249

CATALOGUE OF STARS

FOR THE EPOCH

JAN. 1, 1892

FROM OBSERVATIONS

BY THE

GREAT TRIGONOMETRICAL SURVEY OF INDIA.

COMPILED UNDER THE DIRECTION OF

COLONEL H. R. THUILLIER, C.I.E., R.E., SURVEYOR GENERAL OF INDIA.

BY

COLONEL G. STRAHAN, R.E., DEPUTY SURVEYOR GENERAL,
IN CHARGE OF THE TRIGONOMETRICAL BRANCH OF THE SURVEY OF INDIA.

Dehra Dun:
PRINTED AT THE OFFICE OF THE TRIGONOMETRICAL BRANCH, SURVEY OF INDIA.
B. V. HUGHES.

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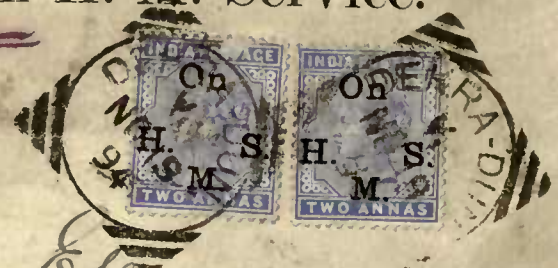

To

E. Davidson Esq
Davidson Observatory
San Francisco
(United States, America)

Baldeo Sahai, Computer,
Trigonometrical Branch Office,
Survey of India.

Trigl. Branch, Dehra Dún, 8-6-94—500.

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PREFACE.

For the effective prosecution of a geodetic survey, it is indispensable that the latitudes and longitudes of a certain number of the principal stations of the triangulation should be obtained from astronomical observations, independently of their values as computed from the triangulation. The great accumulation of observed zenith distances of stars for latitudes, and of observed transits for longitudes in the geodetic survey of India, gave rise to the conviction that the material thus laboriously collected might be utilized for compiling a star catalogue, a conviction which has resulted in the publication of the accompanying list of star-places for January, 1892, with the necessary constants for the reduction of their places to other epochs.

In order that the method by which the latitude and longitude observations were employed in the construction of the catalogue may be understood, a few introductory remarks seem necessary.

To begin with the Right Ascensions. These are purely differential, that is to say they are obtained by measurement of the difference of Right Ascension of the catalogued star and of some adjacent Nautical Almanac star observed with it; the latter being considered for the purposes of this Catalogue as errorless. For convenience of reference the name of the comparison Nautical Almanac star or stars thus employed is entered in the fifth column of the Catalogue.

In determining differences of longitude in India with the help of the electric telegraph, the method adopted as being the most direct and trustworthy was to record at both stations, by one and the same clock, the times of transit of certain stars at intervals of from one to three minutes, arranged in groups of eight or ten. The clock at the eastern station was employed first, and when two groups of stars had passed, the clock at the western station was similarly used. During the passage of each group the whole apparatus remained in *statu quo*, excepting only the necessary change in altitude of the transit telescope, so that when all corrections for collimation, level, and azimuth have been made, the interval between the transits of any two stars at either station represents the difference of their right ascensions. Each station furnishes a record of this description. As it is obvious that only approximate star places are required when this method is adopted, B.A.C. stars were freely used; for the differences of longitude depend solely upon the time occupied by a star passing from the meridian of the eastern, to that of the western observer. It was however found convenient for reasons connected with the subsequent computation, which need not be entered into here, to introduce a Nautical Almanac star into each group; the transit observations therefore furnish the difference of right ascension between this Nautical Almanac star and every other star in

the group. It has thus most fortunately happened that this practice, which was originally introduced for a totally different purpose, has rendered possible the determination of the Right Ascensions of nearly all the stars used in the longitude observations.

It would be superfluous to enter into any minute details of the instruments employed, especially as they are given at considerable length in Volumes IX, X and XV of the *Account of the Operations of the Great Trigonometrical Survey of India*, suffice it to say that the transit telescopes are by Messrs. T. Cooke and Sons of York, their effective aperture is 5 inches, and their focal length slightly over 5 feet. Their diaphragms are wired to carry two horizontal, and twenty-five vertical, wires in tallies of five each, the mean distance between them being 2·4 seconds of time, with a double interval between the tallies. The whole number of vertical wires was never used, the ordinary number being eleven or fifteen, equally distributed on either side of the central one. The collimation was adjusted by a pair of collimators, one to the north and one to the south, and the level by reflection of the system of wires from a mercury trough, with the aid of a Bohnenberger eye-piece. The azimuthal deviation was in almost all cases determined by reference to a pair of circumpolar stars, one at the upper, and the other at the lower culmination. A zenith distance not exceeding 24° south or north was laid down as a limit for the longitude stars. The transits were recorded by electricity on a chronograph, in a way which calls for no special mention here, and it was found that the probable error of the estimated time of a star passing one wire was about $0^s{\cdot}04$, and consequently about $0^s{\cdot}01$ for the whole group of fifteen wires. A full longitude determination consisted generally of six nights' work, on each of which the same groups with some few exceptions were employed.

In forming the Catalogue the times of transit of every star in a group, including the Nautical Almanac comparison star, were first purified from all known sources of error, and hence the difference of the right ascension of each star from that of the comparison star became known. The true right ascension of the comparison star at the moment of observation was then computed from the Nautical Almanac data, and hence the true right ascension of every observed star was obtained for that instant.

The place thus found was then corrected by the "Quantities for correcting the places of Stars" given in the Nautical Almanac, to reduce it to January 1 of the year of observation, using the proper motion, for this short interval, as given in the best catalogue available.

It was now quite simple to reduce the place to January 1, 1892 (which date is taken for the epoch of the Catalogue) as far as precession and nutation were concerned, but it became a matter of great doubt and difficulty to decide upon the proper motion; for in some cases the intervals between the date of observation and the epoch of the Catalogue, are so considerable, as to make it by no means an unimportant matter what proper motion is used for bringing up the place to the latter date. It was believed that the observations on which this Catalogue was founded were sufficiently accurate to give a reliable indication of what proper motion a star had been endued with since it had been last observed at some standard observatory; and to this end a sort of short history or abstract of its places, as determined from the Greenwich Catalogues of 1860, 1864, 1872 and 1880, was compiled, among which the places found from the longitude observations were inserted in their proper position according to date.

All these positions were then by the application of the precession and secular variation brought up to the epoch of January 1, 1892, *proper motion being entirely neglected.*

An examination of these showed the movements of each star due to its proper motion for a period of time of from twenty to thirty years, and from a consideration of these a proper motion was deduced which seemed to involve the minimum of discrepancy in the results, assuming that the proper motion in right ascension was proportional to the time. There seems to be in some cases evidence of this assumption being unsound,

but the quantities involved are so minute that it would be unsafe to base any theory upon them, and the proper motion assigned in all cases, and entered in the Catalogue, was such as to best represent the star's position on the supposition of uniform motion in right ascension. The finally reduced right ascension on January 1, 1892, as given in the Catalogue, is the mean of all the places found from the longitude observations brought up with the proper motion obtained as above.

The formulæ employed in computing the annual precession in right ascension and its secular variation are as follows:—

$$\text{Precession in seconds of time} = 3\cdot0726 + [0\cdot1260838] \sin a \cot \text{N.P.D.}$$

$$\text{Secular variation do.} = [\bar{2}\cdot1138] \sin a \cos a \operatorname{cosec}^2 \text{N.P.D.} + [\bar{3}\cdot9878] p \cos a \cot \text{N.P.D.}$$
$$+ 0\cdot00322 - [\bar{4}\cdot6338] p$$

where a is the star's right ascension in arc, and N.P.D. the north polar distance, both to the nearest second, and p in the latter formula is the annual precession in R. A. The formula for p is deduced as follows from that given at page 617 of Volume I of Chauvenet's "Manual of Spherical and Practical Astronomy," 2nd edition:—

$$p = m + n \sin a \cot \text{N.P.D.}$$

where
$$m = 46''\cdot0623 + 0''\cdot0002849\, t$$
$$n = 20''\cdot0607 - 0''\cdot0000863\, t$$

t being the number of years elapsed since 1800.

Substituting 92 for t and dividing by 15 to reduce to seconds of time, we obtain

$$m = 3^s\cdot0726$$
$$\log n = 0\cdot1260838.$$

The North Polar Distances were determined from zenith distance observations made with the Astronomical Circles Nos. 1 and 2, Strange's Zenith Sectors Nos. 1 and 2 and in a few with Troughton and Simms' Zenith Telescope. Detailed descriptions of the first two kinds of instruments will be found in Volume XI of the *Account of the Operations of the Great Trigonometrical Survey of India*, and it will suffice to say that each of the Astronomical Circles has an effective aperture of 3·46 inches and a focal length of 53·84 inches and that each of the Zenith Sectors has an effective aperture of 4 inches and a focal length of 48·5 inches. The Zenith Telescope is of the usual pattern and has an effective aperture of 2·5 inches and a focal length of 30 inches.

The general principles on which the North Polar Distances were determined is as follows:— the latitude of each station being obtained from observations to a great number of stars, it was presumed that the errors of stars' places cancel in the mean and that the latitude is practically correct. The observations of zenith distances from which the latitude was determined were also accepted so that each observation gave an equation as follows:—

$$\text{north polar distance} = \text{co-latitude} \pm \text{zenith distance}$$

the upper and lower signs applying to stars south and north of the zenith respectively. As, however, the Astronomical Circles gave the latitude as determined by north stars different from that as determined by south stars, the co-latitude as determined by north stars only was used in the above equation when a north star was under consideration and similarly for south stars.

The North Polar Distance was thus obtained for the date of observation at a particular station: the necessary corrections to reduce to January 1 having been already computed, were applied and the mean of the results taken to represent the star's north polar distance on January 1 of a certain year as deduced from observations at a particular station. The same procedure was applied at each station where the star was observed, the results being the north polar distances of the star on January 1 of certain years.

The star's places were then brought up to January 1, 1892, proper motion being entirely neglected.

Just as in the case of the right ascensions, these places were examined and that value assigned to the proper motion which seemed best to accord with the observations.

The proper motion was then applied and the mean of the results taken as the star's North Polar Distance on January 1, 1892.

In a few cases when a star was observed with the zenith telescope, the results of the observations are the sum of the north polar distances of that star and of another whose place was found in the English, French or German Nautical Almanac, and taken from there as correct: the star's place was then found by simple subtraction.

The formulæ employed in computing the annual precessions in north polar distance and its secular variation are as follows:—

$$\text{Precession in seconds of arc} = -[1\cdot3021751]\cos\alpha$$

$$\text{Secular variation} \ldots\ldots = [\bar{1}\cdot1638]\,p\sin\alpha + [\bar{3}\cdot9360]\cos\alpha.$$

The magnitudes of the stars contained in this catalogue were taken from the Greenwich Catalogues where possible, in all other cases they are copied from the B. A. C.

G. STRAHAN, Colonel, R.E.,
Dy. Surveyor General,
In charge Trigonometrical Surveys.

Dehra Dun:
July, 1893.

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JAN. 1, 1892

FROM OBSERVATIONS

BY THE

GREAT TRIGONOMETRICAL SURVEY

OF

INDIA.

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h *m* *s*			*s*	*s*	*s*
1	9 Trianguli . γ	5·5	2 10 53·602	ξ^2 Ceti	14	+ 3·5482	+ 0·0293	+ 0·005
2	22 Arietis . . θ	5·6	2 12 6·997	„	14	+ 3·3292	+ 0·0180	− 0·002
3	Piazzi II. 61 .	6·0	2 16 6·966	„	14	+ 3·7208	+ 0·0381	− 0·009
4	14 Trianguli . .	5·3	2 25 30·600	„	14	+ 3·6417	+ 0·0316	0·000
5	26 Persei . . β	Var.	3 1 8·403	δ Arietis	12	+ 3·8851	+ 0·0355	− 0·002
6	55 Arietis . . .	5·5	3 3 6·826	δ Arietis	12	+ 3·5963	+ 0·0235	− 0·003
7	28 Persei . . ω	4·7	3 4 19·010	„	12	+ 3·8580	+ 0·0335	− 0·003
8	Piazzi III. 5 .	6·0	3 7 46·678	„	12	+ 3·9552	+ 0·0370	+ 0·007
9	Piazzi III. 23.	4·8	3 11 58·481	„	12	+ 3·7383	+ 0·0273	0·000
10	Piazzi III. 32.	4·7	3 13 48·184	„	10	+ 3·6194	+ 0·0228	− 0·001
11	64 Arietis . . .	5·6	3 17 55·885	*o* Tauri	10	+ 3·5324	+ 0·0195	+ 0·004
12	2 Tauri . . ξ	3·8	3 21 19·026	„	6	+ 3·2421	+ 0·0117	+ 0·003
13	5 Tauri . . *f*	4·3	3 24 54·735	„	18	+ 3·3049	+ 0·0130	+ 0·008
14	Piazzi III. 104	6·0	3 34 5·974	η Tauri and *o* Tauri	24	+ 3·8895	+ 0·0284	− 0·004
15	40 Persei . . *o*	6·0	3 35 31·884	„ „	22	+ 3·7906	+ 0·0250	+ 0·002
16	38 Persei . . *o*	4·0	3 37 32·656	η Tauri	18	+ 3·7503	+ 0·0234	− 0·003
17	19 Tauri . . .	4·4	3 38 46·645	„	18	+ 3·5613	+ 0·0180	0·000
18	42 Persei . . *n*	6·0	3 42 42·957	„	8	+ 3·7831	+ 0·0235	− 0·004
19	Piazzi III. 170	5·5	3 43 49·241	„	32	+ 3·5951	+ 0·0183	− 0·004
20	44 Persei . . ζ	3·1	3 47 20·541	„	8	+ 3·7601	+ 0·0221	+ 0·001
21	45 Persei . . ϵ	3·0	3 50 36·279	η Tauri	6	+ 4·0101	+ 0·0287	+ 0·001
22	46 Persei . . ξ	4·1	3 51 57·345	„ and A Tauri	32	+ 3·8806	+ 0·0246	− 0·002
23	39 Tauri . . A^2	6·5	3 58 56·558	A Tauri	20	+ 3·5325	+ 0·0153	+ 0·011
24	44 Tauri . . *p*	5·6	4 4 15·147	„	20	+ 3·6482	+ 0·0169	− 0·003
25	52 Persei . . *f*	4·9	4 7 32·201	„	12	+ 4·0694	+ 0·0265	− 0·004
26	48 Tauri . . .	6·4	4 9 38·386	A Tauri	6	+ 3·3930	+ 0·0116	+ 0·008
27	52 Tauri . . ϕ	5·1	4 13 42·651	„	6	+ 3·6842	+ 0·0164	− 0·002
28	68 Tauri . . δ^3	4·2	4 19 14·371	ϵ Tauri	4	+ 3·4582	+ 0·0118	+ 0·006
29	Piazzi IV. 99.	5·0	4 24 22·521	„	8	+ 3·4221	+ 0·0108	− 0·003
30	85 Tauri . . .	6·0	4 25 41·512	„	18	+ 3·4151	+ 0·0106	+ 0·003
31	Piazzi IV. 148	5·9	4 34 34·061	ϵ Tauri and ι Aurigæ	20	+ 3·7459	+ 0·0145	− 0·001
32	94 Tauri . . τ	4·4	4 35 45·604	ι Aurigæ	10	+ 3·5957	+ 0·0121	− 0·007
33	Piazzi IV. 169	5·3	4 38 26·609	„	6	+ 3·3149	+ 0·0084	+ 0·004
34	1 Aurigæ. . .	5·2	4 42 38·310	„	10	+ 4·0334	+ 0·0178	− 0·008
35	96 Tauri . . .	6·0	4 43 33·318	„	30	+ 3·4280	+ 0·0092	+ 0·003

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
1	56 39 8·4	1	4	− 16·870	+ 0·287	+ 0·020	698	...	...
2	70 35 55·9	5	19	− 16·812	+ 0·272	+ 0·015	707	210	350
3	49 5 39·3	2	11	− 16·619	+ 0·311	+ 0·100	727	212	356
4	54 19 57·8	1	8	− 16·145	+ 0·322	− 0·012	772	226	376
5	49 27 39·0	1	4	− 14·109	+ 0·409	− 0·020	963	285	464
6	61 20 9·3*	...	...	− 13·986	+ 0·382	+ 0·026*	974	288	471
7	50 47 56·2	3	14	− 13·910	+ 0·411	− 0·020	981	290	472
8	47 54 0·3	1	6	− 13·690	+ 0·427	− 0·020	993	...	...
9	56 10 22·6	2	8	− 13·420	+ 0·411	+ 0·060	1017	305	499
10	61 20 38·4	4	105	− 13·300	+ 0·401	+ 0·067	1025	...	504
11	65 39 31·7	11	131	− 13·028	+ 0·397	+ 0·010	1052	313	517
12	80 38 39·0	2	6	− 12·801	+ 0·369	0·000	1068	319	526
13	77 26 2·1	18	68	− 12·558	+ 0·381	+ 0·030	1087	325	539
14	52 46 8·8	2	8	− 11·921	+ 0·461	0·000	1123	334	...
15	56 22 54·9	2	7	− 11·820	+ 0·452	0·000	1132	...	...
16	58 3 16·0	18	228	− 11·677	+ 0·450	+ 0·010	1138	340	571
17	65 52 19·5	3	15	− 11·589	+ 0·429	+ 0·060	1151	...	577
18	57 14 25·7	3	14	− 11·306	+ 0·460	+ 0·010	1175	...	...
19	64 44 43·0	2	97	− 11·226	+ 0·439	...	1192	...	596
20	58 26 15·9	11	151	− 10·970	+ 0·464	+ 0·020	1207	355	603
21	50 18 9·2	1	9	− 10·730	+ 0·499	+ 0·016	1219	361	610
22	54 31 12·3	2	8	− 10·630	+ 0·484	+ 0·013	1228	363	613
23	68 16 58·8	2	10	− 10·106	+ 0·449	+ 0·181	1260	374	633
24	63 48 5·2	7	20	− 9·702	+ 0·470	+ 0·069	1279	381	648
25	49 47 25·6	2	8	− 9·450	+ 0·527	+ 0·025	1291	386	660
26	74 52 12·6	9	121	− 9·287	+ 0·443	+ 0·044	1302	388	664
27	62 54 29·5	8	41	− 8·970	+ 0·484	+ 0·105	1326	398	681
28	72 19 10·9	3	14	− 8·535	+ 0·460	...	1365	413	703
29	74 2 30·0	2	8	− 8·126	+ 0·460	+ 0·050	1391	422	...
30	74 22 50·9	1	5	− 8·021	+ 0·460	+ 0·070	1402	425	...
31	61 35 41·4	7	115	− 7·303	+ 0·512	+ 0·040	1444	440	750
32	67 15 3·1	18	181	− 7·206	+ 0·492	+ 0·022	1449	441	754
33	79 3 20·4	12	45	− 6·986	+ 0·456	+ 0·035	1460	...	761
34	52 42 11·9	4	18	− 6·641	+ 0·558	0·000	1476	447	776
35	74 17 7·7	2	96	− 6·565	+ 0·475	+ 0·080	1485	...	...

* Brought up to date from the Greenwich Catalogue of 1880.

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
36	2 Aurigæ . .	5·0	4 45 24·063	ι Aurigæ	10	+ 4·0106	+ 0·0168	− 0·009
37	3 Orionis . π^3	4·0	4 45 27·226	μ Eridani	8	+ 3·1928	+ 0·0067	+ 0·005
38	5 Orionis . .	5·7	4 47 44·770	ι Aurigæ	12	+ 3·1243	+ 0·0061	+ 0·001
39	98 Tauri . . *k*	5·7	4 51 32·666	,,	10	+ 3·6652	+ 0·0109	− 0·006
40	4 Aurigæ . .	5·1	4 51 55·375	,,	24	+ 4·0615	+ 0·0163	− 0·003
41	102 Tauri . . ι	4·7	4 56 38·311	ι Aurigæ	12	+ 3·5775	+ 0·0094	0·000
42	10 Aurigæ . η	3·3	4 58 56·311	,,	10	+ 4·1972	+ 0·0166	− 0·003
43	15 Orionis . .	4·8	5 3 31·184	β Tauri	14	+ 3·4311	+ 0·0073	+ 0·008
44	11 Aurigæ . μ	4·9	5 6 2·346	,,	14	+ 4·1013	+ 0·0136	+ 0·003
45	18 Orionis . .	5·6	5 10 4·191	,,	14	+ 3·3315	+ 0·0060	...
46	Piazzi V. 26 .	5·3	5 11 53·684	β Tauri	24	+ 3·9424	+ 0·0107	...
47	109 Tauri . . *n*	5·2	5 12 47·363	,,	38	+ 3·6009	+ 0·0076	+ 0·005
48	Piazzi V. 41 .	6·5	5 14 12·536	,,	34	+ 3·7648	+ 0·0087	+ 0·002
49	21 Aurigæ . σ	5·2	5 17 18·914	,,	44	+ 4·0728	+ 0·0108	+ 0·009
50	Piazzi V. 63 .	5·9	5 17 41·018	,,	10	+ 3·8635	+ 0·0089	...
51	111 Tauri . . .	5·2	5 18 7·441	β Tauri	14	+ 3·4816	+ 0·0062	+ 0·024
52	115 Tauri . . .	5·5	5 20 52·174	,,	24	+ 3·4973	+ 0·0060	+ 0·005
53	116 Tauri . . .	6·0	5 21 33·373	,,	36	+ 3·4451	+ 0·0056	+ 0·004
54	25 Aurigæ . χ	5·0	5 25 41·995	,,	12	+ 3·9022	+ 0·0078	+ 0·005
55	121 Tauri . . .	5·4	5 28 51·490	,,	12	+ 3·6614	+ 0·0059	+ 0·009
56	128 Tauri . . .	6·0	5 38 39·888	ε Orionis	8	+ 3·4553	+ 0·0039	− 0·001
57	129 Tauri . . .	6·0	5 40 32·796	,,	8	+ 3·4490	+ 0·0038	− 0·002
58	132 Tauri . . .	5·6	5 42 23·199	,,	8	+ 3·6809	+ 0·0041	− 0·004
59	139 Tauri . . .	5·1	5 51 17·632	ν Orionis	12	+ 3·7224	+ 0·0029	+ 0·002
60	* B.F. 817 . .	6·0	5 52 48·673	,,	14	+ 3·3761	+ 0·0024	0·000
61	141 Tauri . . .	6·7	5 55 10·611	ν Orionis	14	+ 3·6234	+ 0·0023	+ 0·020
62	1 Geminorum .	4·3	5 57 33·378	,,	10	+ 3·6474	+ 0·0020	...
63	40 Aurigæ . .	6·0	5 59 8·424	,,	22	+ 4·1357	+ 0·0016	+ 0·001
64	3 Geminorum .	6·5	6 3 10·538	,, and μ Gem.	96	+ 3·6436	+ 0·0012	+ 0·002
65	68 Orionis . .	6·0	6 5 37·549	μ Geminorum	54	+ 3·5541	+ 0·0010	0·000
66	6 Geminorum .	6·7	6 5 46·325	μ Gem. and ν Orionis	22	+ 3·6380	+ 0·0009	+ 0·004
67	71 Orionis . .	5·1	6 8 29·654	ν Orionis	14	+ 3·5376	+ 0·0007	− 0·006
68	44 Aurigæ . κ	4·5	6 8 29·849	μ Gem. and ν Orionis	26	+ 3·8296	+ 0·0002	− 0·002
69	Bradley 918.	7·0	6 11 40·313	η Gem. and μ Gem.	50	+ 4·0162	− 0·0009	+ 0·005
70	15 Geminorum .	7·0	6 21 20·379	γ Gem. ,,	26	+ 3·5797	− 0·0009	− 0·002

* Baily's Edition of Flamsteed's Catalogue.

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
36	53 28 48·4	5	22	− 6·413	+ 0·557	+ 0·024	1492	450	787
37	84 34 48·6	1	4	− 6·408	+ 0·444	+ 0·002	1495	...	789
38	87 40 15·4*	...	...	− 6·218	+ 0·436	+ 0·014	1508	...	796
39	65 7 1·4	9	121	− 5·901	+ 0·513	+ 0·063	1528	460	808
40	52 16 26·0	3	14	− 5·869	+ 0·569	+ 0·131	1530	...	809
41	68 33 53·9	12	133	− 5·474	+ 0·504	+ 0·050	1551	468	823
42	48 54 44·7	22	170	− 5·280	+ 0·593	+ 0·105	1558	471	828
43	74 32 27·7	4	104	− 4·892	+ 0·487	0·000	1591	480	846
44	51 38 40·3	4	20	− 4·678	+ 0·583	+ 0·125	1602	482	851
45	78 46 51·0*	...	...	− 4·334	+ 0·476	− 0·003	1624	...	869
46	56 22 1·4*	...	...	− 4·178	+ 0·564	+ 0·030	1632	...	874
47	68 0 57·8	7	15	− 4·102	+ 0·516	+ 0·125	1637	495	877
48	62 9 10·3	6	20	− 3·980	+ 0·540	+ 0·007	1648	498	879
49	52 42 58·9	5	21	− 3·713	+ 0·585	0·000	1663	499	888
50	58 57 28·5	2	100	− 3·682	+ 0·555	0·000	1669	...	890
51	72 43 3·1*	...	...	− 3·644	+ 0·501	− 0·006	1671	500	892
52	72 7 51·1	4	18	− 3·407	+ 0·504	− 0·020	1692	...	...
53	74 13 3·4	3	12	− 3·348	+ 0·497	+ 0·014	1701	513	...
54	57 53 18·8	26	269	− 2·990	+ 0·564	+ 0·013	1723	518	915
55	66 1 59·6	8	34	− 2·716	+ 0·530	+ 0·070	1742	525	927
56	73 57 42·3	6	23	− 1·864	+ 0·502	+ 0·088	1819	544	...
57	74 13 12·7	9	113	− 1·700	+ 0·502	0·000	1821	...	...
58	65 28 10·1	7	29	− 1·539	+ 0·536	+ 0·053	1837	551	...
59	64 3 36·9	7	112	− 0·762	+ 0·543	+ 0·030	1896	569	1010
60	77 12 10·4	2	7	− 0·629	+ 0·492	+ 0·041	1907	572	...
61	67 36 9·7	2	8	− 0·422	+ 0·528	+ 0·033	1925	...	1021
62	66 43 53·4	34	221	− 0·214	+ 0·532	+ 0·104	1938	579	1026
63	51 30 28·6	1	3	− 0·075	+ 0·603	...	1942	580	...
64	66 52 10·8	12	127	+ 0·278	+ 0·531	− 0·006	1971	589	1043
65	70 11 9·6	3	13	+ 0·492	+ 0·518	...	1986	592	...
66	67 4 4·0	4	8	+ 0·505	+ 0·530	+ 0·017	1987	593	1052
67	70 48 28·8	1	8	+ 0·743	+ 0·515	+ 0·205	2004	602	1059
68	60 27 46·3	36	296	+ 0·743	+ 0·558	+ 0·270	2001	601	1058
69	54 45 4·5	1	4	+ 1·021	+ 0·584	+ 0·040	2021	608	1065
70	69 8 42·0	9	22	+ 1·864	+ 0·519	+ 0·061	2089	618	1098

* Brought up to date from the Greenwich Catalogue of 1880.

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
71	48 Aurigæ . .	5·2	6 21 37·702	μ Geminorum	46	+ 3·8584	− 0·0022	+ 0·006
72	18 Geminorum ν	4·0	6 22 33·078	,,	2	+ 3·5642	− 0·0010	...
73	Piazzi VI. 114	6·8	6 23 33·270	γ Gem. and μ Gem.	48	+ 3·7881	− 0·0022	+ 0·009
74	Piazzi VI. 126	6·0	6 25 24·454	μ Geminorum	38	+ 3·9200	− 0·0032	+ 0·005
75	49 Aurigæ . .	4·9	6 28 24·005	γ Gem. and μ Gem.	18	+ 3·7811	− 0·0029	+ 0·001
76	Groom. 1190.	6·7	6 29 7·476	μ Geminorum	22	+ 4·1286	− 0·0053	+ 0·006
77	51 Aurigæ . .	5·7	6 31 10·633	,,	10	+ 4·1639	− 0·0060	+ 0·002
78	54 Aurigæ . .	5·7	6 32 44·440	γ Geminorum	18	+ 3·7868	− 0·0036	− 0·004
79	27 Geminorum ϵ	3·2	6 37 17·268	γ Gem. and ξ Gem.	40	+ 3·6944	− 0·0037	+ 0·003
80	17 Monocerotis .	5·0	6 41 27·975	γ Geminorum	16	+ 3·2610	− 0·0014	0·000
81	59 Aurigæ . .	6·7	6 45 35·637	γ Geminorum	16	+ 4·1337	− 0·0092	...
82	38 Geminorum *e*	4·8	6 48 33·189	ξ Geminorum	16	+ 3·3819	− 0·0027	+ 0·010
83	40 Geminorum .	6·7	6 52 47·947	γ Canis Majoris	10	+ 3·7091	− 0·0060	+ 0·003
84	42 Geminorum ω	5·3	6 55 50·074	,,	12	+ 3·6603	− 0·0060	+ 0·005
85	45 Geminorum .	5·6	7 2 10·539	,,	12	+ 3·4444	− 0·0045	+ 0·004
86	46 Geminorum τ	4·6	7 4 15·961	δ Geminorum	12	+ 3·8269	− 0·0091	− 0·001
87	48 Geminorum .	5·8	7 5 52·659	,,	12	+ 3·6517	− 0·0072	− 0·002
88	51 Geminorum .	5·4	7 7 10·195	,,	12	+ 3·4479	− 0·0049	+ 0·001
89	52 Geminorum .	6·3	7 8 5·656	,,	8	+ 3·6706	− 0·0077	+ 0·002
90	54 Geminorum λ	3·6	7 11 53·177	,,	12	+ 3·4549	− 0·0056	− 0·010
91	65 Aurigæ. . .	5·3	7 14 49·745	δ Geminorum	10	+ 4·0255	− 0·0141	− 0·004
92	66 Aurigæ. . .	6·0	7 16 39·831	,,	10	+ 4·1657	− 0·0172	+ 0·003
93	57 Geminorum A	5·0	7 16 53·391	β Canis Minoris	8	+ 3·6682	− 0·0088	− 0·011
94	1 Canis Minoris	5·4	7 18 58·320	β Gem. & β Can. Min.	10	+ 3·3373	− 0·0049	0·000
95	60 Geminorum ι	4·0	7 19 1·170	δ Geminorum	22	+ 3·7419	− 0·0102	− 0·007
96	63 Geminorum .	5·3	7 21 19·786	β Geminorum	2	+ 3·5706	− 0·0080	− 0·004
97	62 Geminorum ρ	4·2	7 22 9·932	δ Geminorum	10	+ 3·8548	− 0·0127	+ 0·013
98	65 Geminorum b^2	5·1	7 23 5·713	β Canis Minoris	12	+ 3·7411	− 0·0108	− 0·004
99	Piazzi VII. 114	6·0	7 23 56·886	,,	12	+ 3·7402	− 0·0110	+ 0·003
100	69 Geminorum ν	4·2	7 29 16·037	,,	4	+ 3·7064	− 0·0112	− 0·005
101	Piazzi VII. 179	7·0	7 36 56·252	β Canis Minoris	12	+ 3·5814	− 0·0100	− 0·003
102	11 Canis Minoris	5·6	7 40 19·754	β Geminorum	12	+ 3·3086	− 0·0060	+ 0·007
103	83 Geminorum ϕ	4·9	7 46 53·144	6 Cancri	42	+ 3·6822	− 0·0132	− 0·009
104	85 Geminorum .	5·3	7 49 21·659	,,	40	+ 3·5088	− 0·0101	− 0·006
105	1 Cancri . . .	5·9	7 50 51·503	,, and β Gem.	44	+ 3·4137	− 0·0085	− 0·005

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
71	59 26 27·1	2	100	+ 1·890	+ 0·559	+ 0·007	2082	620	1099
72	69 43 12·3	23	71	+ 1·970	+ 0·516	0·000	2090	623	1104
73	61 43 2·3	4	10	+ 2·057	+ 0·549	+ 0·100	2097	626	1108
74	57 28 7·6	3	10	+ 2·219	+ 0·567	...	2110	628	1110
75	61 53 38·6	2	10	+ 2·479	+ 0·546	+ 0·015	2133	635	1127
76	51 28 2·1	3	13	+ 2·541	+ 0·596	− 0·110	2139	636	...
77	50 30 53·5	1	6	+ 2·719	+ 0·600	+ 0·119	2155	641	1135
78	61 38 31·8	6	21	+ 2·855	+ 0·545	+ 0·028	2170	649	1144
79	64 45 45·6	37	171	+ 3·248	+ 0·530	+ 0·027	2194	652	1159
80	81 50 49·2	2	4	+ 3·608	+ 0·466	0·000	2216	659	1173
81	51 0 9·7	1	4	+ 3·963	+ 0·589	0·000	2235	663	...
82	76 41 7·7	1	3	+ 4·217	+ 0·480	+ 0·071	2255	669	1184
83	63 56 23·8	4	10	+ 4·579	+ 0·525	+ 0·061	2278	679	...
84	65 37 52·1	7	24	+ 4·837	+ 0·516	− 0·022	2299	682	1197
85	73 53 51·0	10	36	+ 5·374	+ 0·482	+ 0·157	2330	690	1218
86	59 34 42·7	21	225	+ 5·550	+ 0·534	+ 0·066	2340	693	1221
87	65 41 29·2	28	105	+ 5·685	+ 0·508	+ 0·057	2350	697	1227
88	73 39 30·3	4	12	+ 5·793	+ 0·479	+ 0·073	2362	698	1233
89	64 55 41·3	1	2	+ 5·871	+ 0·509	+ 0·105	2364	700	1237
90	73 15 55·2	14	55	+ 6·187	+ 0·477	+ 0·035	2398	706	1250
91	53 2 13·8	5	20	+ 6·432	+ 0·553	+ 0·055	2416	714	1261
92	49 7 13·5	1	4	+ 6·583	+ 0·571	...	2429	718	...
93	64 44 33·9	1	4	+ 6·602	+ 0·502	+ 0·056	2431	719	1265
94	78 7 10·9	1	4	+ 6·774	+ 0·455	+ 0·056	2444	725	1272
95	61 59 16·8	27	146	+ 6·778	+ 0·511	+ 0·109	2442	724	1271
96	68 20 4·0	9	30	+ 6·968	+ 0·485	+ 0·108	2460	727	1281
97	58 0 5·4	8	133	+ 7·036	+ 0·523	− 0·157	2464	729	1284
98	61 51 42·4	8	36	+ 7·112	+ 0·507	+ 0·045	2469	733	1289
99	61 51 (...)	1	3	+ 7·182	+ 0·506	...	2472	734	...
100	62 51 53·2	22	77	+ 7·615	+ 0·497	+ 0·129	2493	742	1303
101	67 20 45·0	2	96	+ 8·231	+ 0·473	− 0·070	2544	...	...
102	78 58 7·4	1	4	+ 8·501	+ 0·433	...	2564	764	...
103	62 57 19·3	23	108	+ 9·017	+ 0·476	+ 0·056	2617	774	1343
104	69 49 54·0	2	8	+ 9·210	+ 0·451	+ 0·070	2632	...	1349
105	73 55 18·7	23	96	+ 9·326	+ 0·437	+ 0·068	2639	777	1350

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
106	2 Cancri . . ω^1	5·9	7 54 23·640	6 Cancri	10	+ 3·6372	− 0·0132	− 0·007
107	3 Cancri . . .	6·0	7 54 35·886	,,	38	+ 3·4448	− 0·0094	− 0·006
108	8 Cancri . . .	6·0	7 59 3·479	,,	12	+ 3·3496	− 0·0080	− 0·005
109	9 Cancri . . μ^1	6·2	7 59 54·462	,,	34	+ 3·5628	− 0·0123	+ 0·003
110	10 Cancri . . μ^2	5·3	8 1 24·464	,,	36	+ 3·5362	− 0·0119	− 0·003
111	16 Cancri . . ζ	4·7	8 6 1·004	6 Cancri	30	+ 3·4423	− 0·0103	+ 0·002
112	* B.F. 1152 . .	7·0	8 6 19·651	β Cancri	8	+ 3·3634	− 0·0088	+ 0·001
113	15 Cancri . . .	5·6	8 6 27·262	,,	34	+ 3·7294	− 0·0171	+ 0·001
114	18 Cancri . . χ	5·1	8 13 30·184	,,	22	+ 3·6554	− 0·0162	− 0·007
115	19 Cancri . . λ	5·7	8 14 6·779	,,	34	+ 3·5772	− 0·0142	− 0·007
116	20 Cancri . . d^1	5·9	8 17 10·713	β Cancri	22	+ 3·4460	− 0·0114	− 0·009
117	Groom. 1433 .	6·0	8 17 24·005	,,	24	+ 4·0787	− 0·0300	+ 0·002
118	30 Cancri . . υ^3	5·8	8 25 7·315	η Cancri	18	+ 3·5625	− 0·0151	− 0·009
119	Groom. 1450 .	6·7	8 25 53·758	β Cancri	12	+ 3·9243	− 0·0266	− 0·013
120	32 Lyncis . . .	6·0	8 26 25·885	γ Cancri	22	+ 3·8755	− 0·0250	− 0·022
121	33 Lyncis . . .	6·0	8 27 47·452	γ Cancri & η Cancri	36	+ 3·8716	− 0·0251	− 0·007
122	35 Cancri . . .	7·7	8 29 6·932	η Cancri	8	+ 3·4589	− 0·0127	− 0·003
123	36 Cancri . . c^1	5·9	8 31 14·510	,,	12	+ 3·2594	− 0·0081	− 0·002
124	Piaz. VIII. 134	7·7	8 34 44·517	γ Cancri	24	+ 3·4516	− 0·0131	− 0·007
125	47 Cancri . . δ	4·3	8 38 32·878	,,	8	+ 3·4181	− 0·0125	− 0·001
126	46 Cancri . . σ^1	6·7	8 38 43·803	γ Cancri	6	+ 3·6930	− 0·0209	− 0·003
127	48 Cancri . . ι	4·0	8 40 9·658	η Canc., γ Canc. & ϵ Hyd.	28	+ 3·6435	− 0·0195	− 0·003
128	50 Cancri . . A^2	5·8	8 41 0·750	γ Cancri	10	+ 3·2989	− 0·0095	− 0·008
129	13 Hydræ . . ρ	4·3	8 42 42·726	,, & ϵ Hydræ	44	+ 3·1834	− 0·0069	− 0·003
130	Piaz. VIII. 173	6·5	8 43 49·516	γ Cancri	2	+ 3·7456	− 0·0236	− 0·012
131	51 Cancri . . .	5·7	8 45 54·321	γ Cancri & ϵ Hydræ	20	+ 3·7200	− 0·0230	+ 0·005
132	53 Cancri . . ρ^1	6·5	8 45 58·939	γ Cancri	16	+ 3·6200	− 0·0195	− 0·002
133	55 Cancri . . ρ^2	6·2	8 46 9·774	,,	8	+ 3·6214	− 0·0195	− 0·041
134	57 Cancri . . σ^2	5·5	8 47 39·152	ϵ Hydræ	18	+ 3·6701	− 0·0215	− 0·006
135	59 Cancri . . .	5·5	8 50 16·470	γ Cancri	2	+ 3·7200	− 0·0237	− 0·017
136	* B.F. 1267 . .	6·3	8 51 52·435	ϵ Hydræ	10	+ 3·2416	− 0·0086	− 0·010
137	64 Cancri . . .	5·7	8 52 54·484	γ Cancri	2	+ 3·7013	− 0·0235	− 0·016
138	10 Ursæ Majoris	4·0	8 53 37·764	κ Cancri	12	+ 3·9535	− 0·0343	− 0·040
139	67 Cancri . . .	5·8	8 55 22·687	,,	12	+ 3·5923	− 0·0198	0·000
140	69 Cancri . . ν	5·6	8 56 25·438	,,	12	+ 3·5177	− 0·0172	0·000

* Baily's Edition of Flamsteed's Catalogue.

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
106	64 18 45·3	15	73	+ 9·599	+ 0·462	+ 0·075	2657	781	1363
107	72 23 44·5	2	10	+ 9·614	+ 0·437	+ 0·025	2659	782	1365
108	76 34 28·2	2	8	+ 9·955	+ 0·420	+ 0·050	2690	...	...
109	67 3 25·9	7	120	+10·019	+ 0·446	+ 0·056	2700	790	1378
110	68 6 18·8	14	50	+10·133	+ 0·441	+ 0·087	2714	792	1383
111	72 1 39·9	8	24	+10·479	+ 0·423	+ 0·150	2744	798	1395
112	75 40 26·6*	...	...	+10·502	+ 0·413	...	2748	801	...
113	60 1 12·5	4	106	+10·511	+ 0·459	+ 0·017	2747	802	1397
114	62 25 59·1	20	95	+11·032	+ 0·440	+ 0·375	2786	809	1405
115	65 38 17·1	14	88	+11·076	+ 0·430	+ 0·036	2789	811	1407
116	71 19 17·5	17	60	+11·299	+ 0·410	+ 0·030	2799	812	1411
117	47 38 54·1	2	11	+11·315	+ 0·486	...	2798	813	...
118	65 33 18·1	10	25	+11·866	+ 0·414	+ 0·035	2850	833	1432
119	51 36 45·9	1	2	+11·921	+ 0·455	...	2855	835	...
120	53 11 53·4	2	9	+11·958	+ 0·448	...	2860	836	...
121	53 12 37·1	1	3	+12·053	+ 0·446	...	2871	840	...
122	70 2 21·0	1	2	+12·146	+ 0·396	+ 0·094	2880	842	1442
123	79 58 10·7	6	34	+12·293	+ 0·370	+ 0·030	2897	...	1449
124	70 2 14·1†	...	...	+12·534	+ 0·387	+ 0·004	2925	...	1463
125	71 26 57·6	16	82	+12·792	+ 0·378	+ 0·268	2953	859	1470
126	58 54 39·3	1	3	+12·804	+ 0·409	− 0·063	2952	860	...
127	60 50 43·6	4	17	+12·900	+ 0·401	0·000	2965	863	1474
128	77 29 39·9	2	48	+12·957	+ 0·362	+ 0·095	2970	...	1476
129	83 45 49·7	1	8	+13·071	+ 0·346	+ 0·070	2978	...	1480
130	56 18 42·7	1	4	+13·144	+ 0·407	+ 0·090	2984	...	...
131	57 7 17·8	1	4	+13·281	+ 0·401	0·000	2999	867	1483
132	61 20 10·1	11	27	+13·286	+ 0·390	+ 0·065	3000	868	1484
133	61 15 24·8	20	150	+13·298	+ 0·390	+ 0·230	3002	...	1486
134	59 0 42·1	3	14	+13·395	+ 0·393	0·000	3016	871	1490
135	56 40 25·8	3	12	+13·565	+ 0·394	0·000	3033	874	1495
136	80 11 46·6	1	3	+13·668	+ 0·340	...	3053	876	1502
137	57 9 44·7	1	4	+13·734	+ 0·387	+ 0·100	3056	879	1505
138	47 47 24·3	2	11	+13·780	+ 0·413	+ 0·270	3059	...	...
139	61 40 20·9†	...	...	+13·891	+ 0·372	+ 0·094	3069	...	1508
140	65 7 21·4	12	46	+13·957	+ 0·362	+ 0·035	3079	881	1511

* Brought up to date from the Greenwich Catalogue of 1872.
† " " " 1880.

No.	Name of Star	Mag.	Mean Right Ascension Jan. I, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h *m* *s*			*s*	*s*	*s*
141	Piaz. VIII. 245	4·7	8 59 39·554	κ Cancri	24	+ 3·8360	− 0·0304	− 0·003
142	77 Cancri . . ξ	5·2	9 3 8·883	83 Cancri	16	+ 3·4584	− 0·0159	− 0·006
143	79 Cancri . . .	6·5	9 4 8·535	,, & κ Cancri	32	+ 3·4558	− 0·0159	− 0·003
144	80 Cancri . . .	6·8	9 5 52·969	κ Cancri	20	+ 3·3804	− 0·0134	− 0·004
145	81 Cancri . . π^1	7·0	9 6 22·884	83 Cancri	12	+ 3·3262	− 0·0117	− 0·041
146	Bradley 1299.	6·5	9 7 27·105	83 Cancri & κ Cancri	38	+ 3·4369	− 0·0155	− 0·004
147	19 Ursæ Majoris.	6·3	9 8 36·411	,, ,,	28	+ 3·7110	− 0·0266	− 0·015
148	82 Cancri . . π^2	5·6	9 9 16·034	83 Cancri	20	+ 3·3220	− 0·0117	− 0·003
149	23 Hydræ . . .	5·4	9 11 19·799	,,	14	+ 2·9798	− 0·0024	− 0·004
150	38 Lyncis . . .	3·8	9 12 7·366	κ Cancri	12	+ 3·7527	− 0·0292	− 0·002
151	40 Lyncis . . a	3·4	9 14 28·484	83 Canc. & κ Canc.	18	+ 3·6879	− 0·0267	− 0·018
152	Piazzi IX. 60 .	6·4	9 17 16·764	,, ,,	26	+ 3·4909	− 0·0185	− 0·014
153	1 Leonis . . κ	4·6	9 18 21·828	83 Cancri	16	+ 3·5075	− 0·0194	− 0·003
154	7 Leonis Min. .	6·7	9 24 11·550	ϵ Leonis	10	+ 3·6423	− 0·0262	− 0·004
155	4 Leonis . . λ	4·4	9 25 33·353	83 Canc. & o Leonis	26	+ 3·4344	− 0·0171	− 0·011
156	9 Leonis Min. .	6·0	9 26 52·567	ϵ Leonis	12	+ 3·6959	− 0·0295	− 0·001
157	33 Hydræ . . .	5·7	9 29 9·295	o Leonis	12	+ 2·9948	− 0·0023	+ 0·001
158	Piazzi IX. 124	6·5	9 30 18·263	,,	12	+ 3·5733	− 0·0240	− 0·004
159	8 Leonis . . .	5·9	9 31 5·012	ϵ Leo., 83 Canc. & o Leo.	40	+ 3·3187	− 0·0129	− 0·004
160	9 Leonis . . .	6·5	9 31 38·983	o Leonis	12	+ 3·4512	− 0·0185	− 0·015
161	Piazzi IX. 135	6·5	9 32 51·029	o Leonis	14	+ 3·3765	− 0·0153	− 0·004
162	35 Hydræ . . ι	4·2	9 34 20·382	,,	14	+ 3·0636	− 0·0040	0·000
163	13 Leonis . . .	6·5	9 35 25·617	μ Leonis & ϵ Leonis	22	+ 3·4641	− 0·0195	− 0·005
164	15 Leonis . . f	5·9	9 37 13·330	o Leonis ,,	24	+ 3·5315	− 0·0230	− 0·006
165	16 Leonis . . ψ	5·7	9 37 51·028	ϵ Leonis	8	+ 3·2738	− 0·0115	0·000
166	Piazzi IX. 176	Var.	9 41 44·936	π Leonis	2	+ 3·2328	− 0·0100	− 0·002
167	4 Sextantis . .	6·0	9 44 52·920	ϵ Leonis	8	+ 3·1357	− 0·0063	− 0·011
168	26 Leonis . . .	7·0	9 52 19·420	a Leonis	10	+ 3·2718	− 0·0121	− 0·005
169	27 Leonis . . ν	5·3	9 52 24·836	π Leonis	26	+ 3·2352	− 0·0105	− 0·001
170	Piazzi IX. 230	5·7	9 56 47·645	,, & a Leonis	32	+ 3·3557	− 0·0165	− 0·001
171	Piazzi IX. 240	7·0	9 59 49·348	a Leonis	10	+ 3·2681	− 0·0123	− 0·004
172	21 Leonis Min. .	4·6	10 1 3·518	π Leonis	14	+ 3·5503	− 0·0284	+ 0·002
173	30 Leonis . . η	3·6	10 1 26·590	a Leonis	10	+ 3·2784	− 0·0129	− 0·026
174	33 Leonis . . .	7·0	10 4 52·387	,,	8	+ 3·2601	− 0·0122	− 0·011
175	34 Leonis . . .	6·7	10 5 49·730	,,	22	+ 3·2305	− 0·0108	+ 0·002

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
141	51 7 0·5	6	74	+ 14·158	+ 0·390	+ 0·050	3097	883	1516
142	67 31 5·1	15	65	+ 14·373	+ 0·345	0·000	3117	889	1524
143	67 33 55·4	2	8	+ 14·433	+ 0·344	0·000	3123	891	1529
144	71 30 49·8	7	18	+ 14·539	+ 0·333	+ 0·008	3129	894	1532
145	74 34 6·1	1	2	+ 14·569	+ 0·327	− 0·305	3132	...	1533
146	68 16 20·6	16	66	+ 14·633	+ 0·336	+ 0·045	3138	895	1536
147	54 55 15·5	2	54	+ 14·702	+ 0·362	− 0·070	3144	896	1539
148	74 36 39·4	6	45	+ 14·741	+ 0·322	+ 0·035	3147	897	1541
149	95 54 9·5	2	8	+ 14·863	+ 0·285	− 0·040	3160	...	1543
150	52 44 26·2	4	22	+ 14·909	+ 0·360	+ 0·114	3162	900	1546
151	55 9 3·5	6	25	+ 15·046	+ 0·349	− 0·040	3178	902	1550
152	64 21 21·5*	...	...	+ 15·207	+ 0·325	− 0·010	3194	...	1554
153	63 21 11·2	31	149	+ 15·269	+ 0·325	+ 0·045	3204	906	1555
154	55 52 11·9	8	31	+ 15·595	+ 0·327	+ 0·050	3238	915	1567
155	66 33 21·5	26	101	+ 15·669	+ 0·306	+ 0·015	3246	918	1571
156	53 2 5·1	1	2	+ 15·741	+ 0·327	...	3252	...	...
157	95 25 59·3	1	4	+ 15·864	+ 0·260	+ 0·045	3271	...	1581
158	58 21 16·4	1	2	+ 15·925	+ 0·310	+ 0·020	3273	...	...
159	73 4 42·7	11	35	+ 15·966	+ 0·286	0·000	3278	923	1583
160	64 50 41·3	6	20	+ 15·996	+ 0·297	+ 0·039	3285	924	1585
161	69 12 56·1	6	16	+ 16·060	+ 0·288	− 0·048	3292	927	1589
162	90 39 9·4	1	3	+ 16·137	+ 0·258	+ 0·045	3303	...	1592
163	63 35 47·3	1	4	+ 16·194	+ 0·291	+ 0·100	3309	929	1595
164	59 31 45·0	1	3	+ 16·286	+ 0·293	+ 0·095	3317	933	1599
165	75 29 4·7	5	24	+ 16·318	+ 0·271	+ 0·064	3321	936	1603
166	78 4 12·9	13	31	+ 16·514	+ 0·260	+ 0·025	3345	...	1614
167	85 9 4·5	4	12	+ 16·668	+ 0·247	+ 0·100	3359	...	...
168	74 15 49·7	2	12	+ 17·021	+ 0·245	+ 0·010	3404	...	...
169	77 2 25·7	21	86	+ 17·025	+ 0·242	+ 0·048	3406	948	1632
170	67 31 48·1	5	12	+ 17·224	+ 0·243	− 0·070	3423	952	1638
171	73 42 58·0	1	24	+ 17·358	+ 0·231	− 0·100	3443	...	...
172	54 13 45·3	15	90	+ 17·412	+ 0·249	+ 0·021	3446	954	1646
173	72 42 39·4	11	38	+ 17·429	+ 0·229	0·000	3453	955	1648
174	73 45 44·1	1	22	+ 17·575	+ 0·221	0·000	3469	961	...
175	76 6 43·4	15	79	+ 17·616	+ 0·218	+ 0·060	3475	962	...

* Brought up to date from the Greenwich Catalogue of 1880.

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
176	22 Leonis Min. .	6·6	10 8 54·157	*a* Leonis	20	+ 3·4619	− 0·0243	− 0·006
177	36 Leonis . . ζ	3·0	10 10 40·965	,,	18	+ 3·3453	− 0·0174	− 0·002
178	40 Leonis . . .	5·0	10 13 51·452	,,	10	+ 3·2902	− 0·0145	− 0·018
179	30 Leonis Min. .	5·4	10 19 43·376	ρ Leonis	10	+ 3·4597	− 0·0264	− 0·008
180	45 Leonis . . .	5·9	10 21 56·812	,,	10	+ 3·1735	− 0·0083	+ 0·005
181	Piazzi X. 83 .	6·0	10 23 2·100	μ Hydræ	12	+ 3·2186	− 0·0110	− 0·009
182	33 Leonis Min. .	5·7	10 25 43·522	ρ Leonis	14	+ 3·4188	− 0·0248	+ 0·004
183	46 Leonis . . *i*	5·7	10 26 25·796	μ Hydræ	12	+ 3·2118	− 0·0108	− 0·007
184	49 Leonis . . .	6·0	10 29 22·220	ρ Leonis	28	+ 3·1561	− 0·0075	− 0·002
185	36 Leonis Min. .	6·0	10 31 44·690	,,	22	+ 3·4195	− 0·0262	− 0·002
186	37 Leonis Min. .	4·8	10 32 38·566	ρ Leonis	10	+ 3·3899	− 0·0241	0·000
187	50 Leonis . . .	6·5	10 33 6·929	μ Hydræ	8	+ 3·2209	− 0·0118	+ 0·002
188	39 Leonis Min. .	6·5	10 34 22·308	,, & ρ Leonis	22	+ 3·3330	− 0·0200	− 0·003
189	Piazzi X. 131 .	6·5	10 36 8·250	ρ Leonis	10	+ 3·3745	− 0·0236	− 0·002
190	Piazzi X. 139 .	5·1	10 37 32·597	*l* Leonis	22	+ 3·2797	− 0·0164	− 0·006
191	36 Sextantis . .	6·5	10 39 35·528	*l* Leonis	22	+ 3·0971	− 0·0038	− 0·003
192	37 Sextantis . .	6·2	10 40 28·262	,,	12	+ 3·1280	− 0·0058	− 0·001
193	55 Leonis . . .	6·0	10 50 8·926	,,	4	+ 3·0818	− 0·0025	+ 0·006
194	50 Leonis Min. .	6·0	10 50 42·692	,,	22	+ 3·2674	− 0·0176	− 0·007
195	49 Ursæ Majoris	6·0	10 54 47·214	,, & χ Leonis	28	+ 3·3852	− 0·0305	− 0·009
196	60 Leonis . . *b*	4·5	10 56 33·811	*l* Leonis & χ Leonis	54	+ 3·2111	− 0·0135	− 0·003
197	67 Leonis . . .	5·6	11 3 1·456	δ Leonis & χ Leonis	22	+ 3·2277	− 0·0163	+ 0·002
198	Piazzi X. 252 .	6·0	11 3 22·743	,, ,,	34	+ 3·3180	− 0·0265	− 0·002
199	72 Leonis . . .	4·9	11 9 27·684	δ Leonis	20	+ 3·2009	− 0·0148	+ 0·002
200	Piazzi XI. 22 .	6·0	11 10 19·456	,,	8	+ 3·1413	− 0·0082	+ 0·003
201	53 Ursæ Maj. . ξ	3·8	11 12 25·457	δ Leonis	46	+ 3·2457	− 0·0212	− 0·022
202	54 Ursæ Maj. . *v*	3·8	11 12 38·720	,,	18	+ 3·2554	− 0·0226	− 0·004
203	88 Leonis . . .	6·0	11 26 10·314	τ Leonis	12	+ 3·1252	− 0·0082	− 0·026
204	Piazzi XI. 111	5·8	11 30 36·894	,,	10	+ 3·1649	− 0·0168	− 0·003
205	59 Ursæ Majoris	5·5	11 32 35·227	,,	12	+ 3·2279	− 0·0315	− 0·020
206	Piazzi XI. 146	6·5	11 37 54·136	τ Leonis	12	+ 3·1898	− 0·0286	0·000
207	Piazzi XI. 164	6·0	11 44 5·067	π Virginis	12	+ 3·1388	− 0·0212	− 0·008
208	Groom. 1830	6·4	11 46 45·314	,,	6	+ 3·1340	− 0·0235	+ 0·344
209	6 Virginis . A^2	6·0	11 49 30·649	,,	6	+ 3·0823	− 0·0035	− 0·004
210	95 Leonis . . *o*	5·4	11 50 7·284	,,	12	+ 3·0894	− 0·0075	0·000

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							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
176	57 59 46·6	1	4	+17·742	+ 0·228	+ 0·050	3490	965	1662
177	66 2 40·3	13	86	+17·815	+ 0·216	− 0·047	3508	969	1666
178	69 58 52·0	4	18	+17·940	+ 0·207	+ 0·201	3522	...	1672
179	55 39 15·0	14	69	+18·164	+ 0·206	+ 0·067	3560	984	...
180	79 41 12·8	5	20	+18·245	+ 0·184	− 0·030	3575	...	1691
181	75 6 16·8	14	51	+18·285	+ 0·185	+ 0·012	3579	989	...
182	57 3 59·5	6	24	+18·380	+ 0·191	+ 0·015	3602	995	1701
183	75 18 31·3	8	20	+18·405	+ 0·178	− 0·025	3606	996	1703
184	80 47 31·4	2	8	+18·505	+ 0·169	+ 0·050	3622	...	...
185	55 21 42·7	2	12	+18·584	+ 0·179	+ 0·060	3633	...	...
186	57 27 47·3	21	142	+18·614	+ 0·176	+ 0·015	3640	1003	1713
187	73 18 39·4	1	3	+18·629	+ 0·166	+ 0·067	3643	1004	1714
188	61 54 43·7	1	2	+18·669	+ 0·169	0·000	3650	1007	1717
189	57 44 16·4	1	4	+18·725	+ 0·168	0·000	3661	1009	1720
190	66 14 47·6	11	41	+18·769	+ 0·160	+ 0·044	3671	1012	1724
191	86 56 39·3	2	12	+18·831	+ 0·147	+ 0·055	3684	...	1727
192	83 3 28·2	2	12	+18·858	+ 0·147	+ 0·025	3690	...	1729
193	88 41 15·2	9	24	+19·129	+ 0·127	+ 0·025	3749	...	1748
194	63 55 23·7	4	16	+19·143	+ 0·134	+ 0·010	3751	...	...
195	50 12 28·3	1	5	+19·246	+ 0·130	+ 0·020	3765	...	...
196	69 14 27·0	5	23	+19·290	+ 0·120	− 0·040	3776	1031	1762
197	64 45 25·1	12	47	+19·436	+ 0·107	− 0·012	3809	1039	1780
198	53 6 22·0	1	4	+19·444	+ 0·110	+ 0·138	3811	1040	...
199	66 18 57·5	5	27	+19·567	+ 0·094	+ 0·005	3842	...	1794
200	76 33 53·9	1	4	+19·584	+ 0·090	+ 0·089	3845	1050	...
201	57 51 47·8	22	182	+19·622	+ 0·089	+ 0·592	3851	1053	1800
202	56 18 59·4	3	13	+19·626	+ 0·089	− 0·052	3852	1054	1802
203	75 2 0·2	1	4	+19·835	+ 0·058	+ 0·155	3919	1068	1831
204	61 37 19·2	14	120	+19·888	+ 0·050	+ 0·012	3937	1074	1840
205	45 46 34·1	1	4	+19·910	+ 0·048	+ 0·055	3952	...	1843
206	47 40 44·7	3	13	+19·960	+ 0·036	+ 0·100	3973	1084	1853
207	54 28 6·6	1	5	+20·004	+ 0·023	+ 0·030	3998	...	...
208	51 30 23·6	9	42	+20·019	+ 0·018	+ 5·770	4010	1094	1870
209	80 57 22·4	3	10	+20·032	+ 0·012	+ 0·071	4027	...	...
210	73 45 9·3	2	8	+20·034	+ 0·011	+ 0·025	4031	1099	1874

No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Observations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
211	2 Comæ . . .	6·0	11 58 44·777	π Virginis	38	+ 3·0756	− 0·0103	+ 0·001
212	9 Virginis . *o*	4·3	11 59 42·490	,,	40	+ 3·0729	− 0·0030	− 0·010
213	10 Virginis . .	6·1	12 4 9·249	η Virginis	8	+ 3·0715	+ 0·0008	+ 0·003
214	Piazzi XII. 3 .	5·7	12 5 16·904	π Virginis	20	+ 3·0563	− 0·0134	...
215	6 Comæ . . .	5·1	12 10 31·058	η Virginis	22	+ 3·0556	− 0·0057	− 0·006
216	11 Comæ . . .	4·9	12 15 15·547	η Virginis	32	+ 3·0430	− 0·0069	− 0·009
217	Piazzi XII. 75	6·2	12 19 49·135	,, & γ Virg.	14	+ 3·0199	− 0·0101	+ 0·004
218	32 Virginis . d^2	6·5	12 40 9·747	δ Virginis	14	+ 3·0388	0·0000	− 0·003
219	34 Virginis . .	5·9	12 41 47·509	,,	12	+ 3·0186	− 0·0021	+ 0·006
220	30 Comæ . . .	6·0	12 44 1·712	,,	22	+ 2·9361	− 0·0099	− 0·009
221	31 Comæ . . .	5·0	12 46 26·331	δ Virginis	24	+ 2·9288	− 0·0097	0·000
222	35 Comæ . . .	5·1	12 47 58·759	,,	14	+ 2·9613	− 0·0063	0·000
223	41 Virginis . .	6·4	12 48 24·588	,,	24	+ 3·0079	− 0·0019	+ 0·005
224	Bradley 1724 .	3·0	12 50 57·256	,, & ϵ Virg.	32	+ 2·8348	− 0·0151	− 0·024
225	36 Comæ . . .	5·0	12 53 35·019	ϵ Virginis	10	+ 2·9720	− 0·0040	− 0·002
226	37 Comæ . . .	5·1	12 55 6·456	ϵ Virginis	20	+ 2·8785	− 0·0105	+ 0·003
227	48 Virginis . .	6·6	12 58 20·525	,, & *a* Can. Ven.	14	+ 3·0907	+ 0·0066	0·000
228	14 Canum Ven. .	5·0	13 0 41·480	ϵ Virginis	16	+ 2·8149	− 0·0124	− 0·002
229	39 Comæ . . .	6·1	13 1 5·424	,, & *a* Can. Ven.	16	+ 2·9322	− 0·0051	− 0·005
230	Bradley 1745 .	6·0	13 2 43·474	,, ,,	36	+ 2·8794	− 0·0081	− 0·005
231	Piazzi XII. 283	6·7	13 4 29·169	*a* Canum Ven.	32	+ 2·9561	− 0·0029	− 0·011
232	17 Canum Ven. .	6·1	13 5 5·686	,, & ϵ Virg.	26	+ 2·7684	− 0·0132	− 0·006
233	Piazzi XIII. 27	5·0	13 8 49·169	,, ,,	26	+ 2·7322	− 0·0135	− 0·002
234	59 Virginis . *e*	5·1	13 11 24·869	ϵ Virginis	8	+ 3·0004	+ 0·0009	− 0·023
235	74 Virginis . l^2	4·9	13 26 20·905	ζ Virg. and *a* Virg.	16	+ 3·1217	+ 0·0092	− 0·009
236	3 Bootis . . .	5·8	13 41 42·482	τ Virginis	10	+ 2·7896	− 0·0038	+ 0·002
237	5 Bootis . . *v*	4·1	13 44 16·088	,,	10	+ 2·9004	+ 0·0001	− 0·005
238	10 Bootis . . .	5·3	13 53 35·264	,,	10	+ 2·8128	− 0·0015	− 0·003
239	Piaz. XIII. 316	6·5	14 3 36·806	,,	8	+ 2·4010	− 0·0062	+ 0·006
240	Bradley 1848 .	6·0	14 10 59·685	*f* Bootis	8	+ 2·8177	+ 0·0005	+ 0·009
241	Bootis . . A	4·8	14 13 26·076	*f* Bootis	10	+ 2·5384	− 0·0037	+ 0·010
242	Groom. 2100 .	6·0	14 15 21·909	,,	10	+ 2·4634	− 0·0041	+ 0·010
243	Groom. 2154 .	5·5	14 46 13·987	ψ Bootis	10	+ 2·3868	− 0·0009	− 0·012
244	37 Bootis . . ξ	4·6	14 46 24·611	,,	16	+ 2·7574	+ 0·0022	+ 0·017
245	Piaz. XIV. 226	5·8	14 52 9·587	,,	24	+ 2·7967	+ 0·0031	+ 0·004

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							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
211	67 56 23·1	2	10	+20·053	− 0·006	− 0·010	4066	...	...
212	80 40 2·5	6	26	+20·053	− 0·008	0·000	4072	1110	1888
213	87 29 45·3	8	22	+20·050	− 0·017	+ 0·190	4094	1112	1892
214	62 7 1·2	1	4	+20·047	− 0·019	− 0·025	4100	1116	1896
215	74 29 59·9	10	37	+20·032	− 0·029	+ 0·067	4125	1128	1908
216	71 36 37·4	4	14	+20·008	− 0·038	− 0·110	4156	1137	1929
217	65 28 27·6	2	8	+19·978	− 0·047	+ 0·036	4184	1141	1937
218	81 44 12·6	2	7	+19·746	− 0·086	+ 0·100	4286	...	...
219	77 27 5·7	4	16	+19·720	− 0·088	+ 0·150	4292	1176	1994
220	61 51 32·9	2	8	+19·684	− 0·090	− 0·060	4304	1182	2003
221	61 52 17·3	5	18	+19·643	− 0·094	0·000	4315	1186	2005
222	68 10 4·2	10	96	+19·615	− 0·098	+ 0·021	4328	1188	2008
223	76 59 38·7	1	4	+19·607	− 0·100	− 0·004	4329	1189	2009
224	51 6 9·3	1	4	+19·559	− 0·100	− 0·055	4345	1195	2019
225	72 0 30·6	4	16	+19·507	− 0·109	− 0·005	4351	1198	2024
226	58 37 56·5	5	22	+19·476	− 0·108	+ 0·005	4360	1201	2029
227	93 4 55·4*	...	...	+19·407	− 0·122	+ 0·018	4373	1206	2035
228	53 37 23·9	5	21	+19·354	− 0·116	+ 0·009	4384	1207	...
229	68 16 1·7	3	14	+19·345	− 0·121	+ 0·020	4387	1208	2039
230	61 51 57·4	1	4	+19·306	− 0·122	+ 0·110	4393	...	...
231	72 34 34·0	1	4	+19·264	− 0·128	+ 0·100	4403	1214	...
232	50 55 38·5	1	4	+19·249	− 0·121	− 0·013	4415	1217	2048
233	49 16 32·6	1	4	+19·155	− 0·126	+ 0·005	4433	...	2055
234	80 0 41·6	1	5	+19·087	− 0·142	− 0·160	4440	...	2060
235	95 41 53·5	1	6	+18·646	− 0·176	+ 0·035	4516	1239	2097
236	63 45 20·9	2	8	+18·110	− 0·182	+ 0·065	4594	1260	2143
237	73 39 58·4	2	4	+18·013	− 0·194	− 0·042	4615	1265	2150
238	67 46 36·7	1	2	+17·640	− 0·203	+ 0·038	4664	1279	2176
239	45 37 53·5	1	6	+17·206	− 0·187	− 0·013	4699	1288	...
240	70 35 7·4	1	5	+16·865	− 0·230	+ 0·060	4731	...	...
241	53 59 31·4	1	2	+16·749	− 0·211	− 0·050	4747	1309	2224
242	50 42 32·8	1	2	+16·656	− 0·207	...	4758	...	...
243	52 17 5·6	1	4	+15·005	− 0·237	− 0·112	4906	1343	2302
244	70 27 2·4	3	10	+14·995	− 0·273	+ 0·150	4905	1344	2303
245	73 10 36·0	3	10	+14·656	− 0·285	− 0·024	4933	1351	2314

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No.	Name of Star	Mag.	Mean Right Ascension Jan. 1, 1892	Nautical Almanac Comparison Star	No. of Obser-vations	Annual Precession	Secular Variation	Proper Motion
			h m s			*s*	*s*	*s*
246	* B.F. 2051 . .	6·0	14 55 17·386	ψ Bootis	10	+ 2·2938	− 0·0002	− 0·001
247	40 Bootis . . .	5·4	14 55 28·561	,,	10	+ 2·3036	− 0·0002	...
248	41 Bootis . . ω	4·9	14 57 22·719	,,	22	+ 2·6282	+ 0·0014	+ 0·003
249	42 Bootis . . β	3·6	14 57 52·731	,,	10	+ 2·2638	0·0000	− 0·001

* Baily's Edition of Flamsteed's Catalogue.

No.	Mean North Polar Distance Jan. 1, 1892	No. of Stations of Observation	Total No. of Observations	Annual Precession	Secular Variation	Proper Motion	Number in		
							B.A.C.	Gr. Cat. 1872	Gr. Cat. 1880
	° ′ ″			″	″	″			
246	49 55 35·0	1	4	+ 14·468	− 0·238	...	4942	...	...
247	50 18 25·1	1	44	+ 14·457	− 0·239	− 0·005	4943	1353	2320
248	64 33 53·5	1	4	+ 14·341	− 0·274	+ 0·113	4953	1355	2325
249	49 10 59·1	4	30	+ 14·310	− 0·237	0·000	4958	1356	2327

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CATALOGUE OF STARS

FOR THE EPOCH

JAN. 1, 1892

FROM OBSERVATIONS

BY THE

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COLONEL H. R. THUILLIER, C.I.E., R.E., SURVEYOR GENERAL OF INDIA.

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COLONEL G. STRAHAN, R.E., DEPUTY SURVEYOR GENERAL,
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