

**THE CAPE CATALOGUE OF 1159 STARS:
DEDUCED FROM OBSERVATIONS AT
THE ROYAL OBSERVATORY, CAPE OF
GOOD HOPE, 1856 TO 1863, REDUCED
TO THE EPOCH 1860**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649393909

The Cape Catalogue of 1159 Stars: Deduced from Observations at the Royal Observatory, Cape of good hope, 1856 to 1863, reduced to the epoch 1860 by E. J. Stone

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Cover @ 2017

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E. J. STONE

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THE CAPE CATALOGUE

OF

1159 STARS,

DEDUCED FROM OBSERVATIONS

AT THE

ROYAL OBSERVATORY, CAPE OF GOOD HOPE,

1856 TO 1861,

REDUCED TO THE EPOCH

1860.

UNDER THE SUPERINTENDENCE OF

Edw. and Gamble

E. J. STONE, M.A., F.R.S., F.R.A.S.

(LATE FELLOW OF QUEEN'S COLLEGE, CAMBRIDGE).

HER MAJESTY'S ASTRONOMER AT THE CAPE.

PUBLISHED BY ORDER OF THE BOARD OF ADMIRALTY, IN OBEEDIENCE TO HER MAJESTY'S COMMAND.

CAPE TOWN:

SAUL SOLOMON & CO., 49 & 50, ST. GEORGE'S-STREET.

1873.

Astr. 808.73.2

1875. June 20

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of the
British Museum
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AT HARVARD

CAPE TOWN:

LAUL SOLOMON AND CO., PRINTERS,
49 AND 50, ST. GEORGE'S-STREET.

INTRODUCTION
TO THE
CAPE CATALOGUE OF 1159 STARS,
FOR THE EPOCH 1860.

The Royal Observatory, Cape of Good Hope, was established by an Order in Council, dated 1820, October 20. The leading idea was to establish a first class Observatory in the Southern Hemisphere, for work of a similar character to that of the Greenwich Observatory in the Northern Hemisphere. The observations were to be made with instruments of the same class, and the results were to be drawn up in the same form, in order that the whole might constitute two corresponding series capable of comparison in all their parts. No opportunity of making observations capable of improving the Theory of Refraction was to be neglected.

The Observatory Buildings were completed ; the instruments, similar to those at that time in use at Greenwich, mounted ; and observations commenced in 1829. But the hand of death was almost upon the first Director. The Assistant, Capt. Ronald, broke down, and left in 1830 ; and Fallows, after struggling on, somewhat hopelessly, as best he could with the aid of his wife, died in July, 1831, at the early age of 43, with the expectations which had drawn him to South Africa unfulfilled. Much could not have been done under the circumstances in which Fallows was placed, and not much was done. A Catalogue of approximate places of the principal stars, south of the zenith of the Cape, made with small instruments, in Cape Town, was published in the Philosophical Transactions for 1824, and another Catalogue, formed from observations made at this Observatory 1829-1831, appears in the Memoirs of the Royal Astronomical Society, Vol. XIX, published in 1851. It contains the Right Ascensions of 425 Stars : but of these only 88 have corresponding observations in North Polar Distance ; a considerable portion of these places are those of well-known Stars observed for clock error.

Fallows was succeeded by Mr. Thos. Henderson, who remained at the Cape a little more than a year ; but that year must ever be a memorable one in the annals of the Cape Observatory. Henderson discovered the sensible parallax of α Centauri, and determined its amount with an accuracy which has left to his successors little more than a

verification of his result. He reduced and published, in 1835, the declinations of 172 Stars, and in 1844, in the Memoirs of the Royal Astronomical Society, the Right Ascensions of 174 of the principal Stars, the results of the observations made by him and his assistant at the Cape in 1831 and 1832. It is impossible to over-estimate the value of these papers as affording accurate places of a limited number of Stars at the epoch: but the extent of the Catalogue is small. Henderson removed all the records of his observations from the Observatory, with a view to their subsequent reduction. It is desirable that the original records should be returned for preservation at this Observatory. Mr. Henderson was succeeded by Mr. (now Sir Thomas) Maclear, who arrived at the Cape on the 5th of January, 1834. The observations made by Mr. Maclear and his Assistant in the year 1834 were published and distributed for the use of Astronomers, and some advance was made in the printing of the observations made in 1835, 1836, 1837; but the reductions of these years were never completed, and the printing was stopped. It would appear that attention was called off from attempts to form a Star Catalogue to the measurement of an arc of meridian. The field work of this arc was finished in 1847; but it was not until 1866 that the volumes containing the results were completely printed and published, and Sir Thos. Maclear placed in a position to receive the congratulations of his contemporaries on the completion of his work. Of the value of this work there cannot be two opinions: but it was allowed to disorganize the other work of the Observatory to such an extent that, when I assumed the Directorship in 1870, I found myself, with a very limited staff, unexpectedly confronted with the results of 36 years of miscellaneous observing in all stages of reduction, nothing completed, and nothing which could be brought forward for publication and use without a very considerable expenditure of time and skilled labour. I fear the course pursued of continuous miscellaneous observing without reduction, has not tended to the advancement of accurate Astronomy to any extent proportional to the labour expended upon the work, and still required to be expended upon it before the results can be rendered useful. Such observing is rarely conducted in a way to facilitate the subsequent reductions or to economize labour in observing. This will be apparent to any one who will count the number of observations of Stars between 67° and 117° North Polar Distance and consider that a Catalogue formed from the results of other years would contain observations of these Stars to very nearly the same relative extent. Of the large number of observations accumulated here from 1834 to 1855, with the Transit instrument and Mural Circles, the places of the Southern Stars, out of the reach of the Northern Observatories, will when reduced, still be of value for proper motions; but the immense number of observations of well-known Stars made here with

the old instruments can now, I fear, never repay the labour required for their reduction.

The Right Ascensions of those Stars which have been used for clock error can do little more than reproduce the assumed tabular places employed in the reductions, and the Right Ascensions of other Stars not further from the Equator than those of the usual clock-star list can never differ much from the results of the Northern Observatories.

The North Polar Distances of the same well-observed Stars can now be of little value. The results are not likely to be compared with those of the Northern Observatories for a discussion of the errors of the refraction tables when results made with more powerful instruments are available.

I have made these remarks, not only in justice to the present staff, and to explain the work upon which they have been employed, but because it was these considerations which led me to pass over the earlier observations, and to commence the systematic reductions with the year 1856, when the Transit Circle was first brought into regular use. I felt that these reductions could not be any longer delayed without the value of the results being greatly diminished. I had, and still have, hopes, that the data collected in the present Catalogue for corresponding observations at the Northern Observatories would be found sufficient to meet the actual requirements of Astronomers, so far as these requirements can be met by the material collected here, and that I might be relieved from the laborious and somewhat useless task of completing the reductions of the earlier observations of Stars whose positions have been fixed already with an accuracy greater than could be expected to be attained in the observations made with the, comparatively speaking, inferior instruments in use at this Observatory before the introduction of the Transit Circle.

The present Catalogue has been formed from the volumes of results of observations made at this Observatory in the years 1856, 1857, 1858, 1859, and 1860, the reductions for which have been completed and the results published since I took charge of the Observatory work in October, 1870. The observations of Stars near the South Pole observed in 1861 have also been included. The whole of the observations combined for the formation of this Catalogue were made with the Transit Circle, an instrument similar in all respects to the Greenwich instrument which has been in use since 1851. The results of the observations made at Greenwich, 1854 to 1860, have been formed into a Catalogue reduced to the epoch 1860. There exist two other Catalogues, of great value, reduced to the same epoch. January 1, 1860, has therefore been chosen as the epoch of the present Catalogue. This choice of epoch affords great facilities for a comparison between the Greenwich and Cape results, and also for the formation of a more general Catalogue, for the whole heavens, by the combination of the different Catalogues reduced to that epoch.

Comparison of the Mean Right Ascensions of Clock-stars in the Greenwich Catalogue for 1860, with those contained in the Cape Catalogue of 1159 Stars for 1860.

Star's Name.	Mean R. A.	No. of G. Obs.	Seconds of Mean R. A. Greenwich.	No. of Cape Obs.	Seconds of Mean R. A. Cape.	Diff. G.—C.
	h m		s		s	
α Andromedæ	0° 1	59	9'44	4	9'56	+0'08
γ Pegasi.....	0° 6	67	1'79	15	1'82	-0'03
δ Ceti.....	0°22	42	53'64	6	53'67	-0'03
β Ceti	0°36	49	33'59	44	33'60	-0'01
δ Piscium.....	0°41	11	25'27	5	25'27	0'00
ϵ Piscium.....	0°55	74	40'79	7	40'79	0'00
ζ Piscium.....	1° 1	17	9'57	2	9'64	-0'07
θ Ceti	1°17	69	1'53	15	1'53	0'00
η Piscium	1°23	74	59'78	6	59'81	-0'03
π Piscium	1°29	12	40'83	3	40'89	-0'06
ν Piscium	1°34	62	8'87	4	8'91	-0'04
\omicron Piscium.....	1°38	11	0'22	1	0'36	-0'08
β Arietis	1°46	52	54'72	13	54'71	+0'01
α Arietis	1°59	75	17'28	13	17'26	+0'02
δ Ceti.....	1°10	40	0'10	10	0'11	-0'01
ζ Ceti.....	2°10	50	43'13	6	43'19	-0'06
γ Ceti.....	2°36	56	2'95	10	2'97	-0'02
ϵ Arietis	2°51	10	12'77	18	12'77	0'00
η Ceti	2°54	57	57'83	13	57'80	+0'03
δ Arietis	3° 3	51	37'74	8	37'74	0'00
δ Tauri	3°36	20	34'10	5	34'11	-0'01
η Tauri	3°39	67	10'09	8	10'07	+0'02
γ Eridani	3° 51	40	29'90	13	29'95	-0'05
δ Eridani.....	4° 5	10	1'96	14	2'02	-0'06
ϵ Tauri.....	4° 20	67	26'71	11	26'70	+0'01
α Tauri.....	4°27	123	53'43	26	53'41	+0'02
δ Leporis	4°59	23	32'10	11	32'13	-0'03
β Orionis.....	5° 7	101	48'63	42	48'63	0'00
δ Tauri	5°17	68	26'67	17	26'64	+0'03
δ Orionis.....	5°24	38	51'30	15	51'31	-0'01

of 1159 Stars for the epoch 1860.

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Star's Name.	Mean R. A.	No. of G. Obs.	Seconds of Mean R.A. Greenwich.	No. of Cape Obs.	Seconds of Mean R.A. Cape.	Diff. G.—C.
α Leporis	5 ^h 26 ^m	15	33 ^s 36	1	33 ^s 36	0 ^o 00
ϵ Orionis	5 ^h 29	28	6 ^s 60	3	6 ^s 55	+0 ^o 05
ζ Tauri	5 ^h 29	12	16 ^s 82	4	16 ^s 78	+0 ^o 04
α Columbe	5 ^h 34	21	34 ^s 79	21	34 ^s 81	-0 ^o 02
α Orionis	5 ^h 47	86	35 ^s 59	28	35 ^s 55	+0 ^o 04
ν Orionis	5 ^h 59	12	34 ^s 71	8	34 ^s 68	+0 ^o 03
η Geminorum	6 ^h 6	35	25 ^s 65	7	25 ^s 58	+0 ^o 07
ϵ Aurigæ	6 ^h 6	18	27 ^s 45	3	27 ^s 47	-0 ^o 02
μ Geminorum	6 ^h 14	48	29 ^s 43	11	29 ^s 42	+0 ^o 01
γ Geminorum	6 ^h 29	25	37 ^s 41	9	37 ^s 41	0 ^o 00
ϵ Geminorum	6 ^h 35	12	19 ^s 00	2	18 ^s 91	+0 ^o 09
δ Canis Majoris	6 ^h 53	28	7 ^s 45	28	7 ^s 39	+0 ^o 06
γ Canis Majoris	6 ^h 57	15	25 ^s 47	6	25 ^s 50	-0 ^o 03
δ Geminorum	7 ^h 11	59	45 ^s 55	18	45 ^s 53	+0 ^o 02
ϵ Geminorum	7 ^h 17	15	1 ^s 67	4	1 ^s 62	+0 ^o 05
α^2 Geminorum	7 ^h 25	61	39 ^s 73	2	39 ^s 66	+0 ^o 07
α Canis Minoris	7 ^h 31	112	58 ^s 34	30	58 ^s 31	+0 ^o 03
β Geminorum	7 ^h 35	119	44 ^s 68	3	44 ^s 62	+0 ^o 06
δ Cancri	7 ^h 54	49	54 ^s 86	2	54 ^s 80	+0 ^o 06
ι Navis	8 ^h 1	25	34 ^s 94	11	34 ^s 92	+0 ^o 02
ψ^2 Cancri	8 ^h 2	14	0 ^s 96	2	0 ^s 92	+0 ^o 04
η Cancri	8 ^h 24	40	35 ^s 48	7	35 ^s 46	+0 ^o 02
γ Cancri	8 ^h 35	35	10 ^s 76	2	10 ^s 76	0 ^o 00
ϵ Hydræ	8 ^h 39	57	21 ^s 57	8	21 ^s 56	+0 ^o 01
δ Cancri	9 ^h 11	56	9 ^s 77	7	9 ^s 70	+0 ^o 07
α Hydræ	9 ^h 20	49	42 ^s 44	17	42 ^s 44	0 ^o 00
ϵ Leonis	9 ^h 17	49	53 ^s 92	3	53 ^s 90	+0 ^o 02
ν Leonis	9 ^h 50	12	41 ^s 29	2	41 ^s 29	0 ^o 00
π Leonis	9 ^h 52	49	48 ^s 75	13	48 ^s 75	0 ^o 00
α Leonis	10 ^h 0	112	54 ^s 78	12	54 ^s 77	+0 ^o 01
γ^1 Leonis	10 ^h 12	28	14 ^s 95	5	14 ^s 97	-0 ^o 02
ρ Leonis	10 ^h 25	58	25 ^s 22	12	25 ^s 27	-0 ^o 05
ι Leonis	10 ^h 41	60	53 ^s 74	6	53 ^s 77	-0 ^o 03
ϵ Leonis	10 ^h 53	12	29 ^s 27	1	29 ^s 34	-0 ^o 07
χ Leonis	10 ^h 57	44	47 ^s 60	15	47 ^s 58	+0 ^o 02