

KG

11366

6.1051



Measures of the Suspected Star
Halande 20406

12500

plate MC 1412 Nov 13 1911

Star

P	d	X	d	4	2
x 32.8	15405-	5505-	5711	15420	
420.4	6880	143 38 ⁴⁴	10365-51	11277	
Large comet	7284	45 35	48 55	70 20	
mean 2.8	00	33 29	60	5910	
		15812	20	4642	
	32.8522	8529	20.4638		
D	15464	5735	6368	14630	
14.4	11435	9757	10140	10840	
16.4	38	40 48	27 ⁴³	34	
Small	64	157 35	72	4630	
mean 0.8	4028	4011	16.3773	3793	
E	15698	6672	5010	14512	
52.9	6828	15378	5638	13902	
1100	3830	76	21 21	849	
3.5	91	16208	150 38	41885	
	32.8861	8871	11.0615	0610	
G	16794	6012	8170	13078	
2488	9778	13027	10112	11158	
35.2	80	50 25	18 11	58	
Good	85	16020	18178!	70	
mean 1.8	7009	7006	35.1943	1918	
H	17150	6240	3757	18352	
24.4	12588	10808 50	10914	11212	
24.7	91	15 11	08	07	
mean 2.6	7146	16255	68	40	
Good 29	4057	4061	7148	7134	

Star E

$\lambda = 23.9$ $\eta = 20.94$

	4378	15861	16282	4026
Elongated	13750	6464	6513	13781
in 4	5855	86	2514	75
Diam	79	79	78	14020
1.8				

23. 9375 9395 20. 9760 9748

23. 9385 20. 9754

J. W. R. 1413 March 19

14C	1412, mean x	Coordinate y	Mean reversed.
P	32. 8524	20. 4640	
D	14. 4020	16. 3783	
C	32. 8866	11. 0612	
G	24. 7007	35. 1931	
H	29. 4559	24. 7141	
E	23. 9385	30. 9754	

J. W. Russell. 1913 March 18

	36 - x	44 - y
P	3.1476	23.5360
D	21.5980	27.6217
C	3.1134	32.9388
G	11.2993	8.8069
H	6.5441	19.2859
E	12.0615	23.0246

Plate 1413

1911-Nov. 13

1913/Mar. 19

Star	d	N	d	N
P	14890	18060	14228	17315
2.3	7575	15356	11098	10425
24.4	80	5656	01	2015
	77	46	06	03
	<u>2.2697</u>	<u>2.2700</u>	<u>24.3121</u>	<u>3112</u>
D				
20.5	16312	16379	17158	16290
28.6	12942	9748	10590	12845
	4440	44	92	48
	00	79	45	80
	<u>20.6634</u>	<u>.6633</u>	<u>28.6561</u>	<u>.6559</u>
C				
2.1	15121	17320	15032	14927
337	6151	16290	+7880	12070
	4856	85	81	70
	12	42	15	22
	<u>2.1033</u>	<u>2.1034</u>	<u>33.7140</u>	<u>33.7145</u>
G				
10.6	18087	16729	18395	15875
9.6	14373	10410	11406	12858
	70	07	02	54
	65	08	78	85
	<u>10.6292</u>	<u>10.6306</u>	<u>9.6980</u>	<u>9.6978</u>
H				
5.7	17880	14830	16464	18703
20.1	15141	7549	14370	9763
	3830	48	61	70
	71	20	40	81
	<u>5.7258</u>	<u>7274</u>	<u>20.2092</u>	<u>1082</u>
E				
11.2	15500	16332	15210	16848
23.9	7392	14418	8595	14090
irregular	89	12	50	82
	91	20	90	30
	93			240
	<u>11.1897</u>	<u>1915</u>	<u>23.9243</u>	

mean Coordinates

MC 1413
1911 Nov 13

	x	y
P	2.2698	24.3116
D	20.6634	28.6560
C	2.1034	33.7142
G	10.6299	9.6979
H	5.7266	20.4087
E	11.1906	23.9242

W. Fowler - 1915 Mar. 19

Reduction of 1413 to 1412 as standard, neglect non-linear term

	$x - \bar{x}$	+150 y	Sum	-91 y	Sum	Sum	O-C
P	-0.8778	+3647	-5131	-219	-4	-5354	-72
D	-0.9346	+4298	-5048	-258	-41	-5347	0
C	-0.0100	+5057	-5043	-303	-4	-5350	-3
G	-0.6694	+1455	-5239	-87	-21	-5345	+2
H	-0.8175	+3031	-5144	-182	-11	-5337	+10
E	-0.8709	+3588	-5121	-257	-22	-5358	-11
			mean - reduction P			-5347	

	$y - \bar{y}$	-140 x	Sum	-15 y		O-C
P	+0.7756	-318	+7438	-36	+7402	0
D	+1.0343	-2893	+7450	-43	+7407	+5
C	+0.7754	-294	+7460	-57	+7409	+7
G	+0.8910	-1488	+7422	-15	+7407	+5
H	+0.8228	-802	+7426	-30	+7396	-6
E	+0.8996	-1567	+7429	-36	+7393	-9
			mean - cycl. P		+7402	

Plate M.C. 1092

1911 May 6

1913 Mar 19
Russian reversed

Star

x

y

P	d	N	d	N
11.3	16343	18509	15980	17922
21.9	973935	1514919	690505	1700099
	39	11	01	9499
	50	00	80	10
<u>11.3390</u>		<u>.3391</u>	<u>17.9076</u>	<u>.4077</u>
D	15735	17695	1108289	1913 Mar 18
29.8	1370501	973027	8689	12295
21.9	00	29	10778	1200094
	35	98		9594
<u>29.7967</u>		<u>.7968</u>	<u>21.9692</u>	<u>.9701</u>
C	17831	15420	18219	1913 Jan 6
11.3	1099889	1225054	1516157	16729
27.3	91	46	65	979599
	31	32	26	90
				37
<u>11.3162</u>		<u>11.3174</u>	<u>27.3060</u>	<u>.3060</u>

G $x = 19.5$ $y = 2.3$ (out of reach)

H				
14.7	17855	17588	17460	16410
13.6	1512019	1031511	1094940	1292630
	18	18	3340	3030
	61	88	55	03
<u>14.7262</u>		<u>.7273</u>	<u>13.6517</u>	<u>.6521</u>
E	16743	15750	13861	1913 Jan 6
	921115	1329493	1002521	16671
	05	93	27	1052730
	61	68	75	28
				90
<u>20.2453</u>		<u>.2461</u>	<u>17.3842</u>	<u>.3845</u>

MC 1992 1911 May 6.
Mean Coordinates

	x	y	
P	11.3390	17.9076	
D	29.7968	21.9696	measured Mar 18
C	11.3168	27.3060	Jan 6
G	out of reach		
H	14.7268	13.6519	
E	20.2457	17.3844	Jan 6

see Fowler 1913 Mar. 19.

MC1093

1911 May 6

Residual revealed

1913 Jan 19.

star

P

d

N

d

N

11.2

18.4

11.240911.240818.372618.3717

1913 Jan 7.

D

29.6

22.6

15233

11881

78

27

17417

10780

80

20

15827

9980

80

20

16034

11881

85

41

29.6650.664022.5843.5848

C

11.141911.143227.769727.7700

1913 Jan 7

g out of reach.

H

14.7

14.2

18127

14752

51

30

17235

10610

10

40

18598

17150

55

00

17273

8720

22

82

14.6623.662814.1448.1442

1913 Jan 7.

E

20.149920.150317.922417.9215

MC 1093

1911 May 6.

Mean Coordinates

	x	y	
P	11.2408	18.5722	measured Jan 7
D	29.6645	22.5846	
C	11.1426	27.7698	Jan 7
G	out of reach		
H	14.6626	14.1445	"
E	20.1501	17.9220	Jan 7.

Mr. Fowler 1913 Mar 19.

Reppawmata reduction to 1093 as standard. S: 4

Star	$k - 5$	$+ 61(y - 10)$	Sum	Diff.
P	- 098.2	+ 678	- 304	+ 3
D	- 132.3	+ 1019	- 304	+ 3
C	- 174.4	+ 1439	- 305	+ 2
H	- 064.2	+ 336	- 306	+ 1
E	- 095.6	+ 642	- 314	- 7

mean. incl. P - 307

4-7

 $- 62(y - 10)$ Sum Diff.

P	+ 464.6	- 102	+ 454.4	0
D	+ 615.6	- 1611	+ 454.4	+ 1
C	+ 463.8	- 94	+ 454.4	0
H	+ 492.8	- 382	+ 454.4	0
E	+ 537.6	- 832	+ 454.4	0

mean. incl. P + 454.4

MC1094

1911 May 6

1913 Mar. 19.
Resyan reversed.P9.65079.650817.768517.7685

D. 17230 16940
 28.1 820910 1596670
 21.9 10 66
 30 50

15580 18401
 676370 1721514
 90 2014
 82 11

28.0980.097421.8814.8814

C

9.60139.602427.168027.1684

G out of reach

H 18506 11246
 130 903014 1073128
 135 2420 30
 10

14965 16670
 972830 1190303
 28 00
 67 75

13.0512.051613.5237.5230

E very faint - elongated

186
 17.3 16797 17780
 12379 1220708
 8589 10
 02 92
18.5585 .5578

15383 15219
 1269090 792721
 81 32
 91 32
17.2698 .2698

note

The non-linear corrections to be applied to a plate, whose center falls at X, Y , on the standard plate,

(so that approximately $x = \xi - X$ $y = \eta - Y$) are

$$\delta x = + \left(x - \frac{1}{2}X\right) \frac{Xx - Yy}{F^2} \quad \delta y = + \left(y - \frac{1}{2}Y\right) \frac{Xx + Yy}{F^2}$$

where X, Y, x and y are measured from the center of the standard plate $x = 16$, $y = 22$ on our ordinary scale, and, for our plates $F = \frac{208285}{466.5} = 443$ $F^2 = 196,000$

Hence, if x, y, X, Y are measured in arcseconds & $\delta x, \delta y$ in $0''.0001$

$$\delta x = \frac{1}{19.6} \left(x - \frac{1}{2}X\right) (Xx - Yy) \quad \delta y = \frac{1}{19.6} \left(y - \frac{1}{2}Y\right) (Xx + Yy)$$

In the case of 1094 we have $X = +1.68$ $Y = +0.134$

and find

Star	x	y	Xx	Yy	$\xi\eta$	$(x - \frac{1}{2}X)$	$(y - \frac{1}{2}Y)$	δx	δy
D	-6.66	-4.09	-11.2	-0.5	-11.7	-7.5	-4.2	+4	+2
D	+11.80	-0.03	+19.8	0	+19.8	+11.0	-0.1	+11	0
C	-6.68	-5.31	-11.2	+0.7	-10.5	-7.5	+5.2	+4	+3
H	+3.28	-8.35	+5.5	-1.2	-6.7	-4.1	-8.5	+1	-3
E	+2.25	-4.62	+3.8	-0.6	+3.2	+1.4	-4.8	+0	-1

MC 1094

1911 May 6

Mean Coordinates

x

y

P	9.6508	17.7685	measured Jan 9
D	28.0977	21.8814	
C	9.6018	27.1682	Jan 9
G	out of reach		
H	13.0514	13.5234	
E	18.5582	17.2698	

In Fowler 1913 Mar 19

Reduction to 1092 as standard

	x - 5	how. lower low	+294	Sum	P+6
P	-1.6882	+4	+574	-1.6364	+3
D	-1.6991	+11	+634	-1.6346	-15
C	-1.7150	+4	+786	-1.6360	0
H	-1.6754	+1	+392	-1.6361	0
E	-1.6875	0	+500	-1.6375	+14
		mean. excl P		-1.6361	

	y - 7		-27.44		
P	-0.1391	+2	-261	-1650	-10
D	-0.0882	0	-758	-1640	0
C	-0.1378	+3	-259	-1640	0
H	-0.1285	+3	-352	-1634	+6
E	-0.1146	-1	-501	-1648	-8

mean. excl P -1640

Position of these stars

A.C. Lep 0218 II

1870.0 Map N.D. 1870.0 P.M. Sun. W

P 4049 7.9 +13° 22' 10" 25" 38.44 +3.14013 -0.0101
 20h 1869.2 +13 33 39.6 -18.378 -0.179

D 4089 8.7 +14° 21' 10" 35" 37.11 +3.1936 -0.0094
 40h 1879.7 +14 7 28.4 -18.705 -0.160

C 4047 6.3 +10° 21' 6" 25" 31.35 +3.2135 -0.0108
 Reddish 20h 1869.3 +14 46 40.3 -18.374 -0.160

E 4068 7.8 +13° 22' 10" 30" 23.32 +3.1947 -0.0099
 20h 1869.2 +13 30 50.8 -18.541 -0.170

H 4034 7.7 +13° 22' 10" 27" 29.05 +3.1937 -0.0097
 20h 1869.2 +13 1' 6" 5" -18.642 -0.175

mean of double??

Zodiacal Cat's. reduced to 1875.0

A.G. -20d

	α	δ	α	δ	α	δ
P	10	25	38.19	+0.25	+13	33 40.2 -0.6
D	10	35	27.10	+0.01	+14	7 28.3 +0.1
C	10	35	31.34	+0.00	+14	46 41.8 -1.5 end. P.14
E	10	30	23.32	-0.00	+13	30 57.3 -0.5

Positions of these Stars Equinox 1900.0

Zodiacal Catalogues 1900

Stockholm D6

P Vol. 20406 8.0	Cape 1439	10 ^h 26 ^m	58 ^s .146	+3.1983	-0.010	5 ^h	1902.53
	Edw.		58.150			3	1903.29
	Lich	1195	58.173			2	P.14?
	Mean		58.158				
	C		+ 13° 26' 59".82	-14.418	-0.18	4	1902.54
D Vol. 20601	E		58.59.02				
	L		58.0.15			2	Apr 3 1902
			59".67				
	Cape 1439	10 36	46.870	+3.1906	-0.010	5 ^h	1901.91
	E		877			5 ^h	1906.07
C Vol. 20601	L	12	55.3			2	
			46.867				
	C		+13 59 39.87	-18.700	-0.16	6	1905.60
	E		39.47			2	
	L		40.08				
C Vol. 20601			39".81				
	Cape 1435	10 36	51.540	+3.2104	-0.011		
	E		51.544				
	L	1194	51.514				
			51.532				
E Vol. 20522	C		+14 39 2.12	-18.414	-0.18	5 ^h	1902.09
	E		1.41				
	L		1.96			2	
			1.85				
	P.M	±0.0000	40".024	-0.0027	+0".013	2	
E Vol. 20522	Cape 1449	10 31	43.120	+3.1918	-0.010	5 ^h	1902.08
	E		093			3	1902.58
	L	1202	135			2	
			43".116				
	C		+13° 23' 6".79	-18.578	-0.17		
E Vol. 20522	E		6.72				
	L		7.29				
			6".93				

non linear Correction $X = +8.19$ $Y = -5.64$

	x	y	Xx	Yy	$Xx + Yy$	$X - \frac{1}{2}X$	$Y - \frac{1}{2}Y$	δx	δy
P	-6.66	-4.09	-54.5	+23.0	-31.5	-10.76	-1.27	+17	+1.
D	+11.80	-0.03	+96.6	+0.2	+96.8	+7.70	+2.79	+38	+14
C	-6.68	+5.31	-54.6	-29.9	-84.5	-10.78	+8.13	+52	-39
H	-3.38	-8.35	-26.8	+47.1	+20.3	-7.38	-5.53	-8	-6
E	+2.25	-4.62	+37.8	+26.0	+63.8	-1.85	-1.80	-6	-6

Inter comparison of

MC 1412 and MC 1092

Star	x^s						
	1092	1412	Diff		1092	1412	Diff
P	11.3390 ^v	3.1476	-8.1914		17.9076	23.5360	+5.6284
D	29.7968 ^v	21.5980	-8.1988		21.9696	27.6217	+5.6521
C	11.3168 ^v	3.1134	-8.2034		27.3060	32.9388	+5.6328
H	14.7268 ^v	6.5441	-8.1827		13.6519	19.2857	+5.6340
E	20.2457 ^v	12.0615	-8.1842		17.3844	23.0246	+5.6402
G	17.4	11.2442	-8.1		8.78	8.8069	

x-5. Corrected for non-linear terms.

	+11.4	Sum	+2.6 y	Sum		
P	-8.1897	-195	-8.1702	-46	-8.1656	-25
D	-8.1950	+242	-8.1708	-57	-8.1657	-20
C	-8.1982	+300	-8.1682	-71	-8.1611	+20
H	-8.1835	+150	-8.1685	-35	-8.1650	-19
E	-8.1848	+191	-8.1657	-45	-8.1612	+19
		mean			-8.1631	

4-y. Corrected for non-linear terms

	13.5 x	Sum		
P	+5.6285	-153	5.6132	+1
D	+5.6535	-403	6.132	+1
C	+5.6291	-153	6.132	+1
H	+5.6336	-199	6.137	+5
E	+5.6396	-274	6.122	-7

mean
and P 5.6131

not satisfactory
x-5. for D was
-8.2850. we assume
fit an excellent fit

Measure star Q on 1092
of former

Star F

H.

$$\begin{array}{r}
 u \quad m \quad s \\
 10 \quad 30 \quad 23.32 \\
 + \quad -3 \quad -6.68 \\
 \hline
 \quad \quad 786.67
 \end{array}$$

$$\begin{array}{r}
 u \quad m \quad s \\
 10 \quad 27 \quad 29.05 \\
 - \quad 6 \quad 8.95 \\
 \hline
 \quad \quad 360.91
 \end{array}$$

$$\begin{array}{r}
 2. \quad 27 \quad 107 \quad m \\
 9. \quad 98 \quad 781 \\
 8. \quad 50 \quad 724
 \end{array}
 \quad
 \begin{array}{r}
 2 \quad 557 \quad 40 \quad m \\
 9. \quad 988 \quad 69 \\
 8. \quad 507 \quad 24
 \end{array}$$

$$\begin{array}{r}
 0. \quad 766 \quad 12 \quad m \\
 - \quad 5. \quad 836 \quad 0 \\
 \hline
 \quad \quad 6 \\
 12 \quad 163 \quad 4 \\
 12. \quad 06 \quad 15 \\
 \hline
 \quad \quad 10 \quad 19
 \end{array}
 \quad
 \begin{array}{r}
 1. \quad 085333 \quad m \\
 - \quad 11. \quad 30 \quad 66 \\
 \hline
 \quad \quad 32 \\
 6. \quad 69 \quad 02 \\
 6. \quad 54 \quad 41 \\
 \hline
 \quad \quad 1461
 \end{array}$$

$$\begin{array}{r}
 + \quad 13^0 \quad 30' \quad 50.8 \\
 + \quad \quad \quad 7 \quad 50.8 \\
 + \quad \quad \quad 470.8
 \end{array}$$

$$\begin{array}{r}
 + \quad 13^0 \quad 1' \quad 6.5 \\
 - \quad 12 \quad 53.5 \\
 - \quad 1313.5
 \end{array}$$

$$\begin{array}{r}
 2. \quad 67284 \\
 7. \quad 33115 \\
 0. \quad 00399
 \end{array}$$

$$\begin{array}{r}
 3. \quad 11843 \quad m \\
 7 \quad 33115 \\
 0. \quad 44958 \quad m
 \end{array}$$

$$\begin{array}{r}
 1. \quad 5322 \\
 9. \quad 3808 \\
 7. \quad 0523 \\
 7. \quad 9653
 \end{array}$$

$$\begin{array}{r}
 2. \quad 0867 \\
 9. \quad 3640 \\
 7. \quad 0523 \\
 8. \quad 5030
 \end{array}$$

$$\begin{array}{r}
 + \quad 1.0092 \\
 22220092
 \end{array}$$

$$\begin{array}{r}
 - \quad 2. \quad 8157 \\
 +22. \quad 0318
 \end{array}$$

$$\begin{array}{r}
 23. \quad 0184 \\
 23. \quad 0246
 \end{array}$$

$$\begin{array}{r}
 19. \quad 2161 \\
 74 \quad 2859
 \end{array}$$

$$+ \quad 0062$$

$$+ \quad 0698$$

Computation of Standard Co-ordinates for A.B. plates

for MC 1412 Assumed plate center A = $10^h 33^m 30^s$ - D = $+13^\circ 28'$

Star	P	D	C
α	10 25 38.44	10 35 27.11	10 25 31.35
$\alpha - A$	- 17 57.56	+ 1 57.11	- 17 58.65
$\alpha - A + D$	- 471.47	+ 177.11	- 478.50
$\log \mu - A + D$	2. 673 45 ^m	2. 068 68	2. 679 93 ^m
$\log \cos \delta$	9. 987 72	9. 986 66	9. 985 39
$\log \frac{1}{\sin \delta}$	8. 507 24	8. 507 24	8. 507 24
$\log \mu$	1. 168 41 ^m	0. 562 50	1. 172 56 ^m
$\log \mu$	- 14. 737 0 ^v	+ 8. 651 81	- 14. 878 6
$\log \mu$	- 82 ^v	+ 5 ^v	- 128 ^v
$\log \mu$	3 25 48	22 65 23	3 10 56
$\log \mu$	3. 147 6	21. 598 0	3. 113 4
$\log \mu$	- 1072	- 0543	+ 0048
$\delta + 12$	33 39.6	+ 14 7 28.4	+ 14 46 40.3
$\delta - D$	+ 70' 39.6	+ 44' 28.4	+ 1 23 40.3
$\delta - D + D$	+ 1639.6	+ 2668.5	+ 50211.3
\log	2. 80 59.1	3. 426 27 ^v	3. 700 82
$\log \frac{1}{\sin \delta}$	7. 33 11.5	7. 33 11.5	7. 33 11.5
$\log \mu$	0. 136 06	0. 757 42	1. 031 97
$\log \mu^2$	2. 33 68	1. 125 0	2. 325 1
$\log \mu$	9. 382 2	9. 400 7	9. 420 99
$\cos \mu = \frac{1}{\sin \delta}$	7. 052 3	7. 052 3	7. 052 3
$\log \mu$	8. 771 3	7. 577 70	8. 798 3
μ_1	+ 1. 367 9	+ 5. 720 3	+ 10. 763 9
μ_2	22 0 59.1	22. 003 8	22 0 62.9
μ	23 42 70	27. 724 3	32 82 68
μ	23. 536 0	27. 621 7	32. 938 8
$\mu - \mu$	+ 1090	- 1024	+ 1120

Reduction of MC 1412 to A.G. Standard

Star	X-5	-110 y	Sum	+4 x 0.8 x	Sum	O-C	Cor. from A.G. + 20d. cat.	O-C from 20d. cats
E	-1019	-2533	-3552	+23 + 10	-3539	+14	0	+14
H	-1461	-2121	-3582	+14 + 5	-3568	-13	?	-12
P	-1072	-2589	-3661	+24 + 2	-3639	-84	-78	-6
D	-543	-3038	-3581	+28 + 17	-3570	-15	-3	-12
C	+48	-3623	-3575	+32 + 2	-3544	+11	0	+11

mean. excluding P -3555

	4-y	+115 x	Sum	-2y	Sum	O-C	Cor. from A.G. + 20d.	O-C from 20d. + y	O-C
E	+62	+1387	+1449	-46	+1403	-5	+11	-16 + 23 + 7	-8
H	+698	+752	+1450	-38	+1412	+4		+4 + 19 + 23 + 6	+6
P	+1090	+363	+1453	-47	+1406	-2	+13	-15 + 23 + 8 - 7	-7
D	-1024	+2484	+1460	-55	+1405	+3	+2	-1 + 28 + 27 + 12	+12
C	+1120	+358	+1478	-66	+1412	+4	+32	-28 + 33 + 5 - 10	-10

mean incl. P 1408

The photographic places of all these stars agree with those given in the zodiacal Catalogue within the limits of their errors. The A.G. place of P differs slightly, probably due to a small proper motion in R.A.

Re-measure and re-computation
of Plate No. M.C. 2151.

1914 June 5.

2181

Stars - measures.

d

4

v

d

22

22

1 16089

5.8 7337 39

11.8 39

89

11.8751

16781

1496968

66

99

5781832

89

double stars

241

2~~should be (1)~~

2

2181 Resonance reverberation 14-5-19

Station	my	Σ	y
2	5.6	8.9	24.1
1	8.6	5.8	11.5
3	7.0	27.8	13.9
4	8.6	28.6	32.1

double check

moon	Σ	y
1	20.0	17.4 ?
2	19.5	17.3 min in y
3	19.0	17.4
4	18.9	17.7
5	17.7	18.0
6	17.5	19.0
7	17.5	19.2 min in x
8	17.6	20.0
9	18.0	20.5
10	18.6	21.0

grade 4

1	2	3
5.8371	27.8444	28.7042
6.2913	28.2776	28.9766
-4.542	-4.332	-2.724

	-88.74		-1.22		+5602
-4542	-1054	= -5596	-7	-5603	-1
-4332	-1237	= -5569	-33	-5602	0
-2724	-2844	= -5568	-34	-5602	0
19.4299	-1701		-23		= 19.8177

$$3 = +1.8177$$

$$\log 3 = 0.25952$$

$$4.99183$$

$$8.50724$$

$$1.76045$$

$$\alpha - A = +57.60$$

$$A = 1.3704$$

$$\alpha_0 = 1.380160$$

$$\text{Red} = +3.56$$

$$\alpha' = 1.380516$$

$$\text{Harpur} = -49.40$$

$$\alpha = 1.371576$$

$$\text{Tabular} = 1.371507$$

$$0 - c = +0.69$$

