

(1) பக்கங்களின் எண்ணிக்கை

14

(2) புதுக்கித் திருப்பிய நாள்

1932

(3) ஆதாரக் குறிப்பவர் சுருக்கொப்பம்

8

## தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

புதுச்சேரி

|                        |            |         |
|------------------------|------------|---------|
| அரசாணை எண்.            | 2730 W.    | அச்சகம் |
| மு. கோப்புத் தாள் எண். | (50)       | பலவகை   |
| நாள் :                 | 25-10-1893 | 199     |

மடிக்கவோ கண்டபடி கையாளவோ கூடாது.

22ND SEPTEMBER 1893, Nos. 342, 343, MARINE.

GOVERNMENT OF MADRAS.  
MARINE DEPARTMENT.

READ—the following paper:—

From Commander H. A. STREET, R.I.M., Acting Presidency Port Officer, Madras, to the Chief Secretary to Government, dated Madras, 9th September 1893, No. 1639—307 G.

I have the honour to forward herewith the annual report on the lights and light-houses in the Madras Presidency for the official year 1892-93.

ENCLOSURE.

REPORT on the Lights and Light-houses on the Coasts of the Madras Presidency for the official year 1892-93.

NEW LIGHT.

On and from 1st October 1892 a 6th order red dioptric port light was exhibited at Tondi, on the Madura Coast, Palks Strait.

SUBSTITUTION OF IMPROVED BURNERS, &c.

A 4-wick Douglass burner with pressure lamp was brought into use at the Muttam and Santopilly light-houses and a 2-wick Douglass burner with reservoirs at the light-houses at Mangalore, Calicut, Cochin, Tuticorin (Hare Island), Pamban, Negapatam, Seven Pagodas, Palicat, Armeghon, Point Divi and Vakalapudi.

CHANGE OF LIGHT.

A 4th order dioptric light apparatus has been substituted for the 6th order light at Hope Island. To effect this change the old light had to be extinguished on the 15th November 1892, and no light was exhibited from that date until the 1st January 1893 when the new apparatus was brought into use.

A red sector showing in the direction of the Sacramento shoal was fitted to the new lantern on the 1st March 1893, but was removed on the 1st August 1893, having been found defective.

OTHER IMPROVEMENTS.

In addition to annual repairs, &c., the following may be noticed:—

*Mangalore.*—Construction of quarters for the light-keepers was commenced in February 1893.

*Cochin.*—A dioptric mirror was supplied and attached to the apparatus.

*Cuddalore.*—Quarters for the light-keepers were completed.

*Point Calimere.*—New quarters for the light-keepers were under construction at the close of the year.

*Calingapatam.*—A new store-room was completed.

LIGHTNING CONDUCTORS.

See remarks in Appendix C.

## ESTABLISHMENT.

Particulars of the light-house establishment maintained in the Presidency are given in Appendix D. Details of cost will be found in Appendix A.

## DISTRIBUTION OF LIGHTS.

The lights as they stood on 31st March 1893 were 30 in number—8 on the West and 22 on the East Coast. Details are furnished in Appendix B.

## STORES AND SUPPLIES.

The supply of stores and mineral oil was well maintained, the latter with a surplus stock of six months' requirements at all the light-houses.

## LIGHT-HOUSE CHARGES.

Charges incurred on account of the several lights and light-houses during the year under review are particularised in Appendix A, and the following is a comparative statement of these charges for the last 3 years:—

|                                                 | 1890-91.   | 1891-92.   | 1892-93.   |
|-------------------------------------------------|------------|------------|------------|
| Establishment, stores and contingencies .. .. . | Rs. 27,606 | Rs. 38,687 | Rs. 72,292 |
| Public Works charges .. .. .                    | 6,800      | 9,463      | 9,849      |
| Total .. .. .                                   | 34,406     | 44,150     | 82,141     |

The variations under each head of charge as compared with charges of 1891-92 are explained below:—

|                              | 1891-92. | 1892-93. | Difference. |       |
|------------------------------|----------|----------|-------------|-------|
|                              | Rs.      | Rs.      | More.       | Less. |
| Superintendents .. .. .      | 10,565   | 10,367   |             | 198   |
| Light-keepers .. .. .        | 8,726    | 9,087    | 361         |       |
| Oil .. .. .                  | 4,204    | 4,850    | 646         |       |
| Stores .. .. .               | 11,528   | 42,342   | 30,814      |       |
| Contingencies .. .. .        | 3,574    | 5,046    | 1,472       |       |
| Public Works charges .. .. . | 5,463    | 9,849    | 4,386       |       |
| Total .. .. .                | 44,150   | 82,141   | 38,189      | 198   |
|                              |          |          | + 37,991    |       |

**Superintendents.**—There was a decrease of Rs. 198 in charges on account of salaries of light-house superintendents below those of the year 1891-92, and this is chiefly due to the pay of the present superintendent of the Vakalapudi light-house being Rs. 30 per mensem less than that allowed to his predecessor.

**Light-keepers.**—The increase under this head is, in a great measure, due to the entertainment of a light establishment at Pondi from 1st September 1892, and charges for a whole year on account of the amalgamated signalling and light-house establishments at Cuddalore, Tuticorin and Negapatam appearing in the accounts of the year 1892-93, whereas only charges for a few months of 1891-92 appeared in the accounts of that year.

**Oil.**—The increase is due to the greater consumption of oil since the improved burners were brought into use.

**Stores.**—Excluding the cost of new lights for Gopalpur, Cuddalore, Tondi, Malpe and Coondapoor debited in the accounts for 1891-92, amounting to Rs. 2,737, the charges for the year 1892-93 under this head were Rs. 40,551 in excess of those of the former year. This increase was chiefly due to cost of new lights during the year amounting to Rs. 39,873.

**Contingencies.**—Payment of bonus, Rs. 1,000, to Mr. Ashpitel largely attributes for the increase under this head, besides a small increase in the average ordinary contingencies of the year due to introduction of improved lights.

**Public Works Charges.**—Provision of quarters for the light-keepers at Cuddalore and Mangalore at an aggregate cost of Rs. 4,249 accounts for the increase under this head.

## APPENDIX A.

PARTICULARS OF CHARGES RELATING TO THE DIFFERENT LIGHTS.

| 1                      | Cost.           |                |             |             |                |                           | Total in     | Remarks.     |             |                                                                               |          |
|------------------------|-----------------|----------------|-------------|-------------|----------------|---------------------------|--------------|--------------|-------------|-------------------------------------------------------------------------------|----------|
|                        | Establishment.  |                | Oil.        | Stores.     | Contingencies. | Construction and repairs. |              |              | 1890-91.    | 1891-92.                                                                      | 1892-93. |
|                        | Superintendent. | Light-keepers. |             |             |                |                           |              |              |             |                                                                               |          |
| 2                      | 3               | 4              | 5           | 6           | 7              | 8                         | 9            | 10           |             |                                                                               |          |
| Coondapoor .. .. .     | Rs. 185 0 0     | Rs. 25 0 0     | Rs. 67 14 9 | Rs. 98 10 9 | Rs. 51 13 10   | Rs. 19 0 0                | Rs. 311 11 7 | Rs. 297 9 0  | Rs. 348 7 4 |                                                                               |          |
| Malpe .. .. .          | 188 0 0         | 25 0 0         | 153 8 10    | 28 10 9     | 27 8 6         | 1,246 6 4                 | 191 3 4      | 206 7 2      | 211 9 3     |                                                                               |          |
| Mangalore .. .. .      | 322 11 9        | 322 11 9       | 40 15 4     | 66 10 3     | 31 8 4         | 0 0                       | 589 11 9     | 404 15 4     | 263 17 7    |                                                                               |          |
| Cannanore .. .. .      | 228 0 0         | 228 0 0        | 139 1 4     | 8 7 2       | 82 12 6        | 136 8 8                   | 499 9 9      | 604 13 8     | 604 13 8    |                                                                               |          |
| Tellicherry .. .. .    | 210 13 11       | 210 13 11      | 67 6 9      | 594 2 0     | 18 1 2         | 206 5 10                  | 710 5 3      | 769 9 5      | 1,451 19 8  |                                                                               |          |
| Calicut .. .. .        | 324 0 0         | 324 0 0        | 115 1 11    | 761 8 10    | 91 8 5         | 475 0 0                   | 832 10 3     | 858 12 3     | 1,777 3 2   | Light at end of Pier.                                                         |          |
| Do. .. .. .            | 558 15 4        | 558 15 4       | 612 1 4     | 1,504 15 3  | 37 16 6        | 347 5 10                  | 2,839 0 5    | 3,899 11 3   | 6,081 9 3   |                                                                               |          |
| Cochin .. .. .         | 295 4 7         | 295 4 7        | 46 4 4      | 114 3 9     | 39 14 11       | 8 0 0                     | 2,837 0 3    | 1,609 14 6   | 1,193 19 7  |                                                                               |          |
| Madras .. .. .         | 694 2 2         | 694 2 2        | 136 6 5     | 834 12 8    | 337 0 11       | 545 6 0                   | 1,133 14 16  | 1,293 14 10  | 2,637 11 2  |                                                                               |          |
| Tuticorin .. .. .      | 324 0 0         | 324 0 0        | 129 0 0     | 764 4 4     | 94 5 3         | 77 11 11                  | 592 12 3     | 1,028 12 3   | 1,389 4 11  |                                                                               |          |
| Pondicherry .. .. .    | 114 0 0         | 114 0 0        | 25 12 5     | 155 2 0     | 390 7 3        | 453 14 9                  | 2,813 6 11   | 669 9 3      | 669 9 3     |                                                                               |          |
| Point Calimere .. .. . | 318 8 9         | 318 8 9        | 130 6 4     | 723 11 4    | 131 2 2        | 453 14 9                  | 1,290 11 15  | 747 15 9     | 1,136 10 11 |                                                                               |          |
| Negapatam .. .. .      | 681 2 7         | 681 2 7        | 130 6 4     | 723 11 4    | 131 2 2        | 453 14 9                  | 1,290 11 15  | 747 15 9     | 1,136 10 11 |                                                                               |          |
| Cuddalore .. .. .      | 432 0 0         | 432 0 0        | 46 11 11    | 8 14 1      | 32 5 0         | 2,316 4 0                 | 238 8 4      | 929 1 6      | 2,526 12 1  |                                                                               |          |
| Seven Pagodas .. .. .  | 840 0 0         | 840 0 0        | 136 8 6     | 933 10 4    | 103 3 9        | 3,316 4 0                 | 1,567 10 8   | 1,725 14 9   | 2,465 4 8   |                                                                               |          |
| Madras .. .. .         | 1,731 6 10      | 1,731 6 10     | 1,617 8 7   | 22,549 0 7  | 1,458 13 10    | 3,875 7 6                 | 3,678 7 6    | 3,415 6 4    | 27,921 4 9  | Two lights mark the entrance to the harbour and two lights show the fair way. |          |
| Do. .. .. .            | 841 7 3         | 841 7 3        | 174 6 8     | 368 11 6    | 181 1 11       | 230 14 9                  | 2,632 14 4   | 2,518 0 8    | 2,725 13 4  |                                                                               |          |
| Fulicat .. .. .        | 1,200 0 0       | 1,200 0 0      | 169 15 10   | 981 11 9    | 59 1 5         | 59 12 0                   | 2,973 3 3    | 2,608 2 8    | 2,691 3 10  |                                                                               |          |
| Armagh .. .. .         | 875 4 3         | 875 4 3        | 141 5 10    | 838 14 3    | 117 12 4       | 37 2 9                    | 2,115 9 5    | 1,921 10 3   | 390 2 10    |                                                                               |          |
| Point Divi .. .. .     | 832 0 0         | 832 0 0        | 42 15 3     | 6 4 6       | 37 2 9         | 1,042 13 6                | 887 12 9     | 370 3 4      | 2,998 9 8   | Groyne lights.                                                                |          |
| Masulipatam .. .. .    | 218 11 11       | 218 11 11      | 42 15 3     | 6 4 6       | 37 2 9         | 1,042 13 6                | 2,008 0 10   | 2,434 9 9    | 2,998 9 8   |                                                                               |          |
| Hope Island .. .. .    | 655 5 8         | 655 5 8        | 162 9 7     | 7,023 11 11 | 271 1 6        | 1,042 13 6                | 2,008 0 10   | 2,434 9 9    | 2,998 9 8   |                                                                               |          |
| Coondapoor .. .. .     | 913 5 4         | 913 5 4        | 163 6 1     | 794 13 11   | 146 2 10       | 59 12 0                   | 1,930 11 9   | 2,315 9 3    | 2,545 7 9   |                                                                               |          |
| Vakalapudi .. .. .     | 845 2 7         | 845 2 7        | 491 0 11    | 1,744 9 6   | 268 4 6        | 31 1 3                    | 2,038 10 5   | 1,908 4 10   | 2,838 2 8   |                                                                               |          |
| Santapally .. .. .     | 188 8 8         | 188 8 8        | 228 0 0     | 22 6 11     | 49 7 3         | 43 2 10                   | 1,616 3 8    | 1,519 11 6   | 608 13 10   |                                                                               |          |
| Calicut .. .. .        | 216 0 0         | 216 0 0        | 23 12 7     | 11 0 8      | 76 8 1         | 386 2 6                   | 1,815 15 3   | 1,815 15 3   | 329 5 4     | Light at end of Pier.                                                         |          |
| Gopalpur .. .. .       | 10,367 2 6      | 10,367 2 6     | 9,087 4 4   | 4,850 5 1   | 42,341 9 10    | 5,046 10 0                | 9,848 8      | 44,633 11 10 | 82,140 8 5  |                                                                               |          |
| Do. .. .. .            | 10,367 2 6      | 10,367 2 6     | 9,087 4 4   | 4,850 5 1   | 42,341 9 10    | 5,046 10 0                | 9,848 8      | 44,633 11 10 | 82,140 8 5  |                                                                               |          |
| Total .. .. .          | 10,367 2 6      | 10,367 2 6     | 9,087 4 4   | 4,850 5 1   | 42,341 9 10    | 5,046 10 0                | 9,848 8      | 44,633 11 10 | 82,140 8 5  |                                                                               |          |
|                        |                 |                |             |             |                |                           |              | 44,633 11 10 | 82,140 8 5  |                                                                               |          |

Two lights mark the entrance to the harbour and two lights show the fair way.

Groynes lights.

Light at end of Pier.

APPEN  
List of Lights on the

| Name of light.                             | Location.                                                                            | Latitude, N. | Longitude, E. | Number and relative position of lights.                                                                                                         | Colour of lights. | Fixed, flashing, in-termittent, alternating or revolving. | Interval of revolution or flash or occultation. |
|--------------------------------------------|--------------------------------------------------------------------------------------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------|-------------------------------------------------|
| Coondapoor ..                              | On the beach at the entrance to the river.                                           | 13° 38' 20"  | 74° 38' 40"   | 1                                                                                                                                               | Red ..            | F.                                                        | ....                                            |
| Malpe ..                                   | Do.                                                                                  | 13 20 40     | 74 42 0       | 1                                                                                                                                               | White.            | F.                                                        | ....                                            |
| Mangalore ..                               | On a hill above the town, and near some high trees.                                  | 12 52 17     | 74 50 08      | 1                                                                                                                                               | Do.               | F.                                                        | ....                                            |
| Cannanore ..                               | On the fort rampart near the beach.                                                  | 11 51 10     | 75 21 45      | 1                                                                                                                                               | Red ..            | F.                                                        | ....                                            |
| Tellicherry ..                             | On the fort wall near the beach.                                                     | 11 44 50     | 75 28 30      | 1                                                                                                                                               | White.            | F.                                                        | ....                                            |
| Mahé (French Territory).                   | On the south side of the entrance to the river, at the foot of the flag-staff.       | 11 42 10     | 75 31 10      | 1                                                                                                                                               | Red ..            | F.                                                        | ....                                            |
| Calicut ..                                 | On the sandy beach.                                                                  | 11 15 05     | 75 45 35      | 1                                                                                                                                               | White.            | F.                                                        | ....                                            |
| Narakel (Cochin Territory).                | On the beach at mouth of creek, 5 miles to the northward of Cochin.                  | 10 03 0      | 76 12 0       | 1                                                                                                                                               | Do.               | F.                                                        | ....                                            |
| Cochin ..                                  | On a small mound which formed a bastion of the old fort to the south of the harbour. | 9 57 47      | 76 13 45      | 1                                                                                                                                               | Do.               | F.                                                        | ....                                            |
| Alleppy or Alippee (Travancore Territory). | On the beach, about one cable inland.                                                | 9 30 0       | 76 19 0       | Only one light visible at a time. There are 9 lamps placed in three sets of three; as they revolve each set of three gives one stream of light. | Do.               | Rev. ...                                                  | A flash every minute.                           |

## DIX B.

## Consts of the Madras Presidency.

| Miles visible in clear weather. | Arc of illumination. (Bearings are magnetic and from seaward.)                                                                                         | Nature of construction, colour or any peculiarity of light-house. | Height in feet of centre of lantern above highwater. | Height in feet of building from base to vane. | Character and order of illuminating apparatus. | Year lighted.                                             | Remarks.                                                                                                                                                                                                                         |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 to 8                          | From N. thro' E. to S., shut in to the westward of N. by trees.                                                                                        | Steel mast ..                                                     | 45                                                   | 40                                            | Dioptric, 6th Port light.                      | 1st October 1888; present light 1st Nov. 1891.            | Intended as a guide to vessels making the port and is exhibited annually from 1st October to 31st May only.                                                                                                                      |
| 6 to 8                          | From N. thro' E. to S., shut in between N. and N.E. by trees, N. 53 E. and N. 57 E. by St. Mary's Islands, N. 73 E. to N. 80 E. by St. Mary's Islands. | Do.                                                               | 53                                                   | 60                                            | Do.                                            | Do.                                                       | Do. do.                                                                                                                                                                                                                          |
| 14                              | From N. by E. ½ E. thro' E. to S. by W. ½ W.                                                                                                           | Small white masonry tower.                                        | 240                                                  | 65                                            | Dioptric, 4th order.                           | 1st October 1852; improved 1870.                          | As a guide to the anchorage.                                                                                                                                                                                                     |
| 6 to 8                          | Between the bearings of N. W. by W. ½ W. and E. by S. ½ S.                                                                                             | Small masonry tower of a light yellow colour.                     | 64                                                   | 25 from the rampart.                          | Dioptric, 6th order.                           | 17th Oct. 1843; improved 1870; transferred to tower 1880. | Do. do.                                                                                                                                                                                                                          |
| 6 to 8                          | N.W. thro' E. to S.E.                                                                                                                                  | Small masonry tower.                                              | 70                                                   | 26                                            | Do.                                            | 1835; improved 1870; transferred to tower 1881.           | Do. do.                                                                                                                                                                                                                          |
| 7                               | All round the compass.                                                                                                                                 | Small white pyramid.                                              | 52                                                   | 7                                             | ..                                             | 1885 ..                                                   | Shown only during N.E. monsoon.                                                                                                                                                                                                  |
| 14                              | From N. 25 W. thro' E. to S. 14 E.                                                                                                                     | White column.                                                     | 102                                                  | 98                                            | Dioptric, 4th order.                           | 1847; improved 1881.                                      | To guide vessels to the anchorage close at the reef, which lies about 1 mile S. 30° W. from the light. A small red light is exhibited from the head of the pier as a guide for small coasting craft when entering the roadstead. |
| 10                              | 180° from N.N. W. thro' E. to S.S.E.                                                                                                                   | Flagstaff ..                                                      | 95                                                   | 103                                           | Country-made lantern.                          | 1865 ..                                                   | Is exhibited only during the S.W. monsoon, viz., from 15th May to 30th September, when Cochin port is avoided by shipping.                                                                                                       |
| 15                              | From N. by W. ½ W. thro' E. to S. by E.                                                                                                                | White laterite column.                                            | 100                                                  | 91                                            | Catadioptric, 4th order.                       | 1st April 1830; improved 1868.                            | ..                                                                                                                                                                                                                               |
| 17                              | All round the compass.                                                                                                                                 | Masonry round white tower.                                        | 113                                                  | 115                                           | Catadioptric, 1st order (Holo-photal).         | 1862 ..                                                   | To guide vessels to the smooth water anchorage during the S. W. monsoon.                                                                                                                                                         |

## List of Lights on the

| Name of light.                  | Location.                                                                                                                    | Latitude, N. | Longitude, E. | Number and relative position of lights. | Colours of lights. | Fixed, flashing, intermittent, alternating or revolving.        | Interval of revolution or flash or occultation.                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|-----------------------------------------|--------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Muttum                          | On a rocky promontory 300 yards from sea, known as Muttum Point.                                                             | 8° 07' 36"   | 77° 15' 10"   | 1                                       | White.             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Gulf of Mannar                  | Munapad ..                                                                                                                   | 9 22 30      | 78 6 30       | 1                                       | Red ..             | F.                                                              | ....                                                                                                                                                                                                                                     |
|                                 | Tuticorin ..                                                                                                                 | 8 47 10      | 78 11 20      | 1                                       | White.             | F.                                                              | ....                                                                                                                                                                                                                                     |
|                                 | Pamban or Pamban Pass.                                                                                                       | 9 17 14      | 79 12 38      | 1                                       | Do.                | F.                                                              | ....                                                                                                                                                                                                                                     |
|                                 | Tondi ..                                                                                                                     | 9 44 45      | 79 00 30      | 1                                       | Red ..             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Point Calimere.                 | On the point about 30 miles south of Negapatam.                                                                              | 10 18 0      | 79 51 30      | 1                                       | Do.                | F.                                                              | ....                                                                                                                                                                                                                                     |
| Negapatam                       | On the jetty near to the river mouth.                                                                                        | 10 45 30     | 79 50 20      | 1                                       | White.             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Karikal (French Territory).     | At the mouth of the Arsenalar river.                                                                                         | 10 55 0      | 79 59 35      | 1                                       | Do.                | F.                                                              | ....                                                                                                                                                                                                                                     |
| Cuddalore                       | On cross trees of flagstaff.                                                                                                 | 11 43 0      | 79 45 15      | 1                                       | Red ..             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Pondicherry (French Territory). | In square near the beach.                                                                                                    | 11 55 25     | 79 49 25      | 1                                       | White.             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Do.                             | End of landing stage.                                                                                                        | ..           | ..            | 1                                       | Red ..             | F.                                                              | ....                                                                                                                                                                                                                                     |
| Seven Pagodas or Mahabalipuram. | On a rock half a mile inland marked on chart "Ruined Pagoda" on rock very conspicuous and about 6 miles northward of Sadras. | 12 30 55     | 80 11 31      | 1                                       | Do.                | F.                                                              | ....                                                                                                                                                                                                                                     |
| Madras or Fort St. George.      | On the Esplanade, north of the Fort.                                                                                         | 13 05 11     | 80 16 51      | 1                                       | White.             | Flash-<br>ing.<br>The motion is reciprocating and not rotatory. | There are 5 faces, and every minute one face flashes towards the same spot, but three faces are presented seaward at one time. The duration of the flashes to that of the eclipses or dark periods is in the ratio of 2 to 3, but as the |

nature of the motion is reciprocating instead of rotatory, the above ratio merely expresses the average proportion of the light and dark intervals, which are themselves variable according to the position of the spectator. The rapidity of movement is so adjusted that the duration of the flashes will vary from 0° to 45° and that of the eclipses from 0° to 72°, the sum of the duration of light and darkness bearing, however, in every position the constant ratio of 2 to 3.

## Coasts of the Madras Presidency—cont.

| Miles visible in clear weather. | Arc of illumination. (Bearings are magnetic and from seaward). | Nature of construction, colour, or any peculiarity of light-house.                 | Height in feet of centre of lantern above high water. | Height in feet of building from base to vane. | Character and order of illuminating apparatus. | Year lighted.                                            | Remarks.                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16                              | From N. 65 W. thro' N. to S. 85 E.                             | Dark grey granite column, showing black and white horizontal stripes from seaward. | 142                                                   | 72                                            | Dioptric, order.                               | 1st altered 1st January 1883; improved 1892.             | This light, in the territory of Travancore, is intended to mark the vicinity of the Crocodile Rock, which lies 3 miles S.W. $\frac{1}{2}$ S. of Cadiapattam. Vessels, unless bound to Kolachel or Cadiapattam, should not pass in-shore of Kota and Adunda Islands, as they are difficult to be distinguished from seaward, and sometimes have the appearance of sunken rocks from the sea sweeping completely over them. |
| 12                              | N.N.E. thro' E. to S.S.W.                                      | White masonry tower.                                                               | 104                                                   | 27                                            | Dioptric, order, light.                        | 4th Port June 1883; improved 1st May 1890.               | Is intended to warn vessels of the dangerous shoal in the vicinity.                                                                                                                                                                                                                                                                                                                                                       |
| 14                              | All round the compass.                                         | Sandstone column coloured brown, lantern white.                                    | 85                                                    | 91                                            | Dioptric, order.                               | 4th 16th May 1845; improved 1874.                        | As a guide for vessels to the anchorage.                                                                                                                                                                                                                                                                                                                                                                                  |
| 14                              | Do.                                                            | Circular masonry column.                                                           | 97                                                    | 72                                            | Catadioptric, 4th order.                       | 21st April 1846; improved 1860.                          | As a guide to vessels making for the Pamban channel.                                                                                                                                                                                                                                                                                                                                                                      |
| 10                              | Visible from all directions seaward.                           | Steel mast ..                                                                      | 63                                                    | 52                                            | Dioptric, order, light.                        | 6th 1st Oct. 1892.                                       | As a guide to vessels making the port.                                                                                                                                                                                                                                                                                                                                                                                    |
| 6                               | All round the compass.                                         | Steel mast, painted white.                                                         | 49                                                    | ..                                            | Dioptric, order, light.                        | 6th Port 1st June 1890.                                  | As a guide to vessels passing between Point Calimere and the shoals to the eastward.                                                                                                                                                                                                                                                                                                                                      |
| 14                              | From N. 5 W. thro' W. to S. S.E.                               | Masonry column, painted white.                                                     | 70                                                    | 53                                            | Dioptric, order.                               | 4th 1st August 1846; improved 1870.                      | As a guide for vessels to the anchorage.                                                                                                                                                                                                                                                                                                                                                                                  |
| 9                               | Visible from all directions seaward.                           | Do.                                                                                | 42                                                    | ..                                            | Lamp burning coconut oil.                      | 1869 ..                                                  | Do. do.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6 to 8                          | N. thro' W. to S.                                              | Flagstaff ..                                                                       | 130                                                   | 31                                            | Dioptric, order, light.                        | 6th Port 1st July 1889; present light, 6th October 1891. | Do. do.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 14                              | Visible from all directions seaward.                           | Masonry column, painted light yellow.                                              | 89                                                    | 76                                            | Dioptric, order.                               | 4th 1886 ..                                              | Do. do.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4                               | Do.                                                            | ..                                                                                 | 31                                                    | ..                                            | ..                                             | 1881 ..                                                  | When surf is heavy and approach to landing prohibited, a fixed green light is shown.                                                                                                                                                                                                                                                                                                                                      |
| 17                              | From N. thro' W. to south (180°).                              | Small grey turret.                                                                 | 119                                                   | 26                                            | Dioptric, order.                               | 4th 10th July 1887.                                      | Is intended to warn mariners of the dangerous outlying patches of rock composing the Tripatore reef and other reported dangers in its vicinity, to avoid which vessels navigating between Sadras and Covelong should not come into a less depth than 13 fathoms.                                                                                                                                                          |
| 20                              | From N.N.E. thro' W. to S. S.E.                                | Granite column.                                                                    | 128                                                   | 125                                           | Catadioptric ..                                | 1st Jan. 1844.                                           | To guide vessels clear of the Pulicat shoal. Mariners should not bring this light to southward of S.S.W. $\frac{1}{2}$ W. to avoid Pulicat shoal.                                                                                                                                                                                                                                                                         |

## List of Lights on the

| Name of light.          | Location.                                                                                              | Latitude, N. | Longitude, E. | Number and relative position of lights. | Colour of lights. | Fixed, flashing, intermittent, alternating, or revolving. | Interval of revolution or flash or occultation. |
|-------------------------|--------------------------------------------------------------------------------------------------------|--------------|---------------|-----------------------------------------|-------------------|-----------------------------------------------------------|-------------------------------------------------|
| Madras Leading Light.   | Madras Pier T. Head.                                                                                   | 13° 05' 44"  | 80° 17' 18"   | 1                                       | Red ..            | F.                                                        | ....                                            |
| Do. ..                  | Port Office Terrace.                                                                                   | 13 05 47     | 80 17 06      | 1                                       | Green..           | F.                                                        | ....                                            |
| Pulicat ..              | Near the Beach ..                                                                                      | 13 25 16     | 80 19 06      | 1                                       | White.            | F.                                                        | ....                                            |
| Armogham or Armogham.   | On the mainland, village of Moona or Moonapollum.                                                      | 13 53 03     | 80 11 47      | 1                                       | Do.               | Rev.                                                      | A flash every 20 seconds.                       |
| Point Divi or Divy.     | About 2 miles north-west of the Point.                                                                 | 15 58 55     | 81 00 25      | 1                                       | Do.               | F.                                                        | ....                                            |
| Masulipatam ..          | In the Fort ..                                                                                         | 16 09 15     | 81 00 26      | 1                                       | Do.               | F.                                                        | ....                                            |
| Island ..               | of Hope Island, Coringa Harbour, and distant about 2½ miles from the sea.                              | 16 49 05     | 82 13 58      | 1                                       | Do.               | F.                                                        | ....                                            |
| Cocanada or Vakilapudi. | 4½ miles north of Cocanada river and about 500 yards from the shore.                                   | 17 0 40      | 82 15 30      | 1                                       | Do.               | Fl.                                                       | A flash every 20 seconds.                       |
| Cocanada River.         | One on the end of the North Groyne and the other on the end of the South Groyne entrance to the river. | ..           | ..            | 2                                       | Red ..            | F.                                                        | ....                                            |
| Santipilly ..           | On a small detached hill some distance in land; this distance said to be ½ of a mile.                  | 18 04 56     | 83 37 35      | 1                                       | White.            | F.                                                        | ....                                            |
| Calingapatam ..         | On the point ..                                                                                        | 18 19 0      | 84 07 30      | 1                                       | Red ..            | F.                                                        | ....                                            |
| Gopalpur ..             | On the mainland 60 yards from low-water mark.                                                          | 19 13 0      | 84 52 0       | 1                                       | White.            | F.                                                        | ....                                            |
| Do. ..                  | On the extreme end of the pier head, port of Gopalpur.                                                 | ..           | ..            | 1                                       | Red ..            | F.                                                        | ....                                            |

## Coasts of the Madras Presidency—cont.

| Miles visible in clear weather. | Arc of illumination. (Bearing as magnetic and from seaward). | Nature of construction; colour or any peculiarity of light-house.                                                 | Height in feet of centre of lantern above highest water. | Height in feet of building from base to vane. | Character and order of illuminating apparatus. | Year lighted.                                                                                 | Remarks.                                                                                                                                                               |
|---------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6                               | From S. 51° 45' W. thro' W. to N. 17° W.                     | Wooden post ..                                                                                                    | 30                                                       | ..                                            | Ship's side light, dioptric.                   | 15th Oct. 1888.                                                                               | To guide vessels leaving the harbour or making the anchorage at night.                                                                                                 |
| 6                               | From S. 51° 45' W. thro' W. to N. 17° W.                     | Do. ..                                                                                                            | 60                                                       | ..                                            | Do. ..                                         | Do. ..                                                                                        | Do. do.                                                                                                                                                                |
| 14                              | From N. by W. thro' W. to S. by E.                           | Masonry column with black bands.                                                                                  | 65                                                       | 57                                            | Dioptric, order.                               | 4th 1860; improved 1870; altered 1881.                                                        | To guide vessels clear of the Pulicat shoal. When the light bears W. ½ N., a vessel is to the northward of all dangers.                                                |
| 14                              | From N.E. thro' W. to S.E.                                   | White masonry column.                                                                                             | 107                                                      | 111                                           | Do. ..                                         | 1st January 1853; improved 1870; present light 1881.                                          | Warns vessels off the Armogham shoal, the shallowest part of which (1½ fathoms) lies 6 miles off shore.                                                                |
| 14                              | From N.E. thro' W. to S.                                     | Do. ..                                                                                                            | 48                                                       | 50                                            | Do. ..                                         | 1st May 1851; improved 1870.                                                                  | Is intended to point out the position of the dangerous sands in the vicinity.                                                                                          |
| 6                               | From S. 20° W. thro' W. to N. 9° E.                          | Flagstaff ..                                                                                                      | 60                                                       | 112                                           | Dioptric, order.                               | 6th 1858; improved 1870.                                                                      | As a guide for vessels to the anchorage.                                                                                                                               |
| 16                              | From N. 6° E. thro' W. to S. 5° W.                           | Masonry tower, horizontal alternate bands of black and white.                                                     | 83                                                       | 94                                            | Dioptric, order.                               | 4th 1817; improved 1886; improved 1893.                                                       | Is intended to lead vessels clear of shoals off Gôdâvari Point.                                                                                                        |
| 14                              | All round the compass.                                       | White column..                                                                                                    | 80                                                       | 76                                            | Do. ..                                         | 15th Jan. 1879.                                                                               | This light is intended to lead vessels clear of the shoals to the northward of Point Gôdâvari when coming into the Cocanada anchorage from the southward and eastward. |
| 24                              | Do. ..                                                       | Wooden post ..                                                                                                    | 10                                                       | ..                                            | ..                                             | 15th Sept. 1886.                                                                              | Exhibited to serve as a guide to boats entering or leaving Cocanada river.                                                                                             |
| 16                              | From N.E. thro' W. to S.W.                                   | On a small basement on the top of a small hill with a small building by the side of the lantern on the west side. | 163-77                                                   | 31-16                                         | Dioptric, order.                               | 2nd 1st Nov. 1848; improved 1871; present light 1886; improved 16th Aug. 1888; improved 1892. | Exhibited to warn mariners of the Santipilly Rocks from which this light bears N. W. 8 W., distant 6½ miles.                                                           |
| 12                              | Do. ..                                                       | Obelisk of cut stone; column white; capital dark blue.                                                            | 76                                                       | 73                                            | Dioptric, order, light.                        | 4th Port 15th Dec. 1876; improved 1st June 1896.                                              | Intended to warn vessels off a small reef which projects from the point and which should not be passed in less than 8 fathoms when making the port at night.           |
| 12                              | From N.E. thro' N.W. to S.W.                                 | Flagstaff, painted white.                                                                                         | 54                                                       | 38                                            | Do. ..                                         | Present light 1871; 1st March 1892.                                                           | As a guide to the anchorage.                                                                                                                                           |
| 3                               | All round the compass.                                       | ..                                                                                                                | 25                                                       | ..                                            | Country lantern.                               | 1st April 1887.                                                                               | Points out the sea end of the pier.                                                                                                                                    |

## APPENDIX C.

STATEMENT furnishing (1) particulars of inspection made of Light-houses on the Madras Coast in 1892-93, and (2) remarks in connection with the lightning conductors.

| (1)                         | (2)                                                     |
|-----------------------------|---------------------------------------------------------|
| Name of Light.              | Designation of officer by whom inspection was made.     |
| Number of inspections made. | Remarks in connection with lightning conductors.        |
| Coondapoor ..               | Port Officer, Mangalore .. ..                           |
| Malpe .. ..                 | Do. do. .. ..                                           |
| Mangalore ..                | Executive Engineer .. ..                                |
| Tellicherry ..              | Port Officer, Calicut .. ..                             |
| Calicut .. ..               | Executive Engineer .. ..                                |
| Cochin .. ..                | Port Officer, Calicut .. ..                             |
| Mattam .. ..                | Superintending Engineer .. ..                           |
| Manapad .. ..               | Port Officer, Tuticorin .. ..                           |
| Tuticorin (Hare Island) ..  | Presidency Port Officer .. ..                           |
| Pamban .. ..                | Superintending Engineer .. ..                           |
| Point Calimere ..           | Executive Engineer, Negapatam Division .. ..            |
| Negapatam ..                | Presidency Port Officer .. ..                           |
| Cuddalore ..                | Personal Assistant to the Presidency Port Officer .. .. |
| Seven Pagodas ..            | Superintending Engineer .. ..                           |
| Pulicat .. ..               | Executive Engineer .. ..                                |
| Arneghon ..                 | Personal Assistant to the Presidency Port Officer .. .. |
| Point Divi ..               | Reserve Port Officer .. ..                              |
| Vakalapudi ..               | Reserve Port Officer .. ..                              |
| Hope Island ..              | Assistant Engineer .. ..                                |
| Santopilly ..               | Port Officer, Masulipatam .. ..                         |
| Calingapatam ..             | Sub-divisional Officer, Public Works Department .. ..   |
| Gopalpur .. ..              | Port Officer, Coenada .. ..                             |
|                             | Superintending Engineer .. ..                           |
|                             | Port Officer, Coenada .. ..                             |
|                             | Superintending Engineer .. ..                           |
|                             | Executive Engineer .. ..                                |
|                             | Presidency Port Officer .. ..                           |
|                             | Port Officer, Bimlipatam .. ..                          |
|                             | Executive Engineer .. ..                                |
|                             | Superintending Engineer .. ..                           |
|                             | Presidency Port Officer .. ..                           |
|                             | Port Officer, Gopalpur .. ..                            |
|                             | Superintending Engineer .. ..                           |
|                             | Presidency Port Officer .. ..                           |
|                             | Port Officer, Gopalpur .. ..                            |

Note.—At stations where there is a Port Officer or Conservator, such officers, in their capacity as *ex-officio* Superintendents, frequently inspected the lights during the year in addition to the outside inspections above recorded.

## APPENDIX D.

STATEMENT showing the sanctioned establishments of Light-houses on the Madras Coast as they stood on 31st March 1893.

| Lights.                    | Superintendents. |            |            | Head Light-keepers. |            |            | Light-keepers. |            |            | Total staff of each light. | Remarks. |             |            |            |                                                                                                      |
|----------------------------|------------------|------------|------------|---------------------|------------|------------|----------------|------------|------------|----------------------------|----------|-------------|------------|------------|------------------------------------------------------------------------------------------------------|
|                            | 1st Class.       | 2nd Class. | 3rd Class. | 1st Class.          | 2nd Class. | 3rd Class. | 1st Class.     | 2nd Class. | 3rd Class. |                            |          |             |            |            |                                                                                                      |
|                            |                  |            |            |                     |            |            |                |            |            |                            |          | Rupces 100. | Rupces 70. | Rupces 50. | Rupces 100.                                                                                          |
| Coondapoor .. ..           | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (a) Temporary from 1st October to 31st May of each year.                                             |
| Malpe .. ..                | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (b) Plus charge allowance of Rs. 2.                                                                  |
| Mangalore .. ..            | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (c) Plus charge allowance of Rs. 1.                                                                  |
| Danunore .. ..             | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (d) Plus special allowance of Rs. 25, which is to cease to next incumbent.                           |
| Tellicherry .. ..          | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | The establishment for Tondi was sanctioned in 1891-92, but entertained only from 1st September 1892. |
| Calicut .. ..              | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (e) Plus house allowance of Rs. 25.                                                                  |
| Cochin .. ..               | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | (f) Plus flag-signalling allowance Rs. 10.                                                           |
| Mattam .. ..               | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         | * Increased to 3 from 1st June 1893.                                                                 |
| Manapad .. ..              | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Tuticorin (Hare Island) .. | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Pamban .. ..               | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Tondi .. ..                | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Point Calimere .. ..       | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Negapatam .. ..            | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Cuddalore .. ..            | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Seven Pagodas .. ..        | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Madras .. ..               | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Pulicat .. ..              | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Arneghon .. ..             | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Point Divi .. ..           | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Masulipatam .. ..          | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Hope Island .. ..          | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Vakalapudi .. ..           | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Santopilly .. ..           | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Calingapatam .. ..         | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |
| Gopalpur .. ..             | ..               | ..         | ..         | ..                  | ..         | ..         | ..             | ..         | ..         | ..                         | ..       | ..          | ..         | ..         |                                                                                                      |

| AMALGAMATED establishments. |                                       |            |            |            |                             |            |           |           |              |
|-----------------------------|---------------------------------------|------------|------------|------------|-----------------------------|------------|-----------|-----------|--------------|
| Lighthouses.                | Head Light-keeper and Head Signaller. |            |            |            | Light-keeper and Signaller. |            |           |           | Total staff. |
|                             | Rupces 20.                            | Rupces 15. | Rupces 12. | Rupces 10. | Rupces 11.                  | Rupces 10. | Rupces 9. | Rupces 8. |              |
|                             |                                       |            |            |            |                             |            |           |           |              |
| Tuticorin .. ..             | 1                                     | ..         | ..         | ..         | 1                           | 1          | 1         | 1         | 6            |
| Negapatam .. ..             | ..                                    | ..         | ..         | ..         | ..                          | ..         | ..        | ..        | 4            |
| Cuddalore .. ..             | ..                                    | ..         | ..         | ..         | ..                          | ..         | ..        | ..        | 4            |
|                             | ..                                    | ..         | ..         | ..         | ..                          | ..         | ..        | ..        | 3            |

Temporary.—Light-house Mechanic Rs. 80 per annum, rising by annual increments of Rs. 5 to Rs. 100.

ORDER—dated 22nd September 1893, No. 342, Marine.

Recorded.

(True Extract.)

J. F. PRICE,  
*Chief Secretary.*

To the Presidency Port Officer.  
„ Public Works Department.

ENDORSEMENT—dated 22nd September 1893, No. 343, Marine.

Five copies forwarded to the Government of India, Department of Finance and Commerce.

J. F. PRICE,  
*Chief Secretary.*

Govt. of {1893} Madras.  
MARINE.

Issued

Recd.

Encl.

G.O., &c., 22nd September 1893,  
Nos. 342, 343.

SEPTEMBER.

Lights and Light-houses.

Recording the report on — in the Madras Presidency for the year 1892-93, and forwarding copies to certain Governments.

With order

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N<sup>o</sup> 2730 W of 25 October 1893

Communicated  
to officers concerned  
for information.

(Id) J. H.

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