KG
11,366
142

No. 1.

MISCELLANEOUS MEMORANDA

E. C. P.

Aug.28,1902,-Dec.15,1912.

KG11366.142

KG 11366.142

HARVARD
UNIVERSITY
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August 28, 1902

Present condition of Annals, unfinished Volumes.

	Oct 1. Expected Distrib.	Fund
37.2 Copies expected daily from binder.		Sc.
39.2 Revis. Merid. nearly ready to begin printing.		
43.2 Blue Hill	–	Cr
44.2 Nearly set up except Introduction.	Printed	Sc.
46.1 Chap. 1. Mer. P. 1899 In type.	–	Sc.?
" " 2 " 1900-01 Nearly ready for printer	At Printers	
" " 3 Summary of Energy? Not begun		
" " 4 Short Period Variables.	?	
47. Misty. Var. Copy in hands of printer.		
48 1. N. Pole Distrib.	Completed.	
" 2 Moon Photo. Nearly in type	Completed.	
49.1 First four pages at printer. Remainder nearly completed		
50. Revised H.P.		

Completed and distrib.:-

37.2; 38; 41, 7, 8, 9; 43, 2; 44.2?; 48.1.

In progress:-

39.2; 46.1,2; 47; 48.2,3~~48.3~~; 49.

~~Oct~~ 1 Aug. 1. 1902

Dunning est. 1563

Sturgis " 2525

Sturgis Fund Dec 1

Jan 1

37,2	665.03
38	1566.22
44,1	525.52
	2756.77

August 28, 1902

12 inch Telescope.

Oct. 28, 29. 1900 Records on Pritchard wedge.

Experiments with Mr. P.

June 10, 95. June 12, 95. Oct-26 95.

Book 91.1 91.44 .

Position angles of λ. JD 2655.

September 1. 1902

Measures of Intensity of F-line Higgs Spectra 2, 3, 75, 76, 79
Postponed owing to lack of faint lines, and irregularity of focus

Memoranda.

Q Note In Lick Bulletin No. 20. it is stated that Espin announced that H_β was bright (A.N. 2963) Was it not first discovered here?

Notes from letters of S. I. B.
Exam of Bruce plates 706-724, 807-822, 848-857, 883-893.
Asteroid trails 725-728, 871-872
Exp. 740-744, 835-836 time correction 882 time correction
Cells 843, 863, 881

Rubens Galvanometer Zeitschrift Inst. 4-5 yrs ago. 1902

Position Arequipa Station long. $4^h 46^m 11^s.71 \pm 0^s.032$ Lat $-16^\circ 22' 28''.0 \pm 0''.19$
53d Report Sept 30. 1898. p 11

Outside dimensions East wing photographic building excluding old wall. 26426. cubic feet.
Inside, including floors to inside of roof. 22638 cubic feet
Cost including heating. \$5.3 .

Sept. 4. 1902

Scale 12 inch having telescope.

1 div. = 3.206 mm Scale wedge enlarge twice. on one leading base 21.3 cm. other 42.7

∴ 25.4 mm = 1.38 mag. King 1 mm. = .0543 mag.

According to K. 1 div. = 0.87 mag.

H.C.O. Vol XIV p 218

Used n = 5

0.78 + 1.06n + 0.04n²

0.78
5.30
1.00
7.08

n	Comp.	Obs.	Resid.	Correc.				Comp.		O-C
0.0	.60	0.79	+19	+18	+18			.78	.54	+1
				-12	-11					
	1.25	1.27	+2	+6	+7			1.32	.56 ²	-5
				-8	-9					
1.0	1.90	1.89		-2	-2			1.88	58 ²	+1
				-7	-7					
	2.55	2.50		-9	-9			2.46	60 ²	+4
				-5	-5					
2.0	3.20	3.03		-14	-14			3.06	62 ²	-3
					-2	-3				
	3.85	3.66		-17	-16	-17		3.68	64 ²	-2
				0	-1	-1				
3.0	4.50	4.39		-17	-18	-18		4.32	66 ²	+7
				+1	+1					
	5.15	4.96		-16	-16	-17	-17	4.98	68 ²	-2
				+4	+3					
4.0	5.80	5.73		-12	-13	-14	-14	5.66	70 ²	+7
				+4	+5					
	6.45	6.33		-8	-8	-9	-9	6.36	72 ²	-3
				+7	+7					
5.0	7.10	7.09		-1	[illegible]	2	-2	7.08	74	[illegible]
				+9	+9					
	7.75	7.80		+8	+8	9	+7	7.82	76 ²	-2
				+10	+10					
6.0	8.40	8.61		+18	+18	20	+18	8.58	78 ²	+3
				+11	+11					
6.5	9.05	9.32		+29	+29	33	+31	9.36		-4

$\frac{24-21}{14}$

±0.032

According to King's measures with photom. plate 1 in = 1.38

1 div = .6315 in = .87 mag.

.626

159/254 .626
1524
660
508
1520

25.4/13 19.4
13
124
117
50
52

19.4/122 1.59
122
720
610
1100

16.04/254 .6315
1524
800
762
380
254
126

1.38
50520
18965
6315
.871470

Plate T. gives smaller intensity than (Rand Plate

Mr. R. gave C.S. that lighter than (Rand

Sep. 17. 1902

Williams Algol Var. Adn 159.

2415960.4948 + 3.598883

I 8755 2656.759 July 11, 1893

$3303.73\overset{58}{\cancel{6}}$ | 3.598883

3238.9947 ~~900~~

64.741$\overset{1}{\cancel{2}}$ /10

35.98883

28.752$\overset{2}{\cancel{4}}$7

28.791064 −8

.038794

3238.9947

35.98883

28.791064

3303.774594

5960.4948

2656.720206

5960.4948

2656.759

3303.7358

3.598883	1
7.197766	2
10.796649	3
14.395532	4
17.994415	5
21.593298	6
25.192181	7
28.791064	8
32.389947	9

Compu min Σ = −918

759

Phase + 0.038794

Sunday Oct. 12
~~Saturday Oct~~ 11, 1902

Stars near Nova Sagittarii

	+f x	+n y					
7.8	+5.4	−5.8	+21.0	3.2	27.7	$\overset{3}{42.2}$	21.9
9.5	5.0	+1.4	+19.4	.1.1	+9.7	41.7	21.1
	+2.2	+0.9	+8.6				
c (	+1.7	−1.9	+6.6				
	+1.5	−2.4	+5.8				
	+1.4	−2.7	+5.4				
a	−4.6	$\overset{5}{+0.6}$	−17.9				
	−5.5	+0.5	−21.4				
H:	−3.6	+0.6	−14.0				
b	−3.6	−1.6	−14.0				
	−4.3	−1.7	−16.7				
	−6.1	−1.9	−23.7				
9.2?	+12.6	−0.3	+49.0	~~36.3~~ 28.9	22.4	39.9	22.1

Cos 13.5 = .97 $\frac{2}{4}$
.3888
389

10.1
38.9
49.0

a prec 18^s n $0'.5$
" $3^s.5$ 0

Oct 12. 1902.

Scale of Plates.

60" = 0.1 cm

Vol 26. Pl V fig 2 η Carinae

" " 10 Nova Normae

Circ. 57 Nova Persei

Vol 32. Pl 3 fig 1.2

15" = 0.1 cm

Vol 32. Pl 1 Orion Neb.

2. fig 7 " "

180" = 0.1 cm

Vol 26. Pl II Southern Cross.

III Milky Way Sagitt.

IV Magell. Cl.

V fig 1 η Carinae

VII Spectra of Carinae

Vol 32. Pl 3. fig 4. 720" = 0.1 cm

20" = 0.1 cm

Vol. 48 No. 1. N. Pole

Length of Reports

	Phototh.	Cat.
51st	12.5	
52	12.6	
53	13.~~4~~5	
54	13.0	
55	18.7	
56	12.4	15.0
57	15.8	18.5
58	12.7	~~12~~

10" = 0.1 cm 20 cm = 2000" = 30' sq.

Vol 26 Pl V fig 3.

Vol 38. ω Centauri

Vol 26 Pl 6 ω Centauri

" " " 8 ω Cent. η Car

" " " 9 47 Toucanae

Oct. 27. 1902

Photometric Observations

	Years.	Stars.
Herschel	1835 – 38	149
Seidel	1844 – 60	208
Wolff I	1869 – 75	475
" II	1876 – 83	970
Peirce C.S.	1872 – 75	1494
Pritchard	1881 – 85	2784
Potsdam	1886 – 93	3522

Vol XI				P	W	S
XIV	1879 – 82	4260	94,476	39,796	26,544	28136
XXIV	1882 – 88	20,982	267,092	170,092	97,000 123,544	
XXXIV	1889 – 91	7922	98,744			Bailey 98,744 10,216 59,416
XLIV–V	1891 – ~~94~~	6387	473,216	473,216		
XLV	1894 – 98	23200			21 8 6 23 56	
XLVI. 1		~~50,816~~	59,416 992,944			
" 2						

683,104
~~672,888~~
939,492
643,368

683104

683,104 M.P.
265,604 12in
948,708 Oct. 1 '02
45,456 May 1, '03
994,164
3,424 May 16 '03
997,588
1,624
999,212 May 23 '03

992,944
50,816
1043,760
94,476
949,284

No. Av.	All.	Obs'l.		
12 inch		1897	33,792	33,792
		1898	46,272	80,064
65,200	65,200	1899	54,360	134,424
79,024	144,224	1900	73,448	207,872
54,448	198,672	1901	54,448	~~198,672~~ ~~262,320~~
66,932	265,604	1902	66,932	~~265,604~~ 329,250
71,992	337,596	1903		
92,396	429,992	1904		
81,284	511,276	1905		

Sept 1, 04 24,566 98,254.

683,104 M.P.
265,604 12in
948,708 Oct. 1, 02
45,836
994,544 Oct 30, 02
~~5,240~~
~~999,784 May 16 '03~~
3,424
997,968 May 16 '03

Se. N ~~[illegible]~~ 55

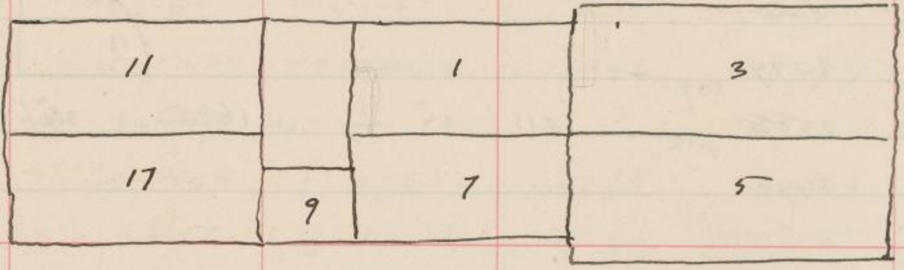
November 22, 1902.

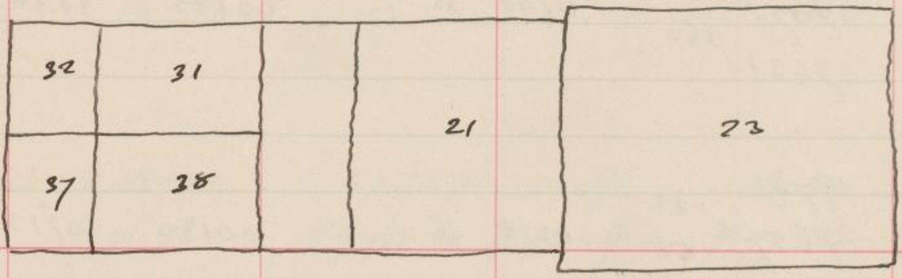
Plates measuring year Oct 1, 1901 – Sept 30, 1902

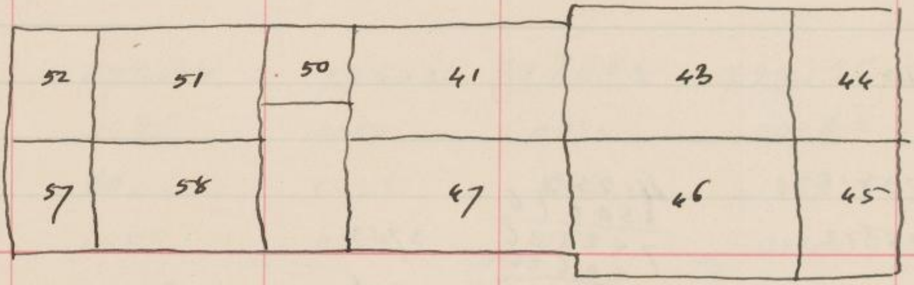
	Cambridge			Areq.
15 inch Reflector.	57	1188		
11 " Draper	475	14020 C	13in Boyden	226 ~~2759~~
8 " "	1642	29298	8in Bache	2139
Cooke Lens.	1044	2853	Cooke Lens	521
Ross Zeiss	152	341	Ross Zeiss	39
Transit Photo	532	4771	Transit Photo	457
Pole Star.	362	4992	Pole Star.	
Enlarge.	888	9434	Bruce	488
Tel-Meridian	685	7721		
Sum.	4264	~~74678~~ 57523		
	1573	17155		
All.	5837	74678		

November 29. 1902

Contents Photog. Laboratory





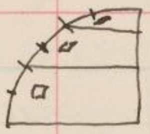


1	3,000	of 14×17 Hospital	
3	28,000	of 8×10	
5	28,000	" "	
11	16,000	" 14×17	
21	56,000	" 8×10	
	6,000	" 8×10 Hospital	
23	42,000	" 8×10	63,000 " 8×10
32	8,400	" 4×10	
37	8,400	" 4×5	
41	24,000	" 5×8	
43	28,000	of 8×10	46 28000 " 8×10
"	19,600	" 4×5	

16,000	14×17	
3,000	" "	Hospital.
182,000	8×10	
6,000	" "	Hospital.
24,000	5×8	
39,200	5×4.	
270,200		

November 26, 1902.

Area of regions counted in Obs



	sin						
12°	2079						
		509					
15°	2588		.1011	24°	$\frac{1}{60}$	.001685	34.65
		502					
18°	3090						
42	.6691						
		380					
45	.7071		.0740	36°	$\frac{1}{40}$	.00185	38.16
		360					
48	.7431						
72	9781						
		122					
75	9659	148	.0270	96	$\frac{1}{15}$	.00180	37.13
78	9511						

$4\pi r^2$

1.75812
1.75812
0.49715
0.60206
4.61545
41,25248

41252
330016
742536 — 37.13
20626
763162 — 38.16

41252
247512
33010
69,3042 — 34.65

50|105
10|21
84
160

December 12 1902

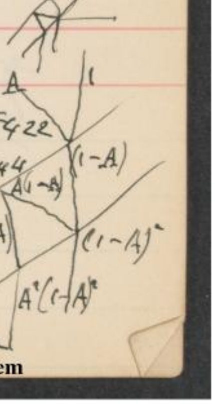
Light reflected at 45°

n =	1.50	1.51	1.52	1.53	1.54	1.55
log n	0.17609	17898	18184	18469	18752	19033
log sin i	.84949					
log sin r	.67340	.67051	.66765	.66480	66197	65916
r	28° 8′	27 55	27 43	27 32	27 20	27 9
		13	12	11	12	11
i + r	63 8	62 55	62 43	62 32	62 20	62 9
i − r	16 52	17 5	17 17	17 28	17 40	17 51
log tan i − r						
" " i + r						
tan(i − r)	9.48171	48759	49296	49784	.50311	50789
log tan²	8.96342	8.97518	8.98592	8.99568	9.00622	9.01578
A	.09197	.09444	.09681	.09901	.1014	.1037
		.0025	.0024	.0022	.0024	.0023
tan⁴ = B	7.92684	7.95036	7.97184	7.99136	8.01244	8.03156
B	.0085	.0089	.0094	.0098	.0103	.0108
(A + B)	.1004	.1033	.1062	.1088	.1117	.1145
½(A + B)	.0502	.0516	.0531	.0544	.0558	.0572
		14	15	13	14	14
	.9498	.9484	.9469	.9456	.9442	.9428
	8.701	8.713	8.725	8.736	8.747	8.757
	1.299	1.287	1.275	1.264	1.253	1.243
	6.50	6.44	6.38	6.32	6.265	6.215
		6	6	6	6	4

Index of refraction of plates of [illegible] [illegible] 1.525 determined by Mr [illegible] from angle of Prism.

$\frac{\sin^2(i-r)}{\sin^2(i+r)} + \frac{\tan^2(i-r)}{\tan^2(i+r)}$ $\tan^2(i-r) + \tan^4(i-r)$

1.03658	1.02482	1.01408	1.00432	0.99378	.98422
2.07316	2.04964	2.02816	2.00864	1.98756	1.96844
4.146					



5.00

518 512 507 502 497 492

Dec 15, 1902

Area of sphere.

sin 1' = tan 1' = 6.4637261

cot 1' ...... 3.5362739 = 3437.747

$$\frac{3438 \times 21600 \times 2}{3600}$$

3437.747
6875494
4125.2964

∴ Surface sphere = 41252.°296 sq. degrees

		.1745	
Sin 0	.00000	.17365	149
10	.17365	.16837	145-
20	.34202	.15798	136-
30	.50000	.14279	123-
40	.64279	.12325	106-
50	.76604	.09999	86-
60	.86603	.07366	63.3
70	.93969	.04512	30.2
80	.98481	.01519	13.0
90	1.00000	1.00000	851

~~360~~ 720 | 349 | 2.063
698
2200
2094
1060
1047
130

150 3000 | 349 | 8.5 .86
2792
2080
1745
3350

41253 / ~~48~~ 8

851
481
6808
3404
40848

December 19, 1902

Addresses

Professor George E. Hale, 5754 Woodlawn Ave. Chicago.

Andrew Carnegie Esq. 2 East 91st Street, N.Y.

Dr D.C. Gilman 614 Park Avenue, Baltimore, Md.

Publicity Bureau 126 State Street, Boston, Mass.

Feb 2, 1903.

Scale of 12 inch telescope

O.C.W. Meas-t.

4 / 1460

Corr. Ecl				Mean
89°3	89°35	0.96	0.94	0.95
	h	3.38	3.45	3.42
	k	4.02	3.89	3.96

		Ads 12 inch	Meas-t. 15 in
89°3	8.94		
35	9.84	.90	.95
h	12.65	3.71	3.42
k	13.34	4.40	3.96

March 18. 1903

E. Meck. Dq7 m75 α Orionis light Oct 15–16, 1902 Packer.

May 3 1903

[illegible] Fund

Est balance	Dec 15 1902		3336 92
37.2		665.03	
38		1566.22	
44-1		525.52	2756.77
			580 15

June 9. 1903.
Photographic map of Sky.

Copy presented to Royal Astronomical Society
Univ. Observatory, Oxford, England.
Case School Science.
Olmstead.
Leiden Observatory.

July 19 1903

Measures of intensity of lines in Standard to Probe Plate.

	2	3	75	76	79		3
345	9.4	9.5	9.5	9.6	9.5		5261.8.
	8.5	8.6	8.5	8.6	8.5		2.1
	~~9.4~~ 9.6	9.65	8.7	8.8	8.7		2.4.
	~~8.9~~ 8.7	8.8	9.5	9.6	9.4		2.7
	~~8.5~~ 8.8	8.9	8.6	8.6	8.5		3.1
	9.5	9.6	8.8	8.7	8.6		3.5.
	9.0	9.2	9.5	9 8.65	8.7		4.0
	9.7	9.7	9.0	9.0	9.6		4.3. ~~4.3~~ 5.0
	9.1	9.2	9.8	9.8	9.0		~~6.0~~
	8.9	9.0	9.1	9.1	9.8		5.4
	9.4	9.5	8.8	8.8	9.0 double		5.6
	9.2	9.3	9.5	9.65	~~9.7~~ 8.8		5.8
	8.9 8.5 on [illegible]	9.1	9.2	9.4	~~8.8~~ 9.0	9.6	6.2
	9.6	8.7	8.9 8.6 on [illegible]	9.0	~~8.8~~	9.3	6.5.
	8.8	9.7	9.65	8.6	8.5	8.9 8.6 on [illegible]	6.7.
	8.9	9.0	8.8	9.8	9.9 h	9.8	7.4
	8.8	9.1	9.0	9.0	9.9	8.8	8.5
	9.8 hz	9.0	8.8	9.0	8.8	8.9	8.8
	9.8	8.6	9.8 h	8.8	8.7	8.8 8.5	9.2 ft.
	8.8	9.9 hz	9.9	9.9	8.8		9.7.
	8.7	9.8	8.8	10.0	8.6		70.5.
	8.8	9.2	8.7	8.9	8.5		1.2
	8.6	9.0	8.8	8.8	9.5		1.4
	9.9	9.1	8.6	8.9	9.5		2.1
	9.4	9.2	9.4	8.7	8.6		2.4
		8.9	9.4	8.6	8.5		2.5
		8.8	8.6	9.6	8.7		3.3
			8.7	9.6			3.5

2	3	75				
8.5	9.5	9.0	8.5	9.0		4.4
8.6	9.5	8.7	8.7	8.7		4.7
9.0	8.6	9.0	9.0	9.0		5.1 –
8.7	8.7	9.1	~~8.6~~ 8.8	9.1		5.3
9.0	9.2	9.6	9.6	9.1	9.65	5.4 –
8.5	8.8		9.6	9.1		5.9
9.1	9.2		9.65			6.2
9.5	9.3					
	9.6					
		416	428	438		170 c 53 min
10ʰ	10ʰ	11ʰ	12			

			10 μμ on cm	∴ 1 Ang. unit cm
2	5261.9	5276.2	14.14	.014
3	8	.2	14.13	"
75	8	.2	21.17	.021
76	8	.2	21.17	"
77	8	.2	21.17	"

9 – 19 2.03 cm G 47018

1 cm = drawn 9.9 = $\frac{2.03}{44.0}$ = .0461 cm.

1 cm on orig drawing = ~~0.461~~ 0.326 Ang units on the scale

" " " = $\frac{0.218}{544}$ " " Ang. "

Mean 0.272

203 | 44
176 .0461
270
264

461 | 1414
4242 .326
3680
2828
8520
8484
360

461 | 2117
4234 .218
3760
2117
16430

272

Thurs. July 23, 1903.

Repetition of measures of lines 5271.2 – 5272.5

Higgs No 3.

Center line	Corrected	
8.9	9.1	2
8.7	9.0	3
8.9	9.1	2
8.8	8.9	1
8.7	8.8	1
		+18

Wednesday July 29, 1903

Observed shock at 9^h ~~20~~ 6^m 20^s. Earthquake?

B 37¼	9	20	0
Ellegon	9	20	0

Observed this shock sitting at breakfast table. The ~~fr~~ side door rattled violently. No motion noticed. Above time probably correct within two seconds.

Shock noticed by several observers in Observatory building. Also by Miss Leland at Langdon Street and Miss Mackie in Shepard Street. The latter noticed motion also.

August 26 1903.

Memoranda

Send pamphlet. [illegible] [illegible] Eastbrook
Seaman
E. [illegible]

Prof. [illegible] Glauthier, Germany
D. Sc. (Vict.) and other degrees.
Alfred Hopkinson Principal Owens College

Brown & Sharpe guarantee error not exceeding
0.003 in. in position of teeth

W.W. [illegible] 8.30 – 12.30   7 – 11.

Peculiar Variable
034930   Decrease since 6 months

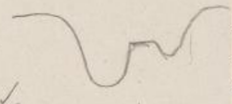
August 29. 1903

Variable Stars. Peculiar to be discussed.

024729	SS Cygni type	Photog
034930	Period. 7.67 yrs.? obs once every 6 months	O.C.W.
054206	[illegible]	
065306	Period probably long.	Photog
072609	Ir. U Monoc.	Argel
074923	[illegible]	Ptg.
075612	U Puppis.	Argel
083350	Not [illegible] for Each	Ptg
101814	[illegible]	Ptg.
130837	Constant? Plate 1.	O.C.W.
154715	[illegible] Period 8 mon!	Argel
155429	Algol but ! 60d.?	O.C.W.
183443	Antalgol.	O.C.W.
200036	ditto? Plate 1.	O.C.W.
200747	H. [illegible]	O.C.W.
205230	Antalgol	

Variable Rec.

034930 ✓
054206 ✓
065306 ✓
072609 ? ✓
072820 a. ✓
074923 ✓
075612
083350 ? ✓
101814
103361
130837 ✓
154715
155429 ✓
183443
200036 ✓
~~[illegible]~~ 200747
024729
205230 Antalgol



Photographs.

R Librae

Antalgol

SS Cygni type

Var. Disc. by E.C.P.

075612	U Puppis.	8.5, <14	II
103361	RX Carinae	10.0 <12.5	II
121948	S Centauri	7 ?	8
150619	ι Librae	4.3 - 5.0	
150850	U Lupi	10.6 - <13.4	
163172	R Ursae Min.	9.0 - 10.3	III
225914	— Pegasi	8.8 - <12.6	II

August 29. 1903

Variable Stars. Peculiar to be discussed.

024729		SS Cygni type	Photog
034930		Period 7.67 yrs.? obs once every 6 months	O.C.W.
054206		Double Wolf.	
065306		Period probably long.	Photog
072609	6.7–7.5	Irr. U Monoc.	Angel
074923	7.9–9.3	Kapteyn type or same [illegible]	Ptg.
075612		U Puppis.	Angel
083350		What [illegible] for Each	Ptg
101814		Rotes.	Peg.
130837		Constant? Phot. 1.	O.C.W.
154715		R Librae Period 8 ann!	Angel
155429		Algol but V ! $60^{d}8$?	O.C.W.
183443		Antalgol.	O.C.W.
200036		Constant? Phot. 1.	O.C.W.
200747		Fl. Hartwig states not var.	O.C.W.
205230		Antalgol	

Var. Disc. by E.C.P.

075612	U Puppis	8.5, <14	II
103361	RX Carinae	10.0 <12.5	II
121948	S Centauri	7 ?	8
150619	ι Librae	4.3 – 5.0	
150850	W Lupi	10.6 – <13.4	
163172	R Ursae Min.	9.0 – 10.3	III
225914	– Pegasi	8.8 – <12.6	II

September 30 1903

Volumes of Annals incomplete

Vol.	Part.	Particulars
39	2	Not begun
i 43	3	pages set up 115-
d 44.	2	distributed
p 46	1	printed not distributed
i "	2	9 pages set up
i 47		46 " " "
d 48.	~~2~~ 1.	distributed
d "	2	"
d "	3	"
d "	4	"
p "	5	Printed
p "	6	"
p "	7	"
p "	8	"
"	9	begun
49		
p 51		Printed
52		21 pages set up

Circular 66

67

68

69

70

71

72

73

October 26, 1903.

From a letter of Prof. ~~B.C.~~ G.C. Comstock. Oct. 23, 1903.

"As only a limited number of copies of this circular letter are available you are requested to forward it together with the enclosure to the person whose name appears next below your own at the bottom of this sheet."

[illegible] [illegible] telescope

mm
3.206 = 1 div. phot. scale.

~~25~~

50.0 cm.
42.7 cm.
21.3 cm.

25.4 = 1.38 | 25.4
1270 .0543 = 1 mm
1100 1603
1016 1629
84 3258
543
∴ according to King mm .870429
1 div. = 0.87 mag.

Oct. 6. 1904.

Effect of change in position of center of plate. Scale

	1°	2°	3°	4°	5°
	5563025				
log tan	8.241.9215	8.5430838	8.7193958	8.8446437	8.941.9518
	.3143810				
	8.5563025	8.857.4648	9.0337768	9.1590247	9.2563328
	3600	7202.2	10808.8	14422.0	18440.00

Feb. 10, 1904.

Numbers of Volumes of Annals.

52: Eclipses Jupiter's Satellites

53. 1. South Polar Catalogue.
2. ~~Rotation of Eros~~ Polar Stars
3. Phoebe.
4. Eratosthenes

55 Blue Hill.

~~54.~~ 12 inch Meridian Photometer

56 ~~55.~~ Detail Spectra.
Spectra Long Per. Var
Peculiar Spectra.

~~56.~~ Bibliog. Var. Stars.

Feb. 13. 1904.

Scale A plates

230.5	43384	130.152	561	
231.5	43197	129.591	558	3
232.5	43011	129.033	552	6
233.5	42827	128.481	549	3
234.5	42644	127.932	543	6
235.5	42463	127.389	.540	3
236.5	42283	126.849	.534	6
237.5	42105	126.315	.528	6
238.5	41929	125.787	.525	3
239.5	41754	125.262		
300.5	332.78$_{3}$	99.834	.333	
299.5	333.89	100.167	.336	
298.5	335.01	100.503	.336	
297.5	33613	100.839	.342	
296.5	33727	101.181		

Feb. 15. 1903

Stellar Magnitude of Sun
Fabry Comptes Rendus Dec 28. 1903. Knowledge New Series I, 9

Minute Dimensions of Stars Knowledge I, 24

March 1. 1904

Asteroid of Wolf.

Jan 17. 1901.	12h 28m.1	+24° 54' (1900)
45 Δ	2.3	15
	12h 25m.8	25° 9' (1855)
20 dys.	8.4	1 32
	12h 34m.2	26° 41'

May 9. 1901	13h 42m.3	47° 1'
	23	15
	13 40.0	47 16
3 day	3.4	17
May 6, 1901	13 36.6	47 33

Feb. 6	I 26569	12.7	+22.5
" 28	26733	12.2	+32.5
March 6	26753	12.1	+37.5
May 6	26957	13.8	47.3

March 28. 1904

Cost of 24 inch Telescope

	I	II
Mirrors	1000	1200
Cell	250	
Mounting	1100	
	2350	

Building	6000
24 in	2500
" 2d	1200
60 in £619	3200
	$12900

Amer. Gift 1902.

June 13 1904 about	$8400
Sept 1 " "	8000
£100.	500
£400	2000
240	1200
	3700
Nov 1 1904 about	4300

Extra Copy

A.G.G. Catalogue

Vol 3

4

5

6

10

14

15

August 31, 1904.

Officers in charge of Arequipa Station

May 1889	S. I. Bailey
Jan 1891	W. H. Pickering
Mar 3 1893	S. I. Bailey
Dec 1897	
Jan 1 1898	W. B. Clymer
Mar 20 1899	
April 1 1899	
" 3 1899	S. I. Bailey
Dec 4 1899	
Jan 1 1900	H. C. Bailey
1903	

September 1, 1904.

Obs. by E.C.W. 2 sights
2 groups each.
64 setting

$3^h\ 44^m.5$ +24° 12′	a′ 3.58	a′ 3.58
	b′ 4.94	b′ 4.94
	h 7.88	g 7.46
	m 12.62	h 7.88
	l 11.57	j 9.07
	k 9.80	k 9.80
	j 9.07	l 11.57
	g 7.46	m 12.62
	assumed f 7.35	
λ $19^h\ 49^m.3$ +88° 54′	a 11.65	
"	c 13.04	
"	b 12.66	
λ assumed.	88 112	
	88° 114 8.28	
	116 10.01	
	" 10.03	

September 1. 1904

Polar Sequence

		24	46
a	88° 8	2.01	1.94
δ	86° 269	4.45	..
51	87° 51	5.27	..
	86° 344	5.64	..
	86° 272	5.90	..
	87° 107	6.29	..
	88° 71	6.33	6.33
	88° 4	6.48	6.44
λ	88° 112	6.59	6.72
	89° 13	7.09	6.96
	88° 64	7.39	7.48
	88° 76	7.64	7.50
	88° 9	8.13	7.89
	88° 2	..	8.10
	88° 114	8.21	8.12
	89° 22	..	8.67
	88° 5	8.76	8.76
	88° 115	8.86	8.90
	89° 3	..	8.87
	89° 2	..	9.19
	89° 9	..	9.25
	89° 12	..	9.58
	89° 35	..	..
	89° 29	..	..
	89° 26	..	..
	89° 1	..	..

a
a′
b
b′
c
d
e
f
g
h
i
j
j′
k
l
m
n
o
p
q
s

Sept 10, 1904

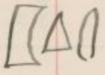
Forms			Omitted
Heading Exam.			
H.R.	0000	11	J.D.
RA 1900	25.6	10	Cups.
Dec 1900	+72 23	16	" Resid I
Phot. Magn.	6.2	8	" II
I App.	6.26	10	
II App	6.12	.10	
		65	

about 6000 lines. = 40 pp.

Star Spectrum R.			
~~Potten. 0125~~			
RA. 1900	12 52.3	16	Design.
Dec. 1900	+72 23	16	
Magn	5.63	10	
Spect.	3	7	
Gal. Long.	235	9	
" Lat	+26	10	
		68	

May 1. 1905.

Photographing faint spectra.
Method of double lens tried



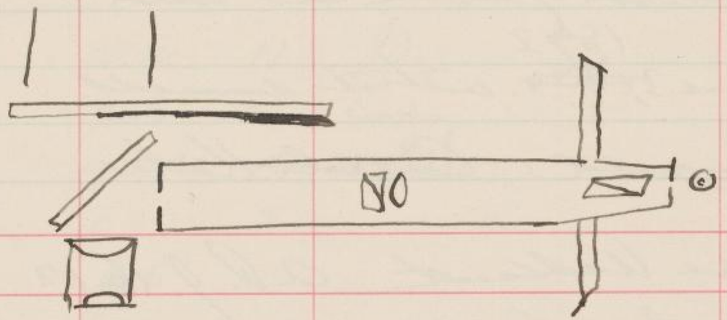
June 3, ~~[illegible]~~ 1893. without success.

Suggested to ~~[illegible]~~ Keeler

Paper Wadsworth A.P.J. 16.12
Tried here April 29. 1905.

November 2. 1905.

Plan for a photometer for the 60-inch telescope



Substantially a Zöllner Photometer with electric light. A great range is secured by a shade giving absorptions of 2.5, 5.0, 7.5 and 10.0. The intervals to be determined by the photometer.

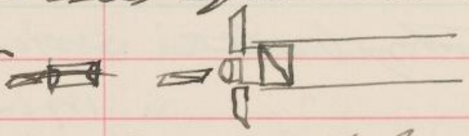
The scale is determined with certainty by the polarization. The images need not be reversed as the scale is differential.

November 2. 1905.

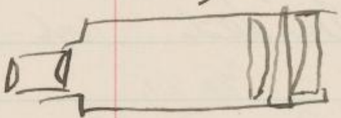
The following attachments will be required for the 60 inch.

Eyepieces giving powers of 250, 500, 125 etc.

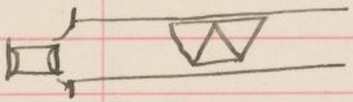
Photometer B, H, R or its equivalent. Steadying double image micrometer



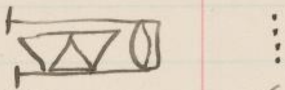
Spectroscope for detecting nebulae, probably using



or



also



for detecting monochromatic light in large nebulae. If gaseous the lines will ~~disappear~~ be visible. If continuous they will overlap and be invisible.

November 22 1905

Work on hand S. I. Bailey.

39-2	Meteorology.	~~Aug.~~	1892-5	Eye Obs
X 1		Arequipa		Eye Obs
39-2	Meteorology	Var Stations	1891-5	Eye Obs
X 1	"	" "	1892-5	Self Rec.
Z 1	"	Avg.	" "	E. Obs Self Rec.
	"	Var Stats	1896-1900	E. Obs
	"	" "	"	Self Rec
	"	Avg.	"	Eye Obs

+38° 4262 is β Lyrae variable Eng Mech. Oct. 1905 p 382

A. E. Douglass at Lowell Observ. Feb. 1894 – July 17, 1901.
+38° 4262 is β Lyrae var. according to Williams Eng. Mech Oct '05 p. 382

November 22, 1905.

Early Record Books

Back Side	Date	
Black Dark brown	'76	
" Mottled white	74-5	
Red. Green Marbled	'88 Sept 30	95 May 28
Bl. Grn Red.	'66	
Bl. Green	75	80
Black Brown	83 Jan	
Red Pink	'95	00
Bl.		
Red Brown	02 Aug 28	— This book

November 26 1905

Variability of Eunomia (15)

6932.	Exp 98	min at	.065	Mar	27.	1905
6934	114	"	.065	"	29	"
6936	129	"	.067	"	31	"
6987	138	" "	.067	Apr	1	"
6939			.065±	"	3	"
6942	177		.059	"	6	"
6943	185		.057	"	7	
6944	193		.061	"	8	
6961			.056	"	25	
6963				"	27	
6964				"	28	
6967			.062	May	1	
6969			.073	"	3	
6970			.063	"	4	

+89° 3

Mar	26, 35, 37, 1	14	8.98
	" shade	7	8.87
	26, 29, 35, 37, 1	316	9.02
	" β	68	9.17
	s	16	9.03
	29, 35, 37, 1	494	8.98
	β	80	9.06
	all A	824	9.00
	all B	148	9.11
	all s	23	8.98
	~~all~~	~~995~~	~~9.01~~

November 26, 1905.

Polar Sequence

	V.18		48, I No	Dogl. Mag	12-inch No.	Ad. Mags
89°3			420	B	924	9.00
89° 1		10.2	386	10.0	1576	10.44
89° 35		10.3	184	10.0	1576	9.84
89° 29	321	9.7	101	B	1075	10.25
89° 31	462	11.0				
h			302	11.2	692	12.65
K			284	11.9	119	13.34
l			265	14.1	25	13.94

	12-in		24	46	Mean
88.8	1.96	10 dr	2.01	1.94	
a 88.4	6.37	20 dr	6.48	6.44	6.48
b 88.9	7.90	20 dr	8.13	7.89	7.97
c 89°3	9.00	824	"	8.87	8.94
e 35	9.84	1576	"	"	9.84
d 29	10.25	1576	"	"	10.25
f 31			"	"	
1	10.44	1576	"	"	
.			"	"	
h	12.65	692	"	"	12.65
k	13.34	119	"	"	13.34
l	13.94	25	"	"	13.94

1898–1905.

	Mer.	Mag
h	692	12.65
K	119	13.34
l	25	13.94

12-inch [illegible]

h		k		l	
386	12.68	52	13.38	7	13.95
219	12.66	45	13.31	5	13.99
605	12.67	97	13.35	12	13.97

	26	29	35	37	1	No.
Oct. 1898 – Sept. 1901	10.72	..	9.83	9.85	10.43	686
Oct. 1901 – Dec. 1904	10.77	10.25	9.86	9.86	10.45	890
Adopted	10.75	10.25	9.84	9.86	10.44	1576

Mean 26, .. 35, 37, 1 = 10.22

" 26, 29, 35, 37, 1 = 10.23

" .. 29 35 37.1 – 10.10

Dec 29. 1905

	k	l	m	n	o	p	q	½ l	Shade	
Oct 3	..	11.64	17.94	24.74	32.57	43.94	52.63	5.94	6.88	
al	5.52	17.58	24.82	..	..	..				
Oct 6	..	10.32	18.88	24.38	31.35	44.66	52.50	8.00	6.54	
al	..	18.32	25.42	~~25.25~~ 25.25	..	..				
Oct 7	..	12.06	19.25	~~30.83~~ 30.83	..	42.66	52.05	5.76	6.28	5.58
al	..	17.82	25.53	~~29.30~~	..	..	..			
Oct 8	.	15.75	23.85	29.30	..	46.67	58.27	5.91	5.55	8.80
al	3.26	21.66	29.40	38.10	..	..	..			
Oct 24	..	16.70	22.58	28.77	36.84	47.44	57.48	4.02	5.30	6.89
al	3.80	20.72	27.88	35.88	..	..				
								29.63	30.55	21.27
								5	5	3
								.592	.611	.709

	k	l	m	n	p	q	xo
Oct 3	..	6.30	6.80		19.20	8.69	
	12.06	7.24	..		..	..	
6	..	8.56	5.50		20.28	7.84	7.83
	..	7.10	..		..	..	7.17
7	..	7.19	6.00		17.41	9.39	8.07
	..	7.21	5.30		..	..	23.07
8	..	8.10	5.45		17.37	11.60	7.69
	18.40	7.74	8.70		~~5.67~~		
24	..	5.88	6.19		18.67	10.04	
	16.92	7.16	8.00				
	47.38	72 ~~66.98~~	51.94		92.93	47.56	81.45
	3	10	8		5	5	13
	15.79	7.30	~~6.47~~ 6.49		18.59 ~~18.586~~	9.51	6.27

Dec. 29. 1905

Results Measures Pleiades. Parkhurst.

					r	×.15				×13			
0.00	k	0.00	15.79	15.79	0.00	.00	9.56	9.56	9.50	0.00	9.56	9.56	9.66
15.79	l	15.79	7.30	7.30	15.79 79	2.37	11.81	9.44	11.87	2.05	11.62	9.57	11.71
23.09	m	23.09	6.49	6.49	23.09 116	3.45	12.87	9.42	12.95	3.00	12.69	9.69	12.66
29.58	n	29.58	18.59 ~~7.29~~	18.59	29.56 14	4.43	14.00	9.57	13.93	3.85 4.85	13.69	9.84	13.51
37.27	o	36.87 ~~48.17~~	~~18.59~~ 4.69		36.25 181	5.43			14.93	~~4.71~~ 6.6 6.26			
48.17	p	48.17	9.57		48.15 241	7.23			16.73	~~4.90~~			
57.68	q	57.68	~~6.27~~ ~~6.27~~		57.66 288	8.64			18.14	7.50			
	r							199 9.50					266 9.66

			.13 r			
o = 29.58 + 7.83	37.41	+.54	9.56	0.00	9.56	9.67
" 7.17	36.75	−.12	11.57	2.05	9.52	11.72
" 8.07	37.65	+.78	12.77	3.00	9.77	12.67
48.17 − 11.37	36.80	− .7	13.67	3.85	9.82	13.52
" 13.11	35.06	−1.81		4.71		14.38
" 10.60	37.57	+.80		6.27		15.94
	41.24	2.12 − 2.10 6		7.50		17.17
	36.87 +2	±.70			267 9.67	

Jan Obsns. Pleiades 12-in Tel.

1901. $u^2 v^2 w^2 x^2 y^2 z^2 a^3 b^3 c^3 d^3 e^3 f^3 g^3 i^3$ 14 hkjgf

1903. $j^{11} m^{11} n^{11} r^{11} s^{11} w^{11} x^{11} g^{12} h^{12} i^{12}$ 20 a–n

1905 $a^{23} h^{23} i^{23} j^{23} k^{23}$ 10 a–n omitting bcdeij

Dec 9. 1905.

Region 30° eq.

~~Ch~~	R.A.	Dec	
A1	4h 00m	+75°	T
2	12 00	"	I28288 D9013
3	20 00	"	
B1	1 20	+45°	
2	4 00	"	
3	6 40	"	I28205 D9016
4	9 20	"	C13798 D9134?
5	12 00	"	
6	14 40	"	
7	17 20	"	
8	20 00	"	
9	22 40	"	
C1	1 00	+15°	
2	3 00	"	
3	5 00	"	
4	7 00	"	
5	9 00	"	C13777 D9091 I28387 D9020
6	11 00	"	C13778 D9094 I28209 D9017
7	13 00	"	
8	15 00	"	
9	17 00	"	I28999 D9426
10	19 00	"	I19617 D9427
11	21 00	"	I23248 D9424 9429
12	23 00	"	

Dec 9 1905

D1	1h 00m	−15°		a6222 D11822	
2	3 00	"		a6246	
3	5 00	"	C13793 ~~C13792~~ D9120	a6287	
4	7 00	"	C13794 D9124	a6294 D11831 3?	
5	9 00	"		a6300 D11832	
6	11 00	"		a5910	
7	13 00	"	C13795 D9131?	a5917 D11824	
8	15 00	"		a5916 D11823	
9	17 00	"	B23789 D9414	a6009 D11830	
10	19 00	"	B25399 D9416 48816 D9425-30	a6172 D11828	
11	21 00	"	B26521 D9415	a6168 D11834	
12	23 00	"		a6171 D11835	
E1	1 20	−45°		a6212	
2	4 00	"		a6280 D12059 ✓ D12054 3,3	
3	6 40	"		a6252 D12057, D12055, 3,3	
4	9 20	"		a6298 D12061, D12011, 3,3	
5	12 00	"		a5913	
6	14 40	"		a5911	
7	17 20	"		a5920 D12013 ✓	3
8	20 00	"		a6047 D12024 ✓	~~3~~4
9	22 40	"		a6166 D12023 ✓	3
F1	4 00	−75°		a6276 D12022 ✓	3
2	12 00	"		a5912 D12021 ✓	3
3	20 00	"		a6007 D120~~24~~19 ✓	3

Dec 13, 1905.

No. stars in Mens. Measures pp. 58, 91, 124

″		Br p58	Tl	p91		p124	″	″
0–1	I	44	28	62	29	91	0.70	0.75
1–2	II	111	186	116	198	314	1.48	1.54
2–4	III	128	383	133	402	535	3.08	2.93
4–8	IV	119	426	130	452	582	5.62	5.82
8–12	V	51	278	54	298	583	9.29	10.02
12–16	VI	46	161	52	179		13.94	13.88
16–24	VII	48	383	54	429	535	19.38	22.60
24–32	VIII	48		52			28.17	
				a	b	c		

$c = a + b$

″			
0–1	91	1	91. per unit area
1–2	314	3	105.
2–4	535	12	45.
4–8	582	48	12.
8–16	583	192	3.
16–32	535	768	0.7
	2640		

14	4260	400
24	21,000	16,000
34	7,920	5,700
44 45	29,600	23,600
46		4000
		53,300

683,104
123,544
28,136
235,924
1070,708
11,352
1082,060

Dec 15 1905

No ~~stars~~ observations M.P.

4 in M.P.

1,051,768

1902 7,808

03 9652

04 5640

05 10416 } 33,516

1,085,284.

Oct 1, '05 2 in 94,476

4 in 1,085,284

12 in 511,276

All 1,691,106

Sept 13

	Nights	No Stars	
Oct 06	11	913	
Nov.	7	578	
Dec	3	420	
	21	1911	7644

Oct 1. '05 12 in 511,276

" 1 '06 65,488 576,764

Jan 1 '07 7,644 584,408

July 15 " 40[illegible] 6[illegible]0,684

2 in 94,476

4 in to Oct 1 1905 1,085,284

Oct 1 '05 to Oct 1 '06 4,640

1,184,400

Ex. P. obs.

2 in [illegible] 39,796

4 in 643,308

12 in 584,408

Total M.P. Jan 1. '07 1,267,512

To Equal 78 -

	P	W	S	B	F	All.	No Stars
14	39,796	26,544	28,136	..	..	94,476	4,260
23,24	170,092	97,000	..	..	..	267,092	20,982
34	..	..	..	98,744	..	98,744	7,922
44,45	473,216	..	..	..	..	473,216	29,587
46 I	..	..	..	59,428	..	59,428	
" II	..	..	..	50,816	..	50,816	
[illegible]	..	..	.	26936	11352	38,288	
	683,104	123,544	28,136	235,924	11,352	1,082,060	

1,082,060
94,476
987,584

~~361030~~
780060

Double Stars Lick Obsns.

A.N. 3635 1 -

3668

L.O. Bull 3. 110 -

12

21

27

57

61

65 701

74 801

L.O.B. 84 Binary Stars

75 Spec. Binaries

Jan 1, 1906.

Work for 60 inch Reflector.

Brightness of satellites Mars, Jupiter, 6, 7 Saturn Ur. Nept.
" " Novae (all) every year
Stellar variables of long period ~~at~~ during minim.
Sequences each class in regions 30° apart
" " " for variables
Observe faint Algol variables
Eclipses sat. Jupiter

Spectra of nebulae

Jan. 1. 1906

Centres of Regions 30° square

1900 h α	δ	1855 Δα 1 yr	1 yr δ	45 s	'	h m s	° '
1 00	+15° 0'	3.1650	19.3709	142	14.5	0h 57m 38s	+14° 45.5
3		3.3256	14.1805	150	10.6	2 57 30	14 49.4
5		3.4183	5.1904	154	3.9	4 57 26	14 56.1
7		3.4183		154		6 57 26	15 3.9
9		3.3256		150		8 57 30	15 10.6
11		3.1650		142		10 57 38	15 14.5
13		2.9795	.0065	~~142~~ 134		12 57 46	15 14.5
15		2.8189		127		14 57 53	15 10.6
17		2.7262		123		16 57 57	15 3.9
19		2.7262		123		18 57 57	14 56.1
21		2.8189		127		20 57 53	14 49.4
23		2.9795		134		22 57 46	14 45.5

1900, h m	δ	1855 h m s	° '
1h 00m	−15° 0'	0h 57 46	−15° 14.5
3		2 57 53	−15 10.6
5		4 57 57	−15 3.9
7		6 57 57	−14 56.1
9		8 57 53	−14 49.4
11		10 57 46	−14 45.5
13		12 57 38	−14 45.5
15		14 57 30	−14 49.4
17		16 57 26	−14 56.1
19		18 57 26	−15 3.7
21		20 57 30	−15 10.6
23		22 56 38	−15 14.5

A 1
2
3
B 1
2
3
4
5
6
7
8
9

	1900			1				1875				
+75°	4h	0m	0s	+185	+4.2			3	56	55	+74	55.8
	12	0	0	+77	+8.4			11	58	43	+7~~5~~4	51.6
	20	0	0	−31	−4.2			20	0	31	+75	4.2
−75°	4h	0m	0s	−31s	+4.2′	~~−74°~~	~~58.8~~	4h	0m	31s	−75°	4.2′
	12	0	0	+77	−8.4	~~−75~~	~~51.6~~ 8.4	11	58	43	−74	51.6
	20	0	0	+185	+4.2	~~−75~~	~~+2~~	19	56	55	−75	4.2

3.864
7728
36368

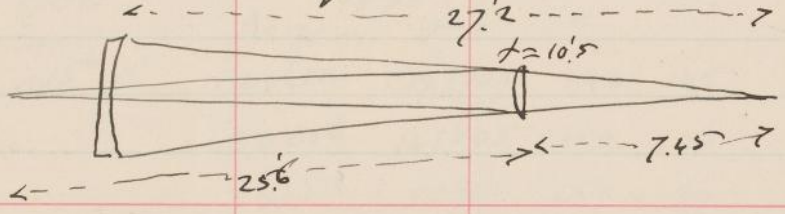
1.035
207
1242

1414
2828
1896.8

cos					
15°	.9659	1.035	10.35′	124.2s	2m 10s
45°	.7071	1.414	14.14	169.7s	3 0
75°	~~96~~ .2588	3.864		363.7s	6 30

Jan 2 1906

60 inch Reflector



$$\frac{1}{10.5} = \frac{1}{7.45} - \frac{1}{25.6}$$

.9524

$$\begin{array}{r} 1.3243 \\ .3906 \\ \hline .9337 \end{array}$$

$$\begin{array}{r} 1.3243 \\ .9524 \\ \hline .3719 \end{array} = 1 \div 26'.9$$

$$\frac{27.2 \times 26\overset{6}{.9}}{7.45}$$

$$\begin{array}{r} 26.9 \\ 27.2 \\ \hline 538 \\ 1883 \\ 538 \\ \hline 73168 \end{array}$$

$$\begin{array}{r|l} 73168 & 7.45 \\ 6705 & 98'.2 \\ \hline 6118 & \\ 5960 & \\ \hline 1580 & \\ 1490 & \\ \hline 900 & \end{array}$$

Jan. 29, 1906

Double Refracta

Jamin III b

Des.	Spar Ord	Ex	Ord Tourmaline	Ext.	λ
Hα C	1.65446	1.48474	1.54188	1.55095	5888
Hβ F	1.66793	1.49084	1.54966	1.55897	43075
HεH	1.68330	1.49771	1.55816	1.56770	38190

Hα	1.654_{14}	.169	1.485_{06}	1.542_{8} .009	1.551	8
Hβ	1.668_{15}	177	1.491_{07}	1.550_{8} .009	1.559	9
? Hε	1.683	.185	1.498	1.538 .010	1.568	

Jamin III b 5φ7. Reading

Hα	1.65452	1.48455	1.54181	1.54085
Hβ	1.66802	1.49075	1.54965	1.55894
H=~~3.77~~He?	1.68330	1.49780	1.55817	1.56772

13	170 177	6	8	1	8
15	185	7	8	9 10	9

Photo. Oct. 4 1906.

Ad. Pg.	Pg-Pr				Ad. Mg. a	B	C ΣB	a-c	Curve D	E C+D	a-E	5.1+c	B'	C ΣB'	a-c
6.42	-1	a	88° 4	6.43	6.43	144	.00	6.43	6.43	6.43	.00	5.1	142	00	6.43
8.02	+5	b	88° 9	7.97	7.97	75	144	6.53	6.58	8.02	-.05	6.5	74	142	6.55
8.93	-1	c	89° 3	8.94	8.94	44	219	6.75	6.74	8.93	+01	7.3	97	216	6.78
10.15	-10	d	89° 39	10.25 ~~[illegible]~~	10.25	41	313	7.12	7.00	10.13	+.12	8.2	34	313	7.12
10.66	+82	e	89° 39	9.84	9.84	40	354	6.30	7.16	10.70	-.86	8.6	37	3.47	6.37
11.20	+81	f	89° 31		10.39	102	394	6.45	7.30	11.24	-.85	9.0	109	3.84	6.55
12.67	+2	h	~~[illegible]~~	12.65	12.65	36	496	7.69	7.71	12.67	-.02	10.1	44	4.93	7.72
13.27	-7	k		13.34	13.34		5.34	8.00	7.88	13.22	+.12	10.4		5.37	7.97
		l		13.94	13.94		..	..	--	--	..				

	Pg. Mag. A.	32017 B. Scale.	A-B.	C. Curve		D B+C	D-a
a	6.43	5.10	1.33	1.33	7.76	6.43	00
b	8.02	6.40	1.62	1.52	8.94	7.92	-10
c	8.93	7.30	1.63	1.72	10.65	9.02	+9
d	10.13	8.30	1.83	2.03	12.16	10.33	+20
e	10.70	8.57	2.13	2.12	12.82	10.69	-1
f	11.24	8.93	2.31	2.27	13.51	11.20	-4
h	12.67	9.83	2.84	2.83	1 50	12.66	-1
k	13.22	10.17	3.05	3.05		13.22	0

29 - 16
45
±.06

Feb 10 1906.

Unfinished Volumes of Annals

		Cases D	% 6.40
39, 2	Peruvian Observ.	6.40	8.03
47.	Photog. Variables	6.61	8.93
49.	Photom. T. C.C. Wendell	6.77	9.17
50	Rev. H.P.	7.04	10.63
52	Eclipses Jupiter's Sat.	7.16	11.15
54	12-inch Tel	7.31 7.74	12.67
55	Var. Stars	7.95	13.32
56 1			
2			
3			
4	Adjacent Stars		
5			
6			
57			
58	Blue Hill		
60 1			
2			

February 17, 1906

Pleiades

	Mean Pen.	Cent '98	'98	1900	R	1902		1903	1904
a	3.06	3 3.21			6 3.09	13 3.17	10 2.95	10 3.12	10 3.12
a′	3.86				.. ..	13 3.85	12 3.80	10 3.68	10 3.78
b	4.31	3 4.04			4 4.16	12 4.29	10 4.20		
b′	5.29				[3 [4.30]	12 5.06	11 5.25	10 5.18	10 5.03
c	5.50				4 5.57	12 5.50	10 5.70		
d	5.91	3 5.66		2 5.78	6 5.74	13 5.80	11 5.81		
e	6.75	3 6.96		6 6.68	6 6.99	15 6.95	7 6.97		
f	7.35	1 7.57	4 7.21	23 7.39	3 7.04	19 7.58	. . .	9 7.45	10 7.51
g	7.42		4 7.58	25 7.61		20 7.57		10 7.65	
h	7.95		4 8.08	26 7.93		22 7.98		10 7.95	
i	8.55		3 8.77	6 8.61		22 8.52			
j	9.09		3 8.92	25 9.03		21 9.02		10 8.99	
j″	10.21					19 10.05			
k	9.56		3 9.30	25 9.45		22 9.68		10 9.75	
l			3 11.33	6 11.49		22 11.70		10 11.73	
m			3 12.90	6 12.68		22 12.70		10 12.71	
n			2 13.64	[10 12.10]					

S.P.h.
13-inch

	n	Σ	Σ/n	Ad.	
a′b	1	49	49	45	45
bb′	2	138	69	98	196
b′c	2	65	32	119	238
cd	3	83	28	41	123
ce	4	394	98	125	500
ef	8	321	40	60	480
eh	1	70	70	120	120
fg	9	144	16	07	63
gh	10	292	29	53	530
		1556			2295

				Aa	
gj	1	100.0	100	1.65	165
hi	9	510	57	.60	540 ~~1503~~
hj	5	388	78	1.14	570
ij	11	234	21	.54	594
jk	15	473	32	.47	705
jl	6 ~~13~~	1045 ~~2054~~	174 ~~1~~		
kl	13	205.4	158		
lm	16	99.3	62		
mn	6	67.3	86		
		170.5			~~3577~~ 2574

Feb. 18 1906.

Number Scale

134

90 134.
91 2.3
225
148 3.7
100 373
231 5.8
604
353 8.8
110 957
522 13.0
1479
760 19.0
120 2239
1065 26.6
3304
1482 37.0
130 4786
1975 49.4
6761

6761

S.Q.B.

ce	ef	fg	gh	gj	hi	hj	ij	jk	kl	lm	mn
10.4	3.6	4.2	0.4	10.0	7.8	7.1	1.6	2.8	14.9	8.5	8.1
9.5	2.8	2.5	3.8	6.2?	d (9.1)	7.5	d (1.4)	2.2	14.0	7.9	8.9
8.8	1.8	0.1	3.0	~~9.1~~	5.6	8.6	0.9	1.7	14.3	7.7	8.3
10.7	4.5	0.3	2.8		4.6	5.7	3.4	2.0	15.6	6.8	8.3
	6.0	2.3	3.3		5.4	9.9	2.0	7.0	16.2	7.7	9.1
	7.0	2.1	5.1		5.5	·	2.4	1.6	14.3	8.0	8.6
	2.2	2.0	1.9		5.2		3.0	4.4	16.2	7.5	
	4.2	0.6	2.8		6.2		2.1	2.6	18.9	7.4	
	~~2.1~~	0.3	3.2		5.6		1.9	2.9	17.0	6.3	
			2.9		5.1		2.6	3.7	18.6	12.0	
					(8.9)		2.2	3.5	16.4	10.1	
							1.3	2.3	14.5	11.4	
								3.2	14.1	8.8	
								5.3		10.0	
								2.1		9.7	
										9.5	

ibz	bb'	b'c	cd
4.9	5.0	4.3	2.1
(6.1)	8.8	2.2	(5.3)
			5.3
			0.9

c

	kl	lm	mn	
12ii	20.2	11.6 ~~12.5~~		
40ii	15.8	7.3	6.5	18.6
13ii	15.8	6.2	8.6	..
	20.3	15.7		
	20.4	11.9		
	20.2	10.0		
	19.8	9.8		

	k	l	m	n	o
12	20.2	~~10.0~~ 11.6			
40	23.7	10.4	9.7	27.9	
13 mm	23.7 2.25	.93 ~~.06~~	12.9 11.3		
956	1181	1287	1400	1679	

eh	jl
7.0	18.2
	16.8
	15.6
	16.8
	20.2
	16.9

2295 | 1556
1556 .147
7290
6224
11660

2574 | 1705
1705 .151
8690
8525
1650

4869 | 3261
3261 .149
16080
16305
2250

9 57
17 21
12 37
7 4
45 309
58
45
51
7 | 263
7.38

March 6 1906

Estimated cost of large Reflectors

	2ft	7ft	4f	6f	8f	10f
Drawing 1	500	1750.00	1000	1500	2000	2,500
Material 3	500	21437.50 ~~2144~~	4000	13500	32000	~~[illegible]~~ 62,500
Machining 2	1500	18375.00	6000	13500	24 ~~48~~000	37,500
Mat. Mirror 3	300	12862.50	2400	8100	19200	37,500
Work. 2	700	8575.00	2800	6300	10200	17,500
Mirror.	1000	21,437.50	5200	14400.	29400	55,000
Mtg.	2500	41,562.50	11.000	28500	58000	102,500
Total	4,000	63,000.00	16,200	42900	87,400	157,500
Cubes	4000	171,500	32.000	108,000	256,000 ~~512,~~	400,000
Grubb's estimate	840	10780	3600	7920	14050	

7 2
49 4
343 8

17150/8
2144

21438
4
85752
171504

343
3
1029/8
12862.5

343,000/8
42875

343
4
1372/8
171500

2	8	4
6	216	108,
7	343	171,5
8	512	256

1750.00
21437.50
18375.00
41,562.50

49
245
735/4
18375.

21437.5
6
12862.50

700

1225
7
8575

343
1715/8
214375

343/8
42875
214375

49
3
147/8
18375

343
3
1029/8
128625

12862.50

343/4
8575

12

March 11. 1906

Results measures to determine variation [illegible] of 12-inch [illegible].

56.3	lighted		
56.7	6.90		0.4
57.3	7.10		1.0
58.7	7.20		2.4
59.4	7.30		3.1
0.5	lighted		
0.8	7.00		0.3
1.7	7.10		1.2
2.8	7.15		2.3
3.7	7.2		3.2
4.5	10.25	B 7.15	4.0
5.3	10.2	7.6	4.8
6.0	10.0	7.4	5.5
6.8	10.0	7.4	6.3
7.3	7.2		6.8
8.0	7.3		7.5
8.6	7.3		8.1
9.1	7.2		8.6
10.0	gas relighted		
11.1	7.15		1.1
11.6	7.1		1.6
12.1	7.2		2.1
12.8	7.2		2.8

[illegible] prism reflector

	L Mirror		L Refr						
0	~~36~~		~~380~~	$40\varepsilon^2$			$44\varepsilon^2$		
6	.								
12	36	54	380	40	-6	380	44	-8	
18	90	78		90	0	1000	99	-9	
24	168	122		160	+8	2090	176	-8	
30	290	110		250	+40	3510	275	+15	
36	400	130		360	+40	5725	400	0	
42	530	190		490	+40	10000	539	-9	
48	720			640	+80		704	+16	
54				810			891		
60				1000			1100		
66				1210			1331		
72				1440			1584		7920
84				1960			2156		
96				2560 25			2810		

March 11, 1906

Amer. Eph. of 1902

· 1	Emperor William	· 11	Mrs. Whitin.
· 2	Andrew Carnegie	· 12	E. Thomson.
3	J. D. Rockefeller	· 13	Mrs. Kimball
· 4	H H Rogers	14	
x 5	Evarts Benjamin	15	Edw. Law.
· 6	Mrs. Draper	· 16	Mrs. Hooper
· 7	C. S. Fairchild	17	" " anon print
8	W. E. Chandler	· 18	J. H. Choate
· 9	President Eliot.	· 19	E. King New York
· 10	H. C. Lodge	· 20	E. C. P.

In Amer. Ephem. 1908. 230 stars

	Decl.	
2	+60°	+90°
200	+35°	+60°
11	0°	+35°
17	-90°	0°

Emperor William
A Carnegie
Mrs Draper
C S Fairchild
President Eliot
H H Rogers.
E Thaxter
Mrs Hooper
H C O. [illegible]
Mrs White
Mrs [illegible].
J H Choate
E King
[illegible]

J D Rockefeller
E Benjamin
W E Chandler
[illegible]

In March 1906. F B Gilbreth lectured to Engin Soc in U.S. described great industrial enterprises.
10,000 letters a day recd Simmons Hardware ~~Co~~ St Louis opened by [illegible].

Built town Woodland, Me in 8 months. contains St Croix Paper Mills largest in world.
Dam 1200 ft long 30–40 ft high.

April 6. 1906.

Mesting. nega. Plates.

	Ordi Phot	12			13		15		40		Parks	(Maddwell)
a	3.06	52	3.10	+.04	-	-	..	..				
a'	3.86	45	3.78	-.08	3.66	-.20	3.65	-.21				
b^R	4.31	32	4.22	-.09	4.45	+.14	..	..				
b'	5.29	43	5.13	-.16	5.21	-.08	5.01	-.28				
c	5.50	26	5.59	+.09	5.54	+.04	..	..				
d	5.91	34	5.81	-.10	5.86	-.05	..	..				
e	6.75	35	6.92	+.17	6.88	+.13	..	..				
f	7.35	69	7.44	+.09	7.24	-.11	7.42	+.07				
g	7.42	69	7.59	+.17	7.45	+.03	7.53	+.11				
h	7.95	70	7.95	.00	7.85	-.10	7.95	.00				
i	8.55	31	8.56	+.01	8.76	+.21	..	..				
j	9.09	69	9.03	-.06	9.08	-.01	9.14	+.05				
j''	10.21	19	10.05	-.16	~~9.5~~	..	..	..				
k	9.56	68	9.56	.00	9.55	-.01	9.87	+.31	9.67	+.11	9.66	
l	11.62	48	11.63	+.01	11.48	-.14	11.64	+.02	11.72	+.10	11.71	11.64
m	12.69	51	12.74	+.05	12.66	-.03	12.69	00	12.67	-.02	12.66	12.41
n	13.69	12	13.69	00	13.86	+.17	..		13.52	-.17	13.51	13.62
o	14.38	..					..		14.38		14.51	
p	15.94	..					..		15.94		15.92	
q	17.17	..					..		17.17		17.16	
r		..										

+63	+72	+56	21
-65	-73	-49	19
17	15	9	±10
±08	±10	±12	

April 9. 1906.

Phot.	I Std.	~~225~~ I Ley		a2123 3 Ley	Ex 18 1153
a					
a'					
b					
b'					
c					
d					
e	6.76				
f	7.30	7.18			
g	7.50	7.50			
h	7.95	8.06			
i	8.64	8.47			
j	9.07	9.22	9.09		
j'	10.20	10.27	10.21	10.21	
k	10.81	10.85	10.93	11.02	
l	11.64	11.60	11.62	11.73	
m	12.69	12.69	12.69	12.61	
n	13.69	13.80	13.69	13.74	
o		14.27	14.38	14.45	
p		14.93	15.98	15.59	
q		15.07	17.12	17.15	
r				18.06	
s				18.52	
t				20.10	

April 27. 1906

Distrib. Pamphlet

			Date Letter Sent Card	
1	The Donor		l 27	l
2	Hon Charlemagne Tower	American Embassy Berlin Ger	l 30	
3	H.C.C. Observatory			
4	President C.W. Eliot	Quincy Sq. Cambridge, Mass	l 27	l c
5	Mrs. Henry Draper	271 Madison Avenue	c 28	·c
6	Hon C S Fairchild	10 West 8th Street	c 28	June 9. ·c
7	J Pierpont Morgan	219 Madison Avenue	l 28	
8	George F. Baer Esq.	Reading, Pa.	l 27	l·
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11	Henry H. Rogers, Esq.	26 East 57 St N.Y.	l 27	c
12	Hon. W. E. Chandler	Spanish Treaty Claims Com Washington D.C.	l 30	l
13	Professor Elihu Thomson	Swampscott, Mass	c 28	·c
14	Mrs. Sarah E. Whitin	Whitinsville Mass	c 28	.c
15	Joseph Wharton, Esq.	Oak Lane, Phil. Pa.	l 27	l c
16	Mrs. Harden	315 W 71st New York	l 30	
17	Hon. Seth Low	30 E. 64th St. N.Y.	c ~~28~~ 30	l c
18	Hon Joseph H. Choate	52 Wall Street, N.Y.	c 28	l
19	Edward King, Esq.	1 Univ. Place, N.Y.	l 28	.c
20	Hon Elihu Root	Department of State Wash	lc 30	l·

Sent - Ann. Fund 1907. Photos.[1] Spect. Vars,[2] ω Centauri.[3] Small Mag. Cloud.
Abstract paper - Frank Bicknell. Also - 60th Rep. Dec. Obs, Endow. Rep 2 to Nos. 4, 8, 15.
Endow Rep 11

June 6. 1906

Adopted magnitudes (photom.) of Polar stars

	No.	89°26	29	35	37	1	
Oct. 98 – Sept. 01	686	52	..	38	36	22	Mean 10.21
Oct. 01 – Dec 04	890	53	01	38	38	21	" 10.24
		10.73	..	9.83	9.85	10.43	
		10.77	10.25	9.86	9.86	10.45	
Adopt mean		10.75	10.25	9.84	9.86	10.44	

Adopt 10.22 for 26 .. 35, 37, 1
" 10.23 " 26, 29, 35, 37, 1
" 10.10 " .. 29, 35, 37, 1

all.			89°3	B	S
14	..	7	8.98	..	8.87
316	68	16	9.02	9.17	9.03
494	80	..	8.98	9.06	..
824			9.00		

	h	K	l	h	K	l
	386 ~~246~~	53 ~~310~~	7	12.68	13.38	13.95
	219	45	5	12.66	13.31	13.99
~~Adopt~~	605	97	12	12.67	13.35	13.97
1898 – 1905 incl	87	22	13	12.52	13.28	13.94
Mean all Adopt.	692	119	25	12.65	13.34	13.94

				Adopted		24	46	12	1st Adopted Mag		2d Adopted Mag
7	a	88°4		6.43 ✓		6.48	8 6.44	21 6.37	6.40	1.57	6.43
13	b	88°9		7.97 ✓		8.13	6 7.87	20 7.90	7.97	1.98	7.99
	c	89°3	9.00	8.94 ~~9.00~~ ✓	0	..	6 8.87	9.00	8.95	1.28	8.95
	d	89°29	10.25	10.25 ✓					10.23		10.21
	e	89°35	9.84	9.84 ✓ 98					10.71		10.64
	f	89°31	12.65	10.39				25 10.43 22 10.35	11.26 ~~12.29~~		11.19
	h	..	13.34	12.65 ✓ 343		+89°26	10.75		12.72		12.71
	k	..	13	13.34 ✓ 394		+89°37	9.86		13.29		13.30
	l	"		13.94 ✓		+89°1	10.44				

June 21. 1906

U Cephei 1903

	U		C.S.		u-cs
6388	8.92	± 15	8.44	±16	+48
6402	6.82	12	7.82.	10	-100
"	8.97	07 ~~00~~	10.48	16	-151
6407	7.19	15	8.35	11	-116
"	9.23	10	11.03	8	-180
6413	8.51	10	8.27	16	+24
6415	6.82	9	8.29	6	-147
	8.73	13	10.19	21	-146

49
74

July 29. 1906.

Routine work.

Aug 3. 1906

Comparing Catalogues Vol 18 and 48.

Vol 18, ~~[illegible]~~ 1009 stars within 60′ ~~eq~~

48 589 " " 30′

				Table XII		″		48 Table VI No.					
89°1	586 ~~617~~	10.5	1078	587	10.2	+570	+60	386	+523	+78	-13	-18	10.0
3	617	9.2	9.26	618	8.0	+730	+840						
26	297	10.6	11.18	297	10.8	-1090	-250	75	-1065	-252	~~-25~~	+2	10.2
35	408	9.8	10.90	408	10.3	-460	-720	184	-429	-708	-31	-12	10.0
37	441	10.5	10.70	441	10.0	-280	-350	227	-262	-340	-18	-10	10.0
h	526	12.8	1212 12.18		12.3	+120	-340	302	+134	-267	-14 ~~-73~~	-73	11.2
k	497	13.2	1270 12.75		13.0	-100	-100	284	+12	-86	-22	-14	11.9
l	478	14.0	0 14.15		14.1	-100	+0	265	-87	+2	+3	-12	14.1
j	414	14.8	15.75		15.0	-410	+120						

Sept 27, 1906.

Electrical units

2 – 16 c p lamps = 1 amp.
at 110 volts = 110 watts
1 Kw = 1000 watts

Zone –10° to –14°

General Standard Stars 100 wks
Faint Zones 20
150 in all

[illegible] Zone stars?
Zones 2 weeks.

Catalogue 200 wks.

A N $\overset{m}{\underset{n}{170}}$, 179. Wedemeyer.

J. H. Metcalf
12" doublet. 8×10 plate 5°×7°
16" doublet 4 cm = 1° 10°×10° on 15×15 plate.
If [illegible] glass alone 3 lenses between crown.

Constant current W. P. White The Phys. Review $\overset{m}{\underset{n}{23}}$, 447.

Oct 9. 1906

Width of column Ann.

mm.	Wd.	
171	10	
169	12	
-164	14	H.P.
	18	
162	24.1	
174	24.4	
173	34 27 28.1	
168	" 2	
	44	
178	45	
178	50	R.H.
179	46.	

Camelopard } et	i	14.29³	55.7²
alis	alis	37.57	
alus	ali	23.	14.347

Lib. Bureau

12–15 a foot.	Winslow
9	Hunter
6.50	Dennison
8.50	Wood. Lib. Bureau

Monotype. Complete $3600
Keyboard $500
$160
$12 a month. 50 hours = 24 cts an hour

Mag. of Sun.

E.C.P.	-25.5
Ceraski.	-26.59
W.H.P.	_2683

Gore Knowledge

November 17, 1906.

		Condition Oct. 1 '06	1906	All	
39.	Reserv. Met.	C			
47	Variable Stars	56 80 ~~93 93~~	24 ~~08~~	80 ~~93~~	24
49	Double Star Meas		00	93	0
50	R.H.		00		
52	Jup. Satell.	I 133 II C IV 22 C V. 6.	6 pp	133 28	161
54	Mer. P. Zones	35 – 54	20 pp.	54	20
55	Cal. Var.	1 – 56	56 pp		56
56	Orig. Meas	IV 65 – 81	16 pp	81	16
57	Var. Obs. [illegible] ?				
58	Blue Hill	III 148			
59	Reserv. Met. ?				
60	Miss. [illegible]	No III pp 50			50
61	Boyden Ret.	25 .			
62	Merid. Circle.	.			

Printed Jan. 1, 1907?

47.1 Photg. Var.
52.1 Ecl. Jup. Satell.
55.1 Var. Stars.
56.4 Adjacent Stars ??

60.2 Phoebe '98–'04

Ready for Monotype

50. Rev. Harv. Photos
54. Zones 12 inch Mer. Photo
5 57.1 Var. Stars 1902–05
5 59.1 Obs. Met. Obs. 1892–95
61. W.H.P.
5 62. Zones
E.S.K.

Stand. Phtg. Magn.

Nov. 18, 1906.

Routine Work.

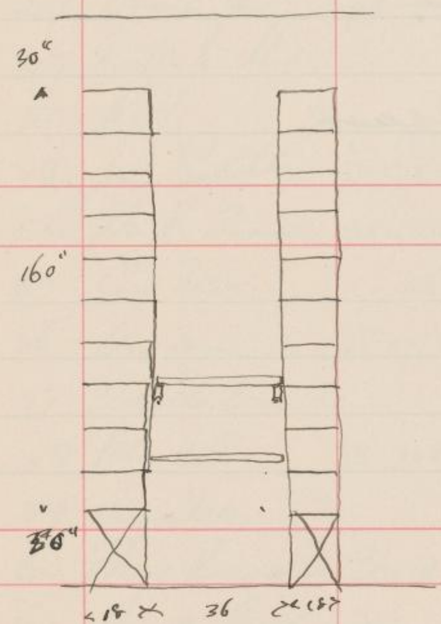
Schönfeld comp. star variables.
" drawn. "
Argelander variables of short period.

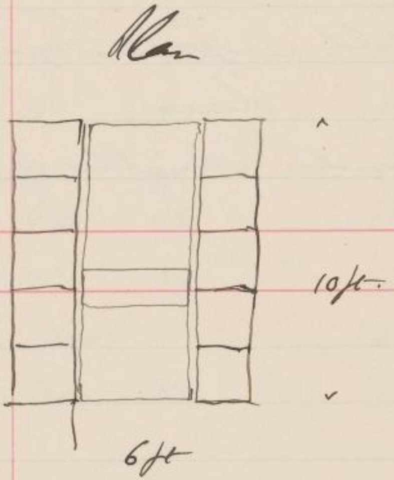
Monotype

Roman Caps	26	. , ; : #
" l.c.	26	’ — + = *
Italic Caps	26	
" l.c.	26	
Gr. Caps	26	
Figures Rom.	10	
" Ital.	10	
" Heavy face	10	
Greek alphabet	24	
	184	

Dec. 9. 1906.

Electric Elevator –





6 ft × 10 ft. capac. 1000 pl per 16 in ht.

220" = 18'4" Height   21
72" = 6'0" Width
120" = 10'0 Length

	Ht
14×17	16×19 = 80
8×10	12×15 = 100

A double stack 9 ft
long will hold 1000 boxes

Shelves double
9×7×2×8 = 1008   9 ft × 5 ft.

Dec 9. 1906

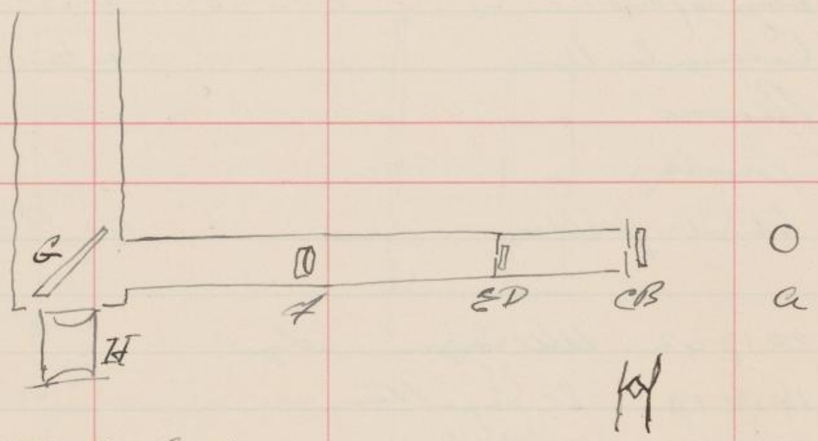
1' Plates.

174 30° Square. HG. +15° 3 02
182 Var. 47 Part I. +45° 4 30
180 Circumpolar Var. +75° 5 33
178 Novae
Phoebe
6th Sat. Jupiter 170 Clusters

Circ. 64. 20 19 42 UW Cygni Algol.
" " 19 14 19 U Sagittae "
" 66 . RV Lyrae "
" 69 21 02 45 VV Cygni Algol
" " 16 12 38 W Cor Bor. Cl II
M 5
M 3
T Andromedae
Cluster Hercules
Lg. Mag. Cl.
Sm. " "
Neb. Orion
Pleiades
o Ceti
Coal sack.
ρ Ophiuchi
Neb. Andromeda
Saturn
Jupiter

December 24, 1906.

New form of photometer



A	standard light			
B	porcelain glass	1	.000	0.00
C	cats-eye	4	.301	1.50
D	porcelain glass	9	.477	2.38
E	artificial star	16	.602	3.01
F	lens	25	.699	3.50
G	reflector	36	.778	3.89
H	eyepiece	49		
		64	.903	4.52
		81	.954	4.77
		100	1.000	5.00

The advantage of this arrangement is that no shade is required and the light is altered by an amount accurately determined by the area of the aperture of the catseye.

Jan 2. 1907.

List of 1' Plates.

Regions 30° square	north of	-45°	8in Drap.
" " "	south "	+45°	Bruce.
Variables in Vol. 47	north	-10°	8in Drap.
" "	south	+	Bruce

Circumpolar Var.

Nova Persei No. 1
" " No. 2
" Aquilae No. 1
" " " 2

Nova Normae
" Carinae

Mess. 13 Herculis
" 3
" 5
Cluster Persei

ω Centauri	
Large Mag. Cloud	30m
Small " "	30m
Coalsack.	30m
ρ Ophiuchi	30m

Jan 11 1907.

Hours Will White

	Morn	Aft.	Even	
Mon		1 – 6	7 – 11	9
Tues	11.15 – 12.30	4.45 – 6.00	—	2.5
Wed		4.45 – 6.00	7 – 11	5.25
Thurs		1 – 6	7 – 11	9
Fri		4.45 – 6.00	7 – 11	5.25
Sat.	10.00 – 12.00	1 – 6	7 – 11	11
				42.00

Polar Sequence

Metcalf's	12 inch	Exp 60m	shows	n	not	n
Bruce	24 "	12	"	n	"	n
Cooke	1 in	185		K	"	n
"	"	75		h	"	k

Mag g 20 obs 12.22 ± 0.06.

d'Arrest Undersögelser
N.G.C. 604, 1032, 1068, 2024, 6175, 6401, 7609.

In map Dept U S Library Standard size maps 42 × 25
In binding top to left. Hence reading down on back.

Jan 12. 1907.

AC 7973 } Polar plates Exp. $\frac{1}{32}$.
" 2519 }

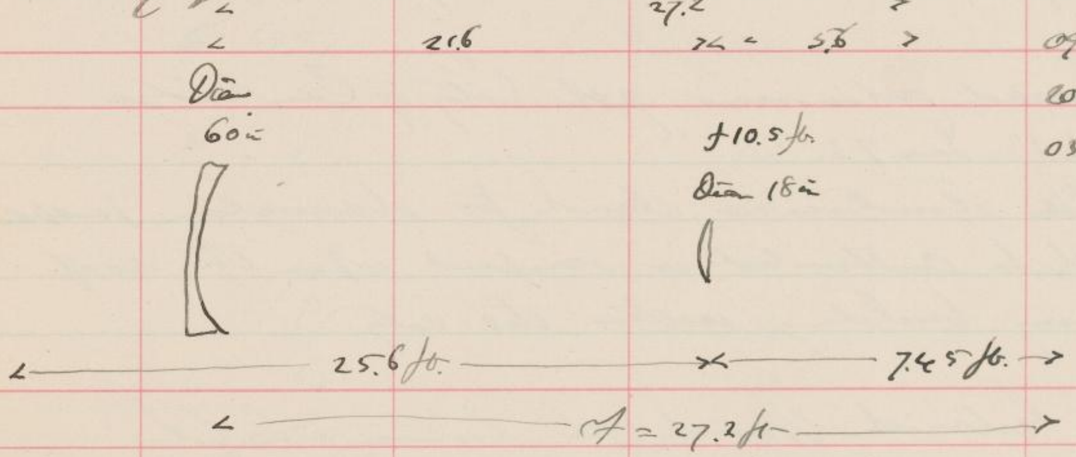
β Lyrae stars

B3 ✓	184633	β Lyrae
" ✓	235215	U Pegasi
—	203226	V Vulpeculae
B1A	075548	U Puppis
F	140957	RR Centauri
A	082958	X Cancri
A	172907	RV Ophiuchi

182612 β Lyrae type according to Yendell. Not certain by Wendell

+30°.3639 This star according to Campbell is surrounded with an atmosphere of hydrogen A.A.P. 12, 913

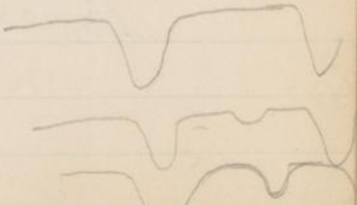
093656. 4h 0m
3h 14m
200158 Shortest period
034930 bin 7 years



Red 13.96

$7.45 : 25.6 = 27.2 : x = 93.4$

U Cephei 2413501.7826 + 2.4928840 E formula used by Wendell



Feb. 9, 1907.

Constellations

13 Camelopard. 9
14 Canes Venat. 11
14 Coma Beren. 10
15 Corona Bor. 10
16 Piscis Austr. 12

Africa, Climate of Science $\overset{n}{24}$, 410
Origin of Spiral Nebulae Nature, Jan. 14, 1904

Revised ordinances of the City of Cambridge
Chap. 13. Sec. 73.
"No structure or stand for observation purposes shall be constructed or occupied upon the roof of any building within the city."

F. B. Gilbreth. March 1906 lecture in [illegible]
10,000 letters a day Simmons Hardware Store. St. Louis.
opened by sandpaper.
Built town Woodland Me.?
St Croix Paper Mills in 8 months
Dam 1200 ft 30-40 ft high.

A.N. 103 p. 105
134 p. 181

Oct. 9. 1907.

Lambda Herculis

Sept. 9, 1904. D 8890

Mar. 9, 1905 D11197

11138

11129

7092

Comparison Series Sept. 28, 1904.

Plates with color screen.

Cramer Spectroscopic

E 6807
10
11
12
16
17
65
84
85
88
89
90
91

#E6204
05
10
20
36
37
38
70 50 – 54
60 – 69
73 23
25
26
31

7332
7335

6609 – 14
6620 – 22

Feb 9, 1907

A.C. Plates. Aperture F = 32.

AC	7693	0h0	+90°	22m				
	7694	0.0	+90	10	0.0	+90	10	F=64
	7714	190	+45	60				
	7883							
	7884							
	93	170	+15	20	0.0	+90	20	
	94	200	+60	20	0.0	+90	20	
	95							
	96							
	97							
	98							
	99							

Material for Monotype Jan 1 1907.

				Vol
✓	A Searle	Cat. Fainter Stars	125	62
✓	S.I. Bailey	Var. Observ.	110	59.1
	"	Reduc. Self Registr.	138	59.2
	E.C.P.	Revised H.P.	200	50.
✓	Leo. Campbell		60	57.1
			625	
	Leavitt H.S.		4000	
			400	
	L.C.		100	

Mch 26, 1907.

Discussion

Pickering E.C.

Hale paper read on Solar research
Stone. wide distances
Comstock measures distant objects. Searched like Herschel's
Hayford 2 readers, 1 reader later. Central expedition useless
discn. of R.A. impossible
W.H. Pickering Good seeing. Moon Mars. Centaurus nebulae
Doolittle obsns. refractor tel.
Newcomb. New methods. Height of sky.

Errors. Annals
38 p. 2 Table I line 8 for −46°57′ read −46°47′
Circular 71. p.3 for N.G.C. 2129 read 2128
p.4. 25 " 2287 " 2264
50 " 3523 " 3532

Book Holders.
7×9×2 = $.75 7.5 cts a book.
24 Library Bureau
24

March 8 1907.

Fire in dome 5h 57m, March 4, 1907. Monday afternoon
Hose carriage arrived about 6h 05m
Damage building $120
" furniture $150-200

Eros.

Opposit. Oct. 5. 0h 40m.5 +37° 15' 10.1 magn.
Sept. 14, to Oct. 20
Sept. 14 1h 10m.1 +32° 44'
Oct. 20 0 9.8 +37 30

								Log r	Log δ
July 3	0	24	36.0	+10°	2'	43".5	0.232649	0.130832
23	0	50	0	+16	1	32.4	0.222794	0.053622
Aug. 12	1	8	39.4	+22	17	56.2	0.210787	9.965809
Sept 1	1	15	32.9	+28	45	23.8	0.196627	9.870293
21	1	3	1.4	+34	37	48.6	0.180370	9.776581

Perihelion Dist. Eros. 1.1331
Ocllo. 1.6076

March 12. 1907

Division Map Sky.

Miss Cannon	1, 4, 7 etc	3n + 1
" Leland	2, 5 8	3n + 2
" Leavitt	3, 6, 9	3n

Plates taken for copies of originals AC 8063, 8064
$1 per ton per 1000 miles = freight.

"The signing and returning this card will be accepted as an indication that the recipient desires that his name be retained upon mailing lists for future publications." Supt. W.P.G.

Mechanical Solution of Normal Equations W. J. Spillman
Phil. Soc. of Washington 14, 395.

Prices printing per page

8 point	$3.50
10 "	2.25
12 "	2.05
Table	3.98

Type Corr. 35 cts per hour

March 20 1907

Bills for printing

39-2	139	669.57	695 -26
58-2	77	338.32	385 -47
58	1	5.00	5 0
52-1	157	768.57	755 +13
55-1	97	556.47	485 +71
60-2-3	42	211.25	210 +1
	507	2549.02	

	47-1	Var Star Comp. St
Sturgis	59-1	" " Vis obs 02-05
	60 No 4	1777 var Mag. Clouds
Fleming	62.1	Merid Circle
	59-1	Meteor Rec.
	61	W.H.P.
	50	R.H.

March 21. 1907

Letter E W Harper Nov 25, 1891
May 17 1892

to Nov 93

Letter to E W H. thanking him for completing fund of $50,000 Dec 5. 1895.

130 Nov 1886.
138 note re some land sold.
142 rent paid term.
144

Mean daily consumption of water
Feb 1 - 19. 150 cu ft.
Feb 19 - Mar 1. 87 " "

$498^{s}.4$ time light travelled radius ⊕ orbit

1 - 185 Zone -12° to -14°
188 - 524
525 - 663

8 P.M.

Bulawayo

		Cl.	No. cl. nights		Cl.	No. cl. nights
1905	Jan	4.1	9	July	1.4	22
	Feb	6.0	5	Aug	1.3	20
	Mar	28	18	Sept	2.0	18
	Apr	0.3	23	Oct	2.3	16
	May	1.1	24	Nov.	1.6	14
	June	0.2	26	Dec	4.0	10

April 30. 1907.

Bond Zone 0° to +1°.

Zones 1 – 25	1852.0	23	33.4	1.6	0′ – 10′
26 – 62	1853.0	22	35.0		10′ – 20′
				1.6	
63 – 83	1854.0	21	36.6	19	20′ – 30′
84 – 116	1855.0	20	38.5		30′ – 40′
		18	42.7		
117 – 150	1859.0	16	48.1		40′ – 50′
151 – 171	1860.0	15	51.3		50′ – 60′

	.0872	11.47	
	.1736	5.76	
1	.2588	3.864	
	.3420	2.924	
	.4226	2.366	
2	.5000	2.000	
3	.7071	1.414	707
4	.8660	1.155	578
5	.9659	1.035	518

$0^s.0234$ per 60′, at 18^h

$x \frac{.0234 \times t}{60} = .005$

$x\ .00039 \times t = .005$ $x = \frac{.005}{.00039 \times t} = \frac{1}{.078\,t} = \frac{12.82}{t}$

$.00078 \times t = .01$

$.078 \times t = 1$

12.82
6
769.2 | 15
75
19
15
51.3″

769.2 | 16
64
129
128
12
48.1″

20
769.2 | 21
63
139
126
132
126
6
36.63

769.2 | 22
66
109
88
212
198
140
34.96
35.0

769.2 | 23
69
79
69
102
92
100
98
33.4

769.2 | 18
72
49
36
132
126
42.7

23	33.44	1.52
22	34.96	1.67
21	36.63	1.83
20	38.46	

	6^h	5^h	4^h	3^h	2^h	$1^h 40^m$	1^h	$1^h 20^m$	$0^h 40^m$	$0^h 20^m$
.005	33.4	34.6	38.6_9	47.2_7	66.8	79.0 ~~44~~	128.9	97.6 ~~144~~	192	383
.015	100.2	104	116	141.	200.4	237.0 ~~423~~	387	292.8 ~~348~~	576	1149
.025	167.0	173.0	193	236	334.0					
.035	233.8	242	271	330.4						
.045	300.6	310.6	347.4							
	35.0	36.3_9	40.5_9	49.5_7	70.0	81.5	135.1	102.3	201.6	401
	105.0	108.8	121.	148.5	210.0	244.	405.3	307		
	175.0	181.3	202	247	350.0					
	245.0	253	284	346.5						
		326.7	364.5							
	36.6_4	37.9_7	42.3_9	51.8_7	73.2		141.3			
	109.8	113.7	127	155.5	219.6					
	183.0	189.	211.5	259	366.0					
	256.2	265.3 260	297	362.6						
	329.64	341.1	380.7							
	38.5_9	39.9	44.5	54.4_7	77.0		148.6_3			
	115.5	119.7	133.5	163.3	231.0		445.8			
	192.5	199.4	164.7	272	385.0					
	269.5	278	313	340.8						
	346.5	359.1								
	48.1_7	49.8_7	55.6_7	68.0	96.2		185.7			
	144.3	149.5	166	204.0	288.6					
	240.5	248	288							
	376.7	348.6	389.2							
	51.3_7	53.2_7	59.3	72.6	102.6		198.0			
	153.9	159.6	177.9	217.6	307.8					
	256.5	265	307							
	359.1	372.4								

May 28, 1907.

Condition of Publication of Annals

c = complete ready
p = in progress
u = unfinished
n = not begun

Vol.				Pt. I	Pt. II	
47	Photog. variables		Hering	Compl.		c u
48	Miscell	|	—	Complete		c c
49	[illegible] 15 inch		Wendell	Merid.		u n
50	Rev. H.P.		E.C.P.	At Printer.		p
51	Moon	|	—			c c
52	Jupiter's Sat.	|	R.C.S.			c p
53	Miscell	|	—			c c
54	~~Miscell~~ Photom. 12 in.		E.C.P.			u
55	Variables	|	A.J.C.			c u
56	Draper		E.C.P.			u
57	Van Sant	|	Campbell			c p
58	Blue Hill	|	Rotch			p
59	Ang. Meas.		Bailey			c ~~n~~ r
60	Miscell.	|	Bailey King			p
61	Boyden		W.H.P.			p
62	Merid. Circ.		Searle			~~n~~ r
63	Miscell.					
64	Merid. Phot. 02-06		E.C.P.			
65	" Circle Zones		Searle			u
66	" " "		Searle			u

May 28. 1907

Completed Soon

47.1	Photog. Var.	Fleming
57.1	77 Var Long Per.	Campbell
60.4	Var. in Mag. Cl.	Leavitt
60.5	10 Algol Var	"
62.1	Mural Circ.	Searle Mainly in type
59.1	Ann. Met. Obs.	Ready Half in type
61.1	Boyden	W.H.P.
50.	R.H.P.	E.C.P. Sent to Printer
52.2	Jup. Satel.	Printing slowly
56	Obs. Zone [illegible]	Jobs in type
59.2		Ready for printer

May 31, 1907.

12 inch measures Additl Polar Stars

10 sets 4 settings each.

f^2	11.18
f^3	11.93
c^2	9.37
c^3	9.57
i	12.24

$20000 Ann.

Brick Building	6000
" " equip	1600
24 inch Tel. A	4200
60 inch Tel. B	3800
Elect. light and install	1500 700
	23800

Campbell, July 29 – Aug 4, Aug 26 – Sept. 2 inclusive.

Comp. Stars Var. 57, II.

146 completed

64 nearly complete.

~~26~~ 9 incomplete

236 — 17 recently added

June 27. 1907

Meas. 1906-7	12in Nights	Merid. Stars
Oct	11	913
Nov	7	578
Dec.	3	420
Jan	5	599
Feb	5	484
Mar	4	514
Apr	4	348
May	6	676
	45	4534
Settings		18,136
		576,764
June 1, 1907		594,900
June 1-15		2020
		596,920
19-24, 18/4		748
		597,668

Earlier Zones

Fundamental stars obs.	4,200	84 pl	62 Pt I
Zone " "	25,384	508 pl	65, 66, ?
Catalogue			67 I
Proper Motion.			67 II
[illegible] stars Zone			62 I

Errata H.C.O. Tables Log sin 89.2 9.0000 should be
Log sec. 14°1.0 [illegible] line for 0.0157 read 0.0151

Aug 5. 1907.

No. Plates showing faint Dust

a

1 - 5000	1525	
5001 - 8210	1210	2735

B

1 - 5000	480	
5001	457	
10001	75	
15001	215	
20001	160	
25001 - 27000	450	1837

Aug 17, 1907

Distribution of Annals.

	Annals	Dist.	Tot.
Oct. 1, 1906	39 – 2		
	58 – 2		
	60 – 1		
	60 – 2		
March 6, 1907	52 – 1		
	55 = 1		
	60 – 3		
Aug. 12, 1907	47 – 1	356 + 356 + 15	756
	57 – 1	" + 422	793
	60 – 4	" + 631	1002
	60 – 5	" + 444	815
	62 – 1	" +435	806

Publications. – Volume 47, Part 1; Volume 52, Part 1; Volume 55, Part I; Volume 57, Part 1; Volume 60, Nos. 1, 2, 3, 4 and 5; Volume 62, Part 1 have been completed and ~~distributed~~ published this year.

49		60	Completed vols 1 – 46.
50	197 pp.	61	47.1, 51, 52, 1, 53, 55, 1, 56, 1, 2, 3.
51 completed.		62	57.1, 58, 1^{2}_{N} 60, 1–5, 62, 1.
52 Part II	53 pp.		
53 completed			
54	none		
55 —			
56			
57.1			
58, 3.	4 Obs. 1905, 21 pp		
59			

September 8, 1907.

Form of card for Mr. R. joint list:-

DM.	R.A.	Dec.	Magn.	Vd.	No.	

DM. 12345	13
R.A. ~~15~~ 26.3	10
Dec. +25 32	16
Magn. 9.62	11
Vd.	7
No.	7
	64
3 cd.	192

Est. no. 14	400	4,260
24.1	16,000	20,982
24.4		
34	5,700	7,922
44		
45	23,600	29,587
46	4,000	
	49,700	

September 8, 1907.

Annals. Contin. numbering of tables.

1	Not numbered.	26	Broken	51	—
2	" "	27	—	52	
3	—	28	Contin	53	Broken
4	Not numbered	29	Broken	54	
5	—	30	Broken	55	
6	—	31	Contin	56	
7	—	32	Contin	57	
8	—	33	Broken	58	Broken
9	—	34	—	59	
10	—	35	—	60	
11	Contin.	36	—	61	
12	—	37	Contin	62	
13	Contin.	38	—		
14	Contin.	39	Brok.		
15	Broken	40	Brok		
16	—	41	Contin Brok.		
17	—	42	Brok.		
18	Broken	43	Brok		
19	Contin	44	Contin		
20	Broken	45	—		
21	Contin	46			
22	—	47			
23		48			
24	—	49			
25	—	50			

Pom.	Bl Hill.	Middle
11 Con	~~19 Cont~~	18 B
14 C	20 Br	
23	30 Br.	
44 C	40 Brk.	
46	42 Br	
	43 Br	
	58 Br.	

M. E. Met.	Dr.	Muster
21 Cont.	26 Br	18 B
31 Cont.	28 Conts	29 B
41 Cont. Br		33 B

September 15, 1907.

Additional Volume of 4 inch Merid. Phot. work.

50 Rev. Harv. Photometry. H.R.
9100 stars 6.4 and brighter

Stars fainter than 6.4 observed with 4 inch M.P.

Discussion M.P. observations
Observ. 1902 – 1906
Discussion Rev. H.P. grouping
" H.P. grouping
Errors, speed of setting &c.
Details of one series J.O. 31#4?
Bright stars observed with 2 Pers. Mer. in southern ht.
Atmos. absorp. for very low stars
Discuss. observ. of 100 circumpolar standards in diff. years. 79 – 06.

September 15; 1907.

Volumes of 12-inch Meridl. Phot. under

Description of instrument, method of observation

Summary of Series

Observ. of Polar Stars.

Zones +4° +9° +14° etc.

Catalogue of All stars except zones

Distribution. Hagen Stars.

September 15, 1907.

Catalogue of stars observed with 12 inch M.P.

Prepare card catalogue.

Form of printed catalogue.

1st column No in Zone of DM.

For other stars (123,45). 123 denotes group and 45 number of stars in group

2d column. R.A. for 1900. min. and tenths 25.6 Hour at top of page.

3d column. Dec. for 1900 deg. & minutes +25° 36'

4th column. Magn. 12.34

5th column. No. of opposition, & and letter denoting shade thus 8b = observ. in 1898 with shade b.

6th column. No. observ.

Three columns on a page. one line for obs. in each opposition (not year) also, one for observ. in H.A. 24m Thus:—

16425	15.8	+16 23	12.34	8b	3
"	"	"	"	2	4
13256	16.3	+5 26	9.62	24	3
"	"	"	9.83	3b	3
.	"	"	9.72	4	2

Design.	123,45	14
R.A.	15.8	10
Dec.	+16 23	16
Magn.	12.34	12
Opp.	8b	7
No. obser.	16	7
		66
		3
		198

September 18, 1907.

Precession for 45 years.

		20°	15°	10°	5°	25°	30°
		~~5~~	~~10~~	~~15~~	~~20~~		
	3.133						
2.25	3.000	$0^{h}\,34^{m}$	$0^{h}\,47^{m}$	$1^{h}\,11^{m}$	$2^{h}\,32^{m}$	$0^{h}\,27^{m}$	$0^{h}\,22^{m}$
2.15	2.867	1 40	2 20	4 03	..	1 17	1 02
2.05	2.733	2 57	4 45	..	..	2 12	1 44
1.95	2.600	5 04	..	..	..	3 17	2 31
1.85	2.467					5 5	3 26
1.75	2.333					..	4 52
1.65	2.200					..	..

2.25 / 45
.05
6
300
195 /.
390
45 115
43
41
39
41 / 115
30 2[illegible]32
110
105
50

43 / 115 286
30
130
120
100

2.877
39 / 115
2

	0°	5°	10°	15°	20°	25°	30°
2.25	..	2 32	1 11	0 47	0 34	0 27	0 22
2.15	..	..	4 03	2 20	1 40	1 17	1 02
2.05	..	..	..	4 45	2 57	2 12	1 44
1.95	..	..	..	..	5 04	3 17	2 31
1.85	..	..	..	..	..	5 5	3 26
1.75	..	..	..	..	..	..	4 52
1.65	..	..	..	..	..	..	..

September 29, 1907.

No. Stars 4-inch Meridian Phot.

H.A. Table	Estimate	No.	5×mm.	Writer	H
24.1	15,506	182		Pr.	G
45	14,760	300			
34.7	6,232	93		S	
24.4	1935	48			
46,1	1839	48		S	
44.1	1560	100	1140		H
46.2	226	28	195		H
14,.27	153	85	180		H
46,3	71	65		Pr.	P.
14, 64	10	..			P.
23, 17	8	.			P.

42,300

2 Stars +88°9 and +89°3 from H.A. 14 397. R.A. $2^h 14^m.2$ and $3^h 18^m.7$

Cloth Boxes to hold cards	18 ins	$.30	2000	$0.15 per M. 1000
Tin " " " "	6.5	.60	1000	0.60 " "
Cabinet	12	2.30	1500	1.50 " "

September 29, 1907.

Start observ. with 12 inch M.P. in zone 0° to 1°

Select fields ten stars in each half hour, beginning $0^h 0^m$, $0^h 30^m$ etc. Observe 3 stars from Vol 24. 5 polar 1 stand. 5 faint, 1 stand. from pl. etc and 3 standards at end. Requiring 20 min. With this time we can generally observe $^{5}4$ regions without waiting.

Thursday November 14, 1907.

Observations of Transit of Mercury

E.C.P. obs W.P.F. rec.

+31

8 47 41 First Contact has probably taken place
49 0 Image apparently bisected !
49 28 Image still seen
49 43 Image suspected
50 25 Not seen with certainty later

Chronom 8^h
[illegible] 8 39 29 = 40
8 40 29 = 41
Watch Comparison

Conclusion.

At – 8^h 48^m 12^s G.M.T. First contact has prob. taken place
49 31 Image apparently bisected
49 59 " still seen
50 14 " suspected
50 56 " not seen with certainty later

November 23, 1907

Form Tables.

Phot. Mag. Doubles			T. Plates		
H.R.	0000	11	Regio.	C11	11
Bu. Gen.	00,000	14	Dm. No.		11
Σ	0000	11	R.A.		16
R.A.	16h 25m.6	16	Dec.		16
Dec.	−25° 38′	16	[illegible]		8
Mean	6.0, 7.2	15	Sky.		12
Magnitudes	21.3, 26, 15, 25	25	Reg.		12
Angs.	115 0.46 102 115	37	Remarks		12
Ad. Ob.	4.26	10			98
a	4.58	10			
B	10.58	12			
Dis.	115″.2	12			
Ang.	126.4	12			
		201			

Dec. 14. 1907.

Cambridge Club. 1907.

Trowbridge	Oct. 31
Lawrence	Nov. 14
Farlow	Dec. 12
Moore	Jan 9
Goodwin	" 23
Gray	Feb. 13
Briggs	" 27
Eliot	March 12
Pickering	" 26
Walcott	April 9
Agassiz	" 23
Ames	May 7

December 20, 1907.

Method of determining brightness and rotation of asteroids

With planet apparatus give motion to plate equal to one half that of asteroid. Images of asteroid and star will thus closely resemble each other.

0° .0000
1736 .347 35
10 .1736
1684 .337 34
20 .3420
1580 .316 31
30 .5000
1428 .39
40 .6428 ~~7660~~
1232 .34
50 .7660
1000 .27
60 .8660
737 .55
70 .9397
451 .34
80 .9848
152 .11
90 1.0000
1.0000

.11 a1 } 7 .77 2.45
.34 27 9.18 9.18
.55 29 15.95 8.99
63 20.62
25.90
80 .32

.11 a3 } 3 0.33 1.05
34 17 5.78 5.78
.55 28 15.40 8.68
21.51 15.51
8 .27

f1 0 .00
3 1.02
3 1.65
2.67 .033

f3 0 .00
3 1.02
7 3.85
4.87 .061

f2 0 .00
36 12.24
61 33.55
45.79 .572

1428 | 3660 .39
1098
3300
3294
6 14274

14640
366
14274

1232 | 366 33.7
1098
1340
1098
2420

1000 | 366 27.3
732
2680
~~28~~
2562
1180

737 | 134 55
670
670

451 | 134 33.66
402
490
402
880
804
760

152 | 134 11.3
134
180
134
460

2.45 1.05
9.18 5.78
8.99

24 31
27 29
238 279
68 62
918 899

34
17
238
34
5.78

34
27
238
34
34
5.78
9.18
31
28
248
62
8.68

28
55
140
140
15.40
55
15.95

305
305
33.55

36
34
144
108
12.24

Dec. 20, 1907.

	14										M		S	ℓ	M
A 1		+18	32	n ℓ	D 1	-76		0	S S	0	A2	0	C1	A1	B2
2		+43	0	n N	2	-55		0	S S	0	B4	0	C2	A3	B8
3	m	+22	27	n ℓ	3	-29	m	22	ℓ	0	B5	0	C12	B1	B9
B 1	m	-17	23 ~~28~~	s ℓ	4	-3	m	77	M	0	B6	0	D1	B3	C4
2	m	-4	50	M	5	+22		37	ℓ	5	B7	0	D2	C3	C10
3		+19	12	m ℓ	6	+40		0	n N	0	C6	0	D11	C5	D4
4		+47	0	n N	7	+46		0	n N	0	C7	0	D12	C11	~~D6~~
5		+71	0	n N	8	+35	m	3	m N	0	C8	0	E1	D3	~~D7~~
6	m	+61	0	n N	9	+14		30	ℓ	7	C9	0	E2	D5	~~D8~~
7		+46	5	n M	10	-11	M	53	M	0	D6	3	E8	D9	D10
8	m	+6	72	M	11	+38		0	S S	0	D7	0	E9	E5	E3
9	m	-13	50	M	12	-64		0	S S	3	D8	3	F1 ~~E10~~	F3	E4
C 1		-46	0	S S	E 1	~~7~~		0	S S				~~6 F7~~		E6
2	m	-35	0	S S	2			0	S S				~~F3~~		E7
3	m	-14	35	ℓ	3			42	M						F2
4	M	+11	70	M	4			74	M						
5		+38	33	n ℓ	5			30	ℓ						
6		+64	0	n N	6			43	M						
7		+76	0	n N	7			64	M						
8		+55	0	n N	8			3	S						
9		+29	7	N	9			0	S S						
10	M	+3	73	M	F 1			3	S S						
11		-22	23	ℓ	2			57	M						
12		-40	0	S S	3			6	S S						

Dec 24. 1907

B1 B2 B3 B4 B5 B6 B7 B8 B9

		B1	B2
27	39	24	8
34	34	27	42
39	27	16	42
		67	

67
27
469
134
1809
26

67
39
603
201
2613

B2 26 × .27 702
54 × .34 1836
38 × .39 1482
4020
.50

B3 0 × 27 = 0
7 × 34 238
28 × 39 1092
1330
.12

B7 2 × 27 54
4 × 34 136
6 × 39 234
424
5

B8 55 × 27 1485
58 × 34 1972
60 × 39 2280
5737
.72

B1 67 × 27 1809
1809
.23

B9 63 × 27 1701
54 × 34 1836
12 × 39 468
4005
.50

E2 1 × 39 39

E3 41 × 39 1599
36 × 34 1224
21 × 27 567
3390
.42

E4 .54 × 39 2106
.62 × 34 2108
.64 × 27 1728
5942
.74

E5 3 × 39 117
20 × 34 680
59 × 27 1593
2390
.30

E6 18 × 39 702
35 × 34 1190
57 × 27 1539
3431
.43

E7 55 × 39 2145
55 × 34 1870
42 × 27 1134
5149
.64

E8 5 × 39 195
2 × 34 68
263
.03

			00000	
0	000.0000000	10	0000	9
0	57	2	336	3
1	2	1	3	1
2	733	3	2	1
3	253	3	700	3
4			23	2
5	00	2	37	2
6			4	4
7	208	3	74	2
				24

Dec 23. 1907.

Harv. 12 inch Phot.

Obj.	R.A.	Dec.	Obj. Mag,	Magn,	Obs. No.
650	3 46.5	+23 14		12.26	06 15

Obj No.	13
R.A.	16
Dec	16
~~Obj No~~	~~8~~
Magn.	12
Date ob	7
No.	7
	79
	71

T' Plates.

Region	C12	11
Obj	6423	11
R.A.		16
Dec		16
Obj Magn.		8
Photog		12
Reg.		12
Resid.		12
		98

12
7
10
7
36

Dec. 23, 1907.

Milky Way.

M			S			P			M		
A2	0 0	+43°	1.C1	00	−46	1 A1	32 ~~26~~	+18°	1 B2	50	−4°
B4	0 0	+47	C2	00	−35	3	27 20	+22	8	72	+6
5	0 0	+71	12	00	−40	B1	23	−17	9	50	−13
6	0 0	+61	D1	00	−76	3	12	+19	C4	70	+11
7	5 6	+46	2	00	−55	C3	35	−14	10	73	+3
C6	0 0	+64	11	00	−38	5	33	+38	D4	77	−3
7	0 0	+76	12	00	−64	11	23	−22	10	53	−11
8	0 0	+55	E1	00	−71	D3	22	−29	E3	42	−19
9	7 7	+29	2	05	−47	5	37	+22	4	74	+4
D6	0 0	+40	8	3	−33	9	30	+14	6	43	+12
7	0 0	+46	9	010	−61	E5	30	+16	7	64	−6
8	3 3	+35	F1	3	−37	F3	6	−32	F2	57	−14
								+38			
		+29			−33			−32			+12
	0-7	+71		0-3	−76		14-38			42-77	−19

Jan. 19. 1908.

		Ob't	
47.1	Photographic Variables	—	Published
2			
48	Miscell	—	Published
49.1	Arequipa	Pub.	Printed
" 2		Pub.	Type
50	Revised Harv. Phot.	Pub.	Type.
51	Atlas of Moon.	—	Published
52	Eclipses Jup: Satel.	— pt	Published Partly type
53	Miscell.	—	Published
54		Partly Printed	
55	Cal. Variables	—	Published
"	Max Min		
56	Draper miscell. values	1 2 3 — 4. Printed	
57 1		—	Published.
2		Pub.	Partly print.
58 1.2	Blue Hill.	~~In type.~~	Blue Hill
" 3		In type.	" "
4			" "
59	Miscell.	1 Pub. 2 In type	I Stand Photg Mags
60	Miscell	6 7 8 9 pub.	I-IX type.
		61.1	
61	Miscel ~~Photometric~~ Catal		

Incomplete

		Cat. +50	Zone +50	Zone -10-14
47.2	Photog. var.	15	35	65
52.2	Jupiter's Satell.		36	66
54				
55.2				
56	4.5 etc.			
58	3.4 etc			
59				

Feb 17-1908

Reference to S. Africa
the Geog. Journal Feb 1908.

Nearly ready Apr. '08

49.2
50
61.1
60.9

54. 4ii M.P.
57.2 Var. Cl. II
56.4 Ady. St.
" 5 Spect. Bin. St.
64.1
" 2
59.2 etc. E.S.K.
55.2

Incomplete

47.2
52.2
55.2
56, 4.5
59
61, 2
62, 2
63 Mitchell Report
64 Phot. M.P.

Nearly Comp.

54.
57.2
58, 3.4

March 22. 1908.

Nova Persei No. 2.

Comparison Stars.

	12in M.P.	15in.
6	7.46	
12	8.54	
23	9.33	
c 46	11.86	
c 34	10.31	
9	8.59	
cs c 20	9.13	
f 49	12.26	
g 56	12.92	
54	12.60	

6	7.46	
+43° 728	8.24	
9	8.59	
12	8.54	
20	9.13	9.10
23	9.33	
32		9.71
34	10.31	10.57
42		11.03
46	11.86	11.94
49	12.26	12.23
54	12.60	
56	12.92	12.51
65		12.70 ~~12.87~~
66		12.87

April 12. 1908.

S 8 in Coll. Polar Telescope
M " " Douglass
6 in W. Egerton
$5\frac{1}{4}$ in Draper on 28 in Bdg.
" Clacey N. Coll.
" " S. "
5 Clarke Bailey S. Cassius.
8 in Finder Common Telescope

Vol 68 —— pp 1-59 + (9 gals = 20pp)
" 61² —— 113-156(?)
52 (149-52 / front) 153-272 (plates) (38pp to makeup + 10pp text
55 —— 38 pp ?
59⁴ —— 95-106+24? = 36
54 (7-54 / plates) 55-59 = 5
64-5 —— 1
56⁴ 65-81 plates
49 —— 1-93 "

DEC 16 1908

April 19. 1908

Adopted Polar Sequence

			H.R.	HC 125
A 1 α	+88°	8	2.12	
B 2 δ	+86°	269	4.44	
C 3a	+85°	383		
D 4	+86°	344		
E 5	+86°	272		
F 6	+88°	71		
G 7	+87°	107		
a^1	+88°	4		6.43
a^2	+87°	51		
a^3	+89°	13		
a^4	+88°	64		
a^5	+88°	112	6.55	
b^1	+88°	9		7.97
(b^3)	+88°	76		
-b^2	+88°	13		
c^1	+89°	3		8.94
c^4	+88°	114		
c^5	+89°	22		
c^6	+89°	12		
c^7	+89°	9		
c^2	+89°	18		
c^3	+89°	25		
d	+89°	29		10.25
e	+89°	35		9.84
f^1	+89°	31		10.39

f^2		
f^3		
g		1222
h		1265
i		
k^1		1334
k^2		
k^2		
k^4		
(k^5)		
l		1394
m		
n		
o		
p		
q		
r		
s		
t		
u		
v		
w		

May 14, 1908.

Jupiter VIII.

			♃			
Jan. 27	8 46 7	+18 04	46 17	+18 47	−0 $\overset{-2.5}{10}$	−43
Feb. 28	31 32	19 16	30 30	+19 48	+1 $\overset{+15.5}{2}$	−32
Mar 8	28 39	19 32	27 29	+19 59	+1 $\overset{+16.5}{10}$	−27
Mar 31	26 40.24	19 49.12	24 18	+20 9	+2 $\overset{+35.4}{21.6}$	−19 38
Apr. 1	26 46	19 49	24 19	+20 9	+2 $\overset{+36.8}{27}$	−20
" 3	~~20 40.24~~	~~19 49.12~~	24 24	+20 8	+2 $\overset{+37.2}{29.0}$	−18 40
29	33 44	19 36	29 55	+19 48	+3 $\overset{+57.2}{49}$	−12

May 25.
Zone catalogue (−10 to −14) will occupy 508 pp of print — with brief description perhaps 550 — all Professor Searle (May 23) expects that it will be ready for the printer June 1, 1909.
Mem. filed under Searle A.

HA 50 Motion Eq. Mechan. 17.555.

Sent to binder May 5, 1908. Distrib. May 25.

May 21.

June 23.
~~May 25.~~ 1908.

Cost-HA.			.. Cor.			Corr
49 - 1	587.92	1226.98	16	37.2	362.09	60
" - 2	639.06		16	56.4	205.44	32
57 - 1	908.05		4	54.	1044.52	46
61 - 1	493.75					
	2628.78 [illegible]		10	64 1.23	374.24	38
60 1	130.74 est.	1-8 1296.76		58.3	335.95	27
2.3	225.51		15	59, 2.3	285.42	42
4	152.81		19	61.2	196.88	37
5	257.57		17	68.1	426.67	76
6	214.66		11	57.4	137.06	15
7	19.20					
8	296.27					
9						

Recd Mus. Zool. Argent Obs. 1-11, 16, 17 Chem., Dr.
Optic. Instr. 4

d of T Herculis C.C.W.

J.D. 6260	1.06	Ca.S.	18h 5m 49.4s	+29° 52.8′	+29 3198.	7.5.
" 6265.	1.11					
" 6267	1.11					

Aug. 19, 1908.

Astronomer.

English
Huggins
Gill
Turner
Christie
Hinks.
Dyson
Rambaut
Schuster. Espin
Cookson. Ball
Colla Crommelin
Maunder
Denning
Dreyer
Doberck
J.N.
W.J.S. } Lockyer
Anderson Cowell
Darwin Eddington
Dunkin ?
Gore ?
Grubb
~~MacClean~~
Monck
Newall
Knobel
Hough
Halm } Cape

French
Baillaud
Hennessin
Deslandres

German
Auwers.
Müller.
Knopf
Küstner
Valentiner
Hartwig
Seeliger
Scheiner
Wolf
Archenhold
Weiss
Foerster de Ball.
Lachtin Galle.
Palisa Holetschek.
Repsold Bauschinger
Struve H.
Tscherwonk ?
Lohse
~~Hartman~~
Villiger
Wilts.
Eberhard.
Ludendorff

Sep. 5 1908

Distrib. Canals 1908

Feb. 1908
47.1 ✓
57.1 ✓
60.3.4 ✓
62-1 ✓
49-1 ✓ Feb 24
59-1 ✓ Feb 24
50-67.8 c ✓ Feb 24
49-2 c ✓ May 23
50 c ✓ May 23
61-1 ✓ May 23

Distrib.

57.2 C ~~Dec~~ '08 ✓
56,4 " ✓
54 C " ✓.
~~58.3 c~~
~~52.2 c~~
59.2 " ✓
64.1 " ✓
64.2 " ✓
64.3 " ✓
60.9 " ✓

Unfin.
47.2
52.2 Jupiter Satellite
55.2 Max. Min.
. 58.3 c Blue Hill.
. 59.4 c Daylight Stars.
. 61.2 c Transcontinental
64.4 c Double Stars.
68.1 c Blue Hill Balcons
69.1 c G.R.W.

Fin. Unfin.
47.2
50
51
52.1 52.2 Jan?
53
54
55.1 55.2 J
56.1.2.3.4 ~~56.5~~
57
58.1.2 58.3
59
60
61.1 61.2
62.1 ~~62.2.3~~
63
64.1.2.3 64.4 -

Dec. 1908
54 "
56-4 "
57-2 "
59-2 "
60-9 "
64-1 "
" -2 "
" -3

58,3 59,4
59,3 61,2
69,1

Sept. 11. 1908.

50 Variables of Long Period Observed in Arequipa

001032	S Sculpt:	6.6	12.8
012233		6.2	8.8
025050		5.9	12.0
043263		7	12
043562		4.8	6.8
043738		7.2	14.0
044349		7.6	10.0
054629		8.0	12.5
055686		7.3	12.3
071044		3.4	6.2
074347			
092962			
094262			
095458			
100537			
100661			
101058			
122854			
133633			
140959			
144646			
151066			
154736			
164844			
165030			

Sept. 11, 1908.

165636
170833
172586
173543
180363
182133
185437
185537a
185537b
193972
194659
194929
195742
200747
201139
203429
204954
205782
214247
221230
221938
221948
222867
235150
235265

Sept. 30. 1908.

47.2.	Distrib	In type	
48.	49.1	54	52.2 in p
	49.2	56.4	
	50.	58.3	
	57.2	59.2	
	59.1		
	60, 6, 7, 8, 9		
	61, I		

Completed.

1-46, 48, 49, 50, 51, 53, ~~56~~, 57, 60

47-1, 52-1, 55.1, ~~58.1.2~~

56-4, 58, 1.2, 59.1, 61.1, 62.1

H.A. 49 Parts I and II; 50; 57 Part II; 59 ~~Part II~~ No. 1; 60, Nos. 6, 7, 8, and 9; 61 Part I have been published and distributed this year. The whole of H.A. 54, 56 No. 4, 58, 59 No. 2 and 64 No. 1. are in type.
It therefore appears that ~~five~~ six volumes H.A. 49, 50, 54, 57, 58 and 60 have been completed this year.

Material read Nov. 17, 1908.

Oct. 11. 1908.

Number 12-inch 60,208 135 [illegible]
613,904
674,112

Neb. found by S. I. B. 515 measured + 1417 [illegible] measured

Plates at Printers Sep. 9. 1908

Ha 54.1 Dim Zones 7-54. Nov. 22 1905 48
56.4 Adjacent Stars 15-81 Sept. 13 1906 17
49 Photo Obs. E Equat. 1-93 May 6 1903 93
55 Max Min Var. Stars 1-30 Feb 17 1906 30
188

	Dist. Nov. '08	
49.1	1 54	1 52.2 Dec '08
1 49.2	56.4	55.2 "
2 50	2 57.2	2 58.3 Dec '08
59, No. 1	59.2	61.2 "
60, No. 6	3 60.9	59.3 Dec '08
" " 7	64.1	" 4 Dec '08
" " 8	" 2	69.1 "
61.1	" 3	
		69.1

Oct-21, 1908.

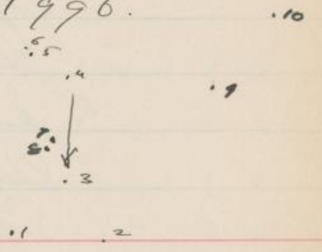
Region for Charts Bruce Tel.

Pleiades
Neb. Orion
Cygnus Neb.
Large Mag. Cloud.
Small " "
η Carinae
Trifid Nebula
ρ Ophiuchi
Nebula and Cluster
S. Cross.
Pole Milky Way

Oct-22 1908.

Experiments ptg mags.

Enlarge 1 Sculptor 002438a 0 11996.



1		–	00		
2	68	66	62	6.53	313
3	43	44	43	4.30	010
4	27 ~~68~~	28	28	2.77	100
5	38	36	40	3.80	020
6	24	20 ~~34~~	22	2.20	220
7	36	36	37	3.63	001
8	25	26	21	2.40	123
9	40	38	(30)	3.90	11..
10	43	36	42	3.97	342
					11 13 9
					±.11 = ±.09

November 21, 1908. Astron. Research Fund '02

July 1	'02	Ormond Stone. Asteroid at 26 in.	200.00
April 13	'04	E. B. Frost — discuss. of spectrograms	200.00
June 8	"	W. H. Pickering trav. expenses to Calif.	325.00
July 19	"	Carleton Coll. Obs'y expenses	1000.00
Dec 18	'07	E. B. Frost — Index astr. journ.	100.00
Sept 11	'08	W. W. Payne " Pop. Astron.	100.00
Nov 5 06	Oct 16. 08	J. H. Metcalf Photog. with doublet.	900.00
Nov. 21	'08	S. F. Whiting Obs. car.	50.00
July 9	09	" returned	—

Addresses for Books for Mr Agassiz

Maggs Bros. (Best)
109 Strand, London.

Francis Edwards,
83 High St. Marylebone, London.

Mar 21. 1908

Opposition of Eros

		mag
1900	Oct. 30	9.3
03	June 8	10.8
05	Aug. 4	11.2
07	Oct 5	10.1
10	May	

	50,	60,	70,	80,	90,	00
1	·	·	1	·	1	2
2	·	1	1	1	2	2
3	·	1	·	·	2	3
4	·	·	·	1	1	1
5	·	1	·	·	2	1
6	1	·	·	2	3	·
7	1	·	2	1	2	6
8	·	·	1	·	·	4
9	·	·	1	3	2	3
0	·	·	1	4	2	

Dates of Annals.

60,70,80,90,00		1850	1860	1870	1880	~~1890~~	1890	1900
. .	1			7	~~12~~	26	26	43,45
. 1	2		3	6	13		31,40	38,41
. 1	3		4		~~13~~	~~15~~	25,29	46,48,51,
. .	4				14		35	58
. 1	5		5		~~14~~		32,34	53,
1 .	6	1			15,16	~~20~~	20,30,36,	
1 .	7	2		8,10	17		28,42	47,49,52,55,57,62
. .	8			9				50,54,60,61
. .	9			11	19,21,22		39,44	68,69,70,
. .	0			12	18,23,24,27		33,37	71,65

50 0,2,3,0,2,6,2,10,8,9,9,15

14 35 20

51 25 10.

Dec 9. 1908.

Limiting mags. of Catalogue

in	G	log		C	G–C
1	9.0	0.00	0.0	9.0	0.0
5	12.0	0.70	3.5	12.5	- 0.5
6	12.5	.78	3.9	12.9	-0.4
8	12.8	.90	4.5	13.5	- 0.7
12	13.5	1.08	5.4	14.4	- 0.9
15		1.18 ~~1.17~~	5.9	14.9	
24		1.38	6.9	15.9	

31".1 = 5 mm 40 inch Yerkes

Circulars sent Dec. 1908.

Catania
Greenwich Obs.
Kiel
Brit. Astron. Ass.
Brit. Museum
Roy. Astron. Soc.
Roy. Soc.
Bodleian Lib.
Univ. Obs. Oxford
Acad. des Sciences

Bib. Nationale Paris
Obser. de Paris
Potsdam Obs.
Pulkova Obs.
Obs. de Leyden
Vienna Observ.

Dec. 9, 1908

Rules for Publication of Annals

The number of subdivisions, title and subtitles should not exceed four.

Each table should have a number and title of one line, certainly not to exceed two lines.

Each column should have a heading not to exceed four lines, and preferable one or two

Cost of Annals.

H.A. 49,1	523.29	Sturgis
49 II	578.38	"
57,1	801.96	"
59,Pt1	167.44	
60 Pt 6	204.37	Fairchild
60,7	18.20	"
60,8	128.22	"
61 Pt. I	382.24	Sturgis
62 Pt I	523.68	Leaming
	3327.78	

Wyeth	400 - 640
Mann	600 - 800
Hinkley	" - "
Swan	600 - 840
Hill	480 - 720

Sturgis 2285.87

June 11, 1908. 341.85

Mean 600.

Dec. 9, 1908.

United States.

Assoc. Paris Inst.	1750	—			..	35
" "	1789	Franklin	Boston	Physicist	3	39
	1829	Warden	N.Y.	Geog.	1	69
	1869	—			..	69
Roy. Soc.	1750	—			..	74
	1789	Bowdoin	Boston	Physicist	2	64
	1829	—			..	49
	1869	Peirce	Cambridge	Astron.	2	49
Russ. Acad.	1750	—			..	42
	1789	Franklin	London	Physicist	3	36
	1829	—			..	51
	1869	Dana	New Haven	Physic. Geol.	3	66
	.	Gray	Cambridge	Botanist		

1908-9	Camb. Club.	
Dec. 31	Walcott.	
Jan. 14		Eliot
" 28	Briggs.	
Feb. 11	Taylor	
" ~~28~~ 25	Pickering	
Mar. 11	Moore, G.F.	
" 25		Gray
April 15		Goodwin.
29	Agassiz	

Trowbridge

Amos

Lawrence

Dec 13 1908

Morehouse's Comet.

	1^h $\Delta\alpha$	1^h $\Delta\delta$
8320	-0.1	-.020
30	0.2	.022
40	0.4	.024
50	1.0	.028
60	2.8	.034
70	5.5	.040
80	29.0	.036
90	62.0	-.009
8400	40.5	+.039
10	-9.4	+.047
20	-2.6	+.036
40	+0.2	+.024
60	+1.3	+.015
8500	+20	+.009

Editor.

1908	
Jan	140.45
Feb	11.80
Mar	20.80
Apr.	27.25
May	—
June	7.40
July	13.30 10.80
Sept.	5.00
Oct.	5.45
Nov.	—
Dec.	18.20
	$260.45

Faint Visibility

	Comp.	Obs.	O−C
1	9.0	9.0	0.0
5	12.5	12.0	−0.5
6	12.9	12.5	−0.4
8	13.5	12.8	−0.7
12	14.4	13.5	−0.9
15	14.9	14.5	−0.4
24	15.9		

Coal 1907-8

West Wing	32.7
Laboratory	11.6
Brick Building	41.6
House 9 2000	46.
1908 House range	13.
[illegible]	33.

Dec. 21. 1908

Annals

Vol.	Subj.	Copy Printed Distrib.	Complete	Inc.
			49	47
49.1		Feb 24	50	52
59.1		"	54	55
60.6		"	~~57~~ 58	56
" .7		"	59	61 –
" 8		"	60	
49.2		May 23		
50	Rev. Harv. Phot.	"	52	
61.1		"	55	
54		Dec. 19		
56.4		"	Distrib.	
57.2		"	58.3	
59.2		"	59.3	
60.9		"	.4	
64.1	M.P. 1902–06.	"	61.2	
" 2	SS Cygni	"	68.1	
" 3	Cat. Stars Schön.	"		

Unfinished.

58.3	Blue Hill				
47.2	Photog. Var.		64.5	Distribution H.C.50.	b
52.2	Eclipses Jup. Sat. – Part in type	b	"	J.D. 3167? .	b
55.2	Meas. Min. Var. Star Posit. "	a	"		
56.5	Adjac. Stars		65		
" 6			66 "		
" 7			67		
61.2	Transnep.	a	68.1	Bolton Sanders	a
" 3	E.H.H.		2		
62.2	A.S.		3		
63.	Mitchell.		69.1	Bolt.	b

Dec 22, 1908.

Plates Dec 16, 1908.

Distrib. H.A. 54.
Began Oct. 1. 1907
Sent to binder Sep. 30, 1908
Distrib. Dec 19 "
1st copy Boston Dec. 20
Calif. Jan 4
Cuba Jan 13
London, Jan. 21 Jan 28
Mexico " 25 Feb 9

· 49 1-93. O.C. Wendell
· 52 front plates 149-152, 153-272 R. A. Sampson
54 7 plates 55-59. 12 inch Merid. Phot.
+ 55 384 A.J.C. Var Stars
56.4 65-81 plates Adjacent Stars.
+ 59.4 95-106 + 24 ? = 36 Phot. mag. Bright Stars
+ 61.2 113-156 (?) Transneptunian d
64.5 —
+ 68 1-59 + 9 plates = 25 pp. Ballons Sondes

· 58.3 At Binder's Blue Hill. 63d Report
· 59.3 " " Moon Phot. S. Ophiuchi
· 59.4 " " E.S.K. · Am. Assoc. Math. Soc.
· 61.2 " " W.H.P. ·
· 68.1 " " Ballons Sondes ·
~~64.4~~

✓ 52 Part II Eclipses Jup. Satt.
✓ 55 " II Max. Min.
✓ 56 No. IV Distribution of the H.R.
✓ 56 " V Double Stars
56 " VI J.D. 3182
59 " V etc.
69 Part I East Equat.

Telegraphone, Cornell
Chocolello

144

Jan 21, 1909.

Annals incomplete

47.1 dist

52.1 dist

52.2 s

55.1 dist.

55,2 s

56,1 dist.

" 2 dist.

" 3 dist.

" 4 dist.

59 1 2 3 4 dist dist

61, 1

" 2 162.

62.1

63 none

64,1

" 2

" 3

" 4

68,1

In Maine installed town, dam. Paper plant most up to date in Eastern Maine. in 8 months built chimney Simon Hardy Co. Ltd Lewis Haseltine 10,000 letters a day. Rogers. Henry Engine Mayor. Keen Cutter R.R. Frank Gilbraith.

~~Jan 23, 1909.~~

	Feb. 9, 1909.		March 20:
		Ack. rec'd	
Distribution	H.A. Stds.		58-3, 59-3,4, 61-2, 68-1
Begun	Oct. 1. 1907.		
Sent to binder	Sept 30. 1908		
Distrib	Dec 19 "		March 23,
1st copy Boston	" ~~20~~ 19 "	Dec. 20. 1908	
Calif.	1909	Jan 4 1909	
Cuba	"	" 13 "	
London	Jan 21 "	" 28 "	
Mexico	" 25 "	Feb. 9 "	
France	Feb. 15	" 25 "	
Germany	" 16	Mar 1 "	

Feb. 28, 1909.

Coal consumed.

West Wing	32	
Isolating	12	
Brick Building	44	before
" "	52	07-08
" "	35±	08-09
House	46	
Range	13	

Visiting Committee

[illegible]
[illegible]
Rainie
Bowditch
Alden
Mrs. Draper
Agassiz
Thomson

Scale of Cloudiness
0. Clear
1. Misted Photom
2. Ordinary Visual
3. " Photog
4. Misted Circle, Circle Lost
5 Cloudy

Periodicals lost Harv. Grad. Mag. Sept. 1907
Pop. Sci. Monthly Feb. 1908

April 12, 1909.

48 Cassiopeiae 3.728 - [illegible] - Wendell. −3.6 to −2.7 per CS.

" " 37240 Duncan

u Helen

Wendell

Schlesinger

Scale

7.77 =

93."

Schilling [illegible]

Eng. Mech

Obsv. Co

Eng Mech

Prepare glass

4

variable x Prob. error 1 Weight 1

" y " " k " $p = k^2$

Approximate relation: $y = qx + \text{const.}$

To find true relation, put:

$$\xi = x + \frac{q}{p} y$$

$$\eta = y - qx$$

and seek in the ordinary way graphically or with least squares the relation

$$\eta = \alpha \xi$$

which fits best the values η taken as functions of ξ.

Then the true relation between x and y is:

$$y = x \frac{p(\alpha + q)}{p - \alpha q}$$

April 12, 1909.

48 Aurigae 3.7282 - Albrecht - Wendell. -3.6 to -2.7 per CS.

" " 37240 Duncan

Nivall. [illegible] der Linien im
[illegible]

a Hel Wendell
Schlesinger

Scale

7.77
93

Schilling [illegible]
Eng. Mech
Observ. Co
Eng Mech

Prepare glass -4

April 12, 1909.

48 Aurigae	3.7282 Albrecht -	Wendell.	-3.66-2.7 per CS.
" "	37240 Duncan		
u Herculis	2,410,001.93 +	2.0536 ± .0001 2.0513 ± .0004	Wendell Schlesinger

Scale 12-inch Metcalf Telescope

7'.77 = 5 cm.
93''.2 = 1 mm.

Silvering Specula.
Eng. Mech. 89, p 444.
Observ. Cat 1892 p 373
Eng Mech 76, 475

Prepare glass for silvering Eng. Mechanic 89 4.54

May 7, 1909.

References to Graphophone.

Nature 80, 188. Gr. as a [illegible].

Diff. obs. bright stars [illegible]
Astron. Soc. of Pacific 20, 24.

683104

12 inch Meridian Phot.: 2,412.5

	Month	No. Series	Stars	Av. No. Se.		
					674112	
1909 June 1	May	4	321	1284	80	695,896	
" July 1	June	6	533	2132	89	698,028	
" Aug 1	July	7	269	1076	38	699,104	
" Sept 1	Aug.	9	559	2236	62	701,340	
" Oct 1	Sept.	14	686	2744	49	704,084	
" Nov 1	Oct.	11	745	2980	68	707,084	
" Dec 1	Nov.	12	773	3092	64	710,138	
1910 Jan 1	Dec.	9	763	3052	85	713,208	1,496,312 Sub. 16.

W.H.P. July 19 – Sept. 11, 1909. 30,028

Canvas

0 19 oz. 22 in wide running yard.
00 20 oz.
000 21 oz.

Comparison large lenses. Pots. Publ. No 46

Eclipse Sun - total near N. Pole. June 17 1909.

Occult. Mars. Sept 1. 1909

		Obs. 15 inch	[illegible]
1st ~~Contact~~		8 57 43	8 57 ~~50~~ 50
2d	"	Cl.	58 5 14
3d	"	9 57 26	9 57 30
4th	"	58 15	9 58 16

August 4, 1909.
Catalogue list – of Astronomers

Campbell, W.W.
Hill, G.W.
Frost, E.B.
Brown, E.W.
Bailey, S.I.
Burnham
Hale
Schlesinger
Barnard
Boss
Fleming, Mrs.
Hussey
Leuschner
Elkin
Doolittle, C.L.
Chandler
Searle
Brashear
Tucker
Porter
Pickering, W.H.
Perrine, Cordoba
Ritchey

Metcalf.
Seares Cannon Leavitt
Comstock
Stebbins, Urbana
Parkhurst, J.A.
Skinner
Moulton
Mitchell, Columbia
Lowell
Lord, Columbus
Lewis
Doolittle E.
Jacoby King
Davis, H.S.
Flint, A.S. Campbell, Leo.
Eichelberger
Whitney Vassar Miss
Very
Curtiss Santiago
Crawford
Ross. Moreley Easterling
Aitken
Brooks
Swift

Chase
Wilson
Wright, Lick
Willson
Frisby
Whitney Miss
Stone
Ellerman
Stockwell
Frost, R.H.
Hill, G.A.
Todd
Poor C.L.
Eastman
Poor, J.M.
Peters
Coggshall, Bloom.
Abbot
Howe H.A.
Brown S.J.
Adams.
Howe Chas S.
Holden E.S.

Wright Chicago
Wadsworth
Upton
Townley
Burckhalter
Rees
Pritchett H.S.
Payne W.W.
Morgan H.R.
Lovett E.O.
Seares F.H.
Leuschner
Miller J.A.
Evans H.B.
Sloan Observatory
See T.J.J.
Todd D.P.
Updegraff
Reed
Moulton E. Kansas
Chandler Cardonell
Peck
Chamberlin
Rosby

Coit
Curtiss
Hall Asaph Jr.
Snyder.
Fox.
Curtiss R.H.

Cannon
Leavitt
Maury
Metcalf.

Dugan
Plaskett
Tuttle

Aug 7-1909.

Annals of Observatory

47	Photog. Var. Near Stars Budget	General Obs.	p	47.II
50	Rev. Harv. Phot.	———	C	–
51	Atlas of Moon	———	C	–
52	Jup. Sat. Obs.	Discuss. Sat.	p.	–
53	Miscell. Researches		C	–
54	Miscel. Phot. H-Stars		C	–
55	Cat. Var. Stars	Max. Min.	p.	–
56	1-4 Draper Researches 5.6		p	56
57	Var. Compilat. 1895-1900.		C	–
58	Blue Hill		C	–
59	Miscell. 1-4 E. S. King		p	56
60	Miscell. Observ.		C	—
61	1,2 W.H.P.		p	III
62	Search Stand. Part I			II
63				
64	Miscel. Phot. 1-6		p	7
65	Zone -10° to -14° Gener.			
66	" "			
67	Cat. Zone			
68	Blue Hill I. Balloon Sounds		p	2t
69	O.C.W.		p.	2t
70	12-inch Mer. Zones		p.	—

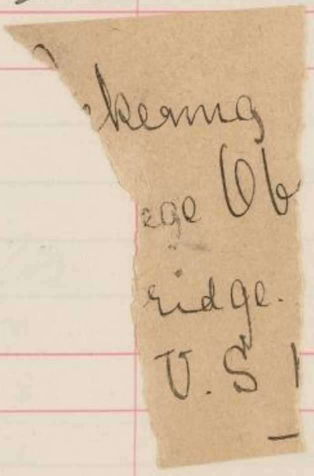
7C 3p. 7p

Aug. 7. 1909.

H.A. 69. Detail table summary
Introd. H.A. 70. Decimal table over zones
Polar Sequence. Introd.
" " Phot. Polar Stars.
" " 1' Plates.
Gr. H.P.
Dist. Abs.
Stars 7.5 mag. Doublet.
Sel. Harvard
" Kapteyn

Laws Bulletin 14, RV Tauri Nature 78,16
Period RR Draconis, 190258?

Envelope mislaid sent with address below:—



kering
ege Ob
ridge.
U.S

October 24, 1909.

Unfinished publications

47.2 Ledgers. Ptg. variables.
Zone 0°50' to 1°00' 16000 stars, 160 sh.
Stand. Ptg. Magn. Stars.
" " " Plates
Ptg. magn. 1 star each 1°. 10,000

Charts Pleiades etc.
Chart 30° square

Unpublished.

47.2
56.5 Pec. Spect.
6
59.5
6
7
8
61.3 Comets W.H.P.
62.2 Proper Motions
63 Miscell. Papers.
64.7
.8
65 Zone Journal
66 "

68.2
69.2 O.C.W.
71.

Oct. 24. 1909.

Miss C.		Miss Leland		Miss Leavitt	
1		2	HC 152	3	HC 127
4	HC 140	5	HC 152	6	HC 127
7	HC 159	8		9	HC 130
10	HC 159	11		12	HC 130
13	HC 140	14		15	HC 131
16	HC. 159	17		18	HC 130
19	HC. 159	20		21	HC 130
22		23		24	HC 135
25		26		27	HC 131
28		29		30	HC 142
31	HC $\overset{127}{129}$	32	HC 152	33	HC 142
34		35		36	HC 135
37	HC 134	38		39	
40		41		42	HC 135
43	HC 137	44	H.C. ~~44~~ 152	45	
46	HC 134	47		48	HC 130
49		50	HC 122. Miss Leavitt	51	HC 130
52		53	HC 152	54	
55					
	10, 9		6, 12		15, 3
	9		12	3	31, 24

Double mean N. Pole.

HA 46, 81 −1008.0 −335.2

−1004.8 −329.2

3″.2 6″.0 Diff 6°.8

Dec. 14, 1909.

Scale	10' sq.	20' sq	30'.	60'
10" = 1mm	60 mm	120 mm	180	360
20" = 1mm	30 mm	60 m	90	180
~~30"~~ 5" = 1mm	120 mm	240 m	360	720
60" = 1m	10 mm	20 m	30	60 m

R U Cephei	1h	2m.9	+84° 19'			
R Camel.	14	25.1	+84 17		7.9	13.7

Dec 15. 1909

Comparison Potsdam, Harvard. page XXIX. 14199

	W	GW	WG	G	All	
C_{11} -44	44 +23	97 +23	55 +10	90 +1	286 +14	W .13.06
C_1 -44	128 +27	600 +23	328 +7	436 -5	1492 +12	GW .52.39
D -45	1347 +35				9029 +19	WG .35.64
Mean	+28				+15	100 .87
Middle	+4					

C_{11} -

200-249	14	+	19 +4
250	28	+	18 +3
300	41	+	15.0
350	65	+	14 -1
400	39	+	15.0
450	57	+	14 -1
500	42	+	12 -3
550			14 -1
600			12 -3
650			19 +4
700			18 +3
750			22 +7
800			24 +9
All	286	+	15

Elected.

1 29
6 32 33 36 36 31 | 48 48 49 44 47
15 48 40 40 49 41 | 45 40 42 40 48 (37)
10 51 52 59 55 50 | 53 50 50 56 57
2 62 64
1 73

1257 | 117 ; 16/7 ; 112/6 ; 7 ; 125
119 ; 74
67 ; 68 ; 8.9

Died

54

67 66 67 67

78 79 ~~74~~ 71 70 79 76 73 77 2

80 81 80

1257

92

Born		Youngest		
1772				
1784 89				
1791 94 94 98 95		Leaming?	1842	21
1809 07 06 07 00		Hill	1863	1
1810 13 15 11 18		Gibbs	1864	4
1822 27 27 28		Trowbridge	1868	2
1834 35 31 31 38		Eliot	1870	5
1846 43 44 46		Agassiz	1875	2
1850 55 51		Rollins	1577	22
		Lawrence	1899	1
		Briggs	1899	10
		Lowell	1909	

Proportions	W	GW	WG	G	All
C_{11}	15.4	33.9	19.2	31.5	100.0
C_1	~~8.~~ 6	40.3	22.0	29.3	100.2
D	14.9	44.3	27.6	13.2	100.0
	389	1185	688	740	
	130	39.5	22.9	24.7	
	13	39	23	25	

B	821	09.4	9 9 ~~9~~ 4
A	2758	31.5	32 41 29
F	1092	12 ~~4~~	12 53 ~~50~~ 47
G	931	10.6	11 64 59
K	2530	28.9	29 93 78
M	629	7.2	7 97
		100.0	100

Dec 15. 1909

Composite Potsdam, Harvard. page XXIX. 14199

	W		GW		WG		G		All			
C11-44	44	+23	97	+23	55	+10	90	+1	286	+14	W	.13 .06
C1-44	128	+27	600	+23	328	+7	436	−5	1492	+12	GW	.52 .39
D-45	1347	+35	4002	+29	2494	+8	1186	−6	9029	+19	WG	.75 .64
Mean		+28		+25		+8		−3		+15		1.00 .87
Middle		~~.14~~		~~26~~								

C11-44

200-249	14	+.19					+19	+4
250	28	+.18					18	+3
300	41	+.15					15	.0
350	65	+.14	42	+13			14	−1
400	39	+.14	141	+16			15	.0
450	57	+.16	265	+12			14	−1
500	42	+.04	475	+13	70	+19	12	−3
550			443	+09	400	+20	14	−1
600			126	+06	1166	+18	12	−3
650					2356	+19	19	+4
700					2910	+18	18	+3
750					1873	+22	22	+7
800					314	+24	24	+9
All	286	+14	1492	+12	9029	+19	+15	

Proportions	W	GW	WG	G	All
C11	15.4	33.9	19.2	31.5	100.0
C1	~~18.~~ 8.6	40.3	22.0	29.3	100.2
D	14.9	44.3	27.6	13.2	100.0
	38.9	118.5	68.8	74.0	
	130	39.5	22.9	24.7	
	13	39	23	25	

B	821	09.4	9 9 ~~9~~ 4
A	2758	31.5	32 41 ~~29~~
F	1092	12.4	12 53 47
G	931	10.6	11 64 59
K	2530	28.9	29 93 78
M	829	7.2	7 97
		100.0	100

Dec 23. 1909.

Form for DM if published in Annals

Magn	10.5	10
R.A.	15 26.3	16
Dec	18.2	10
		36
		180

250 on a page
62,500 in a volume

Form for Spectra print chart

DM. No.	12345	13
R.A.	16.5	10
Dec +16 25		16
Magn	10.3	10
Spect.		11
		60

Revised Photom Magn 00
" Wedge
" C.P.D.

	00,00,00	17
Plate	123	9
Maximum	6.8	8
K line		8
Diff.		6

6

Jan. 9, 1910

60-inch Telescope.

I 36341.2 No plates
Spectrum Index

Orig. cost	2,500
Dismantling transfer	1,095
Erecting Cambridge	300
Building	2,800
Tank	500
New Contract	2,000
Time of W.P.G.	1,000
	10,195

Polishing Machine 65 10

1 Recent Meter Phot. calib 148

					Sub.	Sta.	~~[illegible]~~ Getting
1909 Oct 1		683,104					
		704,084					
1910 Jan 1	Dec	713,208	1,396,312	Dec. 9	763	3052	85
Feb 1		716,500	1,399,604	Jan 13	823	3292	63
Mar 1		717,778	1,400,882	Feb. 8	322	1288	40
Apr 1		719,372	1,402,476	Mar. 8	396	1584	49
May 1		720,344	1,403,448	Apr. 5	243	972	49
June 1		721,052	1,404,156	May 4	177	708	44
July 1		721,624	1,404,728	June 7	143	572	20
Aug 1		724,666	1,407,764	July 14	759	3036	54
Sept 1		725,~~780~~ 440	1,408,544	Aug 5	195	780	19
Oct. 1		725,732	1,408,816	Sept 3	73	272	24
Nov. 1		726,952	1,410,036	Oct 8	305	1220	38
Dec 1				Nov			
Jan 1				Dec			

2,648

Oct. 13, 1910.

30° Square

Region	C 12	11	11		
Dec	15	7	8		
Obs	−15° 16270	24	22	95 Obs mag.	
R.A.	12 15.6	16	10 22	12 15 33.2	
Dec	−14 15	16	19	−14 15.6	
Ptm	10.36	12	12		
Ptg	11.15	12	12		
Spect	K5	10	~~10~~		
Pg − Pm	1.15	10	10		
Resid	0,0,0,0,0,0,0,0,0,0	27	27		
Cor Resid		27	27		
x	00000	13			
y	00000	13			
		198	180		

[illegible]

	N	ΣN	log ΣN
71.00	88	88	1.94
90–99	14	102	2.01
80	26	128	2.11
70	36	164	2.21
60	52	216	2.33
50	81	297	2.47
40	160	457	2.66

Appropriation Expended. 1909.

Assist.	4735.79
Plates	962.40
Transport (lost copy)	347.67
Supplies Coolidge	301.11
	6346.97

H.C. 67 Part II.
Analysis of Zone −10° to −14°.

Cat. No.	Magn.	Resid.	
		α	δ
		s	"
0000	0.0	+.00	+1.6

Fares. B. to Pasadena and back	118.80
Berth each way	22.
Section	44.
Parlor Car.	79.

Feb. 27, 1910.

Asteroids. Order of brightness, m_0

No.	Name.	Mag.
4	Vesta	6.5
1	Ceres	7.4
2	Pallas	8.0
7	Iris	8.4
6	Hebe	8.5
15	Eunomia	8.6
3	Juno	8.7
8	Flora	8.9
9	Metis	"
29	Amphitrite	9.0
20	Massalia	9.2
40	Harmonia	"
11	Parthenope	9.3
18	Melpomene	"
192	Nausikaa	"
10	Hygiea	9.5
39	Laetitia	"
16	Psyche	9.6
511	Davida	"
12	Victoria	9.7
13	Egeria	"
14	Irene	"
27	Euterpe	"
433	Eros	"
19	Fortuna	9.8
22	Kalliope	"
44	Nysa	"
51	Nemausa	"
349	Dembowska	"
387	Aquitania	"
532	Herculina	"
5	Astraea	9.9
30	Urania	"
63	Ausonia	"
109	Felicitas	"
324	Bamberga	"

36

April 1, 1910.

Photometric Comparison of 16 inch Doublet.

412.5 Diameter objective about 413

414

413

90 outer diameter of cell of prism

63 " " "

$413^2 =$ 170569

8100

162469 5.2107

3969 1.5987

1.6120 4.03 magn

27/46

162

106

122

413 + 90 503 2.7016

413 − 90 323 2.5092

63 5.2108

3.5986

1.7993 1.6122 4.03 magn

60-inch Reflector.

$59.5^2 =$ 3540.25

$20^2 =$ 400

3140.25 34970

36 1.5563

~~3104.25~~ ~~3.4920~~

~~19357~~ = 4.84 magn.

19407 = 4.85

23

23

69

46

529

3540.25

529.

3069.25 3.487

1.5563

1.931

4.83

Library

8½ ft. for 4° pamphlets

18 " " 8° "

2|26½

13 drawers

April 3. 1910.

HC

Sept 8	151	20 New Variable Stars in Harvard Map, No. 49.	Cannon
Jan 14	152	" " " " " No. 25, 37, 44, 53	Leland
Feb 16	153	Opposition of Eros (433) in 1910. Eph. of Br. Asteroids.	
Mar 12	154	Determination of Absolute Wavelengths with Objective Prism	
Mar 21	155	Accurate Measurement of Photographs	
	~~156~~	~~Brightness of Halley's Comet.~~	
	~~157~~	~~Stars having Peculiar Spectra~~	~~Fleming~~
	~~158~~	~~New Variable Stars in Harvard Map~~	~~Cannon~~
	159	Curved Photographic Plates.	
	160	Photog. Magn.	
Mar. 30	156.	Comp. Stars for Halley's Comet	
" "	157	Brightness of "	
" 31	158	Stars having Peculiar Spectra	Fleming.
" "	159 160	7, 10, 16, 17 New Variable Stars	Cannon.

Curved Plates.
New Map Miss Cannon
Photog. Magn.

May 29. 1910.

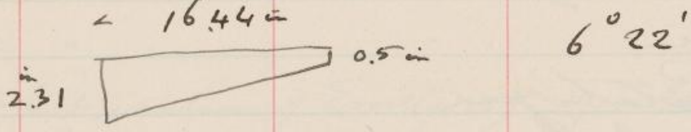
Annals for which description is now needed.

72.2 Plates 30° square.
Bond Zone.
71 Descriptive Catalogue.
64.7 Bright Stars N.P. 4 and 12 inch
Star marked A.
100 Stand.
R. and S. color [illegible]
Second Catalogue. northern stars
Photom. Polar Stars.
Calendar Et. Photog. Magn.
" Pos. Halley's Comet.
Definit. 12-inch
Economy Series
Polar Stars
R Camel.
Eros.

Ptg. Magn.
Backlund ✓
Baillaud –
Gill –
Hale ✓
Kapteyn ✓
Pickering ✓
Scheiner –
Turner ✓

June 2, 1910

Prism 16 inch Metcalf Tel



C = 1.57575
D 1.57972
F 1.58954
G 1.59777

.00823
382

3'.17 60

190".2 | 90

2.1 mm. Hβ & Hγ.

Electrical Constants.

$I = \frac{E}{R}$ ~~Current~~ amperes = $\frac{\text{Volts}}{\text{Ohm}}$

Watts = Volts × amperes

16 candle power (carbon) = 52 watts
746 watts = 1 HP

↓

Uniformity in Mathematical Notation and Printing. Nature, 80 p 102.

Address Lord Rayleigh Royal Society Nov 30, 1908.

Sept. 24, 1910.

Pritchard Region

	B.D.	R.A. 1900			Dec. 190	
	+8° 94	0h	36m	3s	+8°	48.′4
	+7° 450	2	50	55	+7	59.0
?	+7° 6810	4	33	41	+7	40.3
	+8° 2050	8	20	34	+7	53.5
	+6° 2384	10	53	35	+6	37.7
	+9° 2735	13	30	54	+8	42.2
	+7° 3023	15	41	36	+7	40.8
	+8° 3567	17	58	34	+8	24.7
	+7° 4477	20	23	15	+8	6.3
	+8° 4874	22	24	7	+8	36.9

Letter Kapteyn, July 17, 1910.

Nov. 3. 1910.

Astronomical Photography. Early.

1882

Mar 17. Planned Dark frame for Telescope.
" 19 Took photo. of stars with E. Equatorial
" 20 Dev. & measured photo. Error only
$\frac{2}{10000}$ inch instead of $\frac{1}{1000}$ as I had expected
Mar 29 Out to Observatory & photo'd Moon & Pleiades
" 30 Developed & began measuring latter.
Apr 7 Hired a 7½ in Portrait lens.
" 10 Obtained large lens. Developed negatives
& experimented in the evening.
Apr 11 Completed camera for large lens.
" 12 Took some photos in the evening with my
large lens.
Apr 20 In evening took two 30 min. exposure
photos of the pole with my big lens at
the Institute.
Apr 23 Carried my big lens out to Cambridge
this morning. Photographed in evening.
May 2 Got the Clarks started on the clock-
work for my camera.
May 7 Went to Cambridge & photographed Prae-
sepe & the Comet.
May 8 Went to Cambridge & set up photo. camera
May 16 Worked on telescopic camera afternoon & eve.
Nov 16 Got my clockwork for driving my plate
in the Telescopic Camera.
Nov. 18 Began work on Telescopic Camera.
" 20 Finished track for " "
" 23 Worked on car " "
" 24 Completed Car & Track.
Dec 6 Transit Venus. Took 6 photos. [Over]

E	11,492.00
G	511.60
22	3,444.94
24	1303.60
60	3782.34
E	662.55
Fr	35.00
B	1563.20
	$22795.23

D

Dennin

"

Deprec

Incom

Exp

"

Rub

Balances, Dunning 8,000
" Sturgis 1,200

Nov. 3. 1910.

1883

Mar 7 Bgt portrait lens $5.
See acct.
Apr 8 Took photos. of Orion
from Institute.

E	11,492.00
E	511.60
22	3,444.94
24	1303.60
60	3782.34
E	662.55
tr	35.00
B	1563.20
	$22795.23

Denni
"

Defec
Inan
Exp
"
Rel

Balances, Denning	8,000
" Sturgis	1,200

Nov. 3. 1910.

Anonymous Fund 1902.

Expended by University	11,492.00
General Equipment	511.60
24 in Tel. A.	3,444.94
24 " " B	1303.60
60 " Tel.	3782.34
Electric Ltg Plant	662.55
Fire protection	35.00
Brick Bldg Equipt	1563.20
	$22795.23

Income 1909-10.

Dennin. H.O. Income	5.200
" income	7.000
	12.200

Deficit. 1909-10	10,000.
Income 1910-11 inst^mnt	7,000
Expenses S Africa	1,000
" Arequipa	2,000
Publica.	4,000

Balances, Denning	8,000
" Sturgis	1,200

Nov. 5. 1910.

			Seq.	Seq.	
17	Asy. Polaris.	Pol. Cap +90° to +60°	16	16	37.1
58	" "				37.2
2.52	" "	All 9.0 mag. range 3.0 mgts.			57.2
50	" "	South −30°			
##	" "	" "			
177	Sh. Per. Algol	North −20°			
80?	" " "	South −30			

R Camel. c.

1899	4	9.4^{2}	+.20
1900	62	9.33	+.11
1	36	9.13	−.09
2	37	9.23	+.01
3	20	9.15	−.07
4	24	9.18	−.04
5	22	9.26	+.04
6	52	9.26	+.04
7	42	9.16	−.06
8	49	9.21	−.01
9	49	9.23	+.01
10	29	9.12	−.10
all	426	9.2^{2}	±
	12	9.2^{2}	$\pm .0^{65}$
	rejecting 1899		±.053

Pamphlets bound.

1901	2155
02	2303
03	2375
04	1143
05	1035
06	4842
07	2202
08	1307
09	1215
10	3714
	22,291

Nov. 1910.

Visiting Committee

Bowditch	Moulton
Metcalf	Leavitt
Alden	Choate
Mrs Draper	Cross
Agassiz	

Roll vertical file	$33.00
" " " ends, locks	39.00
4 sets A-Z guides .50	2.00
1500 manilla folders 5.00	7.50

Nov. 1906.

Printing D.M.

Drawing	$30	0°-20°
Paper	20	60°-80°
Printing	40	80° to 90°
	$90	

Nov. 22, 1910

Blue Hill Annals.

20,1		
2		
30,1		
2		
3		
4		
40,1	447.00	
2	456.15	
3	414.22	
4	515.68	Bell & A.d.R.
5	521.53	" "
42-1	685.57	" "
2	819.93	
43.1		
2	391.20	
3	719.29 +	
58.1	312.16 +	
2	368.92 +	
3		
68,1		
2		

Reprint of Appx. E. H.A. 43. 1 & .94

+ Cost of illustrations estimated

Nov. 22. 1910.

Salary A. H. Frost

						Annl Sal.
Comm. & Obser.	June 1897 –	May 1898			25 a month	$300
	"	98	"	99	30	360
	"	99	"	1900	35 + 25	720
	"	00	"	01	" + 30	780
	"	01	"	02	40 "	840
Oct. 02 in charge	"	02	"	03	45 "	900
	"	03	"	04	41.67 + 50	1100
	"	04	"	05	70 + 30	1200
	"	05	"	06	78.33 + 80	1300
	"	06	"	07	76.67 + 40	1400
	"	07	"		85 + 40	1500

St. Louis & Mallinckrodt $14.00 for 36 plates 8×10
8×10 market price $2.40 a doz.
1 pl 20 cts. 8×10 14×17.
6 " to go down 1 plate .75
3 " to come back

Nov. 22, 1910.

variable x prob. error 1 weight 1
y " " k " $p = k^2$
approx. relation $y = qx + \text{const.}$
To find true relation, put:

$$\xi = x + \frac{q}{p} y$$

$$\eta = y - qx$$

and seek in the ordinary way graphically or with least squares the relation

$$\eta = \alpha\xi$$

which fits best the values of η taken as functions of ξ

Then the true relation between x and y is:

$$y = x \frac{p(\alpha + q)}{p - \alpha q}$$

Solution by Schwarzschild.

Nov. 24 1910

Photom. magn. Sun −26.83 (H.A. 61.62)
Diam. star magn 1.3 ″0084 (Proc. Amer. Acad. 16, 4)
assuming magn of Sun −25.5. Hence corrected diam
of stars will be found by subtracting 1.3 magn.

Stars diam

Magn	Diam	
0.0	0.″0084	7.92
5.0	0.00084	6.92
10.0	0.000084	
15.0	0.0000084	

813
832
851

Log diam in seconds = 7.92 − 0.2 M.

Proposed by Aitken

0.0 − 3.0	3
3.0 − 6.0	5
6.0 − 9.0	10
9.0 − ∞	20

	log D
0.0	= 2.00
5.0	1.00
10.0	0.00

Proposed by E.C.P.

log D = 2.3 − 0.2 M.

5.0	20.00
6.0	12.62
7.0	7.96
8.0	5.02
9.0	3.16
10.0	2.0

0.0	= 2.00	100.0
1.0	= 1.80	63.1
2.0	= 1.60	39.8
3.0	1.40	25.1
4.0	1.20	15.8
5.0	1.00	10.0
6.0		6.3

November 27. 1910.

Special Plates

H	333	24 inch	Reflector.	Spectrum Pole
	335	"	"	"
	343	"	"	" Pleiades.
	344	"	"	" Praesepe.

November 27, 1910.

Deceased Astronomers.

Copernicus	1473 - 1543	70
Kepler	1571 - 1630	59
Galileo	1564 - 1642	78
Newton	1643 - 1727	84
Bradley	1692 - 1762	70
Herschel W.	1739 - 1822	83
C Herschel	1750 - 1848	98
Gauss	1777 - 1855	78
Bessel	1784 - 1846	62
Bond W.C.	1789 - 1859	70
Encke	1792 - 1865	73
Herschel J	1792 - 1871	79
Struve	1793 - 1864	71
Argelander	1800 - 1875	75
Airy	1801 - 1892	91
Peters C.A.F.	1806 - 1880	74
Leverrier	1811 - 1877	66
Peters C.H.F.	1813 - 1890	77
Rutherfurd	1816 - 1892	76
Adams	1819 - 1892	73
Gould	1824 - 1896	72
Schönfeld	1828 - 1891	63
Draper H	1837 - 1882	45
Rowland	1848 - 1901	53
Keeler	1857 - 1900	43
Huggins	1824 - 1910	86
Newcomb	1835 - 1909	74
Schiaparelli	1835 - 1909	74

November 27, 1910
Living astronomers

Lockyer	1836 –
Hill	1838 –
Auwers	1838 –
Burnham	1838
Ball	1840
Gill	1843
Darwin	1845
Backlund	1846
Pickering	"
Chandler	"
Boss	"
Holden	"
Seeliger	1849
Kapteyn	1851
Müller	"
Michelson	1852
Struve	1854
Poincaré	1854
Elkin	1855
Küstner	1856
Fleming	1857
Barnard	"
Pickering, W.H.	1858
Scheiner	1858
Turner	1861
Campbell W.W.	1862
Dyson	
Schwarzschild	1873

November 27, 1910.

Living astronomers.

Wolf	1863 –
Ritchey	1864 –
Frost –	1866
Hale	1868
Schlesinger	1871

A. Searle	1837	* Astron.
Bailey	1854	* Astron.
Cannon	1863	Astron.
Leavitt		Astron.
Wendell	1845 –	Astron.
Lee	1866	* Astron.
Todd	1855 –	Astron
Lowell	1855 –	* Astron.

Dec. 1. 1910.

Var. Long period

	Ch.	Ecl.
+90 to +30	101	40	12
+30 " 0	98	28	9
0 " -30	89	8	3
-30 " -90	84	14	..
	372	90	

M.	Ecl.	Var.	
3	91	96	190819^3, 125705, 202415, 220133
4	203	204	160021
5	75	76	161122
6	4		
7	120	126	050442, 012607, 161106 185901, 223257^3

Photg. Sc. Magn.

Backlund	1-12
Kapteyn	1-6
Pickering	...
Scheiner	2
Schwarzschild	1-12
Seares - Hale	1-6
Turner	1-12
Gill	1
Dyson	1,2
~~Seares~~	~~1-~~

Dec 19, 1910

	H.A. 59. No. 7		HC 16 $_{O-C}$	ζ Puppis.
	5419.0	5413.2	3.9 +5.1	
	5203.6	3.4		
	4690.2	0.0		
	4682.8	2.7		
	4640.2	0.1		
	4608.4	8.8		
	4542.4	2.6	3.6 −1.2 ~~+0.8~~	
	4472.0	2.8		
Hγ	(4340.7)		0.6 +0.1	
	4200.8	0.8	1.7 −0.9	
Hδ	(4101.3)		1.9 −0.6	
	4026.1	6.1	7.4 −1.3	
Hε	(3969.8)		0.2 −0.4	
	3924.0	4.0	5.2 −1.2	
Hζ	(3889.1)		9.2 −0.3	
	3960.8	0.9	9.8 +1.0	
Hη	(3836.5)		5.5 +1.0	
	3815.7		5.2 +0.5	
	3800.1		8.0 +2.1	
	3769.6			

Blue Hill Photos

7 Neg. by Brayton 8×10
April 11, 1904

January 1, 1911.

Plates taken for Clark Lens. selected for measurement of Spectra.

C 17957	Mars. 8h exposure	
17960	Saturn	23 4 in Cooke
17920	"	E7564 " " Pole
17940	" Pole	I 35832. Pole Shift no. iso
17919	"	I 36011 Spectra δ Cephei
17900	"	I 36009 " "
17980	α Orionis	I 36343 " iso. Pole
17987	"	I 36345 " " " bad
17981	"	I 14159 δ Cephei sp. minim.
.. 17941	Saturn Pole	I 35828 Pole iso spect.
17944	" "	X 8158 Pleiades spect. 2 guides
17939	" "	X 8127 " " "
17901	"	
17943	" "	
17945	" "	
17958	Saturn	
17933	α Lyrae	
17937	Saturn Pole	
17936	" "	
17959	Saturn 8h "	
17932	" " Pole	
17935	" "	

January 7, 1911.

M 3.

a	13.50
b	13.58
c	13.98
d	14.22
e	14.50
f	14.98
g	15.28
h	15.70
k	16.00
l	16.23
m	16.49
n	16.82
o	17.15
p	17.63

Observers, Regardless Zone Vote

Observers	1.2,	2.2,	6	All
G. P. Bond	62	25	7	94
W. C. Bond	"	15	"	15
R. S. Coolidge	"	6	31	37
T. H. Safford		8	20	27
	62	54	58	
Recorded				174
C. W. Tuttle	62	22	37	122
T. H. Safford	"	6	2	8
R. S. Coolidge	"	7	"	7
J. F. Hogg	"	3	"	3
Asaph Hall	·	"	34	52
				174

Kidder's Architects' and Builders' Handbook
Prices Building

Order moved to Melita
L. Agassiz
W. D. Whitney
van 't Hoff.
James Bryce
S. Newcomb.
A. Agassiz.
B. A. Gould
Edw. P.

b probably var.
2 or 3 tenths.

Oct. 18. 1911.

Reflection from 2 mirrors Sci. Oct 7. 1911, 33, 249

cos θ sin φ = sin ½ δ

φ angle two mirrors

θ " inclin to plan perp. intersec

δ required angle reflected ray

Card Drawers

Correspondence	Correspondence
Invest. & Projects	Business
Printed Pamphlets	Meetings
Completed Invest.	

Annals

0	0.0	
		4.0
10	4.0	
		9.0
20	13.0	
		7.0
30	20.0	
		11.0
40	31.0	
		12.3
50	43.3	
60		
70		

Amer Biog.

Hart	Camb.
Willoughby	Balt.
Putnam	Wash.
Thayer	Camb.
Jameson	Wash.
	N.Y.
Billings	Camb.

Feb 19. 1911

Officers of Observ.

		1911 Serv.	Age	Born.	
Searle	'69	42	74	37	7#
Pickering	76	35	65	46	
Wendell	79	32	66	45	
Fleming	81	30	54	57	+
Rolston	86	25	50	61	+
Gerrish	"	"			
W.H.P.	87	24	53	58	
Bailey	"	"	57	54	
King	"	"	50	61	

Annals.

Mar 27. 1911 71.1 Bright distrib. Photog. mags. brightest stars

65 Journal. Zone I

66 " " II

59.6 Phtg. magn. 153 stars.

65th Report.

Amer. Astro. J.

Dinner. A.S.A. 1910

In type.

✓ 59.7. Occult.

✓ " 8 Pos. Moon Occult.

✓ 56.5 Spectra 1688 Southern Stars

~~61.3 [illegible]~~ ~~Draconis Island.~~

✓ 68.2 Blue Hill 1907-8

✓ 64.7 Meridian Obs. 1906-8

71.2 Spectra Stand. Regions

63.1 Neb. (1800)

61.3 Comets.

March 1. 1911

		AC	McC	Mead. Pd.	Cent.
A	1	19	29	36	24
	2	21	34	37	27
	3	21	40		
B	1	19	35	29	18
	2	21	35	31	29
	3	21	36	30	33
	4	23	37	33	30
	5	19	36		26
	6	20	38	35	33
	7	27	39	38	32
	8	23	31		
	9	23	36	39	33
C	1			7	30
	2		34	17	27
	3		33	18	32
	4			8	
	5		33	20	30
	6		37	21	26?
	7			10	19
	8		37	22	32
	9		31	40	
	10			x11	
	11		40	24	27
	12		34	25	19

March 1, 1911

	Am	a	Mark. Pos.	Centre
D 1	24	40		
2	21	36		
3	23	39		
4	26	40		
5	21	40		
6	24	46		
7	22	40		
8	23	40		
9	26	41		
10	26	45		
11	28	46		
12	23	42		25
E 1	24	45		
2				
3	25	45		
4	24	42		24
5	22	42		29
6				
7	24	48		28
8				
9	26	44		24
F 1	28	42		30?
2	22	47		34
3	26	48		35

March 27, 1911.

Cost Annals.

Estim. Wheeler

Contrib. text. $3.50 [illegible] $1.40
tables 5.50

Estim. Univ. Press.

Comp. text $3.00 about $1.00 [illegible]
" tables $9.00

Alterations .75 per hour for copy.
.85 " " " proof.

[illegible]	.38
[illegible]	.65
[illegible]	3
	$1.06

Vacation 1911.

Miss Leavitt. June 15 – Sept. 15
Miss Harwood. " 9 until [illegible] 27. – Oct. 1.
H. W. Winkley, May 22 to Oct. 3 except [illegible]

May 1, 1911.

Memoranda

Geo. Hale.

Wallace, Cramer
Wratten & Wainwright
Panchromatic.

Hall Co Clark Spectrums $4.50

Grouping Spectra.

	64	Russell	Boss.
B	Oe – B8	..	Oe5 – B5
A	B9 " A3	B9 – A5	B8 " A4
F	A4 " F2	A8 – F5	A5 " F8
G	F5 " G0	F8 – G2	G
K	G5 " K2	G5 – K2	K
M		K5 – M	M

Mrs. W. W. Garrett, Missouri School of Mines, Rolla, Mo

Davis Somerville 1866

W. C. English Week days 8:50 to 4:45
Saturdays 8:50 " 12:15

G. P. Fleming, Care of ~~Braden~~ Braden Copper Co.,
Rancagua, Chile.

Miss H Donahue
Maple St. Morristown N.J.

May 13, 1911.

Incomplete volumes of Annals

3	47 Part 1	Light of var. stars disc. [illegible]	W.P.F.	Nov. 1911	Nov.
1	56 No. 5	Spectra 1688 southern stars	A.J.C.	May. 1911	—
4	6	" double stars	"	July .	Dec.
4	7	" objective prism, slit spectra	"	– .	Dec.
5	8	Stars having peculiar spectra	W.P.F.	– .	Nov.
1	59 No. 7	Occultations	E.S.K.	May .	—
1	8	Prismatic normal spectra	"	– .	—
					Dec.
6	61 Part 3	Comets	W.H.P.	July "	Nov.
2	62 Part 2	Light of zone stars	A.S.	" "	~~Nov.~~
3	63 Part 1	Obs. var. long period 1906-10	L.C.	Nov. "	Nov.
5	" 2	Comp. Stars variables	E.C.P.		"
0	64 No. 7	Meridian Phot. 1902-6	E.C.P.	May .	—
6	64 No. 8	100 Circumpolar Standards	E.C.P.	Nov. "	
6	" 9	Grouping H.P.	E.C.P.		
3	67	Catalogue Zone	A.S.	~~July~~ "	Dec.
3	68 Part 2	Blue Hill		May "	—
–	69. Part 2	East Equatorial	O.C.W.	—	
2	71. No. 2	Sequences standard regions	W.P.F.	July	—
6	" 3	Polar Sequence	H.S.L.	Nov.	
6	" 4	Stand. Seq.	E.C.P.	Nov.	
3	72.1	[illegible] 1800 nebulae	S.I.B.	July	Dec.
3	73 1	Blue Hill		Nov	

May 17, 1911.

Publications of Amer. Observ.

	cm.
Harvard	265
U. S. Naval	234
Lick	49
Washburn	28.5
Lowell	19
Columbia	15
Mt Wilson	13
Georgetown	10.5
Yerkes	10
Allegheny	10
Cincinnati	9
Yale	8.5
Flower	8.5
Astrop. Smithson	7
Dudley	7
Laws	3.5
Dearborn	2
Morrison	2
McCormick	2
Vassar	2
Sayre	2
Carleton	1.5
Haverford	1.2
Hudson	1
	212.2
	5
	217.2

Lawrence
Detroit
Chamberlin
Warner
Univ. Ill.
Col. Coll
N. Y.
Univ Minn
Drake
Princeton

	cm
Harvard	265.
U. S. Naval	234.
Others	217 ~~277~~

May 17. 1911.

Our thousand most distinguished men

A Statistical Study of Eminent Men.

Pop. Sci. Monthly. 62. 359 1903

	Sci.	Amer.	
	Bacon	Washington	Watt.
	Aristotle	Columbus?	~~Lagra~~ Lagrange
	Newton	~~[illegible]~~ Livingston	Bunsen
	Descartes	Franklin	
	Leibnitz	Jefferson	
	Franklin	~~Webster~~	
	Galileo	~~Adams, J.~~	
	Pascal		
	W Herschel		
	da Vinci		
	Pythagoras?		
12, 6	Cuvier		
	Darwin	~~Adams, J.~~ Webster.	
	d'Alembert		
	Linnaeus		
	Hunter?		
	Kepler		
6, 2	Hippocrates?		
	Davy	Hamilton	
10, 2	Gassendi?	Jackson A	
	Harvey ?		
	La Place		
	Gay Lussac		
	Arago		
	Spencer		
	~~Lagrange~~ to		

May 22. 1911.

Unfinished Investigations.

W. P. Fleming

pp

30 ½ 71.2 Spectra and Phot. Magn. stars in H Stand Regions. in type Completed

80 56.6? Peculiar Spectra. Completed

120 ½ 47.2 Ledger, variables long period. obsns. In type

150 ½ Mixed type stars.

1 Spectra, 32,000 stars

20 / 2.5 Ledger. var. long per. Spectra according to plates. Out of focus plates.

S. I. Bailey

20 72.1 1800 new nebulae 1659. In type

40 · 2 { Phot. obsns. Arequipa

" " Harvard }

20 3 " " Eros. and other asteroids

150 2 M. 3 Milky Way.

102 M. 5 other clusters Neb. in Magellan Cloud.

2 Peruvian Meteors. S. Africa Expedn

4.5 A. J. Cannon.

20 56.7 Spectra double stars

20 56.8 " slit spectra. ~~Revised Draper Cat.~~

½ [illegible]

1 Draper Catal. to magn 7.0 9.0

1/7 Period of var. disc. by Miss C.

100 Algol variables

20 Revised long period variable

25 Short period var.

May 22, 1911

Unfinished Investigations

H. S. Leavitt

½ Polar Sequence

40 Astro. Stand. Region

Period variables.

Map Sky.

E. F. Leland.

Standard Sequences

1 Charts region 30° square H. S.

Harvard

1 16,000 Bond stars

E. C. Pickering contents annals.

40 1 ~~P~~ Sequences H. S. 30° square.

40 .5 Charts long exposures, 12 inch. Faint stars.

20 64.8 100 circumpolar stars.

20 Grading P. S. etc.

20 [illegible] Rind whl;

250 1 Catalogue 20000 small stars second Rev

50 Sequence Series

50 Polar stars

30 ~~Ecliptic~~ R. Coud

20 Variable stars

100 632 Major sequences

May 22, 1911.
Unfinished Investig.

A. Searle.

½ 62.2 Parallax, Zone stars.
1 Proper motions, Zone stars.
1 67 Catalogue Zone

O. C. Wendell.

Jupiter's Satellites
69.2 Double Stars - Variable

L. Campbell

63.1 Discussion obs. var. 1906-10
Collection obser. 1911-15

W. H. Pickering

Ellipticity Jupiter's Satellites
Photographing Milky Way Zod. light Gegenschein

E. S. King.

Miscell. Obsns 59.10

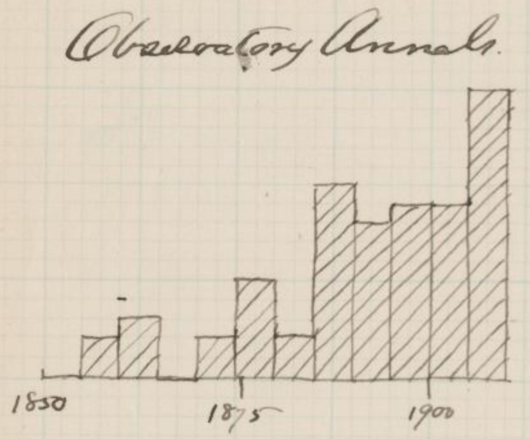
Cl. Preston Parallax, Proper Motion.

July 14, 1911.

Unfinished Annals.

^ · 47.2 800 pages of Table ready for printer Brief introd. needed
^ 56.6 Spectrum double Stars ready for printer in a day or two
56.7 Slit and Obj. Spectra.
x 566 56.8 Stars having peculiar spectra
x x · 59.9
x · 61.3. Manuscript W.H.P. copy complete Aug. 1?
x – 62.2. One third printed.
x 63.1. 1500 pp. MSS. ready 100 pp. in galley Deposit in type.
63.2. Circump. Stars variables. waiting for maps. Proofread whole
64.8 Bailey's Misti Met.
" 9 Classif. H.P.
x 67 Copy sent to Germany in 1910.
69.2 Phot.: O.C.W.
x 71.2 Ephem. H.S. in type.
71.3 McAdie. Eq.
71.4 Sequences
73.1 Blue Hill
x 72.2 1600 new var.
x " 1 Polaris Moon

Observatory Annals.



1850 – 1875	7 volumes
1875 – 1900	34 "
1900 – 1910	24 "

June 2. 1911.

Form for H.A. Proper Motion Stars in Zone -10-13

Proper Motion

No	0000	11		
Cat-	St 1	10		
Epoch	00.0	10		
No	00	8		
R.A.	00 00 00.00	24	00.00	12
Cat:	?			
Ep		10		
M		8		
S. Dec	12 15.26.3	22	59.2	10
		103		81

2 on page

8337 stars, 3.5 = 29,200 = 292 pp

Plates Many Var stars

~~Pl no. A0000 19~~

Yr	00	7	7
J.D.	0000.000 d5i	20	23
R.A.	00 00	13	13
Dec.	+16.3	13	13
Ex.	000	9	9
Limit.	0	7	
		~~69~~ 87	64

3 on page.

a Byrne
b Barker
c
d Proper 8 in

760/216

3.5 per obs

H.A. 47.2

J.D. Yr	00	7
	0000	11
Ex	000	9
Conf.	00,00	12
Mag	10.00	12
Obs. Resid	00.00	12
	17	~~10~~
		73

Algol Min.

Y.M.D.	00,00,00	17
JD	00000.000	20
Σ	00000	13
Resid	000	9
		59
Author	000	9
		68

Sh. Per

Yr.	00	7
J.D.	0000.00	18
Σ	00000	13
Resid	.000	10
		48
Author		

Spectra for Polar Stars
DM Zone +89°

DM No.	0000	11
R.A.	00h 00m.0	16
Dec.	00'.0	10
DM Mag	0.0	8
Spect.	000	10
Measured	000,000	16
Plate	00000	13
		84

Gen Cat. Rec. Spectra.

DM	00000	13
R.A	00.0	10
Dec.	+00 00	16
DM Mag.	00.0	10
Phot.	00.00	12
Cl		10
No.	00	7
Auth.	00	7
		85

Spectra for ~~Polar Stars~~
~~DM Zone 89°, 88° etc~~

DM No	0000	11
R.A.	00 00.0	16
Dec.	00.0	10
DM mag	0.0	8
Phot. mag	00.00	12
Spect.	000	10
		~~55~~
		67

3 on page
150 sta a page
37,500 = 250 pp.

		Sig.
a	16 Circumpolar	37.1
b	56 Mr Van [illegible] Revised	37.2
c	252 " " " "	57.2
d	50 Southern Var.	
e	150 Northern Sh. Per.	
f	~~250~~ 50 Southern [illegible]	

June 4, 1911

H.C. June 1 1911

	Ch.	Cupd.	Corr. 50 cts		Reg. 70 cts					
56.5	1000	137.	93	46.50	19.5	13.65	6.8	5.60	38.10	235.25
59.7	800	42	18	9	5.5	3.85	2.5	"	14.	68.85
68.2	"	463.98	220	110	79	55.30	16	"	89.60	721.68
59.6	"	107	54	27	12	8.40	4	"	22.40	164.80
64.7	"	27	9.5	4.75	5.5	3.85	1.25	"	7.	42.60
65	"	786	112	56	89	62.30	34	"	190.40	1097.50
66	"	762	82	41	123	86.45	32	"	179.20	1071.45
										3408.13

Opp. Eros (433)

5323	951
6274	788
7062	792
7854	961
8815	795
9610	
	4187
	4287

Eminent men &

	Living	Lunar Photo
Shakespeare	Edison	8.8 cm
Napoleon	Roosevelt	12.5 "
Mahomet	Eliot	26.3 "
Confucius	Kitchener	
Homer	Kipling	
Beethoven	Carnegie	Type V.
Dante	Rockefeller	Mayer
Maryland Cong.	William 2d	2.22 Rolleston
Archimedes		2.27
Washington	See also	4.90
Charles	Edward Jan 12	5.19
Linder		5.37
Alexander		5.64
Caesar		
Aristotle		
Bacon		
Newton		

June 15. 1911.

Asteroids.

H.A. 18.3 18 asteroids
29.3 36 [illegible] [illegible]
29 Appendix Cat. [illegible] Müller
33.1 p6 7 Asteroids
406

Miss Cannon Miss Carpenter
Miss Cushman Miss Bydes
Miss McGill Miss Breslin
Miss Wells
Miss Leavitt Miss Walker
Miss Leland
Miss Stevens
Prof. B. Miss Wood
Miss Hammond Miss Mackie
Miss O'Reilly
Miss E. Gill

Miss Hodgdon
Miss Winlock
Miss Locke.

Order [illegible] [illegible]

Born. Educ. Occup.
Bancroft. Mass. Harv. Histor
Whitney Mass. Philol
Gould. Mass. Harv. Astron
Newcomb N. Scotia L.S.S. Astron
Agassiz Switzerl. Harv L.S.S. Natur
[illegible] Italy Astro
[illegible] Mass L.S.S. Astron

---

7 Mass 4, Harv. 5, Ast. 3

Distinct [illegible] numbers

England 7
Holland 2
Sweden 2
Russia 2
Scotland 2
Austria 1
Italy 1
Germany 1
Den 1
U.S. 1

Eng. Mech. 93.379

June 16, 1911.

Investigations which should be taken up

Ptg. magn. of Vesta, Uranus, and Neptune from entire series that
" " all bright asteroids.
" " Stars, Class N, R, O, Pec. etc.
Definitive tests of comets.
Rather meteors.
Photom. magn. asteroids. Eros.
" " Ft. comp. stars
Ptg. magn., moon comp. stars. etc
" " variables long period. AC. plates
" " Algol variables " "
" " short period var. " "

Spect. Binaries A.N. 136.17
Moursund

Card-cases for cards Drawers $2.20 per foot: Deep drawers 1.76
tin trays $1.50, Paper boxes 0.40 per foot

12 drawers	$2.29
15 "	2.20
20 "	2.20
Double "	1.85
New Single 18 dr	1.85
Tin boxes	1.87
Paper boxes	0.14

~~Mounting of Collections~~
Reinforced Photometers.
Old Clark large field lens 1. Goetz. 2. Pellisier 3

No. spect. measured +70° to 90°, 3622. +20° − 0°, 588. −0° − 60°, ~~1891~~ 3998. −60° − 90° 1851. Total 10,059.

Began cont. Wash. signals by wireless July 22, 1909. April 1910 signals were recently signals good about .03 slow [illegible]

July 4, 1911

Hottest-Day ever recorded here.

1h 30m P.M. 103.0 standard thermom. by Meridian Circle
106 on piazza on which Sun shines
91 in Study
~~84~~ in Rotunda. doors closed.
2 40 103.0 stand. thermom.
68.0 Water.
104.5 Stand. thermom. in Water before whirling by E.S.K.
103.0 " " " after "

97 Reading Table

Meridian 3. No. stars in Photo. 60 min

13.5		15.5		17.5		19.5		21.5	Mean dist.
0	1	2	4	4	8	46	74	75	442
0	2	5	2	3	15	44	113	86	382
0	0	3	2	7	31	75	204	124	322
1	3	1	6	9	54	172	285	130	262
1	3	5	17	20	113	239	395	158	202
2	9	16	31	43	221	576	1071	573	2542 all

D7 B5 N
C2 E1 S
C3 A1 P
C10 D4 M.

85 good lunar photos out of 103 to July 7. 1911

Error setting. 1 div = 100"

MC .±0020 MD. 0014

13	19
18	17
24	19
19	17
14	
18	±0.″17

August 14. 1911.

Memoranda.

A.N. 136,17. Lehmann Filhes. Orbit Spect. Binaries.

Tables.	Visit Com	
· Magellan Lat. Long	Metcalf	Draper
· Gal Long. Lat:	Agassiz	Gerrish
· Solar Corona	Alden	Leavitt
· Precession.	Choate	Morton
· J.D. 1850–1950	Cross	

Slide rule for conversion Sid. to Solar Mean Time.
Death J. D. Hooker
"

Halftone mosaic Knowledge Dec. 1911.

Pop. Mechan. Magaz:- Panama[1], Printing[2], Camera[3] Locomotive[4]
Telephone[5], Elect.[6] Anesthesia[7].
Not in Wireless, Photography, Sewing Machine
Mus. H. Telephone, Submarine, Anesthesia, Aeroplane.
Locomotive, Wireless, Photography.
Cards, Storage 12 drawer cabinet per foot $2.29; 15 drawer $2.20;
20 drawer $2.20; Double drawer $1.85 New style 18 dr. $1.85; tin
boxes 1.87 Paper Boxes $0.14

Observations in H.A. 63,1

'03	'04	'05	'06	'07	08	09	10	All	C	Ca	Va
105	1294	1579	3573	3510	4453	4058	4145	22717	12311	2730	1161

Wi 2322, Y 1006, M 3187.

Est. cost mounting Cooke 4-in $150, 6-inch $300, 10-inch 250.

Oct. 10, 1911.

Annual Reports.

Cat.	Obs. Rep.	Σ Eq. Plan. 000	Ins. Pcl.	4 in. M.P.	12 in. M.P.	C	I	All	X	B	A	All	pk	Phen	Circulated	
'88	43															
B 89	44															
B 90	45															
B2 91	46															
B2 92	47			33,792												
B 93	48			26,272												
B 94	49			54,360												
B 95	50			78,448												
B 96	51			~~73~~									..	264	305	11 ..
B 97	52	20-	26	91608	..	1197	2508	..	836	2770	386	..	368	1509	8	..
		23+	28	100,052		1149	3032	..	845	3022	662					
S 98	53	25	23	73,684		873	2192	..	464	1436	539	..	400	319	16	
B 99	54	29+	24	46,172	65,200	744	2395	~~65,200~~	686	2301	693	4392	400	911	12	28
B 00	55	24	18	13,244	79,024	689	2187	..	201	2054	760	3880	281	1207	6	20
S 01	56	16	17	33,316	54,448	673	1766	4081	140	2269	919	4269	361	1,257	9	16
B 02	57	17	17	10,784	66,932	475	1642	4254	276	2140	438	3919	292	973	4	22
B 03	58	15+	15	..	71,992	467	1680	5130	138	1899	413 ~~3636~~	3638	390	1455	8	32
B 04	59	17+	17		92,396	543	1116	5286	113	2357	394	4064	282	3335	14	16
F 05	60	13+	17		81,284	1001	1333	6161	212	2032	532	4136	318	2505	19	39
F 06	61	14	29		65,488	648	848	4580	325	227	638	2,343	458	-741	12 ~~56~~	56
F 07	62	13-	23		37,140	356	611	3200	429	961	392	2719	346	1455	12	51
F 08	63	14	22		60,208	482	657	4100	374	1465	568	2509	337	2497	12	32
H 09	64	16-	21		29,972	362	670	4164	409	1206	747	3610	312	2430	9	25
H 10	65	13-	17		20,648	353	639	4579	204	1088	475	2974	369	-555	11	60
H, C 11	66	8+	13		..	147	449	3796	125 ~~147~~	751 ~~655~~	205	2042	288	1675	4	52
C 12	67	9	4		—										10	

..

..

28

20

16

22

32

16

39

56

51

52

25

60

52

October 13, 1911.

Limiting magnitudes with various instruments

Plate	Ap. in	Ex. m	Mags	log Ap	Red to 60m	Comp. 11+5 log Ap	O-C
AI	0.5	60	9.7 ·	9.70		9.5	+0.2
AC	1.0	60	11.5 ·	0.00		11.0	+0.5
Ae	4	10	12.4	0.60	13.8	14.0	−0.2
I	8	10	14.0 ·	0.90	15.4	15.5	−0.1
"	"	60	15.0	"			−0.5
C	11	10	14.4	1.04	15.8	16.2	+0.4
"	"	60	15.6	"		"	−0.2
MA	12	60	16.8 ·	1.08		16.4	+0.8
MC.	16	10	15.0 ·	1.20	16.4	17.0	−0.7
H	24	60	16.5	1.38		17.9	[~~−1.4~~]
Yerkes	24	45	17.7 ·	"	18.5	17.9	+0.6
Crossley	36	60	18.9 ·	1.56		18.8	+0.1
Mt. W.	60	40	19.1 ·	1.78	19.5	19.9	−0.4
"	" ~~240~~	240	21.0 ·		19.6		−0.3

$\frac{26-24}{13}$

±0.4

Progress Annals Feb. 7, 1912.

May 12, 1912.

47.2 galley page
56.7 at printers
56.8
59.9 at printers
59.10
67, printed
63.1 printed
63.2
69.2
72.2 · galley cut

56.7 at binders
59.10 "
72.2 "
67 complete at printers
47.2 " "
63.1 " "
72.3 " "

56.8 Obj. P. Slit. n
63.2 Seq. Var. St. n
64.8 Bossi's Mer. Phot. n
69.2 15-in
71.3 Polar Seq. n
71.4 Stand. Seq. ~~n~~
72.4 Rutherfurd Phot. n
73.1 Blue Hill n
74 M.B. 12-in n
75.1 Bonn Zone n
75.2 Faint Stars n
76.1 Spect. Var. Peck Meteor n
76.2 Adopted Stars

Oct-18. 1911.

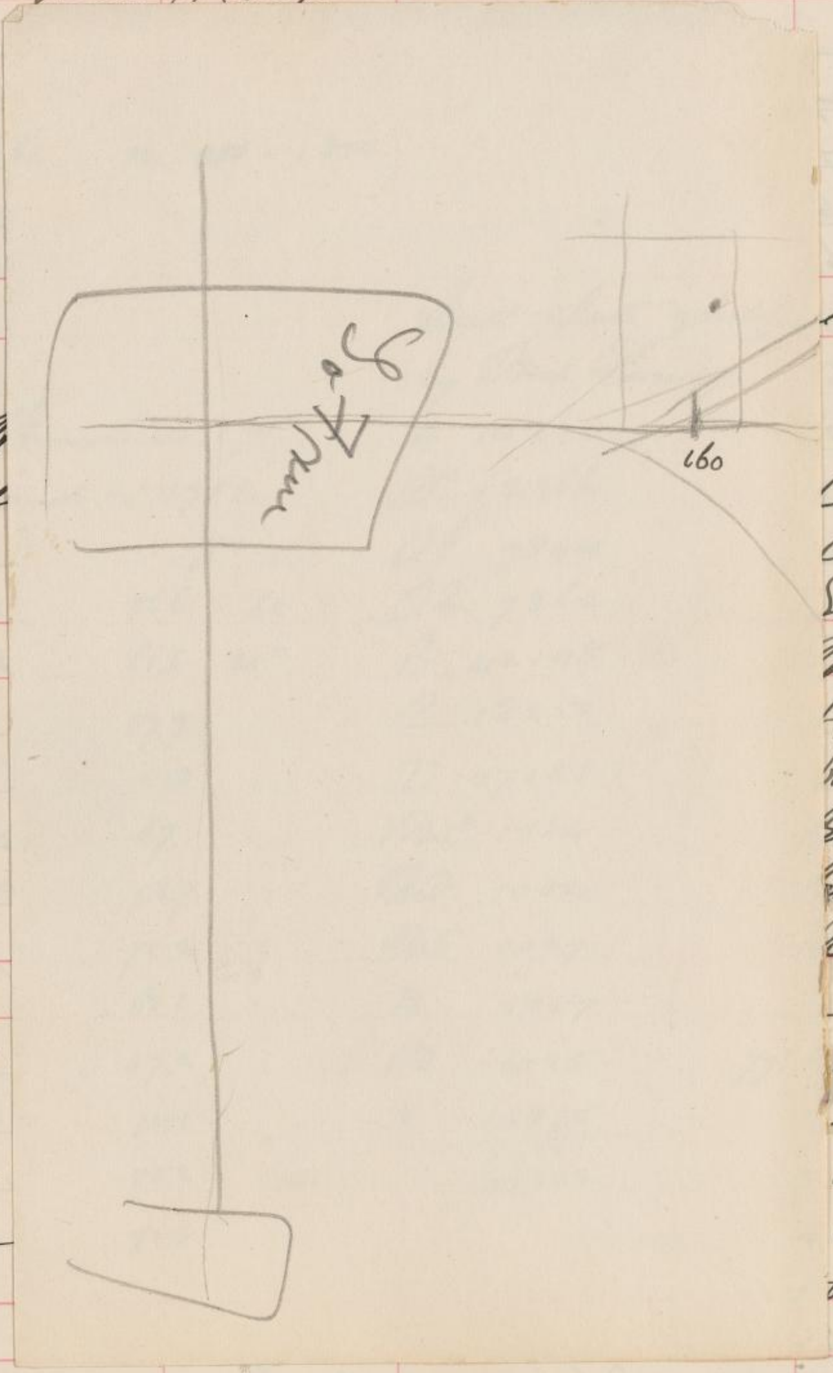
Read Rob Progress. H.A. 67.

Oct. 18. 1 33-
Feb 1±

91

Amounts ist

	1911.
56.5	50
59.6	30
" 7	18
" 8	18
62.2	107
64.7	10
65	264
66	253
68.2	137
71.1	26
71.2	22
72.1	16
	951



Apr 7. 1912.
Cordial Reception
Abbot
Stebbins
Mitchell
Hall
Rice
Bridgman
Eastman
Lyman

Description 12 inch Phot.
Summary of Series
Polar Stars
Constant Wedge Shades
R Camel
Stars in Clusters
Daylight Sky
Cost Dm. range H.A. 54
Scale Dm. 9.16-10.0

Oct. 18. 1911.

Progress. H.A. 67.

Read Rate

Oct. 18. 1 33 - 64 32 351 - 1850

Feb 1±

March 10. 1912.

Annals issued in 1911.

	1911.		1912.
56.5	50	56.6	62
59.6	30	61.3	212
" 7	18	59.9	
" 8	18	" 10	
62.2	107	67	
64.7	10	56.7	
65	264	72.2	
66	253	63.1	
68.2	137	47.2	
71.1	26	75.1	
71.2	22	75.2	
72.1	16	72.3	
	951		

Wall-plate qualified by Mrs Fleming.

A	10332
AC	12366
AF	9844
AM	7360
B	42148
C	18250
I	37181
MC	1084
MD	1084
ME	1097
N	5757
PS	4125
X	12875
	5485
	163,503

Jan 7. 1912.

Cordial Rumford Medal

Abbot

Stebbins

Nichols

Hall

Rice

Bridgman

Brashear

Lyman

77? 1 Description 12 inch Merid.

2 Summary of Series

3 Polar Stars

4 Constant Wedge Shades

5 R Camel

6 Stars in Clusters

Daylight Sky

Cert. Dm. range H.A. 54

Scale Dm. 9.1 to 10.0

Feb 3. 1912.

Opp. Asteroids 1912

No.	Mag.			
69	9.7	10.7	-1.0	Jan 0
52	9.6	10.3	-0.7	Jan 5
192	9.6	9.3	+0.3	Jan 14
1	7.0	7.4	+0.4	Jan. 19
_4	6.6	6.5	+0.1	Feb 18
372	9.7	10.5	-0.8	Feb 20
354	9.3	10.0	-0.7	Feb 22
27	9.1	9.7	-0.6	Feb. 22
7	9.2	8.4	+0.8	Mar. 22
_39	9.9	9.5	+0.4	May 2
695	9.0	9.2	-0.2	June 1
21	9.7	10.1	-0.4	June 1
3	9.8	8.7	+1.1	June 10
70	10.0	10.9	-0.9	June 12
_85	10.0	10.9	-0.9	June 27
29	9.4	9.0	+0.4	June 30
88	9.8	10.8	-1.0	July 14
41	9.5	10.5	-1.0	July 26
103	9.7	10.2	-0.5	July 28
393	8.8	11.0	-2.2	Aug 1
11	8.6	9.3	-0.7	Aug. 7
110	10.0	10.5	-0.5	Aug. 19
33	9.3	11.8	-2.5	Sept. 3
10	9.7	9.5	+0.2	Sept. 11
8	8.1	8.9	-0.8	Sept. 12
9	9.4	8.9	+0.5	Oct. 13
20	8.8	9.2	-0.4	Oct 20
185	9.8	10.0	-0.2	Oct 21
13	9.7	9.7	00	Oct 25
324	7.6	9.9	-2.3	Oct 27
15	7.4	8.6	-1.2	Oct. 31
471	8.5	10.1	-1.6	Nov 5
40	9.0	9.2	-0.2	Nov 13
6	7.4	8.5	-1.1	Nov 17
49	9.8	11.0	-1.2	Dec 3
64	9.9	10.5	-0.6	Dec 7
349	9.5	9.8	-0.3	Dec 7
115	9.4	10.4	-1.0	Dec 22
18	9.2	9.3	-0.1	Jan 39

39

No	000	9
Name		20
Mag. g		10
m_0		10
Diff.		11
Opp. Date		15
Int date		15
R.A.	00 00.0	16
Dec	00 00	16
		122

March 9, 1912.

Annals Distribution 1912

Styles of Figures

		Modern	Ancient
56.5	50	Lick Annals	Amer. Ephem
59.6	30	Yerkes "	French Naut. Al.
7	18	Pop. Astron	V.J.S.
8	18		
62.2	107	Harv Annals	B.J.
64.7	10		A.R.J.
65	264		M.N.
66	253		A.N.
68.2	137		A.A.S.a.
71.1	26		B.D.
".2	22		S.D.
72.1	16		C.D.M.
	961		C.P.D.
Contents.	36		Cape Obs
Circulars			Alleg.
			Helsingfors

Professor

			G.H.C.	H.C.O.
1912	56.6	62	45	57
	61.3	212	50 54 60	62 63
	56.7 ?	20	61	65 66
			68	
	56.8	20	69	
			70	
	59.9	20		
	59.10	30		
	63	250		
	64.8	20		
	67	250		
	72.2	50		
	72.3	50		

May 11. 1912

Distribution of Annual

Mar 8, 1907	60.2	14
May 23 1908	49.2	138
" "	50	252
" "	61.1	104
		494
Dec 18, 1908	54	280
" "	56.4	50
" "	57.2	78
" "	59.2	30
" "	60.9	21
" "	64.1	32
" "	" 2	22
" "	" 3	36
		549
March 23 1909	58.3	86
" "	59.3	32
" "	" 4	32
" "	61.2	58
" "	68.1	92
		300
October 5, 1909	64.4	56
" "	" 5	12
" "	" 6	32
		100
February 12, 1910	52.2	196
" "	55.2	197
" "	59.5	310
" "	69.1	97
" "	70	235
		755

1907	14	1
08	1043	11
09	400	8
10	755	5
11	951	12

	April 8, 1911	59.6	30 -	
	" "	65	264 -	
	" "	66	253 -	
	" "	71.1	26	
			573	
	June 30 1911	56.5	50 - 235	
	" "	59.7	18 -	
.19	com. " "	.8	18	81.61 Com 16.00
	" "	64.7	10 -	
	" "	68.2	137 -	
			233	
.08	October 19, 1911	62.2	107	48.38 516.10
.12	" "	71.2	22	13.00 104.95
			129	
.31	December 29, 1911	72.1	16	17.50 56.90
.18	February 17, 1912	56.6	62	51.50 322.35
.22	" "	61.3		211.00 969.40
.17	April 18, 1912	59.9		17.50 105.60
	June 15 1912	56.7		
	" " "	59.10		
.22	" " "	72.2		64.75 297.00
	~~Nov.~~	67		
	July 17 "	47.2		
	" " "	63.1		
	" " "	72.3		
		.3.3		
	~~Nov.~~	56.8		
	~~Dec~~ 5	64.8		
	" "	72.4		
	" "	67		
		63.2		
		75.1		
		75.2		

November 1, 1912.

Unfinished Annals.

			Jan 1, 1913	Jan 1, 1914
56.8	Obj. Prism. Slit Spect.	5	At printer	Completed
63.2	285 Sequences	4	In prepar.	nearly printed
69.2	15-inch E Equat. 1903–12	3		partly "
71.3	North Polar Sequence	3		nearly ready for printer
" 4	Harv. Stand. Regions	1		
72.4	Obsns. Periodic Meteors	5	Printed	C
" 5	Eros, and other Asteroids	5	At printer	C
73.1	Blue Hill 1909			Ready for ~~the~~ Printer
74.	Catal. ~~Faint Stars~~	4	Nearly printed	C
75.	Bond Zone	4	"	C
	App. Contents 1–75	4	In prepar.	C
76	Absorp. Space. ~~Var. Long Period~~ ~~Phot. mag meas~~ Exact. Third Type. Spect. Neb. Type V adjacent Regions			C
77	~~Scale Phot.~~ Ft. Stars Inter Sel. Var. Long Period Phot. mag meas			
78	Missions 3.	5		C
	" 5. Clusters			
79				
80	72.6,7 Scale Phot. B.O.			C
	C. Phot. C.P.D.			C
81–84	Revised Draper Cat.			
85–90				

June 17, 1912.

Count of Stars c̄ H.R. H.A. 50.

h	Aggregate H.R.	No. Stars	h		No. Stars
0	308	308	12	4940	333
1	611	303	13	5285	345
2	929	318	14	5614	329
3	1266	337	15	5965	371
4	1646	380	16	6347	362
5	2145	499	17	6757	404
6	2661	576	18	7230	479
7	3164	500	19	7675	445
8	3609	445	20	8069	394
9	3967	358	21	8410	341
10	4310	343	22	8783	373
11	4607	297	23	9110	327

h h	No. St.
0 – 5	2145
6 – 11	2462
12 – 17	2144
18 – 23	2359
	9110

0 - 3	1266
4 - 7	1898
8 - 11	1443
12 - 15	1378
16 - 19	1690
20 - 22	1435
	9110

Plates needed for R.D.C.

	Jan 18				
0	9	.	12	15	10
1	15	.	13	6	3
2	10	.	14	10	5
3	6	.	15	9	6
4	10	.	16	5	4
5	5	3	17	10	7
6	2	.	18	12	9
7	3	2	19	9	8
8	7	5	20	10	.
9	8	7	21	12	.
10	8	7	22	9	:
11	8	2	23	12	:
	91			119	

Kapteyn Dm. 25 m r. + 6 h

11h 25m – 27m −60° 0

1001 — 1050			
Harv. Magn.	25m	x	y, # δ
00.00	~~25~~ ~~00.00~~ 25	00′.00	00′ 00″

Sept. 25. 1902.

Distant in Re.

~~H~~ 50	ρ	54	~~45~~ 45	54	74
0	18.0	18.0	9.1	5.1	8.0
1	24.1	24.2	22.0	15.7	17.
2	30.3	30.3	33.0	25.6	27.8
3	36.7	36.6	46.0	36.1	37.7
4	43.5	43.4	58.1	46.0	48.5
5	53.4	50.9	70.5	56.0	59.2
6	63.6	60.4	84.4	67.4	72.8
7		71.3	98.6	80.3	
8		81.4	113.0	93.0	
9		90.2	126.0	105.3	
10		97.4	137.0 ~~147.4~~	115.8	
11		104.3	147.4	125.5	
12		110.2	156.0	135.4	
13		116.7	166.9	144.3	
14		123.6	176.9	153.6	
15		130.4	186.8	163.3	
16		137.6	197.0	173.5	
17		144.9	207.9	184.3	
18		153.0	220.1	196.1	
19		162.6	235.0	209.6	
20		171.6	251.2	224.6	
21		179.4	268.0	238.8	
22		186.3	283.7	251.5	
23		193.6	296.4	262.1	
0		200.3	309.4	272.6	

	a	a	s	a	p			c?		
Gill	1	2	1	1	2	1	1	1	10	1.2
Kapteyn	4	1	2	2	3	2	2	5	21	2.6
Auwers	3	4	4	4	1	3	4	4	27	3.4
Backlund	2	5	5	3	4	4	5	2	30	3.8
Seeliger	5	5	·	5	5	5	3	3		
Darwin	·	3	3	·	·	2	·	·		

		Blue yellow
24 in	60''	17.1 1
	10''	15.1
	1''	
16 in	60	16.5
	10	14.3
	1	
4 in	60	13.8
	10	12.41
	1	
60 in	60	19.5

60'' - 10'' = 1.6 mags

10'' - 1'' = 2.1 mags

Academy Club.

Oct. Spectrum Nova Gemini.

Nov. Curved Ball.

Dec Cards Trick. Cards Tricks

Jan ~~Photomagnetic~~? Perfect Calendar

Feb Gulf Stream

Mar

April

May

Nov. 18, 1912.

Kapt. Special Region Kapt.

Pleiades. 3 24 +23

20 Neb. Orion 20 5 30 −5°

Cluster Hercules

13,14 Sm. Magell. Cloud. 13

21,22 Large " " 21,22 Mr 3

29 η Carinae 29 " 5

Trifid Neb. " 13

31 Coal Sack 3 " 15

N. Pole Milky Way.

S. " " "

28 ρ Ophiuchi 28

Polar Seq.		
10	8.89	
		53
11	9.42	
		31
12	9.73	
		44
13	10.17	
		35
14	10.52	
		42
15	10.94	
		55
17	11.49	
		43
18	11.92	
		36
19	12.28	
		31
20	12.59	
		61
23	13.20	
		53
25	13.73	
		46
26	14.19	

Kapteyn. M.D. Stand. H.R.S.

16in Pole 10m b 4in b 16in P. 1,4,6 flat } 4in b 24in 60m r

" K1 10m " 10 " " } " " b

K2 " D1 1,4,6 curved } "

P " 10 " "

−22° h S.D. 6265.
C.D. 8432
C.D.M. 16573

K1 " D2

2 " 00 00.0 ag 00.0 00
16 7 10 7 42

All stars in C.D.M. for each half hour. 50 or to end of minute

3 "

4 "

P "

AC, AM. HS.		
+75°	3	4h, 12h, 20h
+45°	9	1h20m, 4h0m, 6h40m
+15°	12	1h, 3h, 5
−15°	12	1, 3, 5
−45°	9	1h20m, 4h0m, 6h40m
−75°	3	4, 12, 20
	48	

Map. Sky.		
+90°	1	−
+60	8	0, 3, 6,
+30	12	0, 2, 4
0	12	0, 2, 4
−30	12	0, 2, 4
−60	8	0, 3, 6
−90	1	−
	#54	

Neb. Orion Meas.

1 −3 35.89 −2m 42s −91.5

1101 +2 48.74 +2m 42s +87.0

December 15.

Northern Quadrant station

					Rl.		
0°	1.000	1.000	16.0		~~90~~	~~16~~	
5	.996	1.004	16.1	90	90	16	$2\times3^2\times5$
10	.985	1.015	16.2	90	90	16	
15	.966	1.035	16.6	90	90	16	
20	.940	1.064	17.0	90	90	16	
25	.906	1.103	17.6	90	9	"	
30	.866	1.155	18.5	90	"	"	$2^4\times5$
35	.819	1.221	19.5	80	80	18	"
40	.766	1.305	20.9	80	72	20	$2^3\times3^2$
45	.707	1.414	22.6	72	72	20	"
50	.643	1.556	24.9	72 60	60	24	$2^2\times3\times5$
55	.574	1.743	27.9	60		24	"
60	.500	2.000	32.0	48		30	$2^4\times3$
65	.423	2.366	37.9	~~48~~ 40		36	"
70	.342	2.924	46.8	~~36~~ 30		48	$2^2\times3^2$
75	.259	3.864	61.8	24		60	$2^3\times3$
80	.174	5.759	92.2	16			2^4
85	.087	11.474	183.6	8			2^3
90	.000	∞		1			1

1145

1440° $2^4\times3^2\times5$

16 × 90

18 × 80

20 × 72

24 × 60

30 × 48

36 × 40

	N.R.	Int.	Zone		
0°–30°	90	16	6	540	
30°–40°	80	18	2	160	
40°–50°	72	20	2	144	
50°–60°	60	24	2	120	
60–~~70~~ 65°	48	30	2	~~96~~	48
65–70	40	36	1	~~56~~	40
70–75	36	~~36~~ 48	~~2~~ 1	~~72~~	36
75–80	24	60	12	~~48~~ 24	24
80–85	16	90	12	~~32~~ 16	16
85–90	8	180	12	~~16~~ 8	8
90	1	1440		+	1
				~~1229~~ ~~84~~ ~~1145~~ 1153	1137

5.

41253.02 / 16 = 2578.

~~32~~ 92 ~~80~~ ~~125~~ ~~112~~ ~~133~~ ~~128~~

1289

20626 / 1031

l d

Diffraction Images

Dd	l	Central	1st	2d	3	1–C
	1	mags 1.50	2.49	—	4.87	0.99
	2	.88	2.80	4.20		1.92
	3	.62	3.24	3.99		2.62
	4.	.48	3.64			3.16
	5	.40	3.99			3.59
	6	.33	4.30			3.97
	7	.29	4.57			4.28
	8	.26	4.82			4.56
	9	.23	5.04			4.81

$C = \frac{l^2}{(l+d)^2}$

ratio in $\left(\frac{\sin\frac{l}{l+d}\pi x}{x\pi}\right)^2$

Memoranda.

Addresses
Camb. Club. Jan. 23
Amer. Phil. Soc. April 18? On the Determination of
of Visual Stellar Magnitudes by Photog.

Rutherfurd elected Vienna Acad. Nature 35

Special Notes

5 Pritchard Wedge 12-inch Eclipse 4-inch
9 Scale 12 inch
12 Scale plates Annals
27 Earthquake shock July 29, 1903.
29 Peculiar var. Class
35 Stellar mags. Sun
37 Cost 24-inch Lens Tested 1902
38 Officers Ang. Obser.
39 Observers Pleiades Pole O.C.W.
40 Polar Sequence
43-45 Work 60 inch telescope
46 +38° 4262 as β Lyrae variable
49 Polar Sequence Pleiades
52 Region 30° square
55 Mo. obser. Mont Blanc.
57 Work 60 inch telescope
58 Centre 30° square
60 60 inch dimensions mirror
66 Cost large Reflectors
69 Pritchett lecture on large business enterprises.
72 Distrib. Amer. Gifts 1902
74 Adopted mags. Polar Chart
75 U Cephei
78 Mitchell Facts
80 Unpub. volumes Annals
82 Elect. Indicator
83 & Plates wanted
84 Photometer
85 Plates
86 Mitchell Facts