

# KODAIKANAL OBSERVATORY

BULLETINS Nos 1 to 13

—————  
VOLUME I  
—————

MADRAS  
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—————  
1908

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## ABSTRACTS

Abstract of prominences observed in 1904	60
D            do          1905	216
D            d          1906	327
Do           do          1907	456
Catalogue of widened lines 1904 March 3 to 1905 July 4	108
D            1905 July to 1906 June	234
Do           1906 July to 1907 February	347

# Kodakkanal Observatory.

BULLETIN No I

## WIDENED LINES IN SUNSPOT SPECTRA

The following observation of widened lines in the spectra of sunspots were made between January 1903 and February 1904. Up to the end of January 1904 the work was done by or under the direction of Mr C P Butler Acting Director

The observations have been printed exactly as entered in the record except that all observations of the same spot have been brought together and the number of times that the same line has been observed has been indicated by a number in brackets following the wave length number. The wave length when given to three decimal places are from Rowland's *Determinary Table*. The lines above the bracket in each column are the six lines between *D* and *I* and the six between *b* and *I* which have been selected as the most widened lines.

The observations were made with a grating spectroscope attached to the Lerebour and Secotan equatorial during the first six months of the year and thereafter to the Cooke equatorial. The observations were usually made in the third order.

The observers initials stand for the following observers —

C I B = Charles I. Butler  
 K V S = K V Sivarama Aiyar  
 S S = S Sivarama Aiyar  
 G N = G Nagaraja Aiyar

The classification adopted is that of Lather Cortie in the *Astrophysical Journal* Vol XIII p 200. Where the spot forms one of a group the classification is that of the group and not of the individual spot.

The positions given are only rough but should be sufficient for identification. They have been taken either from projections of the sun's image on a disc of about 8 inches in diameter or from photographs of the same size taken with the Dallmeyer photo heliograph. The numbers are the serial numbers for this observatory.

### No 67 (A)

LAT -18

LONG 841

CLASS—IIc IIIb

Date—1903	Jan	30	31	<i>h</i>	<i>b</i>	<i>s</i>
066 174	(1)		1 6 374	(4)		
5138 18	(4)		5671 071	(4)		
5143 301	(4)		57 7878	(4)		
5117 ( 2	(1)		781 137	(4)		
150 383	(4)		737 288	(4)		
51 ( 8 3	(4)		5713 645	(4)		

Ob -C P B

### No 69

LAT +2

LONG 112

CLASS—IIc

Date—1903	Feb	12	13	14	16	17
5138 70	(2)		1 ( 474	( )		
5138 18	(5)		5671 071	(5)		
119 301	(5)		27 873	(1)		
5147 652	(5)		5 31 137	( )		
51 083	( )		573 89	( )		
1 68 3	( )		713 345	(5)		
066 174	(5)		160 57	(2)		
5131 607	( )		15 0 8	( )		
5160 419	(2)		( 7 55)	(2)		
5163 200	(2)		(7 04	(2)		
			5703 97	(1)		
			7 8 7	(1)		

Ob -C P B

**No 70**

LAT +25

LONG 99

CLASS—IVa

Date—1903 Feb 1 13

5086 174	( )	54 6 4 4	(2)
5188 518	(2)	5871 071	(2)
5148 901	(2)	5727 878	(2)
5147 65	(2)	5781 487	(2)
5150 868	(2)	5787 288	(2)
5156 823	( )	5 48 645	(2)

Ob —O P B

**No 71**

LAT -19

LONG 88

CLASS—IIIb IVd IVc

Date—1903 Feb 20 21 23

5086 1 4	(2)	5426 474	(3)
5188 518	(3)	56 1 0 1	(3)
5148 901	(3)	5 27 827	(3)
5147 652	(3)	5 31 487	(3)
5150 68	(3)	5 37 288	(3)
5156 823	(3)	5748 645	(3)
5184 697	( )	5400 5 2	(2)
5188 200	(3)	5482 078	( )
		5480 367	( )
		5672 047	(1)
		5727 8 3	(1)

Ob —O P B

**No 72**

LAT +19

LONG 285

CLASS—IVa IVb IVc

Date—1903 Feb 25 26 27 28

March 1 2 3 4

5186 70	(5)	54 0 474	(8)
5188 518	(8)	56 1 071	(8)
5148 901	(8)	57 7 878	(8)
5147 65	(8)	5 31 487	(8)
5150 868	(8)	5787 288	(8)
5156 823	(8)	5748 645	(8)
5086 174	(8)	5460	(2)
5184 697	(1)	5471	(1)
51 0 419	(1)	5 1 4	(2)
5168 200	(1)	548	(2)
		548 078	(2)
		5490	(1)
		54 0 887	( )
		490 8	(1)
		5627	(1)
		5671	(1)
		5672 047	(5)
		5687	(4)
		5 89 7	(1)
		5740 2	(1)

Ob —O P B

**No 73 (A)**

LAT -22

LONG 303

CLASS—IIIz

Date—1903 Feb 25 26 27

51 270	(3)	54 6 474	(3)
5188 518	(3)	5071 071	(3)
5148 901	(3)	5727 878	(3)
5147 652	(3)	5781 487	(3)
5150 868	(3)	737 288	(3)
51 6 828	(3)	5748 645	(3)

5086 174	(3)	5471 4	(1)
5184 697	(1)	5182 078	(1)
5180 419	(1)	5190 867	(1)
5168 00	(1)	5672 047	(3)

Ob —O P B

**No 73 (B)**

LAT -23

LONG 298

CLASS—IIIa

Date—1903 Feb 25 26 27

5186 270	(3)	5426 474	(3)
5188 18	(3)	6 1 071	(3)
5148 901	(3)	5727 878	(3)
5147 65	(3)	731 437	(3)
5150 868	(3)	37 288	(3)
5156 823	(3)	5718 645	(3)

5086 174	(3)	5471 4	(1)
5144 697	(1)	5482 078	(1)
5180 419	(1)	490 367	(1)
5168 200	(1)	5672 047	(3)

Ob —O P B

**No 77 (A)**

LAT +21

LONG 306

CLASS—IVb

Date—1903 March 22 23 24 25 26 27 28  
29 30 31 April 1

5086 174	(11)	5426 474	(11)
5188 518	(11)	56 1 071	(11)
5148 901	(11)	737 878	(11)
5147 65	(11)	5 31 487	(11)
5150 868	(11)	5787 288	(11)
5150 8 8	(11)	5748 645	(11)

5111 9	(1)	5460	(1)
180 270	(3)	480 172	(3)
5 60 8	(1)	5471 414	(1)
5168 200	(1)	5482 078	(3)
		5490 367	(2)
		5627 8	(1)
		5672 047	(11)
		687 0	(1)
		687	(3)
		5716 7	(1)
		5740 185	(1)

Ob —O P B

**No 78**

LAT -16

LONG 229

CLASS-IVa

Date-1903 March 27

080 174	(1)	1 6 474	(1)
138 18	(1)	671 071	(1)
143 901	(1)	7 7 873	(1)
147 0 2	(1)	5731 437	(1)
5150 363	(1)	737 288	(1)
5150 8 3	(1)	5713 61	(1)

		(72 047	(1)
		687	(1)

Ob -C P B

**No 99**

LAT +19

LONG 242

CLASS-IVc III/ IVd

Date-1903 May 22 23

130 2 0	( )	120 471	( )
138 18	( )	6 1 071	(2)
143 901	( )	27 873	(2)
5117 652	(2)	31 437	(2)
5150 363	( )	737 88	( )
51 6 8 3	(2)	13 61	(2)

504	(1)	87 017	( )
5086 1 1	( )	50 7 0	(2)

Ob -C P B

**No 80**

LAT -20

LONG 140

CLASS-IV

Date-1903 April 2 3 4 5 6 7 8 9 10

11 12 13 14

5006 174	(11)	120 474	(13)
5138 518	(11)	671 071	(13)
5143 901	(11)	7 7 973	(13)
5117 052	(11)	5731 137	(13)
5150 363	(11)	5737 288	(18)
51 6 823	(11)	719 645	(1)

		400	(1)
		(72 017	(13)
		897	(13)

Ob -O P B

**No 100**

LAT +18

LONG 248

CLASS-III/ IV

Date-190 May 26 27 28

5086 171	( )	1 0 4 1	(3)
5130 70	( )	671 071	(2)
5143 901	( )	5727 873	(2)
147 6 2	( )	731 137	(3)
1 0 363	(2)	37 88	(3)
1 ( 823	(2)	13 61	(3)

04 5	(2)	1 1	( )
5138 16	( )	18	(2)
		103	( )
		5(72 017	(1)
		5087 0	(1)

Ob ( I B

**No 98**

LAT -30

LONG 287

CLASS-IVe IVc IVb III I

Date-1903 May 21

5060 171	(1)	1 6 174	(1)
138 18	(1)	671 071	(1)
5143 901	(1)	6087	(1)
5117 05	(1)	7 7 8 3	(1)
5150 363	(1)	731 1 7	(1)
5150 823	(1)	5737 288	(1)

501 5	(1)	672 047	(1)
		5713 64	(1)

Ob -C P B

**No 108 (A)**

LAT -20

LONG 26

CLASS-IIc

Date-1903 June 11

5060 171	(1)	1 6 174	(1)
5130 270	(1)	6671 071	(1)
5143 901	(1)	727 8 3	(1)
5117 6	(1)	5731 137	(1)
5150 363	(1)	5717 98	(1)
150 8 3	(1)	43 145	(1)

045 5	(1)	52	(1)
5138 518	(1)	(7 047	(1)
		5087 0	(1)

Ob -C P B

**No 108 (B)**

LAT -19

LONG 24

CLASS—IIc

Date—1903 June 11

5426 474 (1)  
 5671 071 (1)  
 5727 873 (1)  
 5781 437 (1)  
 5787 288 (1)  
 5743 645 (1)  
 5672 047 (1)

Ob —O P B

**No 112**

LAT +20

LONG 242

CLASS—IIIb

Date—1903 June 22 23 24

5426 474 (3)  
 5671 071 (3)  
 5727 873 (3)  
 5781 437 (3)  
 5787 288 (3)  
 5743 645 (3)  
 5672 047 (3)

Ob —O P B

**No 113 (A)**

LAT +22

LONG 226

CLASS—IIc IVa

Date—1903 June 22 23 24 28

5426 474 (4)  
 5671 071 (4)  
 57 7 873 (4)  
 5781 437 (4)  
 5787 288 (4)  
 5743 64 (4)  
 5672 047 (4)

Ob —O P B

**No 113 (B)**

LAT +23

LONG 220

CLASS—IIc IVa

Date—1903 June 23

5426 474 (1)  
 5671 071 (1)  
 5727 873 (1)  
 5781 437 (1)  
 8 288 (1)  
 5743 645 (1)  
 5672 047 (1)

Ob —O P B

**No 114**

LAT -24

LONG 2 6

CLASS—III/

Date—1903 June 22

5426 474 (1)  
 56 1 071 (1)  
 5727 873 (1)  
 5781 437 (1)  
 5787 288 (1)  
 5743 645 (1)  
 5657 (1)  
 5672 047 (1)

Ob —O P B

**No 116 (A)**

LAT -19

LONG 39

CLASS—IVa IVb V

Date—1903 July 1 3 4 5 6 7 9 10 11

5134 6 (5)	5426 4 4 (10)
188 518 (6)	871 071 (10)
5143 901 ( )	5 27 873 (10)
5147 6 (8)	781 437 (10)
5156 823 (6)	5787 288 (10)
5163 2 (2)	5 43 645 (10)
5045 5 (1)	5460 (1)
5086 174 (3)	5460 572 (1)
5111 9 (1)	5460 576 (5)
5140 7 (1)	548 (6)
5144 8 (1)	5490 (2)
5148 8 (1)	5490 3 (4)
5150 368 (4)	5872 (2)
5180 3 (1)	5872 047 (9)
5181 00 (1)	5880 2 (1)
	5887 (9)

Ob —O P B

**No 116 (B)**

LAT -16

LONG 48

CLASS—IVa IVb V

Date—1903 July 11

5134 6	(1)	5428 474	(1)
5138 518	(1)	5671 0 1	(1)
5148 901	(1)	5 7 8 3	(1)
5147 652	(1)	5791 187	(1)
51 0 888	(1)	87 488	(1)
5156 829	(1)	718 045	(1)
0061 4	(1)	5400 5 0	(1)
		b 047	(1)
		5087	(1)

Ob —C P B

**No 117**

LAT -18

LONG 4

CLASS—V IVa

Date—1903 July 11

5134 6	(1)	426 174	(1)
5138 518	(1)	5671 071	(1)
5148 901	(1)	57 7 873	(1)
5147 6	(1)	5781 487	(1)
1 0 803	(1)	5797 288	(1)
5156 829	(1)	5 13 015	(1)
5086 174	(1)	540 76	(1)
		5 72 017	(1)
		5687	(1)

Ob —C P B

**No 118**

LAT +17

LONG 358

CLASS—V IIa IVa

Date—1903 July 11

134 6	(1)	4 0 171	(1)
5138 18	(1)	5671 071	(1)
5148 901	(1)	5727 879	(1)
5 47 652	(1)	5781 137	(1)
150 888	(1)	5787 88	(1)
5156 828	(1)	5 48 645	(1)
5086 174	(1)	5480 5 6	(1)
		5672 047	(1)
		568	(1)

Obs —C P B

**No 120**

LAT +14

LONG 235

CLASS—I IVd IV

Date—1903 July 20 21

5006 174	(2)	51 0 474	(2)
5131 697	(2)	5671 071	(2)
5148 901	(2)	727 8 8	(2)
5147 652	(2)	5781 187	(2)
5150 868	(2)	5787 288	(2)
5156 828	(2)	5 48 045	(2)
5138 518	(2)	5672 047	( )
045	(1)	5687	(1)

Ob —C P B

**No 130**

LAT +2

LONG 229

CLASS—IIIb IIIc IIIb

Date—1903 August 16

		4 0	(1)
		5671	(1)
		7 7	(1)
		797	(1)
		731	(1)
		5 13	(1)
		672	(1)
		5687	(1)

Ob —C P B

**No 132 (A)**

LAT +18

LONG 218

CLASS—IIIc

Date—1903 August 16

5113 301	(1)	4 0	(1)
		(71	(1)
		57 7	(1)
		5731	(1)
		5737	(1)
		5 13	(1)
		567	(1)
		5687	(1)

Ob —C P B

**No 132 (B)**

LAT +18  
 LONG 228  
 CLASS—IIIb  
 Date—1903 August 16

5148 01	(1)	54 6	( )
		5671	(1)
		5727	(1)
		5 91	(1)
		5737	(1)
		5748	(1)
		5672	(1)
		5687	(1)

Ob —OPB

**No 144**

LAT -18  
 LONG 192  
 CLASS—IVa IVc IIIb  
 Date—1903 Sept 13 14

5186	(1)	54 6	(1)
188	(1)	5671	(2)
5148 901	(1)	5727	(2)
5147	(1)	5 81	( )
5150	(2)	787	(2)
5156	(1)	5748	(2)
188 6	(1)	5426 474	(1)
5148 9	(1)	5482	(1)
5147 7	(1)	5672	(2)
51 6 8	(1)	5687	( )

Ob rv —OPB

**No 149**

LAT +12  
 LONG 92  
 CLASS—IIIb IVd IVc IIa  
 Date—1903 Sept 25 26 27 28

5066 174	(4)	5426 474	(4)
5188 518	(4)	5671 071	(4)
5148 901	(4)	57 7 878	(4)
5 47 652	(4)	5731 487	(4)
1 0 868	(4)	5737 258	(4)
51 8 828	(4)	5748 646	(4)
4965 2	(1)	100	(2)
5048 8	(1)	5460 6	(1)
5124	(1)	5471 8	(1)
5124 5	(1)	5462	(2)
5136 270	(1)	5490	( )
5152 3	(1)	5490 987	(1)
		56 7	(2)
		56 2 047	(4)
		5687	(4)

Ob —OPB

**No 150**

LAT 10  
 LONG 30  
 CLASS III IV  
 Date—1903 Sept 1

		1 6 4	(1)
		1 1	(1)
		4 8	(2)
		5 11 417	(1)
		7 8 244	(1)
		7 19 17	(1)
		1	(1)
		7 14 2	(1)
		7 11 1	(1)
		7	(1)
		5 1 1	(1)
		5 14 7	(1)

Ob rv —OPB

**No 152**

LAT +12  
 LONG 218  
 CLASS—IVc IVd IVa  
 Date—1903 Oct 1 2 3 4 5 6 7 8 9 10 11 12

5066 174	(3)	120 4 4	(3)
5138 518	(2)	8 71 1 1	( )
5148 901	(1)	57 478	(2)
5147 05	(2)	5 11 427	(2)
5170 863	(1)	7 7 244	(2)
5156 823	(2)	5 11 046	(2)
4 120 0	(4)	5191 0	(1)
5048 5	(2)	7 24 1 1	(1)
5054 2	(1)	7 1 11 4	(2)
5071 1	(1)	7 14 1	(4)
5071 1	(1)	7 14	(1)
5007 1	(1)	7 1 1	(2)
5087 3	(1)	7 14 0 4	(1)
5134 6	(1)	519 1 1	(1)
5134 7	(2)	5 1 1	(4)
5194 J	(1)	5 7 1 1	(7)
5186 J	(1)	5 1 1	(1)
5188 0	(1)	5 7 1 1 1 7	(2)
5140 5	(1)	5 27 1 1	(2)
5141 1	( )	5 1 1 7	(4)
5143 5	(1)	57 7 1 1	(2)
5143 J	(2)	57 1 1 1	(1)
5147 7	(5)	57 1 1 5	(4)
5148 8	(1)	57 1 1 1	(1)
5148 J	(2)	5 27 1 1	(2)
5149 0	(2)	57 1 1 1	(1)
5150 8	(2)	57 1 1 1	(1)
5150 6	(1)		
5152	(2)		

Ob —OPB KVS nd 8 8

**No 153**

LAT -28

LONG 205

CLASS—IIb V IVe V IVe

Date—1903 Oct 6 7 8 9 10 12 14 15

5060 174	(2)	5420 174	(2)
138 518	(1)	5871 071	(8)
5148 901	(2)	5727 878	(2)
5147 652	(2)	5781 427	(2)
5150 808	(2)	787 288	(2)
5156 828	(1)	5748 64	(2)
4820 0	(1)	54 6 4	(8)
5045 5	(1)	5460	(1)
5087 3	(1)	5482 0	(1)
5184 6	(1)	5027	(1)
5184 7	(4)	5871 1	(4)
5184 9	(1)	871 2	(1)
5186 3	(1)	672 047	(2)
5186 4	(1)	5872 1	( )
5186 6	(1)	5887	(2)
5140 5	(2)	727 9	(2)
5141 1	(2)	781 4	( )
5148 5	(1)	731 5	(4)
5148 9	(1)	5737 3	(2)
5147	(2)	743 2	( )
5148 J	(2)	748 6	(4)
5149 0	(2)		
51 0 8	(2)		
5160 6	(1)		
5152 3	(1)		
161 1	(1)		

Ob -OPB KVS 1SS

**No 156**

LAT +15

LONG 92

CLASS—IVa IVb IVa

Date—1903 Oct 15 19 20 21 22 23 24

5045 5	(2)	54 6 4	(1)
134 7	(1)	671 1	(4)
5180 4	(1)	7 7 J	(1)
5138 6	(1)	5731 5	(2)
5147 7	(2)	573 3	(1)
5150 3	(2)	5 18 6	(1)
048 1	(1)	5420 174	(1)
5048 901	(1)	480 6	(1)
0 3	(1)	5482 1	(1)
5087 3	(1)	56 1 071	(2)
5184	(1)	587 047	( )
5184 6	(1)	5887 0	(1)
5136 2 0	(1)	5687	(1)
5186 3	(2)	5 27 873	(2)
5140 8	(1)	5 1 427	(2)
5141 0	(1)	5731 4	(1)
5148 8	(1)	787 288	(2)
5149 9	(2)	5748 64	(2)
5148 901	(2)		
5147 6 2	(2)		
5149 0	(1)		
5150 368	(2)		
5180 4	(1)		
5180 6	(1)		

Ob -KVS 1SS

**No 160**

LAT -18

LONG 297

CLASS—V IIIa I

Date—1903 Oct 30

5048 8	(1)	5420 4	(1)
5045 5	(1)	56 1 1	(1)
5134 7	(1)	5727 9	(1)
148 9	(1)	5781 4	(1)
5147 7	(1)	5737 3	(1)
51 0 8	(1)	5718 6	(1)
5160 8	(1)		

Ob -KVS

**No 161**

LAT +17

LONG 236

CLASS—IIb IVa IVe IVa

Date—1903 Nov 1 7 10

5060 174	(2)	1 ( 471	(2)
5138 518	(1)	56 1 071	(2)
5143 901	( )	57 7 873	( )
147 0 2	( )	5731 137	( )
51 0 363	(2)	5737 288	(2)
5156 828	(1)	5748 645	( )
5045 5	(1)	5121 4	(1)
5134 6	(1)	5182 0	(1)
194 697	(1)	5190 9	(1)
5138 3	(2)	5( 71 1	(1)
5138 6	(1)	5872 047	(2)
140 8	( )	5672 1	(1)
5143 9	(1)	5( 87	( )
5147 7	(1)	727 3	(1)
5150 8	(1)	731 4	(1)
		5737 3	(1)
		571 (	(1)

Ob -CPB dSS

**No 162**

LAT +17

LONG 226

CLASS—IVa IVb IVc

Date—1903 Nov 1

5066 174	(1)	5426 474	(1)
5138 518	(1)	571 071	(1)
5148 901	(1)	5727 978	(1)
5147 652	(1)	5781 4 7	(1)
150 368	(1)	787 288	(1)
5156 828	(1)	5743 645	(1)

Ob —O P B

**No 165**

LAT —25

LONG 166

CLASS—IVe IVd

Date—1903 Nov 12 13 14

5066 2	( )	5426 4	(8)
5184 6	(3)	5671 1	(8)
186 J	(3)	5727 9	(8)
5148 9	(3)	5781 4	(8)
5147 7	(3)	5787 8	(8)
5150 3	(3)	5743 6	(8)
5048 8	(1)	5672 1	( )
5045 5	(3)		
5188 0	(3)		
5156 8	(1)		
5160 0	(1)		

Ob — S d K V S

**No 166**

LAT —24

LONG 159

CLASS—IVc I IVd I

Date—1903 Nov 16

5426 4	(1)
5671 1	(1)
5727 9	(1)
5 81 4	(1)
5787 8	(1)
5743 6	(1)

Ob —K V S

**No 179**

LAT +15

LONG 228

CLASS—IVa IVb IVc

Date—1903 Nov 30 Dec 2

5184 6	(1)	5426 4	(2)
518 8	(1)	5671 1	(2)
5188 6	(1)	5727 9	(2)
5148 9	(1)	5 81 4	(2)
5147 7	(1)	578 8	( )
5150 3	(1)	743 6	(2)

5045 5 (1)

Ob —K V S

**No 181**

LAT —17

LONG 156

CLASS—IIa IVa IVe I

Date—1903 Dec 8

5184 6	(1)	5426 4	(1)
5188 8	(1)	5671 1	(1)
5188 6	(1)	5 21	(1)
5148 9	(1)	5727 9	(1)
5147 7	(1)	5781 4	(1)
5150 3	(1)	48 6	(1)

Ob —S S

**No 185**

LAT —21

LONG 155

CLASS—IVa IVe IVc I

Date—1903 Dec 10

5184 6	(1)	426 4	(1)
5188 8	(1)	5671 1	(1)
5188 6	(1)	67 1	(1)
148 9	(1)	5 27 9	(1)
5117 7	(1)	5 81 4	( )
5150 3	(1)	743 6	(1)

5045 5 (1)

Ob —S S

**No 187**

LAT +14

LONG 98

CLASS—IVa IVb IIa IVc IIa IVb IVa  
IVc IVa

Date—1908 Dec 8 9 10 11 14 15

5184 6	(6)	5426 1	(6)
5186 8	(6)	5671 1	(6)
5140 8	(1)	5672 1	(4)
5143 9	(6)	5727 9	(6)
5147 7	(6)	5731 4	(6)
5150 8	(6)	5748 6	(6)
5048 8	(1)	5296 0	(1)
5045 5	(8)	5400 5	(1)
5066 1	(1)	5400 6	(3)
5138 6	(6)	548 0	( )
5140 5	(2)	5482 1	(1)
5149 0	(1)	5490 4	(1)
5150 4	(1)	627 8	(1)
5156 8	(1)	5737 8	(6)

Ob —S S d K V S

**No 192**

LAT +22

LONG 338

CLASS—IVa IVc I IIc

Date—1908 Dec 17 22

5184 6	(1)	426 4	(2)
5186 3	(1)	5671 1	(2)
5188 6	(1)	727 9	( )
5143 9	(1)	781 1	(2)
5147 7	(1)	5737 3	(2)
5150 4	(1)	5713 6	(2)

5460 6 (1)  
48 0 (1)  
767 1 (1)

Ob —S S 1 K V S

**No 188**

LAT +20

LONG 87

CLASS—IVa IVb IVa IVb IVc IVa

Date—1908 Dec 11 14 15 16 17

5184 6	( )	5126 4	( )
186 3	(5)	5671 1	(5)
5138 6	(5)	27 9	(5)
5143 9	(5)	5781 1	(5)
5147 7	( )	5737 8	(5)
5150 3	(8)	748 6	( )
5048 8	(1)	5480 5	(1)
04 4	(1)	460 6	( )
04 5	(5)	5460 7	(1)
5066 1	(8)	5482 )	(3)
5066 2	(1)	5482 1	(1)
5140 5	(2)	5618 8	(1)
5149 0	(8)	5619 8	(1)
5150 4	(2)	62 8	(1)
5156 8	(2)	672 1	(1)
5158 0	(1)	5687 0	(3)
5160 5	(1)		

Ob —S S d K V

**No 193**

LAT +10

LONG 11

CLASS—I IIc IIa I

Date—1908 Dec 22 23 24

7126 4	(1)
671 1	(3)
727 )	(3)
5731 1	(1)
37 9	(3)
13 (	(3)
00	(2)
230 0	( )
5160 6	( )
18 1	(1)
56 7 8	(2)
70 2 1	(1)

Ob —K V S d S S

**No 202**

LAT -14

LONG 172

CLASS—IVd IVb IVa

Date— 904 Jan 4 6 7 8

5045	(3)	5426 4	(4)
130 3	(3)	5371 1	(4)
5188 6	(3)	57 7 9	(4)
5148 9	(3)	5781 4	(4)
147 7	(3)	5 37 8	(4)
150 3	(3)	5748 6	(4)
5086 1	(1)	5480 6	(1)
5184 6	(1)	5672 1	(1)

Ob -K V S

**No 206**

LAT +18

LONG 85

CLASS—IVa IVb I IVa

Date—1904 Jan 5 6 7 8 10 13

01 5	( )	54 6 4	(6)
136 3	(5)	5671 1	(6)
138 6	( )	5727 9	(6)
5143 9	(5)	5781	(6)
147	( )	5737 3	(6)
5150 3	(5)	5748 6	(6)
4020 0	(1)	220 0	(2)
500 3	(2)	5286 0	(1)
5048 8	(1)	5460 6	(4)
5058 2	(1)	54 1 8	(1)
5086 1	(4)	5482 1	(1)
5087 3	(1)	5627 8	(2)
5134 6	(5)	5672 1	(4)
		5687 0	(1)
		5700 4	(1)
		5 08 8	(1)
		5707 3	(1)
		5718 0	(1)

Ob -K V S d b S

**N 209**

LAT +20

LONG 30

CLASS—IVe IIIa IVe IIIa IVe IIa IVb

Date—1904 Jan 14 15 16 20

5134 6	(3)	4 6 4	(1)
5138 3	(3)	5671 1	(4)
138 8	(3)	5727 9	(1)
118 9	(3)	731 4	(1)
5147	(3)	573 8	(4)
5150 3	(3)	719 6	(4)
5045 5	(3)	180 0	(2)
5086 1	( )	672 1	(4)
066	(1)		

Ob I V S d S S

**No 210**

LAT +21

LONG 318

CLASS—I IIIa IIIb IVb IVc IIc IVb IIa

Date—1904 Jan 21 23

5134 6	(2)	1 4 4	(2)
5138 3	(2)	671 1	( )
5186 6	(2)	7 7 1	( )
113 J	( )	731 4	( )
147 7	(2)	737 3	(2)
51 0 3	(2)	5718 6	(2)
4802 8	(1)	5219 0	(1)
4771 4	(1)	5160 6	(2)
4977 8	(1)	18 1	( )
5015	(2)	672 1	(2)
5086 2	(2)		
1 6 3	(2)		

Ob -S S

**No 213 (A)**

LAT -13

LONG 297

CLASS—J IVd IVb IIIb IIc IIb

Date—1904 Jan 25 26

5045 5	(1)	5428 4	(2)
5138 3	(2)	567 1	(2)
138 6	(2)	57 7 9	(2)
5148 9	(2)	5781 4	(2)
5147 7	(2)	78 3	(2)
5150 3	(2)	5748 6	(2)
5086	( )	5480 6	(1)
5184 6	(3)	5672 1	(2)

Ob -K V S d S S

**No 213 (B)**

LAT -15  
LONG 291

CLASS—I IVd IVb IIIc IIb

Date—1904 Jan 25 26 28

5045 5	(1)	428 1	(3)
5186 8	(2)	5671 1	(3)
5188 6	(2)	5727 9	(3)
5143 9	(2)	5781 4	(3)
5147 7	( )	5787 3	(3)
5150 8	( )	5713 6	(3)
5086 2	(2)	5480 6	(1)
5184 6	(2)	5672 1	(2)

Ob —K V S d S

**No 221**

LAT +12  
LONG 39

CLASS—IIa IVb IVc V IIIc IIIb IVc

Date—1904 Feb 5 6 8 9 13 15

5045 5	(1)	54 6 4	(4)
5086 2	(4)	5671 1	(0)
5184	(2)	5072 1	(3)
5186 8	(3)	5727 9	(3)
5147 7	(4)	5781 4	(3)
5150 8	(3)	5787 3	(4)
4806 5	(1)	5219 9	(1)
4982 8	(1)	54 6 5	(1)
4975 5	(1)	460 5	(1)
4976 4	(1)	400 0	(3)
5009 9	(1)	5461 7	(1)
5018 5	(1)	54 1 9	(1)
5066 1	(1)	548 0	(1)
5071 6	(1)	548 1	(3)
5071 7	(2)	5430 8	(1)
5087 2	(1)	5480 1	(1)
5088 4	(1)	5480 9	(1)
5134 6	(3)	5027 9	(1)
5186 2	(1)	56 8 0	(2)
5188 6	(1)	5687 0	(1)
5148 9	(3)	5708 8	(1)
5150 7	(1)	5708 6	(1)
5156 9	(1)	5 07 1	(1)
187 8	(1)	787 8	(2)
		5748 6	(3)
		5867 9	(1)

Ob —S S G N

**No 227**

LAT -12  
LONG 210

CLASS—IIa IIIa IVb IVa

Date—1904 Feb 19 20 22 23 24 25  
26 27 28 29 March 1

5045 5	(3)	51 6 1	(7)
006 2	(6)	671 1	(10)
5184 7	(4)	5727 8	(5)
5186 8	(3)	5781 4	(7)
147	(3)	5787 8	(3)
150 8	(3)	5743 6	(3)
48 1 6	(1)	5194 3	(1)
48 6 7	(1)	5219 9	(3)
488 0	(2)	52 0 0	(1)
486 4 9	(1)	225 7	(1)
496 1	(2)	5298 8	(1)
496 2	(1)	5200 3	(1)
4905 8	(1)	53 1 9 7	(1)
5009 7	(1)	5121 4	(1)
009 8	(2)	543 8	(3)
048 6	(1)	5442 0	(1)
5048 7	(1)	5100 6	( )
5048 8	(1)	461 0	(1)
5045 0	(1)	461 8	(1)
5045 4	(1)	406 7	(1)
5045 9	(1)	5471 3	(1)
50 3 1	(1)	5471 4	(1)
5058 2	(1)	5177 8	(1)
04 6 1	(4)	5177 9	(1)
5082 3	(1)	5482 0	(3)
5085 0	(1)	748 1	(3)
5087 3	(1)	5480 8	(1)
5087 4	(1)	5100 4	(2)
124 0	(1)	5400 8	(2)
130 5	(1)	805 2	(1)
5134 6	(2)	56 7 9	(0)
5184 9	(1)	0 8 8	(1)
186	(1)	5672 1	(3)
188 5	(1)	5672	(1)
188 6	(3)	5727 9	(3)
5189 0	(1)	5791 5	(3)
5118 9	(1)	5 3 1 8	(1)
5147 6	(1)	736 8	(1)
5117 8	(4)	5713 1	( )
5150 7	(1)	( ) 7	(1)
5152	(1)	815 1	(1)
5156 8	(4)	847 2	(1)
156 9	(1)	586 8	(1)
157 0	(2)	5899 4	(1)
5160 0	(1)		
5160 2	(1)		
5160	(3)		
5160 0	(1)		
5162 8	(1)		
108 0	(1)		
5163 1	(1)		
5165 1	(1)		
5166 5	(1)		

Ob —S S d G N

O MICHEL SMITH  
Director

M A D R A S

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