

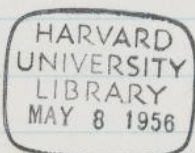
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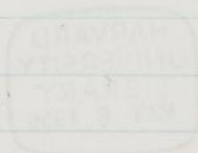


RW11365.477

Prospective Work and Proposed form of Publication.

KU-11365.477





Names to be Published *

Reduction of Last Observations

XI. Photometric Observations I Part I. General,
Conjunct: Planets, Bright Double Stars.

Part II. Satellites Mars, Jupiter, Saturn &

XII. Catalogue 1874-5 Milky Circle.

XIII " 1872-4 Polar. " "

" Photometric Observations II Scale W & A R
C.S. Stars, Zone.

5 Microm. Double Stars, Sat. Mars.

6 Zone Fundamental Stars.

7 Zone.

8 Photometry. 1840-80

7 C.S. Stars.

10 Stars 1876, 7, 8.

Labels duplicated March 4, 1880 by RH 27-29

Scale W. A. D. Apertures

" Phil. K

C.S.

Zone

Dunkle Stars L.W.

Small Telus.

Lib. Mass.

1879

Red Stars.

Comets & Planets

Jupiter Satellites

Algol.

Angel. Var. Stars. Med. K

Merid. Photos.

Prospective Work.

Equatorial. Pole-Stars. - Jupiter's Satellites
 β Rellie - Variable Angulars.

Meridia Circle Absolute position.

Meridian Photometry.

Meridian Observations.

Photometry of Nebulae

Meridian Photometry.

Catalogue to contain all stars in the Uranometric Nova, all in Heis except the 6.7 stars and all in D.M. brighter than 6.1 mag.

Prepared by copying all stars in C.S. Catalogue ~~amounts~~ on half sheets of letter ^{size (A)} paper. One star to each ^{half} sheet. Also copying all B.A.C. stars between 90° and 110° N.P.D. brighter than 6.1 mag. Then arranging according to constellations and inserting magnitudes and omitted stars from Heis and Argelander & H.

Omitted stars found in B.A.C. may be brought forward from it to 1880.

The sheets are then arranged in the order of R.A. ^{numbered} and copied into a Catalogue, Form B.

The work for each evening is determined by selecting sheets corresponding to stars at intervals of about one minute. The recorder enters on these the number of the zone and the two settings. He also checks the corresponding star in a zone book which contains for each zone a current number, date, name of observer and recorder and the number of the stars to be observed. All remarks relating to the particular zone are entered in this book. For example the condition of the air, interruptions, clouds, defects in the instrument, etc. Remarks relating to the star are entered on the sheets. In general about fifty stars should form a zone listing sheet one hour. Four or five hour observations should be included to deduce clearing of the air.

To reduce the observations, the difference of the two readings is taken also their sum. A table is computed giving the magnitude M corresponding to any given difference by the formula $M = 2 + \frac{1}{2} \log \frac{1}{2} d$ and by this the magnitude is entered in the catalogue direct from the sheet.

Term A

Form B. Catalogue and Budget of Stars.

Left Page.

No.	Name	B.A.C. <small>no</small>	RA <small>to tenths of a minute</small>	Dec. <small>to minutes</small>	A	H	O.M.	Remarks
-----	------	-----------------------------	------------------------------------------------	---------------------------------------	---	---	------	---------

Remarks will contain other names, mag. according to other observers, &c.

Right Page.

No.	Name	Long I, II, III			Mag. Diff. I, II, III			Mag. I, II, III			Cor. Mag. I, II, III			M _n	A.D.
-----	------	--------------------	--	--	--------------------------	--	--	--------------------	--	--	-------------------------	--	--	----------------	------

Red. mag. to star system diff.
A H O.M.

4	4
10	10
4	11
6.5	15.5
7.	12.5
3.	12.5
3.	3.5
2.5	3.5
<u>20.0</u>	<u>20.</u>
60.0	92.5
20	Remarks

No Const. B. H. R.A.C. D.M. RA 1850 Dec. 1880 A. H. D.M. S.
B.M.

No.	Date	Time	By	End	No. Stars	Seeing	Obs.
256	July 4,	15 ^h 45 ^m	16	32			P. W.

Term of Ledger for Nebula Mathematica.

Mr.	Date	Hour	Star	Left-Page	Reading	Focus	Left-Page
				a	11.63	389.6	158.4

Diff. Log. Mag. High. Page. Add. Mag. S. Mag. Pub. Retid. Obs.
231.2

Stars.
No. Dat. Hare. Corp. St. Recd. by R. Condr. May.
1
2 Leonis

Center
Mag. St. Result Mag. Resid. Obs.

Lodge for Oct-P.

No.	Date.	Diff.	Magn.	Revis.	Obs.
1	Apr. 26	25.6	5.26		①
2	"	28.2	5.32		"

Secondary Catalogue for Phot. P.

All stars brighter than 10th star.

10th brightest pole star.

Comp. for variables

Variables.

Planets

Bright Asteroids

Stars near pole 80° - 90° N 8.0 - 6.0

Upper culmination of stars suitable for atomic absorption

Four settings observed and recorded
Six or ten evenings

Photometry of Zen. Collation of all stars of same D.M. mag.

1	2	3	4	5	6
RA	Dec.	year		mag.	
		I	II	I	II
minutes	degrees				

Preparation of charts by taking columns 1 and 2 from catalogue and inserting the others from the daily record.

These charts, if printed, will go in small charts or 120 lines to a page. They will run the full sheet 80 pages.

The collation will involve a count of the stars of each magnitude between 0-VI lines VI-XII for each year, and the correction to D.M. magnitude for each.

Vol. XI.

Part I.

- I. Description of Instruments
- II. Journal. Table I.
- III. Conjunctions of Planets. Table II, III.
- IV. Bright Stars. Table IV. Leagues.
- V. Catalogue

Part II.

- V. Constant of P.
- VI. " " E. G. L. J.
- VII. Satellites of Mars.
- VIII. " " Jupiter
- IX. " " Saturn
- X. " " Uranus Neptune
- XI. Faint Stars
- XII. Venus Asteroids.
- Appendices

Vol. XIV.

Scale of W. A. R. {¹ Discharges
 {² Phot. K.
Photometry, C.S.
" Zone.

Star. Phot. K. 4 - 7
" I 5" 7 - 10
" I 9 - 15
" J 10 - 15
Scale other distances.

Computing & Copying.

Zone. 50° - 55° .

Arrange in order of Magn. E.S.B.
 Enter mag. obs. with years.
 Sum for each year, for each quarter year and

Micrometric Photometer.

Head Catel. by Hiss.	✓
" " " W.H.	✓
" " " C.S.	
Number + "	✓
" " on charts	✓
Inspect. D.M. nos. and mag.	✓✓
Reduce W.H. and Liddel	✓
Inspect - "	
" Rogers.	✓

Head Catel. by Rogers Catalogue
 539 Stars.

Durham Photo. I.
Lodgett.

Notes to be published.

XIII. Miscellaneous Observations.

Part I.

Chapter I. Double Stars measured 1866-76.

" II. Miscellaneous 1866-76, Nebulae, Spectra &c.

" III. Pitch of Micrometers Screw.

" IV. Latitudes of Mars & 1877.

" V. " " " 1879.

" VI. Parallel Observations A.S. (?)

Part II.

Chapter VII. Description of Instruments R. S. M. A.

VII. Comparison Stars for Vanies H. (P. Q.)

VIII. Pole Stars (and other Standards?)

IX. Planetary Nebulae

X. Search of Mrs. Rogers

Postscript 1880-80 ?

(Enata & Zans. Prof. P. M. S.)

Vol XIV *Musical Circle*
Pole Stars 1872-3

Vol XV *Musical Circle*

Vol. XVI. Meid. Circ.
C.S. Stars 1878

~~Vol. XVII~~
Other volumes of Meid. Circ. Observations.

Vol - Observ. fundamental stars - 1876-7
" - Zone 50° - 55° Observations.
" - " " Catalogue and Discussion.

Eclipses of Jupiter's Satellites 1878 - (1890?)

Chapter I. History, advantages & objects.

" II. Descriptive Photo H. M. I. Method Obs.

" III. Analytical discussion with table of ^{of light} quantities

" IV. Journal. Details observations

" V. Catalogue. Results. Velocity of Light

" VI. Discussion of Results, Obs. law of variation

Tables for Photometer P

Catalogue Right-hand page.

Number.

Constellations.

Bright letter } 1 on column
Harshly number }

B.A.C. number

D.M. name

R.A. 1880.0 to tenths of minutes.

Dec. 1880.0 to minutes.

Magnitude	Uran. Magn.	Heischel	1790
	Heis.	Uran. Nov.	1820
	Bohmann.	Heis.	1830
	Hansen	D.M.	1850
	D.M.	Hanks	1860
	Uran. Argent.	Uran. Arg.	1870
	(Heischel?)	Hansen	1875
	(Roy Detm. Soc. Leipzig)	Bohmann	
		Peters	
		Siebel	
		Hoff	

Remarks.

Left-hand page.

Number.

Mean obs. uncorrected

" " corrected

Mean obs.

Cor. Dec.

Prob. Error.

Mean of all authorities

Error each

Remarks

*Logues for Bright Lens.**Number.**Date.**Mag. ^{Zone} uncorrected.**" corrected.**Residual.**Observed.*

Contents of Vol. XV. Meridian Photometry.

Introduction. Diff. identifications

Description of Instrument.

Form of Catalogue. Description of Cat.

Catalogue.

Mars & Catalogue

La Jolla. Blue stars.

Catalogue " "

Journal - Zones

" Red stars

Comparison with previous observations.

The reductions, ^{of Hubble} given in Vol. IX will probably be used as they are better than those of Gould. These values and those taken directly from the U. V. star, Hiss, D.M. & will be reduced to the system of Phot P thus:-

D.M.	-5	-4	-3
5.0	11	1	111
5.1		1	74
5.2			
5.3			

In first column magnitudes in given catalogue are given. In other columns the number of stars differing by -5 -4 \dots $+5$ are given. Thus two stars given by Phot 5.0 in D.M. are supposed to be given as 4.5 in Phot P, & one as 4.6, three as 4.7. Greater discrepancies are noted in final column. Such a log is made out for each band for each catalogue. Cross checks are furnished by counts of total number of stars and total sum of magnitudes. The ^{5.0} value of 5.0, 5.1 is to find for total number of stars having each magnitude as 4.5, 4.6. Thus if there are 35 of -5 , 26 of -4 , 83 of -3 , &c we deduce correction to 5.1 thus:-
Let x = true mag. and no total number then $n(5.1 - x)$
= $-5 \times 35 - 4 \times 26 - 3 \times 83$ &c &c.

Corrected values may now be substituted for the magnitudes given in catalogues. These may be further corrected by customary values with

ordinates equal to corrected values and
 abscissas to observed values. A smooth curve
 is drawn through these points and the uncorrected
 values thus obtained. The published table will
 contain one of these three values. Further calculation
 is needed before deciding which. The second
 correction is of doubtful value, since it eliminates
 the effect of unequal angular divisions by the observer.
 If however the need of the second correction
 arises from the insufficient number of stars
 the third value should be used.

Whichever value is used to reduce the observations
 to the system of Photometric P a table is next
 formed giving to each of a magnitude the
 value corrected value corresponding to each value
 given in the catalogue. Each star will
 then be reduced by this table and the mean
 value deduced from all.

Probably the following weights will be given:-

Herschel, 1. A greater wt. would be given but

for the age of the observations and the uncertainty
 of the ~~red~~ reduction.

Crane, Nova, 1. } These catalogues give so closely

Heis, 1. } that and the whole magnitudes

independent to such an extent that no greater
 weight can be assigned to them. As it is
 there is danger that they will introduce
 a concentration around the points 1.0, 2.0, &c.

D. M., 1. Observations best and probably discarded
 but the method of observation is wholly
 different, a difference being used.

Could 2.} Observations excellent assembly. Pretty
Albany 2 } etc

Houzeau 1. Half magnitudes only given.

H.C. Phil. P. 2. Probably. — Probably wt. 3 depending
on conclusions regarding accuracy derived from
reduced values.

The accordance of each of these catalogues
may be found from the table given on page 34
by multiplying the number of stars in each
column by the corresponding residuals indicated in
units of a magnitude. The sum of the whole
regarding all the signs as positive divided
by the number of stars gives the average deviation
of the separate settings.

Instead of dividing the stars into groups according
to the hours. It may be better to adopt some
other division which will bring together the
adjacent stars. Thus divide

Butter
winter
61° nine
61°
thine

the zone $+30^\circ$ to 0 and 0 to -30°
into eight equal parts.

The zone $+30^\circ$ to $+60^\circ$ into two

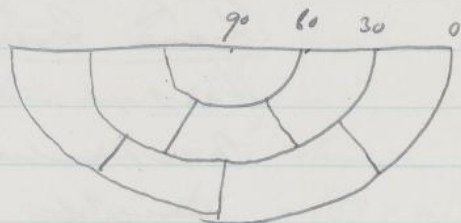
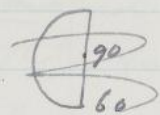
parts and $+60^\circ$ to $+90^\circ$ into
two parts. The calling the

area of the whole sphere not

only the area of the three kinds of sectors will be

.03125, .0305 and .0325. Calling the area of the sphere 32 it will
be divided into 32 parts having areas 100.0, 107.2 and 97.6

The variation in the scale of the different streams



in different R.A.s and Dec's could be admirably
just for this discussion, also the distribution
of stars of various magnitudes.

If the limit of visibility is taken at 61°
we shall have the relative areas $0^\circ - 30^\circ = 100.00$
 $30^\circ - 61^\circ = 99.90$, $61^\circ - 90^\circ = 100.30$ which is probably
preferable.

The distribution of faint stars may be obtained
from the D.M. by a simple count of the number in
each zone which is divided into 8, 6 or 2 parts.
This will correspond closely with the distribution
of a 9.3 magnitude star since this is about the
average brightness of a D.M. star.

For brighter stars, a count may be made
of the stars in the Uran Argenti. for southern stars,
and in the present catalogue for stars north
of -30° . $0^\circ - 30^\circ$ will be common to both.

To exhibit the mass of each catalogue
the deviation of each star from the mean
adopted magnitude will be given in a long
column thus:

The error of each ^{in terms of a magnitude} is represented
by a number from 0 to 9. Many fine
figures denote 10 to 49. Some figures
denote that the observed magnitude is
greater or the star estimated too faint.

H.	D.	S.
7	3	0
2	1	1

Other figures that it is too bright. Thus in above example
star was estimated of mag. too faint by Hubble
3 too bright by Uran Argenti, exactly right by Hubble & Co.

Volumes of Annals.

Oct.-1880

XIII. Part I. Double Stars, New Discoveries, Nebulae 1876-76
Satellites Mars 1877. 79, 81. (Mars)
Rings of Saturn

Part II. Miscell. Photos. Charts

Portland. 1840-80, Eruptive Zones

XIV. Merid. Circle. Primary stars 1870-78 (14000 ds)

XV. Merid. Photometry.

XVI Merid. Circle. Secondary Stars
Solar Catalogue (1200) C. S. Catalogue (1500) Mars Stars (250)
Asteroid Stars (100) Miscellaneous (500)

XVII. Photometry.

XVIII Merid Circle Zone 50°-55°

XIX. Eclipses Jovian Satellites

XX Catalogue Zone 50°-55°

Form for Vol XIV published Oct. 17. 1850.
 Journal giving all prin. stars observed on each day

Mean R.A. Mars

" Dec " I

" " " II

Circ. Ready I

" " II

$\Delta T + 2$ or n

R.A.

Red. to 1875.0 = R.A.

Mean R.A.

Red. to 1875.0 = Dec.

Mean Dec

Light Curve of Spectra of Red Stars.

I.

Each star in Birmingham's Catalogue (also those in U.A. marked ^{marked r, n, or c} north of -30°) to be examined with the spectrograph and the peculiarities of the spectrum if any described. The color also to be observed and the position with respect to at least two stars measured. The difference in declination to be estimated in minutes, that in right ascension in seconds. Star brighter than 12^m to be selected within $5'$ of due and 1^m of time.

II.

All stars having no peculiarity of spectrum to be examined a second time in the same way. Two decrees to take part in at least one evening.

III.

If the spectrum is peculiar its 'singular points' to be measured three times. In no case should all observations be made by the same observer in the same evening.

Form of Record of Observations with large Mercid. Photometer.

Record to be made in general form.

Left Hand Page

Series 526

No. Star	Est Mags	Time	H.A.	Dec.	A	B	C	D
2184	8.9	20 16.3	+2.8	+19 26	27.3	55.7	208.2	240.8
	7.2	17.3	-1.7					

Right Hand Page

Numbers.	B-A	D-C	Σ	Mags.	Est Mags
ABC cen.	28.4	32.6	61.0	2.3	8.8
A					

A ledger sheet to be added for each star
to contain a record of its companion mags.
position angle and distance.

2184 6^h 49.3 + 25° 16' 9.0

A	220	10	7.0
B	210	9	9.0
C	50	4	8.5

Sept. 23, 1881

Large Meridian Photometer.

Conditions to be fulfilled:—

1. Collimation and object-glass to be adjustable.
 2. Prisms and object-glasses to be perfectly protected from dust, to be easily cleaned and to be interchangeable.
 3. Focus of one object-glass to be adjustable without removing prisms.
 4. Northern prism to be movable by screw or wedge and its position determined by levels.
 5. Southern prism movable & declination and hour angle by screw or wedge.
 6. Declination to be read to minutes of arc.
 7. Hour angle to be read to eights of a minute of time.
 8. Head of collimator screw to be graduated.
 9. Double image prism to be movable.
 10. Index of declination scale to be adjustable.
 11. Motion of stops for exposure limited by stops.
- Sept. 23, 1887.

Focus Merid. Trans. Obj.	4' 8"
" Finder Obj.	5' 2"
Diameter	4 $\frac{3}{16}$ "

Proposed Plan for reduction of the
Magnitudes estimated in the vision of the
Durchmusterung.

The zones assigned to the various stars
overlap by 20'. Accordingly about 6000 stars
contained in these regions will have been observed
four times each, twice by each of the observers
of the adjacent zones. Adding the magnitudes
of the Durchmusterung and in the zones of Argelander,
Bessel and others, we see that much material
already exists for determining the brightness
of these stars.

Each of these stars should be measured
on three evenings with the large meridian photo-
meter. Additional measures should be made in
case of discrepancies. A diameter of the pupil
would give the scale of each observer compared
to the vision of the Durchmusterung the scale of
the latter catalogue and incidentally the scale
of various other extensile catalogues.

As few stars would be common to the northern
zones that it might now be advisable to add
stars to the list, omitting some of those near the
equator. About three years would be required
for the necessary observations.

Sept. 27. 1881.

Plan for observations of faint stars selected as standards for stellar magnitudes.

The selection to be made of sequences of stars ~~is~~ in the zone following the standard stars. Preference to be given to the first series of this zone.

The observations to be made as follows:-
Photometer I to be employed with the prism slaps to the left. Each of the three observers to measure the Polar Standards at the beginning and end of the work and at times during its progress. Under sets of three settings to be thus obtained of each of three stars. Each star of a given sequence to be measured by a observer and preference then to be given to other sequences, unless a second observer is present. Thus the measure of each sequence will frequently extend over two or more months. Five ^{or fifteen better} sets to be taken of each star. If the faintest stars are indifferently observed especially clear evenings to be devoted to them, beginning and ending of results with a complete sequence.

The Records to be kept by a set of Ledger sheets 1 for each star $24 \times 10 = 240$ in all.

No.	The Zone	Date	Hour.	Reading	Mean	Resid.	Obs.
1	1	Jan 15	7.3	9.82	1.6	+1	P
2	3	" 18	7.9	8.47	1.7	-2	S
3	4	" 19	8.7	9.01	1.8	0	W

A summary of series also to be kept of. One for each star. 24 in all.

No.	Date	Sketch.	Obs.
1	Jan 15	a b - d e f g - i j	P
2	" 17	- b c d e f - h i j	P
3	" 18	a b c d e f g h i j.	S

Catalogue of stars, one for each standard. 24 in all.

Mem.	Δa	$\Delta \delta$	Series.	Relat.	Mean	Range
a	3	5.6	5.3	13587	<u>20143</u>	242 1085
b	2	41.3	4.1	12346	<u>12005</u>	298 11.47

The last two of these tables alone to be published.

Plan for Observation of stars from $+0^{\circ} 50' \pm 1^{\circ} 00'$.

The object of this investigation would be chiefly to furnish a list of faint stars of known magnitudes as standards of comparison. It would also have as a secondary object the detection of variables and of stars having a large proper motion.

About $\frac{6,000}{2} = 3000$ stars in this zone have been measured.

H.C. Zones already listed.

$\frac{50.7}{6} = 8.45$ are given in D.M.

297 in series of D.M.

The method of observation would consist in observing their transits over a wedge of black glass, noting time on chronograph, and declination and notes by recorder. When objects are too numerous, zones to be reduced to 5' or small steady areas of small specially regions. Zones commonly half a hour long would contain about 16 D.M. stars, beginning and ending with one if possible. Reducing these to photometric scale they would serve as standards for magnitudes of zones. A constant correction could also be made to observed time of transit to deduce R.A. as the declination would be uniformly 3.07 usually or about 75° . A proper motion in R.A. of $1''$ would change the place by about $25''$ or 1.6 and half this ought to be perceptible to even by transit over a single wire.

In publication 1 line would be assigned to each star so 3000 stars would only fill 60 pp. R.A. would be given to 0.1 and 0.1 etc. from H.C. zones. Magn. is D.M., H.C. zones and other zones would be given with no of series in which observed and made.

May 21, 1882

Photographic Catalogue of Stars.

The stars to be photographed by a common flint glass lens. The plate to be moved by clockwork and the stars taken in groups. By varying the focus light of different refrangibility will be brought to a focus, that of different wavelengths being thrown out. We can then arrange stars in the order of their brightness according to each color and readily detect slight differences in tint. The order will thus be independent of the sensitiveness of the plate to different rays. To measure the plates the stars will be identified by sketching the stars reflected in another glass uncolored glass mirror and marking the stars on a sheet of paper placed below.

These may afterwards be identified with the star. A scale will be prepared in which a star will be photographed a number of times with different exposures and the light of each star measured on this scale. We should thus obtain a means of determining the distribution of light in the spectrum of each star. Dec 9. 1882

