− 4 +9.27
d	1.07188					50 45 50.80	8.66 −14 +62				+ .36
	9.80105					+ 9.14 − 9.14					+ 8.55
((δ) − D) $\frac{d'}{100}$	0.96087										+ .40
											− 27.40
+1558 δ_1											45 41.81
+1 40.25									47′ 22.06		
	145	1 7.1	2.1	9.2	1 460	+05	11.29		20	50	53 59.62
	+14.6				21 4.60	1 43.75	20		20	53.33	− 6 +9.17
d	1.16435					50 53 48.35	11.02 −21 +46				+ .10
	9.79981					+ 11.27 − 11.27					+ 8.73
((δ) − D) $\frac{d'}{100}$	1.05210										+ .40
											− 27.30
+1564 δ_2											53 41.49
+1 40.20									55 21.69		
	93	2 6.0	57.9	1289	1 6295	+02	7.24		30	50	42 57.21
	+9.3				32 2.95	50 45 40	.11		31	55.74	− 3 +9.00
d	0.96648					50 42 50.00	7.08 −11 +24				+ .18
	9.80151					+ 7.21 − 7.21					+ 8.50
((δ) − D) $\frac{d'}{100}$	0.85793										+ .35
											− 27.20
+15.75 δ_1											42 39.01
+1 40.15									44 19.16		
	131	1 25.0	21.0	46	1 2800	+05	10.20		15	49	58 40.19
	+13.0				16 23.00	6 25.35	00		16	12.75	− 5 +9.18
d	1.11394					49 58 29.95	10.24 +1				+ .13
	9.80837					+ 10.24 − 10.25					+ 8.80
((δ) − D) $\frac{d'}{100}$	1.01025										+ .30
											− 27.10
+15.75 δ_2											58 22.27
+1 40.15									0 2.42		
	105	5 2.8	58.0	1208	5 0.40	+03	8.18		10	50	X2 074
	+10.4	3			13	9 47.95	.01				− 3 +8.05
d	1.01403					49 59 39.55	7.87 −1 +32		14	52.22	+ +27 8.33
	9.80807					50 + 8.19 − 8.18					+ 7789
((δ) − D) $\frac{d'}{100}$	0.91304										+ .30
											− 27.00
+1581 δ_1											59 41.79
+1 40.10									3 22.17		13 4207
									X 21.89 2		
	165	3 11.9	3.7	19.6	3 980	+07			10	50	X 5621
	+16.6				18 9.80	9 38.55			12	56.74	− 8 +8.30
d	1.22011					50 1 43.15	12.89 −1 +48				+ .29
	9.80777					+ 13.06 − 13.86					+ 779
((δ) − D) $\frac{d'}{100}$	1.11582										+ .30
											− 26.90
δ_2											1 37.61
	142	1 58.0	52.0	1100	1 5580	+05	11.06		10	51	3 2 1.76 8.96
	+14.3				11 56.00	10 53.35	.24		11	44.00	− 5 +9.35
d	1.15534					51 2 57.95	10.78 −2 +24				+ .17
	9.79856					+ 11.01 − 11.00					+ 8.83
((δ) − D) $\frac{d'}{100}$	1.04184										+ .40
											− 27.00
+15.95 δ_1											2 1.31
+1 40.00									4 31.31		2 51.31
									3 41.37 2		
	205	4 14.3	8.0	22.3	4 1115	+12	15.96		50	50	20 57.74
	+20.4				54 11.15	28 37.20	.11		53	55.20	− .11 +8.74
d	1.30963					50 20 41.80	15.74 −11 +32				+ .38
	9.80489					+ 15.94 − 15.95					+ 8.12
((δ) − D) $\frac{d'}{100}$	1.20246										+ .35
											− 26.80
+1604 δ_2											20 39.68
+1 39.90									22 19.58		
	86	3 2.3	−2.5	−0.2	3 −010	+02	6.69		0	50	11 59.79
	+8.6				2 59.90	19 48.45	.02		2	53.15	− 2 +8.53
d	0.93450					50 11 53.05	6.30 −3 +48				+ .27
	9.80625					+ 6.74 − 6.75					+ 7.98
((δ) − D) $\frac{d'}{100}$	0.82869										+ .30
											− 26.70
+1609 δ_1											11 41.62
+1 39.85									13 21.47		
	150	4 2.2	−3.4	−1.2	4 −060	+06	11.68		35	50	36 5.29
	+15.1				38 59.40	48 48.95	.14		38	47.68	− 6 +9.05
d	1.17898				9	50 38 53.55	11.80 −16 +8				+ .36
	9.80259					+ 11.74 − 11.72					+ 8.40
((δ) − D) $\frac{d'}{100}$	1.06951										+ .35
											− 26.60
+16.14 δ_2											35 47.74
+1 39.80									27.5		4
									36 28.3		

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Date$_1$ = 1870 Nov 27 Observer W. A. R. Recorder A. M. Date$_2$ = Observer Recorder

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	23 25	61 13	7.0	27 22.3	34.6	42.2	46.0	50.2	54.1	22 71	45,42	10.53	34 39 5
	24 34.7	50 56.0	7.1							−128.01		11.02	27 34 40
	κ												−128.32
	((δ) − D) $\frac{\kappa'}{100}$												+ .33
													− 2
	a_1											−2 8.01	25 26.39
													− 3.00
										25 39.66			25 23.39
2	27 5	17.1	8.5	28 56.0	13.3	21.0	25.0	28.7	32.7	120 7	24.14	10 86	28 13.29
	26 14.1	50 11.8	8.4							−128.02		10.60	−128.32
	κ												+ .32
	((δ) − D) $\frac{\kappa'}{100}$												− 2
	a_2											8.02	26 5.27
													− 2.98
													26 2.29
										27 18.60			
3	28 33	8.3	9.0	30 27.0	40.9	48.8	52.3	56.2	0.2	25 84	57,68	10 83	40.85
	27 41.3	50 3.0	9.0							−128.02		10.82	30 40 86
	κ												−128.32
	((δ) − D) $\frac{\kappa'}{100}$												+ .32
													− 2
	a_1											8.02	28 32.84
													− 3.01
										28 46.19			28 29.83
4	29 55	−1.2	9.0	31 47.8	3.0	10.7	—	—	—			10 79	32 2.91
	29 3.0	49 54.4	9.0							−128.02		10.79	−128.32
	κ												+ .32
	((δ) − D) $\frac{\kappa'}{100}$												− 2
	a_2											8.02	29 54.89
													− 3.02
													29 51.87
										30 8.27			
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												

Runs

+162 +139

+163 +139

+16.3 +139

+164 +139

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	123	4′ 10.8	5.5	163	4 8.15	+04	9.58		90″	51	0 54.12	
	+12.1	~~3 27.5~~	~~−13.1~~		14 8.15	8 40.20	21			13′ 58.84	− 4	+9.54
d	1.08279					51 0 44.80	9.24−1+8				+ 37	
$((\delta) - D)\ \frac{d'}{100}$	9.79872					+ 9.32	9.31				+ 8.81	
	0.96945										+ .40	
+1627 δ_1											−26.60	
+1 39.65									2′ 16.7		0 37.06	
	~~43~~	3 4.0	−1.2	28	8 1.40				55″	50	17	
	+173				57 1.40	24 46.95				57 47.86	~~+~~ 5.09	
d	1.23805					50 16 51.55	13.38−8+24				− .8	+8.60
$((\delta) - D)\ \frac{d'}{100}$	9.80550					+ 13.54	13.52				+ .27	
	1.13149										+ 8.06	
+1631 δ_2											+ .35	
+1 39.55											−26.40	
									18 26.8		~~+~~ 47.29	
	139	2 7.0	1.8	88	2 4.40	+05	10.82		5″	50	76	
	+139				7 4.40	15 43.95	.03			6 53.48	7 57.46	
d	1.14301					50 7 48.55	10.24−3+71				− .5	+8.34
$((\delta) - D)\ \frac{d'}{100}$	9.80686					+ 10.91	11.92				+ .19	
	1.03781										+ 7.90	
+16.36 δ_1											+ .30	
+1 39.50											−26.20	
									9 21.0		7 41.50	
	152	1 12.0	6.7	187	1 9.35	+06	11.83		15″	49	58 55.49	
	+15.1				16 9.35	6, 39.00	.00			15 57.46	− 6	+8.12
d	1.17898					49 58 43.60	11.80+1+8				+ .14	
$((\delta) - D)\ \frac{d'}{100}$	9.80822					+ 11.89	11.89				+ 7.77	
	1.07514										+ .30	
+1640 δ_2											−26.20	
+1 39.40											58 37.41	
									0 16.8			
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_1												
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_2												
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_1												
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_2												
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_1												
d												
$((\delta) - D)\ \frac{d'}{100}$												
δ_2												

The reductions to the horizontal wire have thus far been made with the inclination 4°37′. The zero stars have been provisionally reduced with the value 4°36′20″. They are therefore to be corrected.

Until further notice the value 4°37′0″ will be employed in all reductions.

Subsequent note.

The final value for the inclination is 4°46′ and with this value all the reductions are to the mode.

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Date$_1$ = 1870 Dec 10 — Observer W.A.R. — Recorder A.M. — Date$_2$ = — Observer — Recorder — Runs

n = +.36 c = +.80 50°

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
31	57.5	19.2	8.4	31 53.3	5.4	5.8	13.3	17.4	21.2	25.0	1654	10.87	32 5.67
31	8.5	50 13.9	8.5		5.8	13.3	17.4	21.2	25.0	−8.16		10.86	32 5.68
													−8.57 62
													+ .43
													− 2
												8.21	31 57.52
										32 11.15			31 54.67 −2.80
33	7	7.3	9.5	33 1.5	15.3	23.3	27.0	31.0	34.0	1306	2612	10.82	33 15.30
32	15.4	50 2.0	9.2							−8.16		10.82	−8.57 62
													+ .43
													− 2
												8.21	33 7.14
													−2.80
										33 20.86	80		33 4.29
36	19	64.5	8.1	36 6.7	27.0	35.0	38.9	42.8	46.5	1902	3802	11.04	36 27.00
35	26.2	50 59.2	8.4							−8.15		11.04	36 27.00
													−8.57 62
													+ .44
													− 2
												8.20	36 18.85
													−2.88
										36 32.59			36 15.92
45	53	10.0	8.8	45 44.0	0.3	8.1	12.0	15.8	19.7	459	1118	1083	46 0.35
44	58.2	50 4.7	8.8							−8.16		10.83	46 0.35
													−8.57 62
													+ .43
													− 2
												8.21	45 52.19
													−2.97
										46 6.12			45 49.19
46	54	7.5	9.0	46 49.5	1.7	9.5	13.0	17.1	21.0	623	1246	1083	47 1.63
45	59.7	50 2.2	8.9							−8.16		10.82	47 1.64
													−8.57 62
													+ .43
													− 2
												8.21	46 53.48
													−2.99
										47 7.43			46 50.49
49	33	42.0	8.4	49 24.0	41.4	49.1	53.3	56.9	0.9	2616	5232	1086	49 41.36
48	38.2	50 36.7	8.8							−8.15		10.86	49 41.37
													−8.57 62
													+ .44
													2
												8.20	49 33.22
													−3.03
										49 47.25			49 30.14
50	16	23.7	8.4	50 31.1	8.3	15.8	19.7	23.8	27.8	954	1908	1089	50 8.19
49	23.0	50 37.9	9.1	8 foll Tm						−8.15		10.88	50 8.20
	5.4												−8.57 62
													+ .44
													− 2
												8.20	50 0.050
													−3.05
										50 14.09			49 56.95

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Dec 10 – J 52 R Red +.10 Rgd

Runs –07 R

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	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	145	1′ 5.2	5′.0	1242	1′ 2.10	–	–11.24		55	50	19 5.09	
	+144				56 2.10	26 46.25	.07			55′ 50.84	– 5	+8.88
d	1.75 8.36					50 18 53.83	11.02 –8 +32				+ .10	
((δ) – D) $\frac{d'}{100}$	9.80 519					+ 11.26	–11.26				+ 8.48	
	1.05 149										+ .35	
											– 27.40	
+16.48 δ_1									20 25.87		18 46.67	
+1 39.30												
	138	3 11.2	4.4	15.6	3 7.80		10.74		5	50	6 58.97	
	+13.8				8 7.00	14 40.55	.02			7 56.95	– 5	+8.80
d	1.13 9.88					50 6 48.13	11.22 –3 +64				+ .31	
((δ) – D) $\frac{d'}{100}$	9.80 701					+ 10.84	–11.85				+ 8.24	
	1.03 483										+ .30	
											– 27.40	
+16.51 δ_2									8 19.57		6 40.37	
+1 39.20												
	200	0 53.5	45.7	99.2	0 49.60		15.57		10	51	4 21.95	
	+20.3				10 49.60	11 58.75	.33			10 33.97	– .11	+8.58
d	1.30 750					50 4 6.33	15.41 –2 +24				+ 8	
((δ) – D) $\frac{d'}{100}$	9.79 825					+ 1562	–15.63				+ 8.21	
	1.19 369										+ .40	
											– 27.40	
+16.67 δ_1									5 42.13		4 3.13	
+1 39.00												
	163	0 18.3	14.3	32.6	0 16.30		12.69		5	50	9	
	+16.3				5 16.30	17 32.05	.04			5 3.51	~~11~~ 52.41	
d	1.21 219					50 9 39.63	12.59 –4 +24				– 7	+8.57
((δ) – D) $\frac{d'}{100}$	9.88 656					+ 12.78	–12.79				+ 3	
	1.10 669										+ 8.31	
											+ .30	
+16.95 δ_2									11		– 26.80	
+1 38.25									~~12~~ 12.4		~~13~~ 9 34.18	
	122	2 30.8	26.2	57.0	2 28.50		9.50		5	50	7 36.93	
	+12.1				7 28.50	15 19.85	.02			7 19.00	– 4	+8.77
d	1.08 279					50 7 24.43	9.45 –3 +8				+ .25	
((δ) – D) $\frac{d'}{100}$	9.80 701					+ 9.50	–9.50				+ 8.26	
	0.97 744										+ .30	
											– 26.70	
+16.99 δ_1											7 19.00	
+1 38.15		3 8.2	3.0						8 5.71		42	
	174	× ~~21.4~~	~~19.7~~	46.1	1 23.05	49 42.75	13.55		30	50	~~48~~ 4.32 3.81	
	+17.4				2 ~~23.05~~	~~51 25.30~~	.19			31 9.56	– 8	+9.~~32~~ 49
d	1.24 055				33 5.60	50 ~~43.41~~ 17.88	50.33 13.38 –24 +31				+ ~~14~~ .31	
((δ) – D) $\frac{d'}{100}$	9.80 136					+ 13.48	–13.49				+ 8.91	
	1.1 2985										+ .35	
											– 26.70	
+17.11 δ_2									43 24.5		~~43~~ 28.98	
+1 37.90									~~44~~ 6.92		41 46.60	
	~~22~~ –22.9	1 26.4	19.7	46.1	1 23.05	+ 17.75			30	50	43 15.13	
	–22.9				31 23.05	51 25.30	– .15			31 40.93	– .14	+9.26
d	1.35 984n					50 43 32.88	17.32 –14 +10				+ .14	
((δ) – D) $\frac{d'}{100}$	9.80 136					– 17.95	+17.88				+ 8.91	
	1.24 914n										+ .35	
											– 26.70	
+17.14 δ_1									.56		42 57.69	
+1 37.90									44 ~~3.55~~			
d												
((δ) – D) $\frac{d'}{100}$												
δ_2												
d												
((δ) – D) $\frac{d'}{100}$												
δ_1												
d												
((δ) – D) $\frac{d'}{100}$												
δ_2												

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n = +.36 C = .00 50° — n = +.33 C = .00

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
0	57m 58s	24.2	8.9	51m 49.4s	6.1	14.0	17.8	21.7	25.6	8552	17104	1088	52 6.27
	5.1 3.8	50 18.9	8.4							−8.52		10.88	52 6.16
	κ												−8.57.62
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											−8 8.20	51 58.01
										52m 12.09s			− 3.05
													51 54.91
			8.2	57 57.3	5.6	13.2	17.2	21.0	24.9	8519	16385	1089	52 5.49
	κ									−7.59		10.88	52 5.50
	((δ) — D) $\frac{\kappa'}{100}$												−7.97.9
													+ .40
													− 2
	a_2											7.61	51 57.91
										52 12.07			− 3.00
													51 54.9189
	53 11	37.2	8.3	53 3.1	20.3	28.0	31.9	35.6	39.2	13555	31110	1094	53 2016
	52 16.7	50 31.9	8.5							−8.15		10.93	53 20.17
	κ												−8.57.62
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.20	53 12.02
										53 26.13			− 3.07
													53 8.90
			8.2	53 10.1	19.4	27.3	31.3	35.0	39.0	13520	30400	1094	53 1646
	κ									−7.59		10.88	53 1647
	((δ) — D) $\frac{\kappa'}{100}$												−7.97.9
													+ .40
													− 2
	a_2											7.61	53 11.88
				37.1						53 26.07			− 3.02
													53 8.84
	57 59	20.5	6.9	54 57.1	5.8	4.5	8.4	12.2	16.3	33862	67664	1087	54 5677
	53 54.2	50 15.2	6.9							−8.16		10.87	54 56.77
	κ												−8.58.61
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.19	54 48.61
										55 2.77			− 3.08
													54 45.50
			6.8	54 54.8	5.6.1	4.0	7.9	11.6	15.6	33552	67104	1087	54 5679
	κ									−7.60		10.87	54 5617
	((δ) — D) $\frac{\kappa'}{100}$												−7.97.9
													+ .39
													− 2
	a_2											7.62	54 48.57
										55 2.79			− 3.03
													54 45.52
	56 25	28.7	9.2	56 3.1	17.1	25.3	29.0	33.0	36.7	14111	28222	1091	56 1731
	55 ~~27.6~~ 13.9	50 ~~23.4~~ 23.4	9.4							−8.16		10.90	56 17.32
	κ												−8.58.61
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.19	56 9.16
										56 23.34			− 3.11
													56 6.02
			8.9	56 4.1	16.6	24.3	28.1	32.0	36.0	13702	27404	1091	56 1649
	κ									−7.59		10.90	56 1650
	((δ) — D) $\frac{\kappa'}{100}$												−7.97.9
													+ .40
													− 2
	a_2											7.61	56 8.91
										56 23.16			− 3.05
													56 5.84
	59 26	−4.6	8.0	59 16.1	33.6	41.0	45.0	48.9	52.7	22123	44246	1078	59 3346
	58 30.9	49 50.1	9.3							−8.17		10.77	59 33.47
	κ												−8.58.61
	((δ) — D) $\frac{\kappa'}{100}$												+ .43
													− 2
	a_1											8.20	59 25.30
										59 39.55			− 3.12
													59 22.15 2215
			7.9	59 25.8	33.0	40.6	44.4	48.3	52.2	21687	43374	1078	59 3292
	κ									−7.60		10.77	59 32.93
	((δ) — D) $\frac{\kappa'}{100}$												−7.97.9
													+ .39
													− 2
	a_2											7.62	59 25.33
										59 39.64			− 3.07
													59 22.24

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Dec 10 - Reg. 4 Rms. 61
13 - 7 52.42 R. + .10
7 50.80 R. .11

Runs - 67 R
-22 D

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ'	
	10 5	0 25.4	20.3	457	0 2 28.5	+10	12.92 +03		50'	50 10 35 30	24 46.19	
	+16.8				50 22.8	32 25.50	.11			50' 9.74	− 8	+8.88
d	1.225231					50 24. 33.08	12.57-11+63				+ 4	
((δ) − D) $\frac{d'}{100}$	9.80428					+ 13.11	-13.11				+ 8.57	
	1,11753										+ 35	
											− 26.60	
+17.18 δ_1									1 11		24 28.47	
+137.70									26 6.2			
	83	0 21.8	15.0	368	0 18.40	+02	6.46 -07		50	50 12.2	24 45.55	1,8
	+8.2				50 18.40	32 29.95	.03			50 11.79	− 2	+8.74
d	0.913581					50 24 39.85	6.30-5+16				+ 3	
((δ) − D) $\frac{d'}{100}$	9.80428					+ 6.40	-6.41				+ 8.38	
	0.80603										+ 35	
											− 26.80	
+17.18 δ_2									26 5.2	50	24 27.49	
+137.70												
	72	2 57.0	52.3	1093	2 54.6	+10	13.39 -20		35	37 41.66	37 14.57	
	+17.1				37 54.6	44 53.70	.02			37 41.37	− 8	+9.36
d	1.233300					50 37 1.28	13.38-18+8				+ 29	
((δ) − D) $\frac{d'}{100}$	9.80244					+ 13.29	-13.28				+ 8.80	
	1,12338										+ 35	
											− 26.50	
+17.23 δ_1									38 35.0		36 57.43	
+137.55												
	93	2 54.2	46.9	1011	2 50.5	+02	7.24 -56		35	37 43.1	37 14.35	1,7
	+9.4				37 50.50	44 57.85	.04			37 43.20	− 3	+9.25
d	0.973313					50 37 7.05	7.08-10+32				+ 31	
((δ) − D) $\frac{d'}{100}$	9.80244					+ 7.30	-7.30				+ 8.62	
	0.86351										+ 35	
											− 26.80	
+17.23 δ_2									38 34.3		36 56.80	
+137.55												
	-08	4 49.3	45.6	949	4 47.45	+02	-34		50	50	20 ~~7.20~~	8
	-0.8				54 47.45	28 0.90				54 47.69	− 0	+9.32
d	~~9.877122~~		+19.7			50 20 ~~0.048~~					+ 48	
((δ) − D) $\frac{d'}{100}$	~~0.024771~~ n		1.29447			− 0.23	0.24				+ 8.49	
	9.80484		9.80504			+ 13.40					+ 35	
	~~9.940669~~										− 26.40	
	9.360(0.)		1.18745								~~19 50.17~~	
+17.27 δ_1									21 43.2		20 ~~5.20~~ 5.10	
+137.40												
	113	4 45.7	40.6	863	4 43.5	+03	8.80 .04		50	54 38.6	20 23.31	
	+11.4				54 43.15	28 5.20	.06			54 34.23	− 3	+9.15
d	1.056690					50 20 1.40	8.66-6+32				+ 52	
((δ) − D) $\frac{d'}{100}$	9.80504					+ 8.91	-8.92				+ 8.31	
	0.94988										+ 35	
											− 26.70	
+17.27 δ_2									21 43.2	50	20 5.76	
+137.40												
	140	2 38.2	32.9	711	2 35.5	+05	10.90 -18		45	47 24.9	27 31.45	
	+8.2				47 35.55	35 12.80	.11			47 24.49	− 5	+9.18
d	1.152229					50 27 2.38	11.02-12+16				+ 26	
((δ) − D) $\frac{d'}{100}$	9.80397					+ 11.07	-11.06				+ 8.62	
	1,04420										+ 35	
											− 26.40	
+17.32 δ_1									28 51.4		27 14.23	
+137.20												
	125	2 37.2	32.0	712	2 35.6	+04	9.73 -58		45	47 23.57	27 31.62	
	+12.4				47 35.60	35 12.75	.10			47 23.93	− 4	+9.03
d	1.093842					50 27 2.95	9.48-10+32				+ 29	
((δ) − D) $\frac{d'}{100}$	9.80397					+ 9.67	-9.67				+ 8.43	
	0.98533										+ 35	
											− 26.70	
+17.32 δ_2									28 51.1	49	27 13.95	
+137.20												
	175	1 30.1	26.0	561	1 28.05	+10	13.62 -10		20	21 14.7	53 41.61	
	+17.4				21 28.05	1 20.30	+02			21 14.33	− 8	+8.40
d	1.240555					49 53 27.88	13.38+2+32				+ 15	
((δ) − D) $\frac{d'}{100}$	9.80912					+ 13.73	-13.72				+ 8.03	
	1,13761										+ 30	
											− 26.10	
+17.40 δ_1									55 0.8		53 23.91	
+136.90												
	72	1 24.8	18.3	431	1 21.55	+01	-5.60 -30		20	21 15.7	53 41.60	
	+7.1				21 21.55	1 26.80	+.01			21 15.94	− 2	+8.27
d	0.851126					49 53 36.08	5.52+1+8				+ 14	
((δ) − D) $\frac{d'}{100}$	9.80897					+ 5.60	-5.61				+ 7.85	
	0.74847										+ 30	
											− 26.40	
+17.40 δ_2									55 0.4		53 23.47	
+136.90												

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Date$_1$ = 1870 Dec 10 — Observer W. A. R. / Recorder A. M. — Date$_2$ = 1870 Dec 13 — Observer W. A. R. / Recorder A. M.

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	1m 41.5s	1.8	8.2	1m 35.6s	49.4	57.3	1.0	5.0	8.6	30.13	6.026	1080	1 49.46
	0 45.8	49 56.5	7.9							−8.17		10.80	1 49.46
	κ												− 8.5861
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .43
	a_1												− .2
												8.20	1 41.29
													− 3.16
										1 55.58			1 38.10
			8.0	1 39.1	48.8	56.6	0.4	4.3	8.0	29.81	5.962	1080	1 48.82
	κ ✓									−7.61		10.80	1 48.82
	((δ) − D) $\frac{\kappa'}{100}$												− 7.9889
													+ .39
	a_2												− .2
												7.62	1 41.21
													− 3.10
										1 55.58			1 38.10
2	54	0.6	9.5	2 46.3	4.0	11.7	15.5	19.1	23.4	7.37	1.474	1080	3 3.94
	1 58.7	49 54.1	8.9							−8.17		10.79	3 3.95
	κ												− 8.5861
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .43
	a_1												− .2
												8.20	2 55.78
													− 3.17
										3 10.10			2 52.58
	κ ✓		9.0	2 50.3	3.2	11.0	14.8	18.6	22.6	7.02	1.404	1080	3 3.24
										−7.61		10.79	3 3.25
	((δ) − D) $\frac{\kappa'}{100}$												− 7.9889
													+ .39
	a_2												− .2
												7.62	2 55.64
													− 3.12
										3 10.03			2 52.51
5	13	55.6	7.5	5 9.1	21.0	29.0	33.0	37.0	41.0	16.10	3.220	1101	5 21.19
	4 16.7	50 50.3	7.0							−8.16		11.01	5 21.20
	κ												− 8.5861
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
	a_1												− .2
												8.19	5 13.04
													− 3.23
										5 27.45			5 9.78
	κ ✓		7.0	5 9.2	20.5	28.4	32.4	36.3	40.3	15.79	3.158	1101	5 20.59
										−7.59		11.00	5 20.58
	((δ) − D) $\frac{\kappa'}{100}$												− 7.9889
													+ .41
	a_2												− .2
												7.60	5 12.99
													− 3.17
										5 27.48			5 9.81
7	45	51 63.7	8.5	7 36.5	52.7	0.7	4.5	8.4	12.3	31.86	6.372	1104	7 52.68
6	48.6	50 58.4	7.1							−8.16		11.04	7 52.68
	κ												− 8.5861
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
	a_1												− .2
												8.19	7 44.52
													− 3.27
										7 58.99			7 41.22
	κ ✓		7.0	7 41.3	52.0	0.1	4.0	7.8	11.8	31.57	6.314	1104	7 52.10
										−7.59		11.04	7 52.10
	((δ) − D) $\frac{\kappa'}{100}$												− 7.9889
													+ .41
	a_2												− .2
												7.61	7 44.51
													− 3.21
										7 59.05			7 41.28
10	58	56 6	9.0	10 55.3	17.3	25.3	29.2	33.0	37.0	14.21	2.842	1102	11 17.40
10	7.9	50 51.3	9.0							−8.16		11.01	11 17.40
	κ 11												− 8.5861
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
	a_1												− .2
												8.19	11 9.21
													− 3.33
										11 23.67	76		11 5.88
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	a_2												

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Runs -01R -22R

$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
138 +13.9	3 46.1	10.8	869	3 4345	+05	−10.74 −26		10′	13, 32.8	1 2.42
d 1.14301				13 43.45	9 4.90	.01			13 32.57	− .5
9.80792				44.80	1 11.48	10.24−1+71				+ .37
(δ) − D) $\frac{d'}{100}$ 1.03887					+ 10.94	−10.94				+ 8.14
+17.48 δ_1										+ .30
+1 36.65										− 26.00
										1 5.18
								2 41.8		
97 −9.7	3 44.3	38.9	832	3 4160	+03	7.58 −80		10	13 38.5	1 23.58
d 0.98677				13 41.60	9 6.75	.01			13 33.96	− 3
9.80792					50 1 15.95	7.08−0+.32				+ .41
(δ) − D) $\frac{d'}{100}$ 0.88263					+ 7.63	7.64				+ 7.95
+17.48 δ_2										+ .30
+1 36.65										− 26.30
										1 5.93
								2 42.6	49	
177 +17.6	1 3.7	57.8	1235	1 1715	+11	13.78 −07		15	15 48.3	59 8.04
d 1.24551				16 1.75	6 46.60	.01			15 47.89	− 9
9.80822					49 58 54.18	13.38 +48				+ .10
(δ) − D) $\frac{d'}{100}$ 1.14167					+ 13.86	13.86				+ 8.12
+17.52 δ_1										+ .30
+1 36.50										− 26.00
										58 50.47
								0 27.0		
129 +13.0	1 2.0	56.5	1185	0 5925	+05	10.04 −22		15	15 51.2	59 8.54
d 1.11394				15 59.25	6 49.10	.00			15 49.01	− 5
9.80822					49 58 58.30	−10.24				+ .10
(δ) − D) $\frac{d'}{100}$ 1.01010					+ 10.24					+ 7.96
+17.52 δ_2										+ .30
+1 36.50										− 26.20
										58 50.66
								0 27.2	50	
119 +12.1	0 2.8	57.8	86	0 030	+04	9.27 .00		20	19 51.5	55 4.97
d 1.08279				2 2.30	2 48.05	.18			19 50.95	− 4
9.79965					50 54 55.63	9.45−18+8				+ 0
(δ) − D) $\frac{d'}{100}$ 0.97038					+ 9.34	9.35				+ 9.14
+17.67 δ_1										+ .40
+1 36.20										− 26.00
										54 48.47
								56 24.7		
113 +11.4	0 4.0	56.8	08	0 040	+03	8.79 .00		20	19 52.4	55 5.95
d 1.05690				2 0.40	2 47.95	.17			19 51.60	− 3
9.79965					50 54 57.15	8.66+17+31				+ 0
(δ) − D) $\frac{d'}{100}$ 0.94449					+ 8.80	8.80				+ 8.94
+17.67 δ_2										+ .40
+1 36.20										− 26.30
										54 48.96
								56 25.2	51	
162 +16.2	1 45.7	39.7	856	1 4280	+08	−12.61 −12		10	11 30.7	3 25.60
d 1.20952				21 4280	11 5.55	.24			11 30.34	− 7
9.79840					51 3 13.13	12.32−2+16				+ .17
(δ) − D) $\frac{d'}{100}$ 1.09586					+ 12.47	12.46				+ 9.27
+17.77 δ_1										+ .40
+1 35.90										− 25.90
										3 9.47
								4 45.4		
107 +10.8	1 43.3	35.7	790	1 3950	+03	8.33 −36		10	11 31.9	3 26.36
d 1.03342				11 39.50	11 8.85	.18			11 31.19	− 3
9.79840					51 3 18.05	17.70−1+62				+ .19
(δ) − D) $\frac{d'}{100}$ 0.91976					+ 8.31	8.31				+ 9.07
+17.77 δ_2										+ .40
+1 35.90										− 26.20
										3 9.79
								4 45.7	50	
220 +22.0	3 39.4	36.1	755	3 2775	+12	17.13 −24		15	18 2.2	56 35.23
d 1.34244 439				18 37.00	1 4 10.60	.34			18 2.0178	− .13
9.79950					50 56 18.18	17.32−35				+ .36
(δ) − D) $\frac{d'}{100}$ 1.23183					+ 1498	16.97				+ 9.15
+17.88 δ_1					17.05					+ .40
+1 35.45										− 25.70
										56 19.24
								57 54.8 X		31
d										
(δ) − D) $\frac{d'}{100}$										
δ_2										

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Date$_1$ = 1870 Dec. 10. Observer W. A. R. Recorder A. M. Date$_2$ = 1870 Dec. 13 Observer W. A. R. Recorder A. M.

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	12h 57.5	55.8	7.9	12m 44.0	1.4	9.4	13.0	17.0	21.0	618	12.36	11.01	13 1.35
	11 56.6	50 54.8	6.5							−8.16		11.00	13 1.36
	κ												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
													− 2
												−0 8.19	12 53.20
	a_1												−3.32
										13 7.79			12 49.85
			7.8	12 50.2	1.0	8.7	12.7	16.7	20.5	596	11.92	11.01	13 0.91
	κ ✓									−7.60		11.00	13 0.92
	((δ) − D) $\frac{\kappa'}{100}$												−7.99 8.00
													+ .41
													− 2
												7.61	12 53.32
	a_2												−3.27
										13 7.98			12 50.04
13	57	25.1	9.4	13 50.0	2.0	10.0	13.9	17.6	21.4	649	12.98	10.89	14 2.09
12	56.8	50 19.8	8.8							−8.16		10.88	14 2.10
	κ												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
													− 2
												8.19	14 1.94
	a_1												−3.32
										14 8.51			13 50.59
			9.0	13 53.5	1.3	9.1	13.1	17.0	20.9	614	12.28	10.89	14 1.39
	κ ✓									−7.51		10.88	14 1.40
	((δ) − D) $\frac{\kappa'}{100}$												−7.99 8.00
													+ .10
													− 2
												7.62	13 53.79
	a_2												−3.27
										14 8.43			13 50.51
15	55	57.3	9.5	15 46.0	3.4	11.3	15.0	19.2	23.0	719	14.38	11.00	16 3.38
14	57.6	50 47.0	9.0							−8.16		11.00	16 3.38
	κ												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
													− 2
												8.19	15 55.22
	a_1												−3.36
										16 9.87			15 51.83
			9.3	15 51.0	2.7	10.4	14.4	18.4	22.3	682	13.64	11.00	16 2.64
	κ ✓									−7.60		11.00	16 2.64
	((δ) − D) $\frac{\kappa'}{100}$												−7.99 8.00
													+ .41
													− 2
												7.61	15 55.04
	a_2												−3.31
										16 9.76			15 51.72
17	28	51 10.6	8.2	17 22.0	36.0	43.8	47.7	51.8	55.8	2331	47.02	11.03	17 38.49
16	30.6	50 55.5	8.0							−8.16		11.02	17 38.00
	κ												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
													− 2
												8.19	17 27.84
	a_1												−3.38
										17 42.53			17 24.43
			8.5	17 21.0	35.3	43.2	47.1	51.0	55.0	2316	46.32	11.03	17 35.24
	κ ✓									−7.60		11.02	17 35.30
	((δ) − D) $\frac{\kappa'}{100}$												−7.99 8.00
													+ .41
													− 2
												7.61	17 27.70
	a_2												−3.33
										17 42.46			17 24.36
19	7	42.7	9.5	19 0.0	late 16.1	24.0	27.5	31.8	35.8	1352	27.04	10.96	19 16.06
18	9.1	50 37.7	9.0							−8.16		10.95	19 16.09
	κ												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .44
													− 2
												8.19	19 7.93
	a_1												−3.39
										19 22.64			19 4.51
			9.0	19 4.2	15.3	23.2	27.3	31.0	35.0	1318	26.36	10.96	19 15.40
	κ ✓									−7.61		10.95	19 15.41
	((δ) − D) $\frac{\kappa'}{100}$												−7.99 8.00
													+ .40
													− 2
												7.62	19 7.80
	a_2												−3.34
										19 22.58			19 4.45

0.65

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Runs -07 R
-22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
d	1.24055	0 14.4	9.3	289	0 1195	+08	−13.53	−01	20	19 58.52	54 54.41	+9.45
((δ) − D) d′/100	9.79965				20 1193	2 3640	.25				− 8	
	1.12814					50 54 43.98	13.38−26+31				+ 2	
+17.94 δ₁						+ 13.43	13.43				+ 9.11	
+1 35.20									56 16.5		+ 40	
											− 25.60	
											54 41.26	
d	1.02938	0 10.8	3.8	146	0 0739	+03	8.41	−01	20	19 59.4	54 54.51	+9.29
((δ) − D) d′/100	9.79965				20 7130	2 41.05	.16			19 57.05	− 3	
	0.91697				6	50 54 57.25	7.87−16+34				+ 1	
+17.94 δ₂						+ 8.26	8.25				+ 8.91	
+1 35.20									56 18.1		+ 40	
											− 25.90	
											54 42.90	
d	1.08279	0 0.9	56.3	−28	0 1402	+04	9.32	05	50	49 49.16	25 6.77	+8.89
((δ) − D) d′/100	9.80428				49 5860	32 49.75	.08				− 4	
	0.97501					50 24 57.33	9.45−9+8				+ 1	
+17.92 δ₁						+ 9.44	9.44				+ 859	
+1 35.05					49 57.50				26 25.3		+ 35	
											− 25.40	
											24 50.26	
d	0.89763	0 0.0	53.0	−35	0 1783	+02	6.07	02	50	49 50.33	25 16.21	+8.72
((δ) − D) d′/100	9.80428				49 1750	32 51.85	.05				− 2	
	0.78985					50 25 1.05	5.52−5+70				+ 840	
+17.92 δ₂						+ 6.16	6.17				+ 35	
+1 35.05									26 24.3		− 25.70	
											24 49.23	
d	1.24055	0 52.8	46.9	997	0 4985	+10	−13.58	−06	20	20 36.44	54 19.52	+9.51
((δ) − D) d′/100	9.79981				20 49.85	1 58.50	.25				− 8	
	1.12830					51 54 6.08	13.38−25+31				+ 8	
+18.04 δ₁						+ 13.44	13.444				+ 9.11	
+1 34.80									55 38.4		+ 40	
											− 25.40	
											54 3.63	
d	1.06446	0 49.0	42.2	917	0 4560	+04	9.11	−04	20	20 36.05	54 20.91	+9.35
((δ) − D) d′/100	9.79981				20 45.60	2 2.75	.16				− 4	
	0.95221					50 54 11.95	8.66−17+46				+ 8	
+18.04 δ₂						+ 8.96	8.95				+ 8.91	
+1 34.80									55 38.5	51	+ 40	
											− 2560	
											54 4.66	
d	1.14613	4 35.3	32.1	674	4 3370	+05	10.90	−32	10	14 22.92	0 33.02	+10.03
((δ) − D) d′/100	9.79887				14 33.70	8 14.65	.22				− 5	
	1.03294					51 0 22.23	10.78				+ 46	
+18.10 δ₁						+ 10.99					+ 9.22	
+1 34.55									52.2		+ 40	
											− 25.40	
											0 17.65	
d	1.15534	4 38.2	31.7	699	4 3495	+05	11.13	−10	10	14 23.93	0 33.62	+9.88
((δ) − D) d′/100	9.79887				14 34.95	8 13.40	.23				− 5	
	1.04215					51 0 22.60	10.78+24				+ 51	
+18.10 δ₂						+ 11.02	11.02				+ 9.02	
+1 34.55									52.4	50	+ 40	
											− 2560	
											0 17.90	
d	1.20683	2 24.9	19.1	440	2 2200	+07	12.53	−18	30	32 9.52	42 46.41	+9.41
((δ) − D) d′/100	9.80151				32 22.00	50 26.35	.19			32	− 7	
	1.09628					50 42 33.93	12.89−19+8				+ 24	
+18.13 δ₁						+ 12.48	12.48				+ 889	
+1 34.35									44 4.9		+ 35	
											− 25.20	
											42 30.62	
d	1.04822	2 24.1	16.9	410	2 2050	+03	8.64	53	30	32 11.81	42 45.73	+9.27
((δ) − D) d′/100	9.80151				32 20.50	50 27.85	.13				− 3	
	0.93864					50 42 37.05	8.66−13+16				+ 25	
+18.13 δ₂						+ 8.68	8.69				+ 8.70	
+1 34.30									44 3.9		+ 35	
											− 2540	
											42 29.60	

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Date$_1$ = 1870 Dec. 10. Observer W. A. R. Recorder A. M. Date$_2$ = 1870 Dec 13 Observer W. A. R. Recorder A. M. Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	20 8	19.7	8.8	20 4.7	17.0	25.0	28.7	32.8	36.7	1402	2804	10.87	20 17.17
	19 10.6	50 14.1	9.0							−8.17		10.87	20 17.17
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
a_1												−0 8.20	20 9.00
										20 23.71			−3.38
													20 5.59
			9.0	20 3.7	16.5	24.3	28.0	32.0	35.9	1367	2734	10.87	20 16.47
κ										−7.62		10.87	−7.99 8.00
((δ) − D) $\frac{\kappa'}{100}$													+ .36
													− 2
a_2												7.63	20 8.86
										20 23.62			−3.36
													20 5.50
	21 9.1	61.0	8.3	21 8.7	14.2	22.3	26.0	30.0	33.8	1263	2526	11.03	21 14.23
	20	50 56.0	6.8							−8.16		11.02	−8.58 61
κ													+ .44
((δ) − D) $\frac{\kappa'}{100}$													− 2
a_1												8.19	21 6.08
										21 20.85			−3.42
													21 2.63
			6.8	21 5.0	13.6	21.3	25.3	29.2	33.2	1226	2452	11.03	21 13.49
κ										−7.60		11.02	−7.99 8.00
((δ) − D) $\frac{\kappa'}{100}$													+ .41
													− 2
a_2												7.61	21 5.90
										21 20.73			−3.38
													21 2.51
	22 53	0.2	8.7	22 45.0	0.8	8.2	12.0	15.8	20.0	566	1136	10.80	22 0.56
	21 54.8	49 55.2	8.5							−8.17		10.79	22 0.87
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .43
													− 2
a_1												8.20	22 52.40
										23 7.15			−3.40
													22 48.97
			8.7	22 49.8	0.0	7.5	11.5	15.3	19.2	535	1070	10.80	23 59.90
κ										−7.62		10.79	22 57.91
((δ) − D) $\frac{\kappa'}{100}$													−7.99 8.00
													+ .37
													− 2
a_2												7.63	22 52.29
										23 7.10			−3.36
													22 48.92
	24 36	9.6	9.0	24 28.0	44.7	52.3	56.4	0.2	4.1	277	5554	10.83	24 44.71
	23 38.0	50 4.7	8.7							−8.17		10.83	−8.58 61
κ													+ .43
((δ) − D) $\frac{\kappa'}{100}$													− 2
a_1												8.20	24 36.54
										24 51.34			−3.43
													24 33.08
			8.8	24 37.0	44.0	51.8	55.6	59.5	63.5	2744	5488	10.83	24 44.05
κ										−7.62		10.83	−7.99 8.00
((δ) − D) $\frac{\kappa'}{100}$													+ .39
													− 2
a_2												7.63	24 36.43
										24 51.29			−3.39
													24 33.03
	28 45	60.7	8.7	28 37.5	55.3	3.0	6.9	10.7	15.0	3309	6618	11.03	28 55.05
	27 48.3	50 55.8	9.0							−8.16		11.02	28 55.06
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
a_1												8.19	28 46.90
										29 1.84			−3.51
													28 43.36
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_2													

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Runs ~ 07 R
~ 32 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ'
	12.3	4 18.0	12.8	30.8	0 1540	+04	−9.51	−.02	55	55 59.50	19 50.30
	+2.5				55 15.40	27 32.95				55 5.62	− 4
d	1.09691					50 19 40.53	9.45−7+40				+ 3
	9.80504					+ 9.77	−9.78				+ 8.48
((δ) − D) $\frac{d'}{100}$	0.98989										+ 35
											− 25.00
+18.12 δ_1									21 8.3		19 34.12
+1 34.15											
	12.8	0 20.3	14.0	34.3	0 1715	+04	−9.90	−.04	55	55 7.3	19 50.41
	+2.8				55 17.15	27 31.20				55 7.14	− 5
d	1.10721					50 19 40.40	9.45−7+63				+ 3
	9.80504					+ 10.01	−10.01				+ 8.30
((δ) − D) $\frac{d'}{100}$	1.00019										+ 35
											− 25.30
+18.12 δ_2									21 7.9	51	19 33.74
+1 34.15											
	5.5	4 2.0	3.6	10.6	4 530	+01	−4.20	−.29	10	14 0.8	0 54.87
	+5.5				14 5.30	8 43.05				14 1.06	− 1
d	0.74036					57 0 50.63	3.85−0+39				+ .41
	9.79872					+ 4.24	−4.24				+ 9.22
((δ) − D) $\frac{d'}{100}$	0.62902										+ .40
											− 25.10
+18.22 δ_1									2 13.8		0 39.79
+1 34.00											
	8.6	4 10.5	3.4	13.9	4 695	+02	−6.36	−.20	10	13 5.95	0 54.15
	+8.5				14 6.95	8 41.40				14 0.40	− 2
d	0.92942					57 0 50.60	6.16−0+39				+ .45
	9.79872					+ 6.55	−6.55				+ 9.03
((δ) − D) $\frac{d'}{100}$	0.81608										+ .40
											− 25.40
+18.22 δ_2									2 15.6	50	0 41.61
+1 34.00											
	15.8	0 5.7	0.8	6.5	0 325	+04	−12.30	−.00	15	14 5.10	0 4.96
	+15.6				15 3.25	7 45.10				14 50.97	− 7
d	1.19312					49 59 52.68	11.80−0+48				+ 0
	9.80807					+ 12.28	−12.28				+ 8.13
((δ) − D) $\frac{d'}{100}$	1.08913										+ .30
											− 24.80
+18.18 δ_1									1 22.3		59 48.52
+1 33.75											
	10.2	0 2.0	55.3	−2.3	0 [illegible]	+03	−7.94	−.00	15	14 50.4	0 6.65
	+10.1				[illegible]	7 49.50				14 50.90	− 3
d	1.60432					49 59 58.70	7.87−0+8				− 1
	9.80807					+ [illegible]	−7.95				+ 7.96
((δ) − D) $\frac{d'}{100}$	0.90033										+ .30
											− 25.10
+18.18 δ_2									0 23.5	50	59 49.77
+1 33.75											
	16.7	0 41.1	31.9	78.0	0 3900	+07	−12.96	−.04	5	5 26.1	9 30.03
	+16.7				5 8.00	17 9.35				5 25.39	− 8
d	1.22272					50 9 16.93	12.89−4+56				+ 7
	9.80671					+ 13.10	−13.11				+ 8.29
((δ) − D) $\frac{d'}{100}$	1.11737										+ .30
											− 24.70
+18.26 δ_1									10 47.4		9 13.91
+1 33.45											
	7.0	0 36.1	28.0	64.1	0 3205	+03	−5.43	−.04	5	5 26.65	9 30.99
	+7.0				5 32.05	17 16.30				5	− 2
d	0.84510					50 9 25.50	5.52−2+0				+ 6
	9.80671					+ 5.49	−5.50				+ 8.11
((δ) − D) $\frac{d'}{100}$	0.73975										+ .30
											− 25.00
+18.26 δ_2									10 47.9	51	9 14.44
+1 33.45											9
	17.8	4 43.5	~~47.2~~ 37.2	90.7	4 [illegible]	+09	−13.57	−.32	10	14 31.5	0 2[illegible]14
	+17.6				14 [illegible]	8 [illegible]				14 31.78	− 9
d	1.24351				40.35	57 0 [illegible]58	13.09+48				+ 48
	9.79887					+ 13.56	−13.57				+ 9.22
((δ) − D) $\frac{d'}{100}$	1.13232										+ .40
											− 24.60
+18.48 δ_1									47.5		0 ~~8.55~~
+1 32.95									1 42.5		1455
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Dec 10 Observer W.A.R. Recorder A.M. Date$_2$ = 1870 Dec 13 Observer W.A.R. Recorder A.M. Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	29m 55s	−3.3	9.0	29m	51.4	3.4	11.1	18.9	18.7	22.6	707	1414	1078
	28 56.6	49 51.8	8.9									10.78	30 8.36
	K												−8.58 61
	((δ) − D) $\frac{\kappa'}{100}$ ✓												+ .43
	α_1												− 2
												−0 8.20	29 55.19
										30m 10.08			−3.48
													29 51.68
	K												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												
	32 21	16.1	8.4	32	10.0	29.0	36.6	40.4	44.4	48.5	1989	3978	1086
	31 22.0	50 11.7	9.0								−8.17		10.85
	K	0											
	((δ) − D) $\frac{\kappa'}{100}$ ✓												
	α_1											8.20	32 20.76
										32 35.71			−3.53
													32 17.20
	✓		8.8	32	19.5	28.2	36.0	39.9	43.7	47.6	1954	3908	1086
	K										−7.62		10.85
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2											7.63	32 19.61
										32 35.63			−3.48
													32 17.12
	33 19	53.6	9.0	33	12.7	28.0	36.0	40.0	43.6	47.7	1953	3906	1100
	32 20.2	50 48.7	9.0								−8.16		11.00
	K												
	((δ) − D) $\frac{\kappa'}{100}$ ✓												
	α_1											8.19	33 19.90
										33 34.92			−3.57
													33 16.36
			9.0	33	16.5	27.5	35.3	39.3	43.1	47.1	1923	3846	1100
	K ✓										−7.61		11.00
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2											7.62	33 18.85
										33 34.94			−3.52
													33 16.32
	34 38	14.6	9.0	34	30.1	46.6	54.3	58.1	2.1	6.0	2871	5742	1085
	33 28.8	50 9.7	9.0								−8.17		10.85
	K												
	((δ) − D) $\frac{\kappa'}{100}$ ✓												
	α_1											8.20	34 38.40
										34 53.41			−3.55
													34 34.82
	K												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												
	35 35	3.5	3.0	35	32.7	43.3	51.0	55.0	58.7	2.7	2707	5414	1087
	34 36.0	49 57.3	4.1								−8.17		10.50
	K	57.6											
	((δ) − D) $\frac{\kappa'}{100}$ ✓												
	α_1											8.20	35 35.17
										35 50.17			−3.55
													35 31.59
				35									
	K												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												

0.65

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Runs −.07 R
−.22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	5	3′ 19.″2	14.″4	34.1	3′ 17.″05	+00	−9.35	−.23	15	18′ 7.″49	
	120				18 17.05	4 31.30					56 48.33
	+12.0					49 56 38.88	9.45+1	+0		18′ 7.″59	− 4
d	1.07918					+ 9.45	−9.46				+ 33
$((\delta) - D)\frac{d'}{100}$	980852										+ 8.06
	0.97564										+ 30
											− 24.40
+1840 δ_1									58	5.″2	56 32.58
+1 32.60											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2										50	
	100	4 30.5	27.8	58.3	4 29.15	+10	−14.71	−.31	55	59 14.2	15 41.58
	+18.9				59 29.15	23 19.20				59 14.36	− .10
d	1.27646					50 15 26.78	14.16−8+71				+ .45
$((\delta) - D)\frac{d'}{100}$	980580					+ 14.80	−14.79				+ 8.40
	1.17020										+ .30
											− 24.20
+18.51 δ_1											15 26.43
+1 32.20									16	58.6	
	87	4 25.3	17.8	43.1	4 21.55	+02	−6.74	−.97	55	59 13.9	15 42.81
	+8.7				59 21.55	23 26.80				59 14.72	− 2.
d	0.93952					50 15 36.00	6.30−3+56				+ .48
$((\delta) - D)\frac{d'}{100}$	980565					+ 6.81	−6.83				+ 8.22
	0.83311										+ .30
											− 24.60
+18.51 δ_2											15 27.19
+1 32.20									16	57.4	
	16.3	1 41.3	37.1	78.4	1 39.20	+06	−11.69	−.12	20	21 27.5	53 28.57
	+15.4				21 39.20	1 9.15				21 27.32	− 6.
d	1.18752					50 53 16.73	11.80−23+31				+ .17
$((\delta) - D)\frac{d'}{100}$	979996					+ 11.84	−11.88				+ 9.10
	1.07342										+ .40
											− 24.30
+18.62 δ_1											53 13.88
+1 32.05									54	45.9	
	11.0	1 39.0	32.8	71.8	1 35.90	+03	−8.40	−.24	20	21 27.0	53 30.15
	+11.0				21 35.90	1 12.45				21 27.41	− 3
d	1.04139					50 53 21.65	8.66−17				+ .18
$((\delta) - D)\frac{d'}{100}$	979996					+ 8.50	−8.49				+ 8.91
	0.92929										+ .40
											− 24.60
+18.62 δ_2											53 15.01
+1 32.05									54	47.1	
	16.5	0 38.0	31.7	69.7	0 34.85	+07	−12.79	−.04	0	0 22.1	14 34.00
	+16.5				0 34.85	22 13.50				0 21.72	− 7
d	1.21748					50 14 21.68	12.39−6+40				+ 6
$((\delta) - D)\frac{d'}{100}$	980595					+ 12.92	−12.93				+ 8.37
	1.11137										+ .30
											− 24.10
+18.59 δ_1											14 18.56
+1 31.80									15	50.4	
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2										50	
	16.6	2 57.0	50.1	104.1	2 52.05	+03	−8.24	−.20	10	12 43.6	2 12.22
	+10.6				12 52.05	9 56.30				12 43.71	− .3
d	1.02531					50 2 38.88	7.87−1+48				+ .29
$((\delta) - D)\frac{d'}{100}$	980777					+ 8.34	−8.34				+ 8.16
	0.92102										+ .30
											− 24.00
+18.58 δ_1											1 56.94
+1 31.65									3	28.6	
d											
$((\delta) - D)\frac{d'}{100}$											
δ_2											

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Date$_1$ = 1870 Dec 10 Observer W & R Recorder A. M. Date$_2$ = 1870 Dec 13 Observer W & R Recorder A. M.

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	38m 49s	28'.4	8.6	38m	33.5s	57.2	4.9	8.8	12.3	166	3398	6796	1090 38 57.06
	37 49.1	50 23.5	9.0							−8.16		10.90	38 57.06
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .44
a_1													− 2
												−0 8.19	38 48.90
													−3.61
										39 4.01			38 45.26
			9.5	38	43.3	56.3	4.2	8.0	11.8	15.8	3361	6722	1090 38 56.32
										−7.62		10.90	38 56.32
κ													−8.01
((δ) − D) $\frac{\kappa'}{100}$													+ .40
a_2													− 2
												7.63	38 47.82
													−3.57
										39 3.87			38 45.32
	40 11	40 9	8.9	40	54.3	40 19.0	27.0	30.7	34.6	38.6	1499	2998	1091 40 19.03
	39 11.2	50 36.0	8.9	39						−8.16		10.94	40 19.02
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .44
a_1													− 2
												8.19	40 10.88
													−3.64
										40 24.03			40 7.21
			8.6	40	6.0	18.5	26.0	30.0	34.0	37.9	1464	2928	1091 40 18.33
										−7.62		10.94	40 18.34
κ													−8.01
((δ) − D) $\frac{\kappa'}{100}$													+ .40
a_2													− 2
												7.63	40 [illegible]
													−3.59
										40 25.94			40 7.12
	42 34	46.9	8.4	42	27.0	43.6	51.6	55.3	59.3	3.2	2730	5460	1088 42 43.62
	41 34.2	50 42.1	8.8							−8.16		10.97	42 43.63
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .44
a_1													− 2
												8.19	42 35.47
													−3.64
										42 50.66			42 31.76
			9.0	42	30.7	43.0	50.9	54.8	58.6	2.7	2700	5400	1098 42 43.02
										−7.62		10.97	42 43.03
κ													−8.01
((δ) − D) $\frac{\kappa'}{100}$													+ .40
a_2													− 2
												7.63	42 38.41
													−3.63
										42 50.67			42 31.77
	43 30	12.1		43								10.83	
	42 29.9	50 7.3	9.5										
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_1													
			9.7	43	27.7	38.3	46.0	50.0	53.5	57.5	2453	4906	1084 43 28.23
										−7.64		10.83	43 28.23
κ													−8.01
((δ) − D) $\frac{\kappa'}{100}$													+ .39
a_2													− 2
												7.64	43 [illegible]
													−3.61
										43 45.84			43 26.98
	44 36	50.3	6.5	44	33.4	45.0	52.8	56.5	0.7	4.6	2795	5592	1098 44 44.93
	43 36.1	50 45.5	6.6							−8.16		10.98	44 44.94
κ													−8.58 61
((δ) − D) $\frac{\kappa'}{100}$													+ .44
a_1													− 2
												8.19	44 36.78
													−3.71
										44 52.02			44 33.04
			6.5	44	37.5	44.1	52.1	56.0	59.8	3.8	2798	5596	1098 44 44.37
										−7.63		10.98	44 44.37
κ													−8.01
((δ) − D) $\frac{\kappa'}{100}$													+ .40
a_2													− 2
												7.63	44 38.55
													−3.65
										44 51.88			44 32.90
													0.70

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Runs ~07 R
~22R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	237	1 46.4	40.7	871	1 43.55	+14	−18.27	−12	45~	46 25.53	28 30.47 +10
	+2.36				46 43.55	36 4.80				46 25.14	− 15 +9.02
d	1.37291				436.50	28 12.38	18.11−17+47				+ 17
	9.80382					+ 18.39	−18.41				+ 8.65
((δ) − D) $\frac{d'}{100}$	1.26467										+ 35
											− 23.80
+18.75 δ_1									29 46.9		28 15.79
+1 31.05											
	190	1 39.2	31.9	711	1 35.55	+05	−10.02	−3.6	45~	46 25.92	28 32.13
	+1.30				46 35.55	36 12.80				46 25.42	− 5 +8.95
d	1.11394					50 28 22.00	10.24−11				+ 8.18
	9.80382					+ 10.13	−10.13				+ 8.47
((δ) − D) $\frac{d'}{100}$	1.00570										+ 35
											− 24.20
+18.75 δ_2									29 47.9		28 16.88
+1 31.05											
	197	4 36.8	32.1	889	4 24.45	+11	−15.13	−3.2	30	34 19.1	40 36.67
	+1.97				34 29.45	48 13.90				34 19.16	− 11 +9.55
d	1.29447				345	40 21.48	14.95−21+55				+ 46
	9.80194					50 + 15.29	−15.29				+ 8.85
((δ) − D) $\frac{d'}{100}$	1.18438										+ 35
											− 23.80
+18.82 δ_1									41 53.2		40 22.42
+1 30.80											
	205	4 32.8	26.1	589	4 29.45	+04	−9.59	−9.7	30	34 19.90	40 37.65
	+1.23				34 29.45	48 18.90				34 19.90	− 4 +9.47
d	1.08991					50 40 28.10	9.45−13+24				+ 49
	9.80197					+ 9.55	−9.55				+ 8.67
((δ) − D) $\frac{d'}{100}$	0.97982										+ 35
											− 24.10
+18.82 δ_2									41 53.8		40 23.02
+1 30.80											
	166	3 12.0	7.5~	195	3 9.75	+08	−12.71	−2.2	30?	37 5.69	46 59.03
	+16.6				28 9.75	54 38.60				27 58.90	− 8 +9.61
d	1.22011					50 46 46.18	12.89−21+47				+ 32
	9.80089					+ 12.85	−12.85				+ 8.97
((δ) − D) $\frac{d'}{100}$	1.10894										+ 40
											− 23.60
+18.90 δ_1									48 15.4		46 45.04
+1 30.35											
	123	3 10.5~	3.1	136	3 6.80	+04	−9.43	−6.8	25~ Sine	37 5.67	47 1.27
	+1.23				28 6.80	54 41.55				27 52.27	− 4 +9.48
d	1.08991					50 46 50.75	9.45−16+24				+ 34
	9.80089					+ 9.52	−9.53				+ 8.78
((δ) − D) $\frac{d'}{100}$	0.97874										+ 40
											− 24.00
+18.90 δ_2									48 16.1		46 45.75
+1 30.35											
d											
((δ) − D) $\frac{d'}{100}$											
δ_1											
	106	3 8.5~	1.4	99	3 4.95	+03	−8.22	−5.7	0	2 56.71	12 0.83
	+10.5				3 4.95	19 43.40				2 56.71	− 3 +8.77
d	1.02119					50 11 52.60	7.87−3+40				+ 34
	9.80610					+ 8.23	−8.24				+ 8.46
((δ) − D) $\frac{d'}{100}$	0.91523										+ 30
											− 23.80
+18.86 δ_2									13 16.0		11 45.80
+1 30.20											
	116	0 0.1	54.7	−52	−0 2.60	+03	−8.84	−0	25~	24 48.56	50 7.42
	+11.5				24 57.40	57 50.95				24 48.50	− 3 +9.38
d	1.06070					50 49 58.53	8.66−16+40				+ − 1
	9.80043					+ 8.87	−8.90				+ 9.02
((δ) − D) $\frac{d'}{100}$	0.94907										+ 40
											− 23.50
+18.98 δ_1									51 23.2		49 53.30
+1 29.95											
	66	4 59.9	52.8	1127	4 56.35	+01	−4.97	−1.0	20	24 5.03	50 6.38
	+.67				24 56.35	57 52.00				24 5.16	− 2 +9.36
d	0.82607					50 50 1.20	4.73−8+54				+ 54
	9.80043					+ 5.18	−5.19				+ 8.84
((δ) − D) $\frac{d'}{100}$	0.71444										+ 40
											− 23.80
+18.98 δ_2									51 22.3		49 52.34
+1 29.95											

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Date$_1$ = 1870 Dec 10 Observer W.A.R. Recorder A.M. Date$_2$ = 1870 Dec 13 Observer W.A.R. Recorder A.M. Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	1h 46m 45s 3.7	46.5 50 41.7	8.9 8.5	45 55.5	12.7	20.4	24.3	28.2	32.0	1176 −8.16	235.2	1097 10.96	46 12.56
													46 12.56 −8.61 +.44 −.2
												-0 8.19	46 4.40 −3.71
										46 19.68			46 0.66
			8.7	46 0.2	12.0	19.7	23.6	27.4	31.3	1140 −7.63	228.0	1097 10.96	46 11.82
													46 11.82 −8.02 +.40 −.2
												7.64	46 3.21 −3.66
										46 19.56			46 0.54
	1h 27m 46 26.0	63.1 50 58.3	6.8 7.3	47 23.8	36.6	44.3	48.2	52.0	56.3	2375 −8.16	475.0	1082 11.03	47 36.46
													47 36.47 −8.61 +.44 −.2
												8.19	47 28.31 −3.73
										47 43.65			47 24.55
			7.8	47 22.3	35.9	43.8	47.6	51.5	55.6	2344 −7.63	468.8	1082 11.03	47 35.84
													47 35.85 −8.02 +.41 −.2
												7.63	47 27.22 −3.69
										47 43.63			47 24.53
	1h 47m 46.4	18.6 50 14.0	9.2 9.1	48 40.8	57.2	0.9	8.3	12.6	16.5	2395 −8.17	479.0	1097 10.96	48 5.19
													48 5.00 −8.61 +.43 −.2
												8.20	48 48.87 −3.71
										49 4.18			48 45.13
			9.0	48 46.0	56.5	4.3	8.0	12.0	15.9	3367 −7.64	673.4	1097 10.96	48 5.64
													48 5.48 −8.02 +.40 −.2
												7.64	48 47.84 −3.67
										49 4.22			48 45.17
	1h 50m 49 31.9	~~50.7~~ 50 10.3	9.0 8.6	50 ~~36.4~~	~~36.4~~ 41.6	~~47.0~~ 48.8	~~48.8~~ 52.9	~~52.9~~ 56.4	0.5	2594 −8.17	518.8	1086 10.85	50 4.03
													50 4.03 −8.61 +.43 −.2
												8.20	50 32.86 −3.73
										50 48.19			50 29.10
			8.8	50 34.6	40.3	48.1	51.9	55.8	59.8	2558 −7.64	511.8	1085 10.85	50 4.01
													50 4.33 −8.02 +.40 −.2
												7.64	50 37.69 −3.68
										50 48.10			50 29.01
	1h 52m 51 48.3	62.8 50 58.0	9.2 9.2	52 44.5	57.0	4.0	10.8	14.7	18.4	3502 −8.16	700.4	1104 11.03	52 5.90
													52 5.91 −8.61 +.44 −.2
												8.19	52 50.85 −3.79
										53 6.30			52 47.03
			9.0	52 45.0	58.3	66.3	70.1	74.0	~~78.0~~	3467 −7.63	693.4	1104 11.03	52 5.82
													52 5.83 −8.02 +.41 −.2
												7.63	52 ~~49~~ 48.68 −50 3.75
										53 6.20			52 46.93

see next page, bottom

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Runs −07 −22

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	62	3′ 24.5	24.1	536	3′ 26.80	+07	−22.41	−24	25	38, 147	46 41.60
	+16.1				28 26.80	54 21.55				28 14.08	− 7 +9.64
d	1.20683					50 46 29.13	12.59−21+8				+ .34
((δ) − D) $\frac{d'}{100}$	9.80105					+ 12.47	−12.72				+ 8.97
	1.09582										+ .40
+19.02 δ_1											− 23.30
+1 29.65									1 11		46 27.94
	118	3 27.1	20.9	480	3 24.00	+02	−9.06	−76	47 57.6 25	28 14.2	46 42.53
	+11.6				25 24.00	54 24.35				28 18.01	− 4 +9.50
d	1.06446					50 46 33.55	8.66−14+47				+ .37
((δ) − D) $\frac{d'}{100}$	9.80089					+ 8.98	−8.99				+ 8.77
	0.95329										+ .40
+19.02 δ_2											− 23.30
+1 29.65									47 57.9	51	46 28.23
	108	1 36.0	37.0	1074	1 53.50	+03	−8.23	−14	10	11 45.2	3 10.67
	+10.7				11 53.50	10 54.85				11 45.27	− 3 +9.83
d	1.02938					51 3 2.93	7.70−1+37				+ .19
((δ) − D) $\frac{d'}{100}$	9.79840					+ 8.24	−8.23				+ 9.27
	0.91572										+ .40
+19.10 δ_1											− 23.30
+1 29.40									4 10 26.6	11 44.0	2 57.20
	136	1 38.1	51.3	1094	1 54.70	+05	−10.36	−48		11 44.09	3 13.24
	+13.5				11 54.70	10 53.65					− 5 +9.63
d	1.13033					51 3 2.85	10.24−2+39				+ .21
((δ) − D) $\frac{d'}{100}$	9.79840					+ 10.39	−10.61				+ 9.07
	1.01661										+ .40
+19.10 δ_2											− 23.90
+1 29.40									4 28.6	50	2 59.17
	164	1 8.2	6.0	147	1 7.35	+07	−12.68	−.08	55	55 54.6	19 1.25
	+16.2				56 7.35	26 41.00				55 54.54	− 7 +8.87
d	1.20952					50 18 48.58	12.59−8+16				+ .11
((δ) − D) $\frac{d'}{100}$	9.80519					+ 12.67	−12.51				+ 8.48
	1.10265										+ .35
+19.05 δ_1											− 23.10
+1 29.15									20 16.2		18 47.02
	105	1 4.3	0.9	52	1 2.60	+03	−8.13	−24	55	55 54.38	19 2.16
	+10.5				56 2.60	26 40.75					− 3 +8.71
d	1.02119					50 18 [illegible]	7.87−5+40				+ .11
((δ) − D) $\frac{d'}{100}$	9.80519					+ 8.21	−8.22				+ 8.28
	0.91432										+ .35
+19.05 δ_2											− 23.50
+1 29.15									20 16.5	50	18 47.37
	46	0 13.6	8.0	216	0 10.80	−01	−3.53	−01	0	0 7.3	14 48.73
	+4.6				0 10.80	22 37.55				0 7.18	− 1 +8.68
d	0.66276					50 14 45.13	3.16−2+48				+ 2
((δ) − D) $\frac{d'}{100}$	9.80580					+ 3.60	−3.62				+ 8.37
	0.55650										+ .30
+19.09 δ_1											− 22.90
+1 28.75									16 3.3		14 34.51
	57	0 15.3	9.2	245	1225	−01	−4.37	−08	0	0 7.4	14 49.76
	+5.7				0 12.25	22 36.10				0 7.17	− 1 +8.49
d	0.75587					50 14 45.36	3.94−2+56				+ 2
((δ) − D) $\frac{d'}{100}$	9.80580					+ 4.46	−4.48				+ 8.18
	0.64961										+ .30
+19.09 δ_2											− 23.30
+1 28.75									16 3.7	51	14 34.95
	145	2 2.5	38.4	+09	2 0.52	+05	−11.05	−14	10	11 49.2	3 6.64
	+14.5				12 0.45	10 47.90				11 49.29	− 5 +9.82
d	1.16137					51 2 35.48	10.78−1+39				+ .20
((δ) − D) $\frac{d'}{100}$	9.79840					+ 11.16	−11.16				+ 9.27
	1.04771										+ .40
+19.27 δ_1											− 22.90
+1 28.30									4 21.89		2 53.56
	133	2 5.0	57.8	28	2 1.40	+05	−10.13	−46	10	11 50.4	3 6.39
	+13.3				12 1.40	10 46.95				11 50.46	− 5 +9.63
d	1.12385					51 2 36.15	10.01−1+24				+ .22
((δ) − D) $\frac{d'}{100}$	9.79840					+ 10.24	−10.24				+ 9.06
	1.01019										+ .40
+19.27 δ_2											− 23.80
+1 28.30									4 21.8	0 2	2 52.72

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Date$_1$ = 1870 Dec 10 8 Observer W. A. R. Recorder A. M. Date$_2$ = 1870 Dec 13 10 Observer W. A. R. Recorder A. M.

Runs

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
1	57 58m 17	42.7	8.8	57 58	13.3	25.4	33.3	37.0	48.0	45.0	1817	3634	1096 58	2538
	57 15.6	50 38.0	8.4							−8.16		10.95	58 2539
	κ												− 8.58 61
													+ .44
	((δ) — D) $\frac{\kappa'}{100}$ ✓												− 2 ((δ
												−0 8.19	58 17.23
	c_1												− 3.84 +19.3
										58 32.75			58 13.36 +1.27
			8.8	58	16.8	24.8	32.6	36.4	40.4	44.4	1786	3572	1096 58 2476
	κ ✓										−7.64	10.95	58 24.77
													− 8.02
													+ .40
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
												7.64	58 16.13
	c_2												−3.79 +19.3
										58 32.73			58 13.34 +1.27
	59 15	24.0	8.7	59	10.2	23.0	30.8	34.4	38.5	42.5	1692	3384	1091 59 2293
	58 13.2	50 24.3	7.9							−8.16		10.90	59 22.94
	κ ✓												− 8.58 61
													+ .44
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
												8.19	59 14.78
	a_1												−3.84 +19.3
										59 30.30			59 10.91 +1.26
			8.7	59	13.3	22.2	30.0	34.0	37.9	41.9	1660	3320	1091 59 2229
	κ ✓										−7.64	10.90	59 22.30
													− 8.02
													+ .40
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
												7.64	59 13.66
	a_2												−3.79 +193
										59 30.26			59 10.87 +1.26
2	1 0m 42s	27.8	8.6	0	35.0	57.3	59.0	3.0	6.7	9.9	3099	6198	1090 0 5108
	59 40.5	50 23.1	8.1							−8.17		10.90	0 57.08
	κ ✓												− 8.58 60
													+ .44
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
												8.18	0 42.91
	a_1												− 3.85 +194
										0 58.49			0 39.05 +1.26
			8.7 double both ✓	0	38.7 40.7	50.4 50.6	58.1 58.2	62.0 62.1	66.0 66.1	70.0 70.1	3065	6130	1090 0 5040
	κ ✓										−7.64	61.42 10.90	0 50.40 50.52
													− 8.02 − 8.02
													+ .40 + .40
	((δ) — D) $\frac{\kappa'}{100}$												− 2 − 2 ((δ
												7.64 7.64	0 41.76
	a_2												− 3.81 − 3.81 +194
										0 58.39		0 58.57	0 38.95 39.07 +1.26
2	1 0m 42s	50 27.8		0	40.6	50.6	58.2	62.6	66.0	70.1	3070	6140	1090 0 5050
	59 40.5	50 23.1	8.1							−7.60		10.90	0 50.50
Dec 13	κ												− 8.02
Same as preceding. double													+ .40
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
													0 41.88
	a_1												− 3.81
													0 39.85
	κ												((δ
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												
Dec 10	2 42s	60.0	8.9	2	34.7	51.7	59.5	3.4	7.3	11.2	3121	6242	1153 2 5159
	1 40.5	50 55.3	8.7							−8.20		11.02	2 51.60
	κ												− 8.58 60
													+ .44
	((δ) — D) $\frac{\kappa'}{100}$												− 2 ((δ
												8.18	2 43.40
V	a_1												− 3.90 +19.3
										2 59.10			2 39.52 +1.26
1 Dec 10	49 42	18.0	9.5	49	40.8	57.2	5 0	8.3	12.6	16.5	3082	6164	1086 49 5078
	48 41.6	50 13.2	9.4		37.3	51.0	58.8	2.4	6.0	10.0	−8.17	10.86	49 50.78
	κ												− 8.58 61
													+ .43
	((δ) — D) $\frac{\kappa'}{100}$ ✓												− 2 ((δ
												8.20	49 42.61
	a_2												− 3.73 49 4
13	✓		9.2	49	39.4	50.0	57.8	1.8	5.6	9.2	49 57.92		49 38.85
											−7.64	10.86	49 50.02 49
											7.64		− 8.02 +1

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Runs

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	121	2 1′ 37.5	32.5	700	2 35.00	+02	−928	−18	30	82, 35.6	42 30.31
	+12.1				32 35.00	60 1335				32 25.91	− 4
d	1.08249					50 42 2093	9.45−14+8				+ .26
	9.80166					+ 9.38	9.39				+ 8.89
((δ) − D) $\frac{d'}{100}$	0.97239										+ .35
											− 22.40
+19.39 δ_1											42 17.37
+1 27.15									43	44.5	
	80	2 35.5	30.0	683	2 34.15	+02	−614	−58	30	32 27.94	42 29.60
	+8.0				32 34.15	50 1420					− 2
d	0.90309					50 42 2340	6.30−9				+ .29
	9.80166					+ 6.20	6.21				+ 8.68
((δ) − D) $\frac{d'}{100}$	0.79269										+ .35
											− 22.90
+19.39 δ_2											42 16.00
+1 27.15									43	43.2	50
	128	1 20.3	16.0	363	1 18.15	+08	−986	−09	45	46 8.25	28 47.67
	+12.7				46 18.15	36 3020				46	− 5
d	1.10380					50 28 3778	9.45−10+55				+ .13
	9.80366					+ 9.89	9.90				+ 8.64
((δ) − D) $\frac{d'}{100}$	0.99540										+ .35
											− 22.30
+19.39 δ_1											28 34.44
+1 26.95									30	1.4	
	89	1 18.7	11.2	391	1 15.05	+02	−686	−29	45	46 8.65	28 49.51
	+9.0	1 18.9			46 15.05	36 33.30				46	− 2
d	0.95424					50 28 42.50	7.18−8				+ 8.14
	9.80366					+ 7.01	7.00				+ 7.46
((δ) − D) $\frac{d'}{100}$	0.84584										+ .35
											− 2280
+19.39 δ_2											28 34.64 3564
+1 26.95									30	2.6	50
	160	2 42.1	37.4	795	2 39.75	+07	−1257	−19	45	47 27.20	27 28.73
	+16.1				47 39.75	35 8.60				47	− 7
d	1.20683					50 27 16.88	12.59−12+8				+ .27
	9.80397					+ 12.55	12.55				+ 8.62
((δ) − D) $\frac{d'}{100}$	1.09874										+ .35
											− 2220
+19.44 δ_1											27 15.70
+1 26.65									28	42.4	
	118	2 37.7	31.6	693	2 34.65	+03	−903	−57	45	47 25.83	27 32.02
	+11.7	+ 9.8			47 34.65	35 13.70					− 4 +9.02
d	1.06819	0.99123				50 27 22.90	8.66−9+55				+ .29
	9.80397	9.80397				+ 9.12	9.12				+ 8.42
((δ) − D) $\frac{d'}{100}$	0.96010	0.88314				+ 7.64					+ .35
											− 2260
+19.44 δ_2											27 18.44
+1 26.65									28	45.1	28 43.6 50
	100	2 37.7	31.6			+03	−803				27 27.42
	+9.9				47 34.65	35 13.70					− 3
d	0.99564					50 27 22.90	7.08−8+70				+ .29
	9.80397					+ 7.72	7.70				+ 8.62
((δ) − D) $\frac{d'}{100}$	0.88755										+ .35
											− 2270
δ_1											27 16.25
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
	170	0 14.3	8.9	232	0 11.60	+08	−1297	−01	15	14 58.59	50
	+16.9				15 11.60	7.36.75					54 57.35
d	1.22969					50 59 44.33	12.32+69				− 8
	9.79887					+ 13.02	13.01				+ 2
((δ) − D) $\frac{d'}{100}$	1.11470										+ 9.22
											+ .10
+19.58 δ_1											− 22.10
+1 26.20											59 44.81 61
	130	2 18.8	14.1		57 16.45	+04	−1061		55	10.8	50 Dec 10
	+13.5	Dec 10		Dec 13.		50 25 3190					17 50.03
+19.07	1.13039	50 25				+1055	10.24−6+40				− 5
+1 28.95 d	9.80412	+ 9.12		+ 8.96		50 17 39.48	10.58				+ .23
− 802	1.02239					+ 10.55					+ 8.59
((δ) − D) $\frac{d'}{100}$											± .35
						−7 5.60					− 23.00
δ_2									19	5.1	25 28.57
49 42.88									26	57.5	17 36.15
− 3.66											
49 38.70											
+19.07	1.10631	2 17.9	12.2		57 15.05	+03	−818		55	5.6	
+1 28.95						50 25 3330	7.87−5+47		19		
						50 17 4280	8.29		26	55.1	

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Date$_1$ = ~~1870 Dec 10~~ 50° Observer / Recorder

Date$_2$ = 1870 Dec 13. Observer A. M. / Recorder W. A. R.

n = +.33

Runs

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
2	11m 36s	21.5		m s	s	s	s	s	s	s	s	s	m s
	10 33.0	50 16.8	7.0										
κ													
((δ) — D) $\frac{\kappa'}{100}$													((δ)
c_1										m s			
			7.5	11 31.7	42.4	50.3	54.2	58.0	1.9	2668	5336	1088	2.48
κ										-7.69		10.87	11 42.49
													-8075
													+ .40
((δ) — D) $\frac{\kappa'}{100}$													((δ)
												-0 7.67	11 38.80
c_2													- 3.92
										11 50.64			11 30.90
	12 57	41.9	4										
	11 49.4	50 37.3	8.3										
κ													
((δ) — D) $\frac{\kappa'}{100}$													((δ)
a_1													
			7.8	12 48.0	×0.8	8.6	12.5	16.3	20.3	585	1170	1096	0.74
κ										-7.69		10.95	13 0.75
													-8075
													+ .40
((δ) — D) $\frac{\kappa'}{100}$													((δ)
												7.67	12 52.06
a_2													- 3.95
										13 8.97			12 49.13
	14 20	26.7											
	13 17.1	50 22.1	8.6										
κ													
((δ) — D) $\frac{\kappa'}{100}$													((δ)
a_1													
			8.5	14 ~~24.8~~ 25.5	29	43.7	47.0	51.8	55.0	2014	4028	1090	29.38
κ										-7.64		10.89	14 29.39
													-8076
													+ .40
((δ) — D) $\frac{\kappa'}{100}$													((δ)
												7.68	14 28.70
a_2													- 3.95
										14 37.60			14 17.76
	15 11	18.7											
	14 7.9	50 14.1	8.5										
κ													
((δ) — D) $\frac{\kappa'}{100}$													((δ)
a_1													
			8.3	15 12.9	20.7	28.8	32.1	36.0	40.0	1571	3142	1087	20.55
κ										-7.69		10.86	15 20.56
													-8076
													+ .40
((δ) — D) $\frac{\kappa'}{100}$													((δ)
												7.68	15 12.87
a_2													- 3.95
										15 28.78			15 8.93
	16 4.5	39.3											
	15 41.7	50 34.8	9.0										
κ													
((δ) — D) $\frac{\kappa'}{100}$													((δ)
a_1													
			9.0	16 30.7	45.8	53.6	61.5	65.4	69.2	2955	5910	1094	28.16
κ										-7.69		10.94	16 20.47
													-8076
													+ .40
((δ) — D) $\frac{\kappa'}{100}$													((δ)
												7.68	16 40.47
a_2													- 3.99
										16 56.43			16 36.49

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Runs −07 Rw −7 5058 M. +11" Rns.

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	1.07 +10.8 1.03342 9.80473 0.92609	3	22.7	18.5	41.2	8 2060 53 20.60	+03 29 27.75 50 21 37.17 + 8.43	−828 −23 7.87−6+63 −8.44	50	53 12.16	21 45.60 − 3 + 36 + 8.32 + .35 − 21.70 21 32.90 +9.00
$((\delta) - D)\frac{d'}{100}$											
+19.74 δ_2 +1 24.15									22 57.1		
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	1.28 +12.7 1.10380 9.80166 0.99340	3	25.2	21.6	46.6	8 2340 33 23.40	+03 49 24.95 50 41 34.37 + 9.85	−583 −23 9.45−14+55 9.86	30	33 13.64	41 44.22 − 5 + .37 + 8.66 + .35 − 21.70 41 31.85 +9.33
$((\delta) - D)\frac{d'}{100}$											
+19.84 δ_2 +1 23.80									42 55.6		
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											38.71
+ 4.6 0.66276 9.80397 0.55467 $((\delta) - D)\frac{d'}{100}$	1.26 ~~+12.6~~ 1.10037 9.80394 0.99228	3	29.6	15.7	45.3	8 2265 48 22.65	+03 34 25.70 50 26 35.12 + ~~4.12~~ 9.83 + 3.59	−572 −23 7.45−9+47	45	48 12.82	26 44.94 − 5 + .37 + 8.39 + .35 − 21.50 26 ~~32.60~~ 26.32 +9.06
+19.84 δ_2 +1 23.45									27 ~~38.0~~ 49.8		
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	1.38 +17.7 0.88649 9.80519 0.77962	1	21.1	16.3	37.4	1 1870 56 18.70	+02 26 29.65 50 18 39.07 + 6.02	−604 −09 5.52−3+55 6.04	55	56 12.66	18 45.09 − 2 + .14 + 8.27 + .35 − 21.50 18 32.33 +8.74
$((\delta) - D)\frac{d'}{100}$											
+19.85 δ_2 +1 23.25									19 55.6		
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	1.54 +17.5 1.24304 9.80213 1.13311	0	34.3	29.4	63.7	0 3185 35 ~~31.85~~ 31.85	+06 44 16.50 50 39 25.92 + 13.54	−1160 −04 13.38−19+39 13.58	35	35 18.27	39 ~~39.51~~ 39.51 − 8 + 6 + 8.63 + .35 − 21.40 39 27.07 +8.96
$((\delta) - D)\frac{d'}{100}$											
δ_2									40 50.0		

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Date$_1$ = 1870 Dec 10 n=+.3680° Observer A.M. Recorder W.A.R.

Date$_2$ = 1870 Dec 13 n=+.33 Observer A.M. Recorder W.A.R.

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Runs

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
2	2h 19m 7	52.1		m s	s	s	s	s	s	m s	s	s	m s
	18 3.8	50 47.6	9.0										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			9.0	19 3.0	15.1	22.9	27.0	31.0	35.8	1308 −7.69	2616	10.99	15.16 19 15.17 −8.76 +.40 −.2
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												−0 7.68 19 7.48 −4.02
										19 23.52			19 3.47
21	10	39.5−											
20	6.3	50 35.1	8.5										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			8.5−	21 5.3	17.7	25.4	29.5−	33.3	37.2	1431 −7.69	2862	10.94	17.68 10.94 21 17.68 −8.76 +.40 −.2
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												7.68 21 9.99 −4.03
										21 26.05			21 5.97
22	34	44.5−											
21	30.7	50 40.2	8.6										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			9.0	22 33.8	41.9	49.7	53.7	57.5	61.6	2644 −7.69	5288	10.96	41.92 10.96 22 41.92 −8.76 +.40 −.2
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												7.68 22 34.23 −4.05
										22 50.32			22 30.19
24	26	37.3											
25	21.8	50 33.0	9.0										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			9.3	26 18.3	34.2	42.4	46.2	50.1	53.9	2268 −7.69	4536	10.93	34.42 26 34.43 −8.76 +.40 −.2
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												7.68 26 26.74 −4.08
										26 42.89			26 22.67
27	25−	18.3	8.6−	29 6.8	8.9	41.8	45.7	49.3	53.4	2241 −8.31	4482	10.86	33.96 10.86 29 33.96 −8.76 +.43 −.2
25	20.7	50 14.0	8.5										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												8.30 29 25.65 −4.12
										29 41.79			29 21.54
			8.7	29 16.7	33.2	41.0	45.0	48.7	52.7	2206 −7.69	4412	10.86	33.26 10.86 29 33.26 −8.76 +.40 −.2
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2												7.68 29 25.57 −4.09
										29 41.74			29 21.49

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Dec. 10 - 7 Rzs 51.06 M Rzt +10
13 50.58 M. +.11

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Runs -07R
-22R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1		3							′ ″		51
d	121 +12.2	23.0	17.3	403	23 20.15	+021 549 2820	-925		20	25′ 10″.71	58 44 4705
$((\delta) - D)\frac{d'}{100}$	1.08636 9.80043 0.97473					50 49 37.62 + 9.43	9.45-17+16 9.44				− 4 + 3 + 8.87 + 40 − 21.20
$+2005\ \delta_2$									52		49 35.05
$+1\ 22.25$									50 57.3		57
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											50
d	124 +12.4	0 25.7	19.1	448	0 22.40	+021 47 25.95	-552 -08		35	35 12.77	39 44.99
$((\delta) - D)\frac{d'}{100}$	1.09342 9.80197 0.98333					50 39 35.37 + 9.62	9.45-13+31 9.63				− 4 + 4 + 8.63 + 35 − 21.00
$+2008\ \delta_2$									40 54.7		39 32.97
$+1\ 21.75$											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											50
d	81 +8.1	0 29.7	22.3	520	0 26.00	+02 52 22.35	-621 -44		30	30 17.72	44 35.05
$((\delta) - D)\frac{d'}{100}$	0.99849 9.80120 0.79763					50 44 31.77 + 6.28	6.30-10+8 6.28				− 2 + 4 + 8.70 + 35 − 20.90
$+2013\ \delta_2$									45 47.6		44 26.22
$+1\ 21.40$											
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											50
d	159 +16.1	3 0.0	54.1	1141	0 57.05	+07 44 51.30	-1222 -60		35	35 44.55	37 1328
$((\delta) - D)\frac{d'}{100}$	1.26683 9.80244 1.09721					50 37 0.72 + 1251	12.57-17+8 12.58				− 7 + 33 + 8.60 + 35 − 20.70
$+2022\ \delta_2$									38 22.2	50	37 1.74
$+1\ 20.45$											
d	271 +27.2	1/2 3.1 0.2 −0.48		882	42 1.50	+19 25 46.45	-227 -14		55	56 40.10 56 40.63	18 17.14
$((\delta) - D)\frac{d'}{100}$	1.43457 9.80534 1.32785					50 17 55.87 + 21.27	21.25-14+16 21.27				− .20 + .20 + 8.47 + 35 − 19.70 19.80
$+2025\ \delta_1$									19 25.8		18 6.16
$+1\ 19.65$											
d	165 +16.6	1 58.3 sure 53.0		1113	56 55.65	+07 25 52.70	-1275 -44		55	56 42.67	18 15.10
$((\delta) - D)\frac{d'}{100}$	1.22011 9.80534 1.11339					50 18 2.12 + 12.98	12.57-8+47 12.58				− .8 + .21 + 8.27 + .35 − 20.30
$+2025\ \delta_2$									19 23.2		18 3.55
$+1\ 19.65$											

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Date$_1$ = 1870 Dec 10 — Observer A. M. — Recorder W. A. R.
n = +.36 c = +.00 50°

Date$_2$ = 1870 Dec 13 — Observer A. M. — Recorder W. A. R.
n = +.33 c = .00

Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
2 h	30 m 28	13.7	9.0	30 m	25.9 s	35.7	43.5	47.6	51.3	55.4	2325	46.70	10.85	35.85
	29	23.1	50 4.4	8.9							−8.31		10.84	30 35.86
	κ													−8.71
	((δ) — D) $\frac{\kappa'}{100}$													+ .43
														− 2
	α_1												−0 8.30	30 27.55
														− 4.12
											30 43.71			30 23.43
			8.0	30	23.2	35.2	42.9	46.7	50.4	54.5	2297	45.94	10.85	35.09
											−7.70		10.84	30 35.10
	κ													−8.06
	((δ) — D) $\frac{\kappa'}{100}$													+ .39
														− 2
	α_2												7.69	30 27.40
														− 4.10
											30 43.58			30 23.31
	31 43	64.0	8.5	31	28.5	52.2	0.1	4.3	8.2	12.1	3169	63.38	11.04	52.34
2d Str for δ	30	57.8	8.5								−8.30		11.04	31 8.34
	κ	38.5												−8.71
	((δ) — D) $\frac{\kappa'}{100}$													+ .44
														− 2
	α_1												8.29	31 44.04
														− 4.19
											32 0.31			31 39.86
			8.0	31	~~20.9~~ 41.9	~~44.6~~ 51.5	59.6	63.5	67.5	71.3	3134	62.68	11.04	51.64
											−7.59		11.04	31 51.64
	κ													−8.06
	((δ) — D) $\frac{\kappa'}{100}$													+ .41
														− 2
	α_2												7.67	31 43.95
														− 4.16
											32 0.26			31 39.81
	47 49	44.3	6.5	47	37.5	54.5	65.2	9.2	13.0	16.9	3418	68.36	10.97	57.39
	46 43.0	50 40.3	6.5								−8.29		10.96	47 57.40
	κ													−8.71
	((δ) — D) $\frac{\kappa'}{100}$													+ .44
														− 2
	α_1												8.29	47 49.11
														− 4.30
											48 5.64			47 44.81
			7.0	47	48.4	56.8	64.5	68.5	72.4	76.4	3386	67.72	10.97	56.73
											−7.70		10.96	47 56.76
	κ													−8.08
	((δ) — D) $\frac{\kappa'}{100}$													+ .40
														− 2
	α_2												7.69	47 49.06
														− 4.28
											48 5.62			47 44.79
	49 4	26.7	not seen											
	49 58.5	50 22.7	9.2											
	κ													
	((δ) — D) $\frac{\kappa'}{100}$													
	α_1													
			9.5	~~48~~	1.9	13.5	21.3	25.3	29.2	33.2	1225	24.50	10.40	13.60
											−7.70		10.89	13.61
	κ													−8.07
	((δ) — D) $\frac{\kappa'}{100}$													+ .40
														− 2
	α_2												7.69	49 5.91
														− 4.29
		51.5									49 22.44			49 1.63
	50 38	57.5	9.0	50	29.3	47.3	55.1	59.3	3.0	7.2	2919	58.38	11.02	47.36
	49 31.6	56 47.6	8.9								−8.29		10.99	50 47.39
	κ													−8.06
	((δ) — D) $\frac{\kappa'}{100}$													+ .44
														− 2
	α_1												8.28	50 39.10
														− 4.33
											50 55.71			50 34.78
			8.0	50	35.3	46.8	54.5	58.1	60.5	66.5	2890	57.80	10.99	46.68
											−7.69			50 46.81
	κ													−8.07
	((δ) — D) $\frac{\kappa'}{100}$													+ .41
														− 2
	α_2												7.68	50 39.12
														− 4.31
											50 55.79			50 34.82

0.67

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9e10 − 4′ Ref 37.06 m. Inst +.10
13 50.58 m. .11

Runs −07R
−22R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	9.8 +10.0	1 46.5	46.3	928	1 4640	+03	−760	−12	0′	1 36.1	13 18.72	
					1 46.40	21 1.95				1 38.57	− 3	+8.82
d	1.000000					50 13 10.89	7.87−4				+ .18	
((δ) − D) $\frac{d'}{100}$	9.80610					+ 7.83	−7.83				+ 8.37	
	0.89404										+ .30	
+20.27 δ_1											− 19.60	
+1 19.35									14 27.3		13 7.94	
	12.0 +11.9	1 52.3	45.9	982	1 4910	+04	−930	−41	0	1 39.4	13 17.99	
					1 49.10	20 5.25				1 39.77	− 4	+8.65
d	1.075555					50 13 8.67	8.66−4+71				+ .20	
((δ) − D) $\frac{d'}{100}$	9.80610					+ 9.32	−9.33				+ 8.19	
	0.96959										+ .30	
+20.27 δ_2											− 20.10	
+1 19.35									14 25.9	51	13 6.54	
	23.7 +23.8	1 22.6	19.2	418	1 2090	+14	−1805	−09	10	11 29	3 54.70	
					11 20.90	11 27.45	17.72−3+62			11 2.57	− .15	+9.65
d	1.376758					51 3 36.39					+ .13	
((δ) − D) $\frac{d'}{100}$	9.79825					+ 18.31	−18.31				+ 9.27	
	1.26277										+ .40	
+20.45 δ_1											− 19.60	
+1 19.00									5 3.7		3 44.75	
	9.6 +9.7	1 16.7	10.1	268	1 1340	+03	−734	−29	10	11 58	3 51.53	
					11 13.40	11 37.95				11 5.94	− 3	+9.55
d	0.986771					51 3 44.37	+6.93−1+57				+ .13	
((δ) − D) $\frac{d'}{100}$	9.79825					+ 7.46	−7.46				+ 9.05	
	0.87296										+ .40	
+20.45 δ_2											− 20.10	
+1 19.00									5 0.3	50	3 41.28	
	20.0 +19.9	1 3.8	0.5	43	1 215	+11	−1533	−07	30	30 46.9	44 10.56	
					31 2.15	51 46.20				30 46.73	− .11	+9.25
d	1.298885					50 43 55.14	14.95−23+70				+ .10	
((δ) − D) $\frac{d'}{100}$	9.80136					+ 15.42	−15.42				+ 8.91	
	1.18815										+ .35	
+20.83 δ_1											− 18.10	
+1 14.50									45 16.2		44 1.71	
	10.0 +10.9	0 58.8	52.8	1116	0 5580	+03	−836	−21	30	30 47.3	44 10.42	
					20 55.80	51 52.55				30 47.35	− 3	+9.11
d	1.037743					50 44 1.97	7.87−12+70				+ .10	
((δ) − D) $\frac{d'}{100}$	9.80136					+ 8.45	−8.45				+ 8.69	
	0.92673										+ .35	
+20.83 δ_2											− 18.60	
+1 14.50									45 15.4		44 0.93	
d												
((δ) − D) $\frac{d'}{100}$												
δ_1												
	11.6 +11.7	3 35.2	31.0	662	3 3310	+03	−894	−25	45	46 29.2	26 33.79	
					48 33.10	34 15.25				48 23.97	− 4	+9.09
d	1.068119					50 26 24.67	8.66−8+55				+ .40	
((δ) − D) $\frac{d'}{100}$	9.80412					+ 9.12	−9.13				+ 8.38	
	0.96025										+ .35	
+20.81 δ_2											− 18.50	
+1 14.10									27 38.5	50	26 24.38	
	18.0 +18.1	3 58.8	46.9	957	3 4785	+09	−1372	−79	20	23 33.4	51 23.42	
					23 47.85	59 0.50				23 33.87	− 9	+9.75
d	1.257768					50 51 9.44	14.16−26+8				+ .38	
((δ) − D) $\frac{d'}{100}$	9.80027					+ 13.98	−13.98				+ 9.06	
	1.14569										+ .40	
+20.93 δ_1											− 17.80	
+1 13.65									52.5 29.0		51 15.37	
	17.5 +17.8	3 46.6	42.0	886	3 4430	+03	−877	−26	20	23 35.8	51 22.36	
					23 44.30	59 4.05				23 35.41	− 4	+9.60
d	1.067070					50 51 13.44	8.66−16+39				+ .41	
((δ) − D) $\frac{d'}{100}$	9.80027					+ 8.89	−8.89				+ 8.83	
	0.94891										+ .40	
+20.93 δ_2											− 18.30	
+1 13.65									52 27.3		51 13.66	

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Date$_1$ = 1870 Dec 10 — Observer A. M. — Recorder W. A. R. — Date$_2$ = 1870 Dec 13 — Observer A. M. — Recorder W. A. R.

Star.	α	δ	Mag.	T_s	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
2	2h 53m 3s	55.8	8.8	5m 2s 54.5	58 12.4	20.6	24.8	28.5	32.4	1182	2384	11.01	1263
	51 56.5	50 51.9	8.6							−8.29		11.00	53 12.84
κ													−8.720
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
a_1												−0 8.28	53 4.55
										53 m 21.21 s			−4.36
													53 0.20
			8.2	52 59.6	12.3	19.9	23.9	28.0	31.7	1158	2316	11.01	1215
										−7.69		11.00	53 12.16
κ													−8.08
((δ) − D) $\frac{\kappa'}{100}$													+ .41
													− 2
a_2												7.69	53 4.47
										53 21.13			−4.35
													53 0.12
	54 3	55 3	8.9	54 2.9	~~6.4~~	~~16.2~~	~~20.0~~	~~23.9~~	~~28.1~~	1163	2326	11.07	1223
	52 56.5	50 51.4	8.6		12.2	20.0	23.9	28.1	32.1	−8.29		11.00	54 12.26
κ													−8.720
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
a_1												8.28	54 3.97
										54 20.64			−4.37
													53 59.61
			8.3	53 59.2	11.6	19.3	23.7	27.4	31.4	1128	2256	11.01	1155
										−7.69		11.00	54 11.56
κ													−8.08
((δ) − D) $\frac{\kappa'}{100}$													+ .41
													− 2
a_2												7.69	54 3.87
													−4.35
										54 20.55			53 59.52
	55 27	57.5	not seen										
	54 20.0	50 47.7	8.8										
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_1													
			8.0	55 19.1	35.6	43.2	47.4	51.4	55.3	2329	4658	10.99	3569
										−7.70		10.99	55 35.39
κ													−8.08
((δ) − D) $\frac{\kappa'}{100}$													+ .40
													− 2
a_2												7.70	55 27.89
										55 44.59			−4.36
													55 23.53
	57 4	35.9	9.5 ~~7.6~~	57									
	55 59.0	50 32.1	9.0										
κ													
((δ) − D) $\frac{\kappa'}{100}$													
a_1													
			8.8	56 53.5	11.0	18.9	22.9	26.9	30.8	1105	2210	10.93	1117
										−7.70		10.93	57 11.17
κ													−8.08
((δ) − D) $\frac{\kappa'}{100}$													+ .40
													− 2
a_2												7.70	57 3.47
										57 20.15			−4.36
													56 59.11
	59 18	39.6	7.5	59 2.3	26.4	34.3	38.2	42.1	46.0	1870	3740	10.95	2645
	58 10.8	50 35.8	7.0							−8.29		10.94	59 26.46
κ													−8.720
((δ) − D) $\frac{\kappa'}{100}$													+ .44
													− 2
a_1												8.28	59 18.14
										59 34.90			−4.39
													59 13.79
			7.0	59 16.5	25.8	33.7	37.4	41.3	45.2	1834	3668	10.95	2573
										−7.70		10.94	59 25.74
— κ													−8.08
((δ) − D) $\frac{\kappa'}{100}$													+ .40
													− 2
a_2												7.70	59 18.04
										59 34.76			−4.39
													59 13.65
													s 0.70

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Runs —07 R
—22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	181 +18.3	4′ 38.0	35.6	736	4′ 36.80	+09	−1379	−12	20	230	55 34.62	
d	1.262 45				19 36.80	3 11,55				19 22.68	− 9	+9.91
	9.79965					50 55 20.49	14.16 −28 +24				+ 46	
((δ) — D) $\frac{d'}{100}$	1.15004					+ 14.13	−14.12				+ 9.14	
											+ .40	
+21.01 δ_1											− 17.60	
+1 12.95											55 26.93	
									56 39.9			
	127 +12.7	4 36.1	32.3	684	4 34.20	+021	−9.70 −101		15 sure	19 23.5	55 33.27	
d	1.10037				19 34.20	3 14.15				19 24.54	− 5	+9.76
	9.79965					50 55 23.57	9.45 −18 +39				+ .50	
((δ) — D) $\frac{d'}{100}$	0.98796					+ 9.43	−9.66				+ 8.91	
											+ .40	
+21.01 δ_2											− 18.10	
+1 12.95											55 24.93	
									56 37.9	50		
	93 +9.4	0 19.6	16.7	363	0 18.15	+02	−710 −02		20	20 11.0	54 46.40	
d	0.97313				20 18.15	2 3020				20 10.89	− 3	+9.51
	9.79965					50 54 39.14	7.08 −13 +31				+ 3	
((δ) — D) $\frac{d'}{100}$	0.86042					+ 7.26	−7.26				+ 9.11	
											+ .40	
+21.03 δ_1											− 17.50	
+1 12.65											54 38.41	
									55 51.06			
	124 +12.4	0 22.3	16.3	386	0 19.30	+04	−946 −07		20	20 9.72	54 48.04	
d	1.09342				20 19.30	2 29.05					− 4	+9.27
	9.79965					50 54 38.47	9.45 −18 +31				+ 3	
((δ) — D) $\frac{d'}{100}$	0.98101					+ 9.57	−9.58				+ 8.88	
											+ .40	
+21.03 δ_2											− 18.00	
+1 12.65											54 39.31	
									55 52.06		1 12.65	
d												
((δ) — D) $\frac{d'}{100}$												
δ_1												
										50		
	165 +16.5	3 48.0	43.9	919	3 45.95	+07	−1262 −83		20	23 32.6	51 24.57	
d	1.21748				23 45.95	59 2.40				23 33.20	− 7	+9.58
	9.80027					50 51 11.82	12.59 −23 +39				+ .42	
((δ) — D) $\frac{d'}{100}$	1.10569					+ 12.75	−12.75				+ 8.83	
											+ .40	
+21.06 δ_2											− 17.80	
+1 12.25											51 16.35	
									52 28.6			
d												
((δ) — D) $\frac{d'}{100}$												
δ_1												
										50		
	175 +17.7	4 13.0	8.7	277	4 10.85	+08	−1345 −92		35	38 56.5	36 0.68	
d	1.24397				39 10.85	43 37.50				38 57.09	− 9	+9.29
	9.80259					50 35 46.92	6.338 −17 +55				+ 46	
((δ) — D) $\frac{d'}{100}$	1.13850					+ 13.76	−13.76				+ 8.57	
											+ .35	
+21.04 δ_2											− 17.60	
+1 11.70									37 4.1	50	35 52.37	
	241 +24.2	0 18.0	16.0	340	0 17.00	+14	−1651 −02		35	38 58.6	39 59.07	
d	1.38382				35 17.00	47 31.35				34 58.22	− .15	+9.06
	9.80197					50 39 40.29	18.89 −27 +16				+ 3	
((δ) — D) $\frac{d'}{100}$	1.27373					+ 18.78	−18.78				+ 8.83	
											+ .35	
+21.11 δ_1											− 17.00	
+1 11.05											39 51.13	
									41 2.2			
	103 +10.2	0 9.2	5.14	146	0 7.30	+03	−792 −03		35	38 54.4	39 58.39	
d	1.00860				35 7.30	47 41.05				34 57.38	− 3	+8.95
	9.80197					50 39 50.47	7.87 −11 +16				+ 1	
((δ) — D) $\frac{d'}{100}$	0.89851					+ 7.92	−7.92				+ 8.62	
											+ .35	
+21.11 δ_2											− 17.50	
+1 11.05											39 49.84	
									41 0.9			

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W. A. R. Date$_2$ = 1870 Dec 13 Observer A. M. Recorder W. A. R. Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
	3h 0m 13s	4′.7	8.0	0m 5s.8	20s.3	28s.0	32s.0	35s.9	39s.5	155s.7	31s.142	10s.81	20s.33
	2 5h 5s.5	50 1.0	8.3							−8.30		10.81	0 20.33
	κ												−8.770
	((δ) — D) $\frac{\kappa'}{100}$												+ .43
													− 2
	a_1											8.29	0 12.03
													− 4.37
				0m 5s						0 28.68			0 7.67
			7.5	0 9.0	19.9	27.3	31.3	35.0	38.9	152s.4	30s.48	10s.81	19.67
										−7.71		10.81	0 19.67
	κ												−8.08
	((δ) — D) $\frac{\kappa'}{100}$												+ .39
													− 2
	a_2											7.71	0 11.96
													− 4.35
				130						0 28.62			0 7.61
	1 15	26.2	8.3	1 (65) (1.0)	24.4	32.5	36.2	40.3	47.2	177s.9	35s.58	10s.89	24.69
	0 8.4	50 22.5	9.2							−8.29		10.89	1 24.69
	κ		0										−8.770
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.28	1 16.40
													− 4.39
										1 33.13			1 12.02
			8.0?	1 13.0 (17.1)	24.1	31.4	35.8	39.6	43.4	174s.6	34s.92	10s.89	24.03
										−7.70		10.89	1 24.03
	κ												−8.08
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− 2
	a_2											7.70	1 16.33
													− 4.38
										1 33.06			1 11.95
	2 14	50.1	8.5	2 11.6	24.5	32.0	36.1	40.1	44.0	176s.7	35s.34	10s.98	24.35
	1 6.7	50 46.4	9.0							−8.29		10.98	2 24.36
	κ												−8.770
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.28	2 16.07
													− 4.42
										2 32.85			2 11.66
			8.0	2 18.2	23.7	31.4	35.4	39.0	43.0	172s.5	34s.50	10s.99	23.51
										−7.70		10.99	2 23.51
	κ												−8.08
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− 2
	a_2											7.70	2 15.81
													− 4.41
										2 32.62			2 11.40
	3 38	56.5	9.0	3 32.2	47.4	55.4	59.2	63.3	67.4	293s.2	58s.64	11s.03	47.63
	2 31.0	50 52.8	9.0							−8.29		11.03	3 47.64
	κ												−8.770
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.28	3 39.35
													− 4.44
										3 56.20			3 34.92
fol*			8.2	3 32.6	47.0	54.8	58.9	62.4	66.6	290s.0	58s.00	11s.01	46.99
										−7.69		11.01	3 46.99
	κ												−8.08
	((δ) — D) $\frac{\kappa'}{100}$												+ .41
													− 2
	a_2											7.69	3 39.30
													− 4.43
										3 56.15			3 34.87
	4 15	62.0	9.0	6 3.3	23.7	31.6	35.4	39.2	44.0	173s.9	34s.78	11s.03	23.75
	5 6.4	50 58.3	9.2							−8.28		11.03	6 23.75
	κ												−8.770
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	a_1											8.28	6 15.47
													− 4.47
										6 32.36			6 11.40
			8.7	6 6.6	23.0	34.8 30.8	38.6 34.9	38.8	42.6	170s.1	34s.02	11s.03	22.97
										−7.69		11.03	6 22.99
	κ												−8.08
	((δ) — D) $\frac{\kappa'}{100}$												+ .41
													− 2
	a_2											7.69	6 15.30
													− 4.46
										6 32.20			6 10.84

a72

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Runs – 07R
– 22R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	145 +145	0′ 16.7	12.7	294	0′ 14.70	+05	−1128	−02	10	10 34	50 4 53.98
d	1.16137				10 14.70	12 33.65				10′ 9.30	− 5 +5.47
	9.80 734					50 4 42.59	11.02 −2 +40				+ 2
((δ) − D) $\frac{d'}{100}$	1.05662					+ 11.39	11.40				+ 8.20
											+ .30
											−16.80
+21.01 δ_1									5	11	4 45.65
+/ 10.75									5	56.4	
	109 +10.7	0 12.1	8.7	208	0 10.40	+03	−848	−04	10	10 1.9	4 55.78
d	1.02938				10 10.40	12 37.95				10 1.98	− 3 +8.29
	9.80 731					50 4 47.37	7.87 −1 +56				+ 2
((δ) − D) $\frac{d'}{100}$	0.92463					+ 8.41	8.42				+ 8.00
											+ .30
											−17.30
+21.01 δ_2									5	575	4 46.77
+/ 10.75											
	82 +8.2	4 0.1	57.2 28	−274 48	−125 5865	+02	−634	−28	45	48 520	50 26 ~~9.64~~
d	0.91381	+11.7				33 49.70				48 52.25	− 2 +9.32
	9.80 412	1.06819				50 25 58.64	6.30 −6 +16				+ .40
((δ) − D) $\frac{d'}{100}$	0.80587	9.80412				+ 6.40	6.40				+ 8.59
		0.96025				+ 9.13					+ .35
											−16.70
											~~25 57.66~~
+21.11 δ_1									27	10.6	26 0.39
+/ 10.45											
	111 +11.0	4 0.0	54.7 53	~~−26~~ 53	4 −263 48 5935	+03	−858	−86	45	48 479	26 9.60
d	1.04139					33 51.00				48 48.77	− 3 +9.13
	9.80 412					50 26 0.42	8.66 −8				+ 44
((δ) − D) $\frac{d'}{100}$	0.93345					+ 8.58	8.58				+ 8.37
											+ .35
											−17.20
+21.11 δ_2											26 0.93
+/ 10.45									27	11.4	
	129 +12.8	4 51.5	49.1	1006	4 5030 24 56.80	+04	−956	−34	20	24 401 24 40.40	50 16.89
d	1.10721					57 52.05					− 5 +9.86
	9.80 043					50 50 6.99	9.45 −17 +62				+ 48
((δ) − D) $\frac{d'}{100}$	0.99558					+ 9.96	9.90				+ 9.03
											+ .40
											−16.70
+21.22 δ_1											50 10.05
+/ 10.10									51	20.2	
	55 +5.3	4 47.3	42.7	900	4 4500 24 46.00	+01	−422	−102	20	24 398 24 40.89	50 16.87
d	0.72428					58 3.35					− 1 +9.783
	9.80 043					50 50 12.77	3.94 −7 +24				+ .53
((δ) − D) $\frac{d'}{100}$	0.61265					+ 4.10	4.11				+ 8.81
											+ .40
											−17.20
+21.22 δ_2											50 9.40
+/ 10.10						29.10			51	19.5	
	157 +15.4	3 30.3	~~28.0~~	550	3 ~~2715~~ 18 ~~27.05~~	+07	−1195	−24	15	18 15.5 18 15.78	56 ~~41.62~~ 40.025
d	1.18752					4 ~~20.70~~ 19.20					− 6 +9.83
	9.79 950					50 56 ~~2.44~~ ~~2.54~~	11.80 −24 +31				+ .35
((δ) − D) $\frac{d'}{100}$	1.07496					+ 11.88	11.87				+ 9.14
											+ .40
											−16.60
+21.28 δ_1									57	42.9 49.4	56 ~~34.75~~ 33.25
+/ 9.65											
	144 +14.4	3 32.8	28.0	608	3 3040 18 30.40	+05	−1101	−78	15	18 184 18 19.29	56 38.48
d	1.15836					4 17.95					− 5 +9.65
	9.79 950					50 56 27.37	11.02 −22 +31				+ .38
((δ) − D) $\frac{d'}{100}$	1.04580					+ 11.14	11.11				+ 8.92
											+ .40
											−17.00
+21.28 δ_2											56 31.13
+/ 9.65									57	40.8	51
	204 +20.4	3 16.3	15.0	313	3 1565 18 15.65	+11	−153	−22	10	12 13 00 59.94	1 57.35
d	1.30963					9 32.70					− .11 +9.85
	9.79 856					51 1 41.64	15.41 −1 +31				+ .33
((δ) − D) $\frac{d'}{100}$	1.19613					+ 15.41	15.71				+ 9.23
											+ .40
											−16.30
+21.36 δ_1											1 56.90
+/ 8.85									2	59.8	
	164 +16.4	3 14.6	9.0	236	3 1180 18 11.80	+07	−1250	−72	10	12 584 12 57.18	1 58.60
d	1.21484					9 36.55					− 4 +9.49
	9.79 856					51 1 45.97	12.32 −1 +31				+ .35
((δ) − D) $\frac{d'}{100}$	1.10134					+ 12.63	12.62				+ 9.01
											+ .40
											−16.80
+21.36 δ_2											1 51.49
+/ 8.85									3	0.3	

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W.A.R. Date$_2$ = 1870 Dec 13 Observer A. M. Recorder W.A.R. Ru

Star. α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
3 1 7m 34s 6 26.2	44.2 50 40.5	7.3 7.6	7m 24.0	42.8	50.7	54.5	58.5	62.5	2690 −8.28	5380	10 96 10.96	m s 4284 7 4284 −8.70 +.44 −2
κ											−0 8.28	7 34.56 −4.46
((δ) − D) $\frac{\kappa'}{100}$												+21
a_1									7 51.43			7 30.10 +1
		7.0	7 28.7	42.2	50.0	53.9	57.8	61.8	2657 −7.71	5314	1096 10.96	4218 7 4218 −8.08 +.40 −2
κ											7.70	7 34.47 −4.45
((δ) − D) $\frac{\kappa'}{100}$												+21
a_2									7 51.36			7 30.03 +1
9 12 Pin failed 4.0	41.8 50 1.2	7.5 8.0									10.81	
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												
2d befor δ		7.5	9 8.0	19.7	27.4	31.2	35.1	39.0	1524 −7.72	3048	1087 10.87	1967 9 1967 −8.08 +.39 −2
κ											7.71	9 11.95 −4.47
((δ) − D) $\frac{\kappa'}{100}$												+21
a_2									9 28.75			9 7.52 +1
10 50 9 42.4	24.9 50 26.3	7.5 7.0										
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												
		7.3	10 47.6	58.9	66.6	70.5	74.4	78.2	3486 −7.71	6972	1091 10.91	5881 10 5882 −8.08 +.40 −2
κ											7.70	10 51.11 −4.46
((δ) − D) $\frac{\kappa'}{100}$												+21
a_2									11 8.02			10 46.66 +1
11 44 10 35.9	30.5 50 27.9	9.0										
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												
		8.0	11 44.3	52.3	59.6	63.5	67.4	71.3	3241 −7.71	6282	1091 10.91	5191 11 5191 −8.08 +.40 −2
κ											7.70	11 44.20 −4.47
((δ) − D) $\frac{\kappa'}{100}$												+21
a_2									12 1.13			11 39.74 +1
14 19 13 14.0	12.0 50 8.4	8.0 8.6										
κ												
((δ) − D) $\frac{\kappa'}{100}$												
a_1												
		8.3	14 13.2	27.5	35.0	38.8	42.9	46.7	1909 −7.72	3818	1084 10.83	2735 14 2735 −8.09 +.39 −2
κ											7.72	14 19.63 −4.47
((δ) − D) $\frac{\kappa'}{100}$												+21
a_2									14 36.45			14 15.16 +1

.0,66

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Runs −07 R
−22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	50 δ′	
	5 1.88	0 ′ 69.5	56.6	1161	0 ′ 58.05	+10	−1442	−07	30′	30 43.4	44 13.81	
	+18 8				30 58.05	51 50 30				30′ 43.48	− .10	+9.27
d	1.27416					50 43 59.24	14.16 −22 +63				+ .10	
	9.80136					+ 14.57	−14.57				+ 8.92	
((δ) − D) $\frac{d'}{100}$	1.16346										+ 35	
											− 16.10	
+2133 δ_1									45	15.4	44 6.98	
+1 8.45									45			
	135	0 57.0	57.1	1081	0 54.05	+05	−1035	−22	30	30 43.5	44 14.18	
	43.5				30 54.05	51 54.30				30 43.58	− 5	+9.10
d	1.13033					50 44 37.2	11.24 −16 +39				+ .10	
	9.80136					+ 10.46	10.47				+ 8.70	
((δ) − D) $\frac{d'}{100}$	1.01963										+ 35	
											− 16.60	
+21.33 δ_2									45	15.1	44 6.68	
+1 8.45												
d												
((δ) − D) $\frac{d'}{100}$												
δ_1											50	
	11.7	0 25.2	20.1	453	0 22.65	+04	−910	−09	10	10 13.5	4 44.31	
	+11.7				10 22.65	12 25.70				10 13.44	− 4	+8.30
d	1.06819					50 4 35.12	8.66 −1 +56				+ 4	
	9.80731					+ 9.19	−9.21				+ 8.00	
((δ) − D) $\frac{d'}{100}$	0.98344										+ .30	
											− 16.40	
+21.23 δ_2									5	44.1	4 36.21	
+1 7.90												
							−871					
d												
((δ) − D) $\frac{d'}{100}$												
δ_1											50	
	11.3	0 25.6	19.0	446	0 22.30	+03	−871	−09	45	10 13.5	29 44.19	
	+11.2				45 22.30	37 26.05				45 13.57	− 3	+8.81
d	1.04922					50 29 35.47	8.66 −9 +16				+ 4	
	9.80351					+ 8.42	8.73				+ 8.45	
((δ) − D) $\frac{d'}{100}$	0.94067										+ .35	
											− 16.30	
+21.36 δ_2									30	44.0	29 36.70	
+1 7.35												
d												
((δ) − D) $\frac{d'}{100}$												
δ_1											50	
	8.0	3 42.3	43.5	908	3 45.40	+02	−617	−83	40	43 38.4	31 17.29	
	+7.6				43 45.40	39 2.95				43 39.47	− 2	+9.23
d	0.88081					50 31 11.37	8.52 −6 +47				+ 42	
	9.80336					+ 5.72	5.93				+ 8.48	
((δ) − D) $\frac{d'}{100}$	0.77211										+ 35	
											− 16.20	
+21.39 δ_2									32	17.4	31 10.32	
+1 7.10												
d												
((δ) − D) $\frac{d'}{100}$												
δ_1											50	
	14.5	3 11.0	2.5	185	3 9.25	+05	−1109	−71	0	2 5.5	11 59.57	
	+14.1				3 9.25	19 39.10				2 58.20	− 5	+8.72
d	1.14922					50 11 48.52	11.02 −5 +8				+ 34	
	9.80625					+ 11.05	−11.05				+ 8.13	
((δ) − D) $\frac{d'}{100}$	1.04341										+ .30	
											− 15.90	
+21.29 δ_2									12	58.6	11 52.39	
+1 6.25												

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W. A. R. Date$_2$ = 1870 Dec 13 Observer A. M. Recorder W. A. R. Ru

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
3	16m 41s	0° 57′.2	7.7	m s	s	s	s	s	s	m s	s	s	m s
	15 22.7	50 53.6	7.6										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
										m s			
			7.4	16	36.2	49.5	57.4	61.3	65.6	69.0	3027	6054	11.01	4952
										-7.70		11.01	49.53
													(16) −8.09
													+ .41
													− 2
												7.70	16 41.83
													− 4.53
	a_2									16	58.90		16 37.30
	17 42.	3.0	8.5										
	16 33.7	48 57.5	8.9										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			8.0	17 40.0	57.2	54.0	62.9	66.7	70.8	31.06	62.12	10.87	51.31
										-7.72		10.80	17 51.32
													− 8.09
													+ .39
													− 2
												7.72	17 43.60
													− 4.49
	a_2									18	0.54		17 39.11
	18 43	29.3	8.1										
	17 38.5	50 25.8	8.1										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			7.5	18 45.9	55.4	63.0	67.2	71.0	74.7	33.13	66.26	10.91	55.35
										-7.71		10.90	18 55.36
													− 8.09
													+ .40
													− 2
												7.71	18 47.65
													− 4.52
	a_2									19	4.67		18 43.13
	20 42	54.5	9.0										
	19 39.0	50 51.0	8.9										
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_1												
			8.3	20 47.2	56.4	64.3	68.2	72.0	76.0	33.66	67.38	11.00	56.38
										-7.70		11.00	20 56.38
													− 8.09
													+ .41
													− 2
												7.70	20 48.68
													− 4.56
	a_2									21	5.90		20 44.12
	22 29.	−0.2	7.8	22 21.9	37.2	44.8	48.8	52.5	56.4	23.91	47.94	10.79	37.15
	21 19.8	49. 54.9	8.0							-8.29		10.79	22 37.15
	κ												− 8.70
	((δ) — D) $\frac{\kappa'}{100}$												+ .43
	a_1												− 2
												8.29	22 28.86
													− 4.50
										22 45.87			22 24.36
			7.8	22 20.3	36.6	44.3	48.0	52.0	56.0	23.69	47.38	10.79	36.59
										-7.72		10.79	22 36.59
													− 8.09
													+ .39
													− 2
												7.72	22 28.87
													− 4.51
	κ												
	((δ) — D) $\frac{\kappa'}{100}$												
	a_2									22 45.87			22 24.36

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Runs — 07 R
-22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	133 +13.3 1.12385	2 49.7	45.1	946 2 4740 17 47.40		+05 5 0.95 50 57 10.37 + 10.26	−1016 10.24−21+24 10.27	−57	15	17 36 17 37.13	50 57 20.63 − 5 + .31 + 8.94 + .40 − 1580 57 14.43
$((\delta) - D)\frac{d'}{100}$	9.79934 1.01113										
δ_2	+21.60 +1 5.45								58 199		+9.60
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	112 +11.3 1.05308	1 49.5	49.3	988 1 4940 11 49.40		+03 140 58.95 50 3 48.37 + 8.88	−871 8.66−1+24 8.89	−39	10	11 40.3 11 40.57	50 1 3 47.25 − 3 + .20 + 7.98 + .30 − 1560 3 10.10
$((\delta) - D)\frac{d'}{100}$	9.80762 0.94864										
δ_2	+2143 +1 5.10								4 1 35.2		+8.45
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	95 +9.5 0.97772	0 57.2	53.4	1136 0 5680 45 56.40		+02 3851.55 50 29 0.97 + 7.41	−733 7.08−8+10 7.40	−22	45	45 49 45 49.40	50 29 25 8.38 − 3 + .10 + 8.37 + .35 − 1550 25 24 1.67
$((\delta) - D)\frac{d'}{100}$	9.80428 0.86994										
δ_2	+2154 +1 4.75								26 10 6.4		+8.79
d											
$((\delta) - D)\frac{d'}{100}$											
δ_1											
d	92 +9.2 0.96379	1 14.3	7.0	213 1 1065 21 10.65		+02 1 3770 50 54 3 47.12 + 7.10	−705 7.08−13+16 7.11	−27	20	21 33 21 33.57	50 3 54 54.22 − 3 + .13 + 8.88 + .40 − 15.30 54 3 48.30
$((\delta) - D)\frac{d'}{100}$	9.79965 0.85138										
δ_2	+2168 +1 4.10								54 52.4		+9.38
d	53 +5.3 1.18469						H. 11.80 +24 −12.04				
$((\delta) - D)\frac{d'}{100}$											
δ_1	+2151 +1 3.55										
d	63 +6.3 1.21249	2 8.3	4.2	125 2 625 17 6.25		+06 5.42 10 49 57 51.52 + 12.84	−1269 12.59+24 12.83	−46	15	16 53 16 53.42	47 58 4.36 − 7 + .23 + 5.91 + .30 − 1500 57 57.73
$((\delta) - D)\frac{d'}{100}$	9.80837 1.10880										
δ_2	+2151 +1 3.55								59 1.3		+8.37

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Date$_1$ = 1870 Dec 10 9 Observer A.M. Recorder W.A.R

Date$_2$ = 1870 Dec 13 11 Observer A.M. Recorder W.A.R.

Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
3	2h 24m 47s	8.1	9.0	24m 38.8	56.3	62.8	67.4	71.2	75.6	3343	66.86	10.83	5603
	23 38.2	50 5.2	9.0							−8.29		10.82	24 56.01
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .43
													− 2
	α_1											8.29	24 47.75
										25	4.82		− 4.53
													24 43.22
			9.0	24	44.6	55.7	63.5	67.4	71.0	75.1	3327	66.54	10.83	55.71
										−7.74		10.82	24 55.72
	κ												−8.09
	((δ) − D) $\frac{\kappa'}{100}$												+ .37
													− 2
	α_2											7.72	24 48.00
													−4.53
										25	5.07		24 43.47
3	2h 33m 9s	45.6 46.7	7.5	32	59.7	33 18.2	26.1	29.9	33.9	37.6	1457	29.14	10.97	1837
	31 5.93	50 42.3	7.5							−8.27		10.97	33 18.37
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	33 10.10
													−4.64
										33	27.37 17		33 5.75 5.75
			7.8	33	06	17.6	25.5	29.4	33.3	37.1	1429	28.58	10.97
										−7.71		10.97	33 17.61
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .46
													− 2
	α_2											7.72	33 9.90
													−4.64
										33	27.17		33 5.25
	36 26	0.7	8.7	36	9.9 ~~28~~	1.73 36.4	43.7	47.8	51.9	55.8	2357	47.12	10.80	3632
	35 15.9	49 57.3	8.7							−8.28		10.79	36 36.33
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .43
													− 2
	α_1											8.29	36 28.05
													− 4.60
										36	45.26		36 23.45
			7.8	36	31.4	36.2	43.6	47.5	51.4	55.1	2338	46.76	10.80	35.96
										7.72		10.79	36 30.97
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .39
													− 2
	α_2											7.73	36 28.25
													− 4.60
										36	45.46		36 23.64
	39 5	57.0	7.5	38	56.1 (39)	13.9	21.8	25.6	28.7	33.7	1247	24.94	11.02	13.92
	37 55.5	5 0 55.8	7.0							−8.27		11.02	39 13.92
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	39 5.65
													−4.69
										39	23.05		39 0.95
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												
	40 10	48.0	8.0	40	13.4	20.1	27.9	31.8	35.7	39.8	1553	31.06	10.98	2008
	38 57.8	50 44.9	8.8							−8.27		10.98	40 2008
	κ												−8.70
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	40 ~~11~~.81
													11.68
										40	29.20		40 7.12
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												

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Runs −04 R
+22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	175	′ ″	″		′ ″	+08	−1360		′			
	+0.2						13.38−4+16					
d	1.23553						−13.50					
((δ) − D) $\frac{d'}{100}$												
+21.60 δ_1									′	″ 50		
	111	1 35.4	30.6	660	1 3300	+03	−862 −35		5	6 241	8 3348	
	+111				6 33.00	16 15.35				24.28	− 3	+8.52
d	1.04532					50 8 24.77	8.66−2+8				+ .18	
	9.80686					+ 8.71	−8.72				+ 8.07	
((δ) − D) $\frac{d'}{100}$	0.94012										+ .30	
											− 14.80	
+2160 δ_2											8 27.20	
+13.75									9 30.0	50		
	165	4 36.0	34.1	701	4 2805	+09	−1443 −82		25	29 203	45 36.73	
	+87				29 25.05	53 13.30				29 20.58	− .10	+9.65
d	1.27184	26647				50 45 22.24	14.16−23+32.4				+ 46	
	9.80120	80120				+ 14.49	−14.47				+ 8.94	
((δ) − D) $\frac{d'}{100}$	1.16098	05794									+ .35	
		18561									−13.40	
+21.92 δ_1		14.31									45 32.98	32.80
+59.80									46 32.8	32.6		
	170	4 35.4	31.8	672	4 3360	+08	−1326 −101		25	29 194	45 37.34	
	+170				29 33.60	53 14.75				20.44	− 8	+9.50
d	1.23045					50 45 24.17	13.38−22				+ .51	
	9.80120					+ 13.17	−13.16				+ 8.72	
((δ) − D) $\frac{d'}{100}$	1.11959										+ .35	
											− 14.00	
+21.92 δ_2											45 32.84	
+59.80									46 32.6	50	34.62	
	191	4 44.0	42.9	869	4 4345	+10	−148 −3.2		10	14 281	0 ~~24.77~~	
	+190				14 43.45	8 4.90				14 28.50	− .10	+8.80
d	1.27875	26.4				50 0 13.84					+ ~~.47~~	
	9.80807	1.42160				+ ~~1495~~	−1495				+ 8.13	
((δ) − D) $\frac{d'}{100}$	1.17776	9.80807				2078					+ .30	
		1.31761									− 13.00	
+21.82 δ_1											0 ~~24.57~~ 30.42	
+58.70									1 29.1			
	48	4 29.6	25.8	554	4 2770	+01	−374 −99		10	14 230	0 33.69	
	+46				14 27.70	8 20.65				24.06	− 1	+8.71
d	0.66276					50 8 30.07	3.16+48				+ .49	
	9.80807					+ 3.62	−3.64				+ 7.93	
((δ) − D) $\frac{d'}{100}$	0.55877										+ .30	
											− 13.50	
+2182 δ_2											0 28.90	
+58.70									1 27.6	50		
	178	1 53.3	~~49.8~~ ?	1031	1 3[illegible]	+08	−1357 −13		15	16 424	58 19.47	
	+178				16 [illegible]	5 15.80				37.83	− 9	+9.70
d	1.25042					50 58 5.74	+13.38−28+62				+ .19	
	9.79918					+ 13.73	−13.72				+ 9.20	
((δ) − D) $\frac{d'}{100}$	1.13754										+ .40	
											− 12.80	
+2210 δ_1											58 16.37	
+57.85									59 14.2			
d												
((δ) − D) $\frac{d'}{100}$												
δ_2												
	67	2 25.0	20.6	467	2 2280	+01	−813 −16		25	27 145	47 39.67	
	+67				27 22.80	55 25.55				27 17.61	− 2	+9.59
d	0.82604					50 47 34.19	4.73−8+32.4				+ .74	
	9.80074					+ 5.18	−8.19				+ 8.97	
((δ) − D) $\frac{d'}{100}$	0.71475										+ .40	
											− 12.60	
+2208 δ_1											47 36.66	
+57.35									48 34.0			
d.												
((δ) − D) $\frac{d'}{100}$												
δ_2												

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W. A. R.

Date$_2$ = 1870 Dec 13 Observer A. M. Recorder W. A. R.

Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
37	41 m 35.5	0 57.6	9.5	41 m 26.3 s	46.5 s	54.5 s	58.3 s	62.3 s	66.3 s	28 m 79 s	57 s 58	11.02	m 8
	40 25.3	50 54.5	9.0							−8.27		11.02	46 58
	K												41 46 56
	((δ) — D) $\frac{\kappa'}{100}$												−8.69 70
													+ .44
													− 2
	α_1											−0 8.28	41 38.29
													−4.70
										41	55.73 s		41 33.58
		23.1											
	K												
	((δ) — D) $\frac{\kappa'}{100}$												
	α_2												
	42 35	23.4	—	42 34.8	43.6	57.4	55.3	57.0	63.2	2725	54.50	1088	43.62
	41 24.8	50 20.4	7.7							−8.27		10.88	42 43.62
	K												−8.69 70
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	42 35.35
										42	52 50.70		− 4.67
													42 30.67
			7.0	42 28.6	43.1	51.0	54.9	58.7	62.5	27.02	54.04	1088	43.16
										−7.72		10.88	42 43.16
	K												−8.10
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− − 2
	α_2											7.72	42 35.44
										42	52 50.80		− 4.67
													42 30.77
	51 2	53.2	9.0	50 54.6	11.3	19.4	22.9	26.9	30.9	1114	2228	1107	1128
	49 51.7	50 50.3	9.0							−8.26		10.99	51 11.29
	K												−8.08 70
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	51 3.03
										51	20.57		−4.75
													50 58.26
			8.0	50 55.7	10.8	18.8	22.5	26.4	30.5	1090	2180	1100	1.080
										−7.72		10.99	51 10.81
	K												−8.10
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− 2
	α_2											7.73	51 3.09
										51	20.63		−4.76
													50 58.32
	52 0	21.4	8.0	52 0.4	8.9	16.6	20.2	24.2	28.2	981	1962	1088	8.94
	50 50.0	50 18.5	9.0							−8.26		10.87	52 8.70
	K												−8.08 70
	((δ) — D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.28	52 0.49
										52	17.95		−4.72
													51 56.75
			7.8	52 0.0	8.2	16.0	19.9	23.7	27.6	954	1908	1088	8.20
										−7.72		10.87	52 8.21
	K												−8.10
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− − 2
	α_2											7.73	52 0.49
										52	17.86		−4.72
													51 55.76
	53 31	14.2	8.0	53 20.0	40.4	48.0	52.0	5.5.8	59.9	2564	5122	1085	40.37
	52 20.7	50 11.8	8.6							−8.27		10.85	53 40.37
	K												−8.08 70
	((δ) — D) $\frac{\kappa'}{100}$												+ .43
													− 2
	α_1											8.29	53 32.10
										53	57		−4.71
													53 27.37
			8.0	53 35.1	39.8	47.6	51.4	55.3	59.2	2533	5066	1085	39.81
										−7.72		10.85	53 39.81
	K												−8.10
	((δ) — D) $\frac{\kappa'}{100}$												+ .40
													− 2
	α_2											7.73	53 32.09
										53	49.56		−4.72
													53 27.36

.51

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Runs −07 R
−22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′	
	202	2′ 11″ 31.1	27.8	589	2′ 29.45	+11	−1543	−18	15	−2 13.9	57 13.50	
	+20.3				17 29.41	5 18.90				17 13.80	− .11	+9.71
d	1.30750					57 29.84	15.74−33+21				+ 25	
((δ) − D) d′/100	9.79934					+ 1566	−15.65				+ 9.17	
	1.19478										+ 40	
+2215 δ1											− 12.50	
+56.85									58′	37.6″	57 40.71	
d												
((δ) − D) d′/100												
δ2												
	88	1 44.7	41.0	857	1 4285	+02	−680	−11	50	51 3607	23 21.31	
	+8.8				51 42.85	31 5.50				51 35.47	− 2	+9.05
d	0.94448					50 23 14.44	6.30−5+32				+ .17	
((δ) − D) d′/100	9.80458					+ 6.87	−6.88				+ 8.55	
	0.83700										+ .35	
+2203 δ1											− 12.30	
+56.50									24	14.6	23 18.06	
	145	1 50.0	44.0	940	1 4700	+05	−1120	−40	50	51 3855	23 22.17	
	+14.6				51 47.00	31 1.35				51 35.61	− 6	+8.82
d	1.16435					50 23 10.77	11.02−10+47				+ .20	
((δ) − D) d′/100	9.80458					+ 11.40	−11.39				+ 8.33	
	1.05687										+ .35	
+2203 δ2											− 12.80	
+56.50									24	14.6	23 18.09	
	167	2 35.3	31.0	683	2 3815	+07	−1278	−18	20	22 2203	52 37.04	
	+16.7				22 38.15	0 18.20				22 20.26	− 8	+9.65
d	1.22272					50 52 25.14	12.59−24+32				+ .26	
((δ) − D) d′/100	9.80012					+ 12.90	−12.89				+ 9.07	
	1.11078										+ 40	
+2231 δ1											− 11.50	
+53.40									53 29 28.6		52 35.19	
	151	2 30.0	25.7	557	2 2785	+05	−1153	−55	20	22 158	52 41.59	
	+15.1				22 27.85	0 20.50				22 16.20	− 6	+9.46
d	1.17898					50 52 23.92	11.80−23+8				+ .27	
((δ) − D) d′/100	9.80012					+ 11.67	−11.65				+ 8.85	
	1.06704										+ 40	
+2231 δ2											− 12.00	
+53.40									53 32.4		52 39.05	
	85	3 30.9	29.8	607	3 3035	+02	−657	−25	50	53 2335	21 33.42	
	+8.3				53 30.35	29 18.00				53 23.35	− 2	+9.19
d	0.91908					50 21 26.94	6.30−4+24				+ .35	
((δ) − D) d′/100	9.80489					+ 6.48	−6.50				+ 8.51	
	0.81191										+ .35	
+2220 δ1											− 11.30	
+53.00									22	24.3	21 31.31	
	82	3 29.2	26.7	559	3 2795	+02	−634	−77	50	53 2085	21 36.23	
	+6.2				53 27.95	29 20.40				53 21.83	− 2	+9.01
d	0.91381					50 21 29.82	6.30−4+16				+ .38	
((δ) − D) d′/100	9.80489					+ 6.41	−6.42				+ 8.30	
	0.80664										+ .35	
+2220 δ2											− 11.90	
+53.00									22	26.3	21 33.34	
	204	0 51.5	49.0	1005	0 5025	+11	−1580	−66	0	0 345	14 23.02	
	+20.4				0 50.25	21 58.10				0 34.27	− .11	+8.64
d	1.30963					50 14 7.04	15.74−8+32				+ 8	
((δ) − D) d′/100	9.80595					+ 1598	−15.98				+ 8.37	
	1.20352										+ .30	
+2220 δ1											− 11.10	
+52.45		0 47.0 47							15	13.0	14 ~~19.56~~ 2056	
	148	0 47.0 43.3		903	0 4515	+06	−1224	−17	0	0 3218	14 24.12	
	+14.7				0 45.15	22 3.20				0 33.63	− 6	+8.48
d	1.16732					50 14 12.62	11.02−6+56				+ 9	
((δ) − D) d′/100	9.80595					+ 11.51	−11.52				+ 8.15	
	1.06121										+ .30	
+2220 δ2											− 11.70	
+52.45									15	13.3	14 20.90	

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W. A. R. Date$_2$ = 1870 Dec 18 Observer A. M. Recorder W. A. R.

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
3	4 53 9	43.0	9.0	55	58	19.8	27.4	31.5	35.3	39.3	153.3	30.66	10.96	1970
	53 57.8	50 40.1	9.0								−8.26		10.95	55 19.71
	κ													−8.689
	((δ) − D) $\frac{\kappa'}{100}$													+ .44
														− 2
													−0 8.27	55 11.45
	α_1													+ 4.75
										55 29.04				55 6.69
			9.0	55	57	18.9	26.8	30.8	34.6	38.7	147.8	29.96	10.96	1900
											−7.72		10.95	55 19.01
	κ													−8.181
	((δ) − D) $\frac{\kappa'}{100}$													+ .40
														− 2
													7.73	55 11.29
	α_2													− 4.76
										55 28.87				55 6.52
	57 1	0.1	6.5	56	58	7.6	15.3	19.1	23.0	26.8	91.8	18.36	10.89	756
	58 49.4	49 57.3	4.2								−8.27		10.79	57 7.57
	κ													−8.689
	((δ) − D) $\frac{\kappa'}{100}$													+ .43
														− 2
													8.28	56 59.30
	α_1													− 4.71
										57 16.79				56 54.58
			6.0	56	57.8	7.0	14.6	18.7	22.6	26.8	89.2	17.84	10.80	704
											−7.73		10.79	57 7.05
	κ													−8.181
	((δ) − D) $\frac{\kappa'}{100}$													+ .39
														− 2
													7.74	56 59.32
	α_2													− 4.72
										57 16.80				56 54.59
4	2 5.3	45.9	7.8	3	40.8	2.2	10.1	14.0	17.7	21.8	65.9	13.18	10.98	2.16
	1 41.7	50 47.2	8.0								−8.26			2 2.20
	κ													−8.689
	((δ) − D) $\frac{\kappa'}{100}$ 1'													+ .44
														− 2
													8.27	2 53.94
	α_1													− 4.80
										3 11.65				2 49.13
			7.2	2	49.0	1.7	9.3	13.1	17.3	21.3	62.7	12.54	10.99	1.55
											−7.72		10.98	2 1.56
	κ													−8.181
	((δ) − D) $\frac{\kappa'}{100}$													+ .40
														− 2
													7.73	2 53.84
	α_2													− 4.81
										3 11.54				2 49.02
	4 15	8.8	7.8	4	8.9	23.0	30.8	34.5	38.4	42.5	169.2	33.84	10.83	28.01
	3 2.9	50 6.1	8.0								−8.27		10.82	4 2.302
	κ													−8.689
	((δ) − D) $\frac{\kappa'}{100}$													+ .43
														− 2
													8.28	4 14.75
	α_1													− 4.75
										4 32.36				4 9.99
			7.8	4	13.2	22.5	30.3	34.0	37.8	41.9	166.5	33.30	10.83	22.47
											−7.73		10.82	4 2.248
	κ													−8.181
	((δ) − D) $\frac{\kappa'}{100}$													+ .39
														− 2
													7.74	4 14.75
	α_2													− 4.76
										4 32.35				4 9.98
	5 19	21.3	8.0	5	17.7	28.2	35.8	39.9	43.8	47.9	195.4	39.08	10.86	28.20
	4 7.5	50 18.6	7.4								−8.27		10.87	5 2.821
	κ													−8.689
	((δ) − D) $\frac{\kappa'}{100}$													+ .43
														− 2
													8.28	5 19.94
	α_1													− 4.77
										5 37.60				5 15.16
			7.3	5	18.4	27.7	35.4	39.4	43.1	47.0	192.6	38.52	10.86	27.64
											−7.72		10.87	5 2.765
	κ													−8.181
	((δ) − D) $\frac{\kappa'}{100}$													+ .40
														− 2
													7.73	5 19.93
	α_2													− 4.78
										5 37.58				5 15.14

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Runs −04 R
−22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	140	2 19.4	15.3	347	2 17.35	+05	−1074	−16	30	82 6.56	42 50.72
	+2.9				32 17.35	50 31.00			32		− 5
d	1.14301					50 42 39.94	10.24−15+70				+ .23
	9.80151					+ 1078	−10.79				+ 884
((δ) − D) $\frac{d'}{100}$	1.03246										+ .35
											− 11.00
+22.35 δ_1									1	11	42 49.14
+51.85									43	46.0	
	152	2 17.7	10.9	286	2 14.30	+06	−1166	−51	30	32 2.44	42 55.33
	+15.3				32 14.30	50 34.05			32		− 6
d	1.18469					50 42 43.47	11.80−18+24				+ 24
	9.80159					+ 11.86	−11.86				+ 8.66
((δ) − D) $\frac{d'}{100}$	1.07414										+ .35
											− 11.50
+22.35 δ_2											42 53.02
+51.85									43	44.9	49
	148	0 22.0	20.7	427	0 21.35	+06	−1152	−02	15	15 6.69	59 47.59
	+17.8				15 21.35	7 27.00			15		− 6
d	1.17026					49 59 35.94	11.02+64				+ 3
	9.80807					+ 11.65	−11.66				+ 8.12
((δ) − D) $\frac{d'}{100}$	1.06627										+ .30
											− 10.70
+2221 δ_1											59 45.28
+51.15									0	36.4	
	92	0 20.0	13.7	337	0 16.85	+02	−716	−04	15	15 9.61	59 48.16
	+9.2				15 16.85	7 31.50			15		− 3
d	0.96379					49 59 40.92	+7.18+16				+ 3
	9.80807					+ 7.24	−7.24				+ 7.91
((δ) − D) $\frac{d'}{100}$	0.85980										+ .30
											− 11.30
+2221 δ_2											59 45.07
+51.15									0	36.2	50
	214	0 33.7	30.0	637	0 31.85	+12	−1637	−04	25	25 15.30	49 41.99
	+21.4				25 31.85	57 16.50			25		− .12
d	1.33041					50 49 25.44	16.53−29+31				+ 5
	9.80058					+ 16.55	−16.55				+ 9.10
((δ) − D) $\frac{d'}{100}$	1.21893										+ .40
											− 10.10
+2252 δ_1											49 41.32
+48.95									50	30.3	
	127	0 30.6	23.3	539	0 26.95	+04	−973	−11	25	25 17.21	49 40.57
	+12.6				25 26.95	57 21.40			25		− 5
d	1.10037					50 49 30.82	9.45−17+46				+ 4
	9.80058					+ 9.75	−9.74				+ 8.78
((δ) − D) $\frac{d'}{100}$	0.98889										+ .40
											− 10.70
+2252 δ_2											49 39.04
+48.95									50	28.0	50
	141	1 39.0	35.3	774	1 37.15	+05	−1095	−11	5	6 26.08	8 31.21
	+14.1				6 37.15	16 11.20			6		− 5
d	1.14922					50 8 20.14	11.02−3+8				+ .16
	9.80686					+ 11.07	−11.07				+ 8.27
((δ) − D) $\frac{d'}{100}$	1.04402										+ .30
											− 9.90
+22.37 δ_1											8 ~~30.77~~ 29.99
+48.40									9	18.4	
	93	1 36.0	30.1	661	1 33.05	+02	−722	−35	3	6 25.75	8 32.02
	+9.3				6 33.05	16 15.30			6		− 3
d	0.96848					50 8 24.72	7.08−2+24				+ .18
	9.80686					+ 7.30	−7.30				+ 8.05
((δ) − D) $\frac{d'}{100}$	0.86328										+ .30
											− 10.50
+22.37 δ_2											8 ~~27.02~~ 30.02
+48.40									9	18.4	50
	105	3 53.0	50.7	1037	3 51.85	+03	−812	−27	50	53 43.64	21 13.64
	+10.5				53 51.85	28 56.50			53		− 3
d	1.02119					50 21 5.44	7.87−6+40				+ .39
	9.80489					+ 8.20	−8.21				+ 8.51
((δ) − D) $\frac{d'}{100}$	0.91402										+ .35
											− 9.80
+2244 δ_1											21 13.06
+48.00									22	1.1	
	93	3 52.3	48.8	1011	3 50.55	+02	−719	−85	50	53 43.28	21 14.49
	+9.3				53 50.55	28 57.80			53		− 3
d	0.96848					50 21 7.22	7.08−5+24				+ .42
	9.80489					+ 7.27	−7.27				+ 8.29
((δ) − D) $\frac{d'}{100}$	0.86131										+ .35
											− 10.40
+2244 δ_2											21 13.12
+48.00									22	1.1	

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Date$_1$ = 1870 Dec 10 Observer A. M. Recorder W. A. R.

Zone 50°–51° 11

Date$_2$ = 1870 Dec 13 Observer A. M. Recorder W. A. R.

Run

Star.	α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
4	h 6 m 36 s	° ′ 24.8	8.2	m s 6 30.9	45.7	53.3	56.8	60.9	64.9	28.16	5.632	10.88	m s 4543
	5 24.9	50 22.1	9.1							−8.26		10.88	6 45.44
	κ												−8.689
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											−0 8.27	6 37.18
													− 4.78
										6 54.86			6 32.39
			8.0	6 32.3	41.0	52.7	56.6	60.4	64.2	27.89	5.578	10.89	4489
										8.22		10.88	6 44.90
	κ												−8.689
	((δ) − D) $\frac{\kappa'}{100}$												+ .40
													− 2
	α_2											7.73	6 37.18
													− 4.80
										6 54.84			6 32.38
7	6 47	29.6	9.4	7 36.9	57.4	65.2	69.6	73.1	77.3	34.26	6.852	10.91	5761
	6 35.5	50 26.9	9.2							−8.26		10.90	7 57.62
	κ												−8.689
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.27	7 49.36
													− 4.79
										8 7.08			7 44.56
				7									
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												
9	8 30	62.4	8.3	9 21.4	38.4	46.4	50.3	54.0	58.2	24.73	4.946	11.03	3843
	8 17.9	59.7	8.2							−8.26		11.03	9 38.43
	κ												−8.689
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.27	9 30.17
													− 4.84
										9 48.01			9 25.32
			8.0	9 28.7	38.0	45.9	49.7	53.7	57.6	24.09	4.898	11.03	37.95
										−7.71			9 37.95
	κ												−8.102
	((δ) − D) $\frac{\kappa'}{100}$												+ .41
													− 2
	α_2											7.73	9 30.24
													− 4.86
										9 48.05			9 25.36
10	9 56	48.3	8.8	10 38.4	5.8	13.6	17.4	21.3	25.1	8.32	1.664	10.98	566
	9 44.2	50 45.6	8.5	46.3						−8.26		10.98	11 5.66
	κ												−8.689
	((δ) − D) $\frac{\kappa'}{100}$												+ .44
													− 2
	α_1											8.27	10 57.40
													− 4.83
										11 15.21			10 52.56
			7.8	10 50.0	5.2	12.9	16.9	20.8	24.8	8.06	1.612	10.98	514
										−7.72		10.98	11 5.14
	κ												−8.102
	((δ) − D) $\frac{\kappa'}{100}$												+ .40
													− 2
	α_2											7.74	10 57.42
													− 4.85
										11 15.20			10 52.55
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_1												
	κ												
	((δ) − D) $\frac{\kappa'}{100}$												
	α_2												

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Runs −07 R
−22 R

	$T_m - T$	A	C	Sum	Mean	Red. to m. wire	Red. to h. wire	Red. runs	Stroke	z	δ′
	148	0 48.2	44.3	92.5	0 46.25	+06	−143	−04	50	50 34.8	24 22.36
d	145				50 46.25	32 2.10				50' 34.93	− 6
((δ) − D) $\frac{d'}{100}$	1.16137					50 24 1.104	11.02 − 10 + 40				+ 8
	9.80443					+ 1132	− 11.32				+ 8.57
	1.05374										+ .35
+2247 δ_1											− 9.70
+47.50											24 21.60
									25 9.1		
	127	0 47.1	62.2	89.3	0 44.65	+05	−981	−13	50	50 34.9	24 22.95
	426				50 44.65	32 3.70				50 34.81	− 5
d	1.10037					50 24 1.312	9.45 − 8 + 47				+ 8
((δ) − D) $\frac{d'}{100}$	9.80443					+ 9.83	− 9.84				+ 8.34
	0.99274										+ .35
+2247 δ_2											− 10.20
+47.50											24 21.47
						6			25 9.0	50	
	207	0 57.7	49.9	101.6	0 50.80	+12	−1596	−06	45	45 34.83	25 22.77
	+20.9				45 50.80	32 5.55					− 12
d	1.32015					50 25 1.649	15.74 − 17 + 70				+ 8
((δ) − D) $\frac{d'}{100}$	9.80428 366					+ 1685	− 18.27				+ 8.59
	1.21 234										+ .35
	175										− 9.50
+2252 δ_1									30		25 22.70
+47.05									28 9.2		17
											29
d											
((δ) − D) $\frac{d'}{100}$											
δ_2											
											51
	170	3 6.1	2.2	8.3	3 4.15	+08	−1293	−22	10	12 51.1	2 6.23
	+17.0				13 4.15	9 44.20				12 51.07	− 8
d	1.23045					51 1 53.14	13.09 − 1				+ .31
((δ) − D) $\frac{d'}{100}$	9.79856					+ 1309	− 13.08				+ 9.25
	1.11695										+ .40
+2269 δ_1											− 9.40
+46.35											2 6.71
									2 53.1		
	91	3 1.0	54.4	115.4	3 57.70	+02	−694	−66	10	12 50.1	2 7.00
	+9.0				12 57.70	9 50.65				12 50.77	− 3
d	0.95424					51 2 0.07	6.93 − 0				+ .33
((δ) − D) $\frac{d'}{100}$	9.79856					+ 693	− 6.93				+ 9.01
	0.84074										+ .40
+2269 δ_2											− 9.90
+46.35											2 6.81
									2 53.2		50
	195	2 19.1	14.9	34.0	2 17.00	+10	−1493	−16	25	27 1.99	47 55.30
	+19.4				27 17.00	55 31.35					− 10
d	1.28780					50 47 4429	14.95 − 25 + 31				+ .23
((δ) − D) $\frac{d'}{100}$	9.80074					+ 1501	− 15.01				+ 8.98
	1.17648										+ .40
+2265 δ_1											− 9.20
+45.80											47 55.61
									48 41.4		
	152	2 18.2	12.2	30.4	2 15.20	+06	−1165	−50	25	27 3.53	47 54.26
	+15.1				27 15.20	55 33.15					− 6
d	1.17898					50 47 4257	11.80 − 21 + 8				+ .25
((δ) − D) $\frac{d'}{100}$	9.80074					+ 1169	− 11.67				+ 8.73
	1.06766										+ .40
+2265 δ_2											− 9.70
+45.80											47 53.88
									48 39.7		

The following are the values for the changes of the sidereal clocks between D2 @ 10 and D2 @ 13, derived from the observations on each page.

	R + R	A. M.
	0.66	0.69
	.63	67
	.65	70
	.69	72
	.65	66
	70	51
	66	57
	69	51
Means.	0.66	0.63

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Date$_1$ = Observer / Recorder

Date$_2$ = Observer / Recorder

Star. α	δ	Mag.	T_δ	T_m	T_e	T_f	T_g	T_h	Sum	Mean	Red. to T_m	T
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_1												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_2												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_1												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_2												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_1												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_2												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_1												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_2												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_1												
κ												
$((\delta) - D)\frac{\kappa'}{100}$												
α_2												

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