



# ADMINISTRATION REPORT

OF THE

## PUBLIC WORKS DEPARTMENT,

(GENERAL, BUILDINGS AND ROADS BRANCH,)

MADRAS PRESIDENCY,

FOR THE YEAR

1888-89.

MADRAS:

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1889.

N.B.—The maps illustrating this report will be issued separately.

# ADMINISTRATION REPORT

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## PUBLIC WORKS DEPARTMENT, MADRAS,

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FOR THE YEAR 1888-89.

### I.—GENERAL REMARKS.

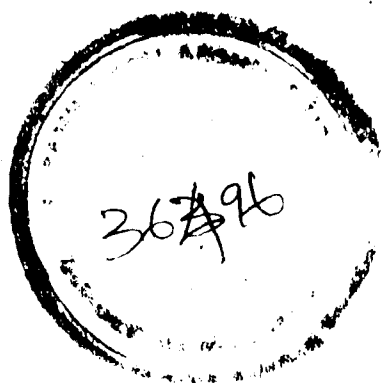
COLONEL J. O. HASTED, R.E., Chief Engineer and Secretary to Government, proceeded during the year on six months' special leave, which was afterwards commuted into furlough for twenty-two months. The administration of the department devolved in consequence on Colonel H. R. Mead, R.E., who, having held the position of Acting Chief Engineer and Secretary from October 1888 to the middle of March 1889, himself proceeded on six months' special leave, handing over charge of the General and Buildings and Roads Branches of the department to Lieut.-Col. R. R. E. Drake-Brockman, R.E., with position in the Secretariat of Joint Secretary. The Irrigation Branch of the department, held by Mr. G. T. Walch since the date of Colonel Hasted's departure, has been continued in his hands, with position in the Secretariat of Secretary to Government. These appointments have been made pending final arrangements which will probably come into force in March 1890.

2. *Grants and Expenditure.*—The following statement shows the grants and expenditure under the different service heads:—

|                                | Original grant. | Revised estimate. | Expenditure. |
|--------------------------------|-----------------|-------------------|--------------|
|                                | RS.             | RS.               | RS.          |
| Imperial Military Works .. ..  | 6,24,300        | 6,26,700          | 6,16,511     |
| Do. Civil Works .. ..          | 18,700          | 20,500            | 20,186       |
| Provincial Civil Works .. ..   | 23,00,000       | 21,72,000         | 20,77,463    |
| Local Incorporated Funds .. .. | 2,04,000        | 2,05,000          | 2,07,867     |
| Do. Excluded Funds .. ..       | 28,585          | 50,897            | 48,459       |
| Estate Works .. ..             | 3,62,013        | 2,33,618          | 2,12,541     |

3. *Amalgamation of Provincial and Local Establishment for Public Works.*—This matter was raised in 1886 by the Finance Committee, who entered at considerable length into the question of the expense caused by the maintenance of double establishments for that class of public works which are known as Civil Buildings, Roads and Other Services. The Madras Government, after careful consideration of the arguments of the committee and of local circumstances as obtaining in this Presidency, reported to the Government of India that it was inexpedient to hand over to the Public Works Department any of the public works now under the control of Local Boards. This view was reiterated in the year under notice on the matter being again brought forward; the Government being satisfied that the expenditure from local rates, against which the cost of these works falls, is sufficiently controlled and supervised in this Presidency. As to whether any works now in charge of the Public Works Department could with advantage be handed over to Local Boards, it was found on inquiry that very few such works could be transferred. The subject will, however, be kept in view, and if at any time it is found that works appertaining to the Public

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Works Department in a particular locality can more conveniently be carried out by Local Boards, the needful transfer will be made in the interests of economy; the principle of mutual help between the Public Works Department and Local Boards, hitherto maintained, being kept steadily in view.

4. *Accounts Branch.*—The report of the Public Service Commission on the Accounts branch of the Public Works Department came under the consideration of the Government of India during the year. The commission was of opinion that the recruitment for this branch of the service was unsatisfactory. The recruitment has hitherto generally been—

- (1) by transfer of officers (Military and Civil) from the Engineer establishment of the Public Works Department;
- (2) by promotion of selected accountants from the subordinate service; and
- (3) by appointment of nominated candidates outside the service who have passed a prescribed entrance examination.

The Public Service Commission considered that the number of Engineers and Military officers already employed was excessive, and recommended certain alterations in the mode of recruitment of outside candidates.

The Government of India laid down certain general rules for future recruitment under which appointments to the superior service of the accounts branch of the department will be made mainly from successful candidates in a nominated (not open) competitive examination, and occasionally from senior accountants already on the establishment. Nominations to the competitive examination will rest with the Accountant-General. The candidates who pass the examination will be appointed apprentice examiners in order of merit and to the extent of vacancies. The nature of the examination to be passed and other details as to age, &c., have been published in the *Gazette of India*.

The Government of India had also under consideration the question of the reduction of accounts work in the offices of Executive Engineers, and appointed a committee to make a searching inquiry into the system of accounting for receipts and expenditure, and to report how far the present procedure could be simplified without sacrificing administrative control. The duties of the committee were to thoroughly investigate the procedure as laid down in the Public Works Code and Book of Forms, and to consider what accounts and returns were essentially necessary for purposes of control, and what might be dispensed with. The committee were also to discuss how far the accounts proposed to be retained could be simplified in order to lessen the labor in Executive Engineers' offices. The committee were further empowered to take the evidence of local officers of experience, and for this purpose held their sittings at the principal stations of the empire.

5. *Employment of Pioneer Troops on Public Works.*—His Excellency the Commander-in-Chief brought to notice the desirableness of employing Pioneer troops on such public works as might be deemed suitable. He was of opinion that the usefulness and efficiency of these troops, as Pioneer battalions, could only be maintained by their frequent employment, in times of peace, on works which would afford some training for the duties required of the men in the field, and which would give them some opportunity of earning working pay and thus render service in the Pioneer battalions popular. The Government accordingly directed that employment should be found for these men when practicable, a certain number being at once sent to the Cuddalore bridge works and the Periyár project.

6. *Famine Relief Works.*—In October last the Collector reported that great scarcity existed throughout the district of Ganjam; that the rains had failed; and that, should matters not speedily improve, it would be necessary to start famine relief works. The Government of India had already been asked to make an additional grant for the continuance of work on the Rushikulya project, and the report of the condition of the district made by the Collector emphasised the demand. Although the Government was not at that time prepared to admit the necessity of starting relief works, it entertained grave apprehensions, and arrangements were made for augmenting the Public Works staff of the district and providing a sufficient supply of tools immediately the necessity for them should become apparent. In order to ascertain the exact condition of affairs, Mr. J. H. Garstin, C.S.I., 1st Member of the Board of

Revenue, was deputed, on the 25th October, to proceed to Ganjam, and report to Government the result of his personal observations. He was at the same time authorised to take the necessary steps for putting in hand at once the works connected with the Rushikulya project under the rules prescribed by the Famine Code for professional agency works should, in his opinion, the condition of the district render such a step advisable. Mr. Garstin did not consider it necessary to exercise the power conferred on him to order the immediate commencement of the Rushikulya project as a famine relief work, but thought it sufficient to direct the Executive Engineer to receive all able-bodied applicants for labor that came to him, to carry on the work in the ordinary way, to indent for a large supply of tools, and to arrange with the Collector for a supply of small coin in case daily payments should become necessary. Between the 9th November, when the Russelkonda reservoir work was recommenced, and the 24th idem, the total number of workpeople who came to the canal works was 2,522. Mr. Garstin also recommended that steps should be at once taken to begin work on the Ganjam-Gopálpur canal as, should the distress spread, there would not be sufficient room on the Rushikulya project for all persons who might be expected to apply for work. This latter work would provide employment for all distressed persons throughout the eastern portion of the district. Should these two large works not afford sufficient employment, nine lines of road were suggested as subsidiary works.

These recommendations were approved by Government, who directed the immediate commencement of the required additional Public Works establishment and the provision of the requisite supply of tools. The Rushikulya project works were calculated to afford employment to some 20,000 laborers for the ensuing four or five months. The grant for the work then amounted to Rs. 43,000, and after the 1st April there would be  $3\frac{1}{2}$  lakhs available. The Ganjam-Gopálpur canal would afford employment for 4,000 coolies for five months, and an allotment of Rs. 30,000 was made for immediate requirements. The numbers employed on the works at the close of the year were as follows:—

|                          | Men.   | Women. | Children. | Total. |
|--------------------------|--------|--------|-----------|--------|
| Rushikulya ..            | 5,694  | 2,982  | 2,421     | 11,097 |
| Ganjam-Gopálpur canal .. | 4,315  | 3,329  | 505       | 8,149  |
| Total ..                 | 10,009 | 6,311  | 2,926     | 19,246 |

7. *Madras Harbour Works.*—At the close of the previous year the Harbour Trust Board had under consideration the report of the London Committee on the best position for the entrance to the harbour, a question which had been reopened in consequence of the effects of the cyclone of 1887. The Board submitted their report in April 1888. They considered that if the harbour is to be a success, smooth water is an absolute necessity, and that this could not be secured with an eastern entrance, through which heavy rollers find free admission in bad weather, rendering unsafe structures within the harbour which may be erected for the landing and shipping operations of the port. They accordingly adhered to their former resolution in favor of a north-east entrance and gave the preference to plan No. III, which had been approved by the London Committee. The additional cost of this they estimated to be Rs. 27,70,103 or Rs. 30,08,363, according as the overlap of the pier would be 600 or 800 feet, respectively. These conclusions were laid before the Secretary of State for final decision, and meanwhile the Harbour Trust Board were called on for an expression of their views as to the best means of carrying out the proposed plan and for a detailed estimate of the cost. On further inquiry the Board found that the carrying out of plan No. III presented great practical difficulties. They therefore resolved, on engineering grounds, to adopt a form of entrance based on plan No. IV of the London Committee, or plan A put forward by Mr. Parkes, and to carry out the work in accordance with Mr. Parkes' suggestions; that it is say, they proposed, as a first step, virtually to restore the harbour to the state it was in previous to the storm of November 1881, with an eastern entrance. Should it then be found that the eastern entrance does not give sufficiently smooth water, the north-east entrance can be gradually substituted without serious engineering difficulties, and during the period

of alteration from the eastern to the north-east entrance, the usefulness of the harbour will be in no way impaired. Plan No. III was originally preferred on *nautical* grounds, and as no exception on such grounds could be taken to the new plan No. IV A while the arguments in favor of its adoption on engineering grounds were very strong, the proposal was forwarded to the Secretary of State with a request that sanction might be given to the preliminary step of restoring the harbour with an eastern entrance. Sanction to this proposal was received and communicated to the Harbour Trust Board towards the close of the year.

In May 1888 Mr. Thorowgood, the Engineer to the Harbour Trust Board, resigned his appointment and was relieved by his Assistant, Mr. A. L. Pogson, whose appointment as Engineer was sanctioned provisionally pending settlement of the north-east entrance to the harbour when active operations were expected to be resumed. Mr. Pogson has recently been confirmed in the appointment. Intimation was received of the death in England, on the 5th February 1889, of Mr. Parkes, the designer of the works, and of late years the Consulting Engineer for the Harbour Works to the India office in London. Mr. Parkes' place has not been filled up.

There was a satisfactory outturn of work on the harbour improvements, but better progress would have been made had the ultimate design of the harbour been settled and authority to proceed with the north arm received earlier in the year. Work at the north pier was in abeyance till February 1889, but since that month active operations have been going on.

At the north pier 494 blocks were set by divers in 46 working days, adding a length of 299 feet to the superstructure, and making up the total length of the masonry pier to 2,825 feet from the shore end. 76 thirty-ton blocks were dropped into position by the large wavebreaker crane up to the end of June, when it was decided to transfer this crane to the south pier. The crane had to be dismantled and removed by rail, then re-erected before it could be travelled over the work it was designed for; the crane was finally completed and launched on the 17th January 1889. 2,544½ tons of stone were deposited in the base and foreshore of the north pier, and 2,147 concrete blocks were made for the superstructure and wavebreaker protection. These blocks represented 36,800 cubic yards of concrete. 6,383 tons of Portland cement from England were used. The average rate, delivered on the works, was Rs. 48-1-1 per ton.

The total quantity of materials supplied from the Pallavaram quarries was 48,585 tons, brought to Madras in 8,365 railway wagons. There were 48,283 tons of stone for the rubble base and chips for block-making, and 302 tons of ballast for the beach improvements. The quarry lines were maintained in excellent order and there were no derailments during the year.

At the south pier 656 superstructure blocks were set in position, advancing this arm by 414½ feet and making the total length on the 31st March 1889 3,519 feet, measured from the first block set on shore in 1877.

The wavebreaker protection was strengthened by 714 blocks being dropped into position, widening the screen to the full section of 40 feet from the superstructure, and 4,037½ tons of rubble stone were deposited in the base and foreshore of the work.

The expenditure on the works during the year was Rs. 6,17,226, made up as follows:—

|                 |     |     |     |     |     |     |     |     |          |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| Works           | ... | ... | ... | ... | ... | ... | ... | ... | Rs.      |
| Establishment   | ... | ... | ... | ... | ... | ... | ... | ... | 5,30,224 |
| Tools and plant | ... | ... | ... | ... | ... | ... | ... | ... | 72,714   |
|                 |     |     |     |     |     |     |     |     | 5,546    |

Net debits to suspense heads ... 6,08,484

Total ... 6,17,226

and the total expenditure from the commencement Rs. 30,33,478-5-7 against the estimate of Rs. 45,90,051.

A scheme for beach improvements was drawn up and sanctioned. This consisted of a rearrangement of all railway lines, erection of goods sheds and thorough repair of the iron pier. 230 running feet of the old pier were dismantled of all timber work, and, in lieu, an embankment was formed upon which three large corrugated iron goods sheds were erected. 2,978½ running feet of new railway lines were laid and

2,481 running feet were taken up, partly renewed, and relaid, in accordance with the new scheme. Three large turn-tables were erected, thus placing both the Madras and South Indian Railways in direct communication with the harbour works and the iron pier. Two steam cranes were also erected and placed in position on the iron pier, and fourteen hand cranes thoroughly repaired, while twenty-seven trucks were made and repaired for use on the pier and custom-house.

8. *Bangalore Water-supply.*—The investigations made of late years having, as mentioned in the previous report, failed to produce an efficient and economical scheme of water-supply to the troops stationed in Bangalore, the Government resolved to offer a reward of Rs. 1,000 for the best essay on the subject, on conditions which were duly notified in the *Fort St. George Gazette*. A number of essays were received in compliance with this invitation and were carefully examined by the Chief Engineer, who awarded the prize to Mr. Standish Lee, Sanitary Engineer, Mysore. A thorough examination of all the schemes submitted as well as the country in the neighbourhood of Bangalore led the Chief Engineer to the conclusion that the best sources of supply are to be found in the Hebbal basin near the head of the Penna Kinni valley, about four miles north of Bangalore, and in the so-called Magadi road basin near the head of the Arkavutty valley, about seven miles west of Bangalore. Mr. Standish Lee's scheme provides for a supply from the latter valley. He proposes the construction of a reservoir on a stream which crosses the Magadi road about seven miles from the cantonment, the stream to be dammed about a mile below the road where he finds the catchment area to be 8.84 square miles. The country here is very different in character to that of the Hebbal basin, and the slope of the drainage is very much greater. High rocky mounds, with deep valleys between, break up the surface, and for the most part the land is waste, there being only a few small villages with a little dry cultivation. The country, the soil of which is of a poor character, is eminently suited for a gathering ground. The valley is deep and very narrow in parts, and there are sites where reservoirs might be formed at very reasonable outlay. There is very little laterite to be seen at the head of the valley, but everywhere else the outcropping rock is igneous, the bed of the stream being rocky throughout. As regards the quantity of water available, the run-off from 8.84 square miles in the neighbourhood of Bangalore has been calculated to be 61.8 million cubic feet in the worst year of rainfall, and deducting one-third for loss by evaporation, &c., the quantity available for consumption would be 41.2 million cubic feet, or 7 gallons per head per diem for 100,000 persons. The character of the ground, however, in this valley seems to warrant the assumption that the run-off would be somewhat greater, and would afford a supply of 6¼ gallons to 130,000 persons, and that one year's supply could be stored without a very heavy expenditure. The scheme roughly worked out would seem to promise a sufficient supply of as nearly pure water as any surface drainage can be for 100,000 persons at a reasonable cost, or about 6 lakhs of rupees, the cost per 1,000 gallons being less than one-third of a rupee. In view of these circumstances the Government deputed a special officer for more detailed investigation, the scope of the inquiry being extended to several other schemes which were presented. Mr. J. C. Larminie, Executive Engineer, was employed on the duty from the middle of 1888 to the end of the official year. Mr. Larminie's report had not been dealt with when the year closed.

9. *Bellary Water-supply.*—The want of a sufficient supply of good water for the town and cantonment of Bellary has long been felt. The present sources of supply are the Alipore tank, the Fort ditch reservoir, and various scattered wells; but the quantity obtained is inadequate, the quality, particularly from the wells and Fort ditch reservoir, is inferior, and the cost of delivery excessive. The Executive Engineer, Bellary division, prepared a scheme during the year for the improvement of the existing sources of supply, the estimated cost of which amounts to Rs. 60,000. The present annual charge for supply of water to the troops amounts to Rs. 23,700. The proposed improvements will involve an increase of Rs. 6,300 per annum. Final decision on the Executive Engineer's proposals has been deferred, pending the report of a committee appointed to consider the incidence of the cost and how the civil population is to be supplied if the Fort ditch reservoir is closed to them and reserved exclusively for the military.

10. *Cuddapah Water-supply.*—The unhealthiness of the town of Cuddapah has long been manifest, and various schemes for the amelioration of the present condition of things have been brought forward. Of these, a good water-supply and improved drainage have been unanimously advocated. The working out of a water-supply scheme was entrusted to Major (now Lieut.-Colonel) R. R. E. Drake-Brockman, R.E., of the Public Works Department, and his report was laid before Government in 1885. The following are the leading features of the scheme. Certain natural springs, situated about three miles south of the town, called the Boogga springs, the supply from which is stated to be abundant and of the purest quality, were to be tapped and their flow arrested by means of an infiltration gallery constructed in a diagonal direction across the Booggeru river. The upper end of this gallery was to abut on the left bank of the river just below the springs. The lower end was to be carried into the right bank and communicate with a well from which the water was to be raised by mechanical appliances into a cistern at the head of a masonry conduit, 8,840 feet in length, terminating in an 8-inch cast iron pipe, 2,150 feet in length, to supply the service reservoir. The reservoir was to have a capacity of about 175,000 gallons, or three-fourths of one day's maximum demand of 10 gallons per head of population. The main pipe leading to the town was to be 11 inches in diameter and 7,370 feet in length, and, laid at an inclination of 4 feet a mile, would discharge 47 cubic feet a minute. Two sub-mains, 7 inches each in diameter, connected by a breeches piece with the main, and carried to a distance of 1,475 and 1,365 feet, respectively, were provided, the service pipes being connected with these and the main. Provision was also made for fountain hydrants. On review of the project by the Chief Engineer, it was considered desirable to enlarge the service reservoir sufficiently to render it capable of holding two days' supply, and its position was subsequently changed to the pumping station at the river head, the water being carried thence the whole way to the sub-mains in an iron pipe. These changes, with other alterations, principally as regards the thickness of the pipes (not yet, however, finally settled), have raised the estimate from Rs. 75,000 to Rs. 1,06,329. The work is being carried out by means of a loan raised by the municipality and a contribution of Rs. 40,000 from Provincial funds, and is being supervised by an officer of the Public Works Department.

11. *Artesian boring in the Kortalayár Valley.*—The depth reached at the end of the previous year was 37½ feet. Operations were continued during the present year, but were not very energetically carried on by the contractor, who, after reaching a depth of 405 feet, stopped work. It was thereupon resolved by Government to take the opinion of the Geological Department on the results already attained and the advisability of continuing the experiment. The Director replied in January 1889 that, from the record of the samples given, he was unable to judge accurately of the age of the different strata passed through, but he was inclined to think that much of the lower portion did not belong to the alluvial deposits proper, that for about 190 feet the boring may have been in the strata underlying the Cuddalore sandstones (Red Hills laterite, &c.), and that in these there was not likely to be water sheets of any promise. He did not recommend that the boring should be made deeper in the expectation of meeting rising water. The boring was accordingly discontinued.

12. *Inspection of Lighthouses.*—In accordance with the general instructions of the Government of India, the following lighthouses of this Presidency were inspected during the year by superior officers of the Public Works Department, their condition noted and requirements ordered to be supplied :—

|                        |                |
|------------------------|----------------|
| Hope Island (Coringa). | Calicut.       |
| Vakalapudi (Cocanada). | Cochin.        |
| Point Divi.            | Cannanore.     |
| Pulicat.               | Seven Pagodas. |
| Armeghon.              | Madras.        |
| Tellicherry.           | Tuticorin.     |
| Mangalore.             | Negapatam.     |

The Superintending Engineer, VI Circle, reported that he could not obtain the use of a steamer and therefore proposed to defer his inspection of the lighthouses at

Muttum and Pámbau. Seeing that these lighthouses were reported to be in good order last year, and one of them, Muttum, had recently been visited by the Port officer, Madras, the proposal was agreed to, the Executive Engineers concerned being ordered to undertake the inspection as soon as practicable.

13. *Work in Estates under the Court of Wards.*—Under arrangements made by the Court of Wards, the Public Works Department have taken charge of works in the estates of minors under the control of the Court. The following estates were thus dealt with during the official year :—

## Ganjam District.

|                                  | Grant.<br>RS. | Outlay.<br>RS. |
|----------------------------------|---------------|----------------|
| Parlakimedi ... ..               | 60,270        | 45,707         |
| Chinnakimedi ... ..              | 8,241         | 6,940          |
| Jarada ... ..                    | 4,441         | 2,179          |
| Bodagada ... ..                  | ...           | 2,128          |
| Utlam ... ..                     | 10,516        | 10,349         |
| Dhárakót ... ..                  | ...           | 5,727          |
| Chakapalli and Tarlapatta ... .. | ...           | 700            |
| Aska ... ..                      | ...           | 702            |
| Kurla ... ..                     | ...           | 2,227          |
| Atagada and Kallikotta ... ..    | 13,315        | 6,944          |

## Vizagapatam District.

|                                     |       |     |
|-------------------------------------|-------|-----|
| Chidikada and Jaganathapuram ... .. | 2,000 | 118 |
|-------------------------------------|-------|-----|

## Godavari District.

|                   |       |       |
|-------------------|-------|-------|
| Lukkavaram ... .. | 3,275 | 2,445 |
|-------------------|-------|-------|

## Salem District.

|                   |       |     |
|-------------------|-------|-----|
| Erumapatti ... .. | 938   | 428 |
| Yelagiri ... ..   | 2,000 | ... |

## Madura District.

|                         |          |          |
|-------------------------|----------|----------|
| Ramnad ... ..           | 1,28,622 | 1,25,980 |
| Gandamanayakanur ... .. | ...      | —33      |

The following statement shows the grant and outlay under Public Works Department service heads, and will convey, perhaps, a better general idea of the nature and amount of the work carried out than an enumeration of a long list of individual works, many of them necessarily small as compared with State works of the same class :—

|                        | Grant.<br>RS. | Outlay.<br>RS. |
|------------------------|---------------|----------------|
| Irrigation ... ..      | 1,03,492      | 89,936         |
| Civil buildings ... .. | 61,419        | 62,658         |
| Communications ... ..  | 25,060        | 20,413         |
| Establishment ... ..   | 43,647        | 39,534         |

The grants were not utilised to the fullest possible extent. This was due in some measure to the difficulty experienced in carrying out work in the remote localities in which many of these estates are placed.

The want of progress attracted the notice of Government during the year, and the attention of the officers concerned was called to it. It is hoped that with the improved arrangements since made, better results will be recorded next year.

14. *Presidency Public Works Stores.*—Colonel S. C. Clarke, R.E., Executive Engineer, First grade, was posted to the Stores and Workshops in May 1888, and continued to hold these charges during the remainder of the official year. Stock

taking was carried out by Colonel Clarke, who found the articles in store to be in agreement with the books:—

The opening balance at the beginning of the year was ... 1,75,496 12 7  
and the receipts were as follows:—

|                                          | RS.      | A. | P. |
|------------------------------------------|----------|----|----|
| From London ... ..                       | 34,849   | 11 | 5  |
| „ Public Works divisions ... ..          | 71       | 9  | 6  |
| „ Presidency Workshops ... ..            | 1,714    | 5  | 6  |
|                                          | 36,635   | 10 | 5  |
| Total ...                                | 2,12,132 | 7  | 0  |
| The issues were—                         |          |    |    |
| To Public Works divisions ... ..         | 29,658   | 2  | 6  |
| „ Public Works Workshops ... ..          | 23,166   | 13 | 6  |
| „ Dowlaishweram do. ... ..               | 5,592    | 0  | 2  |
| „ Civil Departments ... ..               | 40       | 7  | 8  |
| „ Military Department ... ..             | 259      | 15 | 4  |
| „ State Railways ... ..                  | 452      | 12 | 2  |
| „ Guaranteed Railways ... ..             | 2,192    | 10 | 2  |
| „ Mysore State Railways ... ..           | 1,487    | 9  | 7  |
| „ Madras Harbour Works ... ..            | 767      | 12 | 9  |
| „ Private sales ... ..                   | 1,255    | 3  | 1  |
| „ Loss by sale of surplus stores ... ..  | 968      | 2  | 8  |
|                                          | 65,841   | 9  | 9  |
| Thus leaving a closing balance of ... .. | 1,46,290 | 13 | 3  |

or Rs. 29,205 less than the opening balance at the beginning of the year.

Twenty-seven consignments of stores were received from England, and the same number of shipments by steamers to the northern ports were made.

15. *Presidency Public Works Workshops.*—The following is a comparative statement of the work done in the shops for the year under review as compared with the previous year:—

|                                           | 1888-89.      | 1887-88.     | More than<br>1887-88. | Less than<br>1887-88. |
|-------------------------------------------|---------------|--------------|-----------------------|-----------------------|
|                                           | RS. A. P.     | RS. A. P.    | RS. A. P.             | RS. A. P.             |
| Work done for Public Works Department ... | 82,174 3 7    | 79,312 9 8   | 2,861 9 11            |                       |
| Do. for Other Departments ...             | 31,212 0 7    | 64,241 4 10  |                       | 33,029 4 3            |
| Do. for do. Private parties ...           | 4,244 6 10    | 6,153 8 3    |                       | 1,909 1 5             |
| Total ..                                  | 1,17,630 11 0 | 1,49,707 6 9 | 2,861 9 11            | 32,076 11 9           |

The decrease in the amount of work done for other departments is accounted for by the fact that during the preceding year exceptionally large orders were given by the Salt and Commissariat departments for weighing scales and weights and other articles.

The falling off in the amount of work done for private parties is not to be regretted, if, as appears probable, the iron manufactories started by native firms, have been more resorted to by private individuals.

The value of machinery in the shops at the beginning of the year was Rs. 1,07,945. After deducting 4 per cent. for depreciation, and adding certain receipts amounting to Rs. 4,294-14-11, the balance at end of the year was Rs. 1,07,908-8-6.

16. *Port Storekeeper's Department.*—Very little work was done in this department. Only twelve consignments of stores were received, six from London, five from Calcutta and one for Rangoon. The shipments were only two, both to Calcutta. The reduction of work was due to the withdrawal of the Bellary-Kistna and Cuddapah-Nellore State Railways which were transferred to the Southern Mahratta Railway Company and the South Indian Railway Company, respectively.

17. *Government Lithographic Press.*—It was decided during the year to transfer to the Revenue Survey Department all lithographic work hitherto done by the Government Lithograph Press, the latter being abolished with effect from the end of the official year. Some of the draftsmen were retained to form a drawing office

attached to the Chief Engineer's office. The draftsmen are expected to prepare for lithography large scale copies of all drawings which may require enlargement, the Survey Department not having the means of doing this. The saving in the Public Works Department by reduction of the establishment amounts to Rs. 570 per mensem. During the year the press turned out work to the value of Rs. 11,064, the working expenses being Rs. 9,909. The bulk of the work was for the Public Works Department, though the services of the press were utilised by many other departments of Government.

18. *Type-designs for Bridges.*—In 1886 the Secretary of State was requested to arrange for the preparation in England, by competent Engineers, of complete sets of type-drawings, specifications, and estimates for iron bridges of certain specified dimensions, in view to officers not only of the Public Works Department but also of Local Boards being placed in possession of designs on the most approved pattern. The work was accordingly undertaken and the drawings were completed during the year. They consist of complete designs and details; those portions of the drawings which show the general construction of the bridges being lithographed, together with the necessary specifications. It is expected that such drawings will be sufficient to enable Engineers in India to select the type of bridge most suitable for any particular requirement and to estimate its cost. The following is a list of the drawings prepared:—

|                                                                                                                              | Number of type-<br>drawings. |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Bridges rising by increments of 2 feet 6 inches from 5 feet to 10 feet clear span, with 9 feet 6 inches clear roadway ... .. | 3                            |
| Do. do. with 14 feet 6 inches clear roadway ... ..                                                                           | 3                            |
| Bridge of 15 feet clear span, with 9 feet 6 inches clear roadway ... ..                                                      | 1                            |
| Do. do. with 14 feet 6 inches clear roadway ... ..                                                                           | 1                            |
| Bridges rising by increments of 5 feet from 20 feet to 30 feet clear span, with 9 feet clear roadway ... ..                  | 3                            |
| Do. do. with 14 feet clear roadway ... ..                                                                                    | 3                            |
| Bridges rising by increments of 10 feet from 40 feet to 80 feet span centres bearings, with 14 feet clear roadway ... ..     | 5                            |
| Bridges rising by increments of 19 feet from 95 feet to 152 feet span centres bearings, with 14 feet clear roadway ... ..    | 4                            |
| Total ...                                                                                                                    | 23                           |

19. *Scrutiny of Local Fund Estimates by the Public Works Department.*—It was decided, shortly after the transfer to Local Boards of the execution of Local Fund works, that the plans and estimates of the more important works should be scrutinised by superior officers of the Public Works Department. The estimates of all new works costing Rs. 2,500 and upwards, and of all repairs costing upwards of Rs. 10,000, as well as of such other works as might require special professional examination, were to be submitted to the Chief Engineer or Superintending Engineers. For professional services thus rendered, Local Boards were charged a yearly contribution of Rs. 21,250, which was expended on the entertainment of subordinate establishments in the Public Works offices performing the work. The contribution was subsequently fixed at 2½ per cent. on the value of the estimates scrutinised, and repair estimates were excluded from professional check by the Public Works Department. The rules given below have now been brought into force.

The 2½ per cent. shall be struck as follows:—

- Original estimates*, or those examined for the first time on the amount of the estimates as submitted to the Superintending Engineer.
- Revised estimates.*—There shall be no fresh charge when the alteration is due to change of quantities or rates, and not of design. In other cases the full percentage shall be charged on the amount of items altered as appearing in the revised estimate submitted to the Superintending Engineer.
- No charge for scrutiny of estimates is to be made when Local Funds pay the ordinary percentage for establishment, &c., for works executed by the Public Works Department.

20. *Service Books.*—The orders with respect to the due and correct maintenance of the service books of public servants appear to have received attention at the hands of officers of the Public Works Department.

## II.—PROGRESS OF WORKS.

## I.—IMPERIAL—MILITARY WORKS.

21. **Ganjam**.—Constructing a Regimental school for the Native Infantry at Berhampore, revised estimate Rs. 1,680.—This work was not completed owing to insufficient provision in the original estimate for woodwork, for which a revised estimate had to be prepared and sanctioned before any more work could be carried out.

22. The expenditure under minor original works and repairs was Rs. 1,653 and 1,603, respectively. The number of original works were 4, of which 3 \* were completed, and the Regimental school-house at Berhampore was in progress.

|                                                               |           |  |
|---------------------------------------------------------------|-----------|--|
|                                                               | Estimate. |  |
| * Demarcating lands of cholera camp for military cantonment   | Rs. 90    |  |
| Altering existing butt at the present rifle range             | 350       |  |
| Supplying ammunition boxes to 5th Regiment M.N.I., Berhampore | 80        |  |

23. The number of repair works in progress during the year was 18, all of which were completed.

24. The principal works were as noted below:—

|                                                                                       | Estimate. |
|---------------------------------------------------------------------------------------|-----------|
|                                                                                       | Rs.       |
| (1) Special repairs to regimental barracks at Berhampore                              | 180       |
| (2) Remetalling the roads in the regimental lines at Berhampore                       | 350       |
| (3) Do. do. in the compound of military hospital at Berhampore                        | 130       |
| (4) Annual repairs to the military buildings of the 5th Regiment M.N.I. at Berhampore | 182       |

25. **Vizagapatam**.—The expenditure on minor original works was Rs. 424 and on repairs Rs. 3,549 against allotments of Rs. 965 and Rs. 3,500, respectively. The construction of butts and making 16 kit-boxes for the 28th Regiment M.N.I. at Vizianagrum and the repairs to road drains and military buildings of the E.I.V. Company at Vizagapatam were completed.

26. **Godavari (East)**.—Repairs to the military buildings at Sámalkót were carried out at an outlay of Rs. 4,070 against a grant of Rs. 2,700. Additional funds were applied for to cover the excess outlay (Rs. 1,370), but were not sanctioned by the Military Department from the funds placed at their disposal.

27. **Bellary**.—New Gun-shed for the Royal Artillery.—Work completed, but the old gun-shed had yet to be demolished. The Military authorities could not vacate it until the new sheds were handed over. Estimate Rs. 11,560, outlay Rs. 7,480, against an allotment of Rs. 7,590; outlay including previous year's, Rs. 11,455.

28. **Workshops in the Arsenal**.—The walls were built to within 2 feet of the full height. Ironwork for the roof and other roofing materials were at site. The chimney was built to half its height. Roofing and flooring remained to be done. Estimate Rs. 45,500, outlay Rs. 29,531.

29. **Reroofing the verandah of the European Infantry Married Ranges**.—Mangalore tiles and teak reepers were collected. Estimate Rs. 13,307, outlay Rs. 6,544, against the year's allotment of Rs. 6,600.

30. Ten minor new works were carried out at an outlay of Rs. 7,913.

31. The total outlay under Repairs, Military, was Rs. 38,100. This sum was expended in the maintenance and repairs of the military buildings and roads including the Barrack Master's expenditure on petty repairs and compensation for inferior and hired quarters.

32. **Nilgiris**.—The following works were completed or in progress:—

- (1) The bakery at Wellington was completed at a cost of Rs. 35,785 against an estimate of Rs. 35,850.

- (2) Quarters for three Apothecaries were practically completed, only a few minor items remaining to be executed at the close of the year, and were occupied at the end of the year; estimate Rs. 16,000, outlay Rs. 14,566.

- (3) Minor works; expenditure Rs. 3,606, allotment Rs. 3,530.

The principal works were—

- (1) Completing the laying of the 2" pipes from the drinking-water cistern to Station Hospital at Wellington; outlay Rs. 540.
- (2) Supplying cooking stoves to eight Staff Sergeants' quarters at Wellington; outlay Rs. 684.
- (3) Reconstructing the compound wall of the Lock Hospital at Wellington; outlay Rs. 1,049.
- (4) Repairs were executed to the Lawrence Asylum and the military buildings at a cost of Rs. 1,307 and Rs. 28,008, respectively.

33. **Coimbatore**.—The following minor original works were completed during the year:—

- (1) Constructing a well at site of the new camping ground at Jalárpét; estimate Rs. 655, outlay during the year Rs. 43, outlay up to date Rs. 471.
- (2) Converting the present kitchen attached to the quarters for the superintendent of the rest-house at Mettupálayam into a shed for two sick carts and erecting a new kitchen; outlay Rs. 500.

34. The following works were in progress:—

- (1) Sinking a well in stud lines and constructing a masonry conduit at the Remount Dépôt, Hosúr.
- (2) Sinking a well near sick lines and constructing a masonry conduit at the Remount Dépôt, Hosúr.
- (3) Extending the existing weir of the Jegoor tank at the Remount Dépôt, Hosúr.

35. The outlay under repairs, including compensation in lieu of quarters and rent of hired buildings for the Medical and Military subordinates, amounted to Rs. 4,653 against an allotment of Rs. 3,696. The excess outlay, Rs. 957, was due to the emergent repairs carried out to the rest-house at Mettupálayam and to certain buildings at the Remount Dépôt at the urgent requisition of the Military authorities.

36. **West Coast**.—The new third block barracks at Malapuram for 50 men was still in progress; masonry work completed including verandah pillars; three-fourths of the building roofed in; and asphalte flooring and plastering of the corresponding section completed.

37. The washhouse and latrine were completed.

38. The improvements to the canteen were completed and the building handed over for occupation.

39. The drains in connection with the completed barracks were finished.

40. The materials for a system of lightning conductors were procured from Bombay and the work commenced.

41. The outlay on works in connection with Malapuram barracks was Rs. 21,298 during the year against a grant of Rs. 20,234.

42. A contagious disease ward at Malapuram was almost completed; outlay Rs. 1,260, estimate Rs. 1,800.

43. **Presidency and Bangalore**.—The conversion of the racquet court in Fort St. George into a covered gymnasium, an incomplete work of previous years, was carried out to completion at a total cost of Rs. 11,801.

44. The Sergeants' mess and adjacent godowns in Fort St. George were converted into a latrine and lavatory for single men's barracks at a total cost of Rs. 3,441, on an estimate of Rs. 3,820.

45. Land and buildings at the old Vepery lines, Madras, were purchased at an outlay of Rs. 41,625 for a coal store, &c.

46. A sum of Rs. 2,176 was paid on account of work done this year on improvements to water-supply of Fort St. George which had been nearly completed in 1886-87. The total cost on the works was Rs. 8,623.

47. Saddle and store room for British Cavalry at Agaram, Bangalore, were built at a total cost of Rs. 4,373 on an estimate of Rs. 4,158.

48. Public buildings for a regiment of Native Infantry at the Arab lines were completed, but the extension of the place-of-arms, &c., could not be completed owing to a change in design of building required by the Military Department late in the year after sanction was accorded by Government.

49. The outlay during the year was Rs. 2,264 and the total outlay to end of the year was Rs. 24,167 on an estimate of Rs. 30,346.

50. Station butcher's quarters, commenced in the previous year, were finished at a cost of Rs. 3,886 against an estimate of Rs. 3,864.

51. An expenditure of Rs. 1,000 was incurred on the investigation of the Bangalore water-supply scheme out of Rs. 2,000 assigned for it.

52. European guard-room, fire-engine shed and latrine at the Agaram entrenchment were commenced and completed. The total outlay was Rs. 6,005 on the estimate of Rs. 5,555.

53. Twenty-nine minor new works at the Presidency and thirty at Bangalore were commenced and completed during the year at a cost of Rs. 13,213.

54. One hundred and ninety-six repair works at the Presidency and one hundred and seventy-two at Bangalore were carried out during the year.

55. Payments were made to the Madras Municipality of Rs. 13,715 on account of house, water and lighting taxes on Government military buildings outside the Fort, and of Rs. 6,000 on account of maintenance and repairs of the Esplanade and Fort Beach roads.

56. At Bangalore Rs. 1,200 and 6,300 were paid to the municipality of the civil and military station for conservancy of the main sewer and repairs to military roads, respectively.

57. The total outlay under repairs, including Barrack Master's expenditure on petty repairs, compensation for quarters and payments made to the municipalities on account of taxes and maintenance grants, was Rs. 1,12,212 at the Presidency and Rs. 45,862 at Bangalore.

58. The most important of the repair works undertaken during the year were—

59. **Madras.**—Repairing and lime-washing the European Infantry barracks, Fort St. George; estimate Rs. 5,534, outlay Rs. 3,499.

60. Painting doors and windows of the European Infantry barracks, Fort St. George; estimate Rs. 2,840, outlay Rs. 2,239.

61. Thorough repairs to the Officers' mess-house, Fort St. George; estimate Rs. 4,945, outlay Rs. 4,966.

62. Renewing the roof of hospital, Perambúr Native Infantry lines; estimate Rs. 3,725, outlay Rs. 3,197.

63. Repairing walls and floors and painting doors and windows of the office of the Inspector-General of Ordnance, Fort St. George; estimate Rs. 2,594, outlay Rs. 2,309.

64. **Bangalore.**—Whitewashing all the buildings of Parade barracks; estimate Rs. 2,990, outlay Rs. 2,840.

65. Whitewashing all the buildings of Agaram Cavalry barracks; estimate Rs. 2,500, outlay Rs. 2,247.

66. Substituting Mangalore tiles for ordinary tiled roofing to the Agaram Cavalry stables; estimate Rs. 5,073, outlay Rs. 2,196.

67. **Chingleput.**—The construction of new barracks for 200 men at Poonamallee, for which an estimate of Rs. 1,66,885 was sanctioned in February 1879 and for which foundations had been partially laid, was resumed. Out of an allotment of 20,000 an outlay of Rs. 20,017 was incurred. The main walls were raised to basement

level, 2,690 cubic feet of cut-stone, 2½ lakhs of platform bricks and 2,875 cubic feet of timber were collected at site.

68. Improvements to the barrel racks, reserve powder magazine, Mount, commenced in 1887-88, were completed during the year.

69. Eighteen minor new works were completed at a cost of Rs. 6,532.

70. Repairs to 25 buildings and several minor repairs, costing less than Rs. 500 each, were carried out at a total expenditure of Rs. 20,140, and the roads in the cantonments of Mount, Pallavaram and Poonamallee were maintained at an outlay of Rs. 3,782. The total expenditure under repairs, including Barrack Master's petty repairs, compensation for quarters, &c., was Rs. 30,236.

71. The more important of the repairs were—

(1) Renewing the lightning conductor of the reserve powder magazine down to earth plate at Mount; estimate Rs. 1,400, outlay Rs. 1,496.

(2) Repairing, white and color washing the Ordnance dépôt and its outhouses, Mount; estimate Rs. 1,855, outlay Rs. 1,314.

(3) Repairing, white and color washing west barracks and outhouses of Q/1st Royal Artillery, Mount; estimate Rs. 3,880, outlay Rs. 3,873.

(4) Repairing, white and color washing 16 family quarters with outhouses of Q/1st Royal Artillery, Mount; estimate Rs. 1,566, outlay Rs. 1,515.

(5) Repairing, white and color washing Royal Artillery mess, Mount; estimate Rs. 1,630, outlay Rs. 1,571.

(6) Repairing, white and color washing the station hospital, Mount; estimate Rs. 1,660, outlay Rs. 1,680.

72. **North Arcot.**—No major new works were carried out in the year.

73. The only minor new work was the supply of ammunition boxes for the Native Infantry Regiment at Vellore, on which a sum of Rs. 74 was spent.

74. A sum of Rs. 2,015 was spent under repairs including the usual annual contribution of Rs. 1,000 paid to the municipality on account of maintenance of Vellore cantonment roads.

75. **Trichinopoly.**—Barrack-boxes were supplied to the 17th Regiment, Madras Infantry, at a cost of Rs. 217, and 19 accoutrement-stands were provided for the 4th Pioneers by the Military Department, for which Rs. 216 were paid by this department. Rs. 4,992 were spent in repairing buildings and maintaining cantonment roads at Trichinopoly.

76. **Negapatam.**—A bath-room and kitchen were built at a cost of Rs. 698 to the old taluk cutcherry occupied by the Sergeant Instructor, South Indian Railway Volunteer Rifle Corps at Negapatam.

77. In the Tanjore, Negapatam, Madura and Tinnevely divisions Rs. 1,894 were paid on account of compensation for quarters to the military and medical subordinates.

## II.—IMPERIAL—CIVIL WORKS.

78. **Vizagapatam.**—Repairs were executed to the Post offices at Vizagapatam and Bimlipatam and to the Telegraph office building at Vizagapatam at a cost of Rs. 500 and 256.

79. **Ganjam.**—The special repairs to Post office at Gopálpur were carried out at a cost of Rs. 27.

80. **Godavari (East).**—The Post offices at Sámalkót, Bhadrachalam and Kūnavaram were repaired at a cost of Rs. 485, and the telegraph buildings at Cocanada and Rajahmundry at a cost of Rs. 384.

81. **Kistna (East).**—A kitchen in the compound of the Telegraph office at Bezvada was completed at a cost of Rs. 358.

82. Additional godowns for the Telegraph offices at Bezvada and Masulipatam were completed.

83. The Telegraph offices at Masulipatam and Bezvada were repaired during the year.

84. **Kistna (West).**—The Telegraph office at Guntur was repaired during the year.

85. **Coimbatore.**—Repairs to the Post office at Tirupur and Mettupalaiyam were carried out.

86. The total outlay under this head was Rs. 220 against an allotment of Rs. 200.

87. **Nilgiris.**—Allotment Rs. 625, outlay Rs. 488, of which Rs. 388 were spent on renewing roof of Post office at Cherambadi and Rs. 100 on improvements to Postmaster's quarters at Kotagiri.

88. Rupees 881 were spent on repairs, postal, and Rs. 241 on repairs, telegraph buildings.

89. **West Coast.**—Iron bars were fixed to the Post-office, Manantoddy, at a cost of Rs. 140.

90. Rupees 176 were spent in sinking a well at the Post office, Malapuram, a work still in hand:

91. The several Post offices in the division were kept in repair at a cost of Rs. 826.

92. **Presidency and Bangalore.**—No work of any importance was carried out in the Presidency division; the few small works carried out were—

(1) The completion, at a total cost of Rs. 1,160, of improvements to the Post office at Mysore commenced last year. The year's outlay was Rs. 246.

(2) Improvements to the Mylapore Post office at Madras commenced and completed in the year at an outlay of Rs. 757 on an estimate of Rs. 770.

(3) Improvements to the Post office at Bangalore commenced and completed in the year at an outlay of Rs. 267 on an estimate of Rs. 264.

93. The following repairs were carried out:—

(1) Stopping leaks in roof of Post office at Bangalore; estimate Rs. 162, outlay Rs. 153.

(2) General repairs to the Telegraph Master's quarters at the old telegraph office, Bangalore; estimate Rs. 190, outlay Rs. 194.

(3) Petty repairs to the Telegraph office in Fort St. George; estimate Rs. 160, outlay Rs. 86.

94. **North Arcot.**—Under minor new works in North Arcot a sum of Rs. 29 was spent in providing a sky-light for the Post and Telegraph office at Chittoor.

95. Under repairs Rs. 94 were expended in repairing the Post office at Ambur and the combined Post and Telegraph office at Vellore.

96. **Chingleput.**—A sum of Rs. 67 was spent under postal repairs in the Chingleput division in repairing the Post office at Puduvoil.

97. **South Arcot.**—In South Arcot division, under Minor New Works, Postal, a verandah to the Post office building at Tindivanam was built and bars were provided for the front door of the building at a cost of Rs. 64 and 16, respectively. Repairs to the Post office at Manjakuppam were carried out at a cost of Rs. 124.

98. Under Minor New Works, Telegraph, the iron rails of the old record room at the post office at Manjakuppam were removed and wooden rails were provided for the Telegraph office in same building at an outlay of Rs. 45.

99. **Negapatam.**—The Telegraph office at Negapatam was repaired at an outlay of Rs. 108.

100. A sum of Rs. 643 was spent in repairing Post offices at Teppakolum in Trichinopoly, Ammayanayakanur and Batlagundu in Madura, Kumbakonam and Tranquebar in Tanjore, Tenkasi and Palamcottah in Tinnevely, and at Ramnad. A tiled verandah on the western side of the Post office at Ramnad was also constructed at a cost of Rs. 244.

### III.—PROVINCIAL—CIVIL BUILDINGS.

101. **Ganjam.**—Additions and alterations to the Police Superintendent's office at Chatrapur.—Estimate Rs. 4,600. The expenditure to the end of March 1889 was Rs. 3,065 against an allotment of Rs. 4,100.

102. **Constructing a Police hospital at Chicacole.**—Estimate Rs. 1,480. The expenditure to end of March 1889 was Rs. 910. This work was commenced in the middle of February 1889.

103. **Repairs to the Collector's bungalow at Chatrapur.**—Estimate Rs. 3,372 and expenditure to end of March 1889 Rs. 2,027. The repairs to this building were stopped as it was afterwards proposed to abandon it and to construct a new one.

104. **Vizagapatam.**—Police station-house at Koraput.—This was an incomplete work of the previous year. The work remaining to be done was carried out during the year and the building was completed at a cost of Rs. 4,547 against a revised estimate of Rs. 4,510 and handed over to the Police Department.

105. **Constructing thirty-four Reserve Police huts at Koraput.**—Estimate Rs. 14,800, expenditure Rs. 7,218, against an allotment of Rs. 6,940. The superstructure of two of the four blocks were completed and all woodwork for doors and windows for these blocks was purchased.

106. **Additional accommodation to the Huzur Treasury at Vizagapatam.**—This was an incomplete work of the previous year. It was completed at a cost of Rs. 9,711 against an estimate Rs. 9,890 and handed over to the Revenue Department.

107. **Constructing an hospital at Gunupuram.**—Estimate Rs. 4,020, expenditure to end of the year Rs. 3,619; the expenditure during the year was Rs. 1,578 against a grant of Rs. 1,480. Superstructure was completed and roofing in progress.

108. **Constructing an office for the Superintendent of Police at Koraput.**—Estimate Rs. 12,030, expenditure Rs. 7,396 against an allotment of Rs. 7,500. The walls of the building were raised to a height of 11 feet and roof timber, doors and windows purchased.

109. **Constructing a 3rd-class Tahsildar's office at Sahr.**—Estimate Rs. 10,230, expenditure during the year Rs. 3,470 against a grant of Rs. 3,500. This work is being carried out on contract system. The superstructure of the main building was nearly complete, the compound wall was built and the outhouses were in progress.

110. **New Police hospital with subsidiary buildings at Koraput.**—Estimate Rs. 10,540. The expenditure during the year was Rs. 688 against a grant of Rs. 500. Materials were being collected for the work.

111. **Constructing the Deputy Tahsildar's office and sub-jail at Pottinghi.**—Estimate Rs. 11,700. The expenditure to end of the year was Rs. 4,241. The old building was dismantled; foundations excavated and concrete partly laid; doors and windows purchased.

112. **Reconstructing the compound wall of the District Jail at Vizagapatam.**—Estimate Rs. 4,290. The expenditure during the year was Rs. 823 against an allotment of Rs. 1,250.

113. **Sub-Registrar's office at Parvatipur.**—Revised estimate Rs. 2,145. The outlay during the year was Rs. 347 against a grant of Rs. 750. The superstructure of the building was almost completed.

114. The Warders' lines of the District Jail and Police Superintendent's office at Vizagapatam and seven other minor buildings were repaired at a cost of Rs. 2,989.

115. **Godavari (East).**—A lightning conductor was provided to the central tower of the Rajahmundry Central Jail at a cost of Rs. 335 against an estimate of Rs. 360.

116. **Dispensary at Bhadrachalam.**—Outhouses and a well were completed during the year and the buildings were handed over to the Medical Department in November 1888. The total cost of the building was Rs. 4,001.

117. **Residence for the Executive Engineer at Rajahmundry.**—The servants' quarters and cook-house were completed during the year. The total cost of the building amounted to Rs. 17,349 against an estimate of Rs. 17,000.

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118. *Repairs to Collector's cutcherry at Cocanadu* were carried out during the year at a cost of Rs. 2,562.

119. *Repairs to the church at Rajahmundry*.—The corrugated iron required for repairs to this building was obtained from Madras in March 1889 and the repairs were put in hand. Repairs to Public Works buildings were carried out during the year at Dowlaishweram.

120. **Godavari (Central)**.—*Sub-Magistrate's office at Rajole*.—Estimate Rs. 2,750 and expenditure Rs. 2,924.

121. *Conversion of the store-shed at Ralli into Divisional office*.—Estimate Rs. 3,040. This work was completed at a cost of Rs. 3,738 and the building was transferred to Provincial.

122. Repairs were carried out during the year to the Sub-Magistrate's cutcherry at Kottapetta and the old Division office at Gunnavaram at a cost of Rs. 166.

123. **Godavari (West)**.—The following works were completed or in progress during the year:—

|                                                                                               | Estimate.<br>RS. | Outlay.<br>RS. |
|-----------------------------------------------------------------------------------------------|------------------|----------------|
| (1) Constructing 1st-class taluk cutcherry at Tanuku, completed                               | 23,580           | 23,347         |
| (2) Constructing 1st-class taluk cutcherry at Bhimavaram, completed                           | 25,670           | 24,615         |
| (3) Sub-Registrar's office, Tanuku, completed except fixing iron bars to the cracked portions | 3,090            | 3,075          |
| (4) Sub-Registrar's office at Bhimavaram; materials being collected                           | 3,420            | 535            |
| (5) Sub-Registrar's office at Narsapur; tiling in progress.                                   | 3,430            | 762            |
| (6) Do. at Ellore; roofing nearly completed.                                                  | 3,380            | 3,398          |

Necessary repairs were executed to the old hospital at Ellore.

124. **Kistna (East)**.—Repairs to the Collector's residence at Masulipatam were completed, but the accounts were not closed. The expenditure on the work amounted to Rs. 14,153 against an estimate of Rs. 14,305.

125. A corrugated iron goods shed in the fort of Masulipatam was nearly completed. The expenditure amounted to Rs. 4,616 against an estimate of Rs. 4,500. The excess over estimate was due to the necessity for replacing some ironwork broken in landing.

126. Two Head Constables' and ten Constables' huts at Bezvada were completed. The expenditure amounted to Rs. 3,585 against an estimate of Rs. 4,538.

127. The following buildings were repaired during the year:—

- (1) Kistna Eastern Division office.
- (2) Superintending Engineer's residence and office.
- (3) Press office and cook-room of the Collector's cutcherry at Masulipatam.
- (4) Protestant cemetery in the fort of Masulipatam.

128. **Kistna (West)**.—The Sub-Registrar's office at Bapatla was completed at a cost of Rs. 2,978 against an estimate of Rs. 2,860. The building was finally handed over to the Registration Department in November 1888.

129. Work on the taluk cutcherry at Sattenapalle was in progress. The expenditure amounted to Rs. 6,848 against an estimate of Rs. 21,880.

130. Improvements to the taluk cutcherry at Répalle were in progress. The expenditure amounted to Rs. 796 against an estimate of Rs. 1,845.

131. Repairs to the Kārempūdi District Munsif's Court and the Division office at Duggirala were completed. The plantations in the Division office compound at Duggirala were maintained.

132. **Nellore**.—The District Jail at Nellore was completed and handed over to the Jail Department. The expenditure amounted to Rs. 7,518 against an estimate of Rs. 6,491. The excess was owing to additional work found necessary.

133. *Collector's office, Nellore*.—The basement was completed, and the doors and windows prepared in the Nellore workshops. The expenditure amounted to Rs. 14,457 against an estimate of Rs. 48,455.

134. Materials were under collection for the Sea Custom-house at Kistnapatam.

135. The following works were completed during the year:—

- (1) Improvements to Sub-Collector's bungalow at Ongole.
- (2) Sub-Registrar's office at Kandukūr.
- (3) Quarters for the Sub-Divisional officer, Gúdur.
- (4) Improving Huzur treasury room.

136. The following buildings were repaired during the year:—

- (1) Old Sheristadar's room of Collector's cutcherry, Nellore.
- (2) Sub-Collector's cutcherry, Ongole.
- (3) Hill bungalow at Ongole.
- (4) Sub-Collector's bungalow at Ongole.
- (5) Collector's bungalow at Nellore.
- (6) Nellore Division office.
- (7) Police Assistant Superintendent's bungalow at Ongole.

137. **Bellary**.—The two new wings of the Collector's office were completed with the exception of iron spiral stair cases to the towers, flooring of verandahs and the final courses of tiles and plaster to the terraced roofs. Estimate Rs. 47,540, outlay Rs. 17,067, previous year's outlay Rs. 27,131.

138. The lower storey of the Collector's residence at Anantapur was completed. Owing to several causes the progress on the work was not quite satisfactory. Estimate Rs. 28,190, outlay during the year Rs. 730, previous year's outlay Rs. 23,759.

139. The walls of the seven Police huts at Vanavole were completed and the arched roofs commenced.

140. Materials at an outlay of Rs. 3,885 were collected for the first-class taluk office at Kúdligi. Estimate Rs. 23,871, grant Rs. 3,804.

141. The undermentioned minor new works were carried out:—

|                                                                                                           | Outlay.<br>RS. |
|-----------------------------------------------------------------------------------------------------------|----------------|
| (1) Covering with corrugated iron the roof of the combined Superintending and Executive Engineers' office | 1,324          |
| (2) Robing room and gateway to the cemetery at Bellary                                                    | 514            |
| (3) Arm rack for the Collector's cutcherry at Anantapur                                                   | 42             |
| (4) Platform to the new Press office at Anantapur                                                         | 114            |
| (5) Arm racks for the Bookapatam cutcherry                                                                | 21             |

142. **Cuddapah**.—The roof of the upper storey of the Collector's office, as also of the four large and four small domes and cut-stone mantapams were finished, and the roof of the lower storey also completed. The Printing office was completed and handed over to the Revenue Department. Estimate Rs. 1,43,741, grant for the year Rs. 35,655, outlay of the year Rs. 35,664, outlay up to date Rs. 1,17,624.

143. The year's allotment, Rs. 11,342, for alterations and improvements to the district jail was fully worked out. A revised estimate providing for the extra improvements carried out and for adding a compound wall was under preparation. Estimate Rs. 31,900, grant Rs. 11,342; outlay Rs. 11,343, outlay up to date Rs. 35,245.

144. The Registrar's office at Cuddapah was completed at a cost of Rs. 5,449 against an estimate of Rs. 5,192.

145. The walls of the main building of the taluk office at Rajampet and of the cook-room and latrine were built to the full height. Trusses were being put to the main building, and materials for flooring and tiles for roofing were collected. Estimate Rs. 24,838, grant for the year Rs. 10,000, outlay of the year Rs. 11,222, outlay up to date Rs. 14,696.

146. The timberwork of the roof of Christ Church at Cuddapah was almost finished and new ventilators were put up. Estimate Rs. 3,176, grant for the year Rs. 3,176, outlay of the year Rs. 2,470, outlay up to date Rs. 2,470.

147. The superstructure of the Divisional office at Cuddapah was built up to 8 feet height. Estimate Rs. 8,508, grant for the year Rs. 3,157, outlay of the year Rs. 4,000, outlay up to date Rs. 4,000.

148. The foundations of the taluk office at Badvel were almost finished. The outlay during the year amounted to Rs. 6,404 against an allotment of Rs. 5,000. Estimate Rs. 21,330.

149. **Kurnool.**—Work on the taluk office at Nandyal was almost completed. Estimate Rs. 34,676, grant for the year Rs. 9,000, outlay Rs. 9,109, outlay up to date Rs. 33,746.

150. Nine constables' huts at Pattikonda were completed at a cost of Rs. 2,854 against an estimate of Rs. 2,903.

151. The walls of the Head Assistant Collector's office at Nandyal were raised to roof level and the woodwork for the roof was collected. Estimate Rs. 14,234, grant for the year Rs. 5,593, outlay for the year Rs. 5,089, outlay up to date Rs. 5,187.

152. **Nilgiris.**—Rupees 7,996 were spent in additions and improvements to Government House, Ootacamund, the principal items of expenditure being—

|                                                              | RS.   |
|--------------------------------------------------------------|-------|
| Furniture ... ..                                             | 4,000 |
| Married Bandsmen's quarters ... ..                           | 1,800 |
| Connecting Government House with Snowdon water-supply ... .. | 1,800 |

153. Rupees 3,818 were spent on completing the repairs to Mountstuart buildings occupied by Army head quarters, the total expenditure being Rs. 20,464 against an estimate of Rs. 22,330. The buildings are now in a satisfactory condition.

154. The peons' quarters on Mountstuart were improved at a cost of Rs. 2,000, the principal item being a new roof.

155. *Providing accommodation for the Subordinate Judge at Ootacamund.*—The outlay during the year was Rs. 8,029. The total expenditure on this work, which includes the new Breeks' school, amounted to Rs. 58,055 against an estimate of Rs. 59,030, and the work was practically completed during the year, only some petty items remaining to be done.

156. The Roman Catholic church at Wellington was supplied with furniture at a cost of Rs. 2,259.

157. The Protestant church at Wellington was supplied with furniture at an outlay of Rs. 3,762.

158. Rupees 945 were spent in completing the alterations to the District Jail buildings at Ootacamund.

159. The outlay on minor works during the year was Rs. 11,203.

160. The following are the principal works:—

|                                                                                                       | RS.   |
|-------------------------------------------------------------------------------------------------------|-------|
| (1) Covering with Mangalore tiles the roof of All Saints' church at Coonoor ... ..                    | 1,414 |
| (2) Repairs to the Police station and huts at Coonoor ... ..                                          | 1,246 |
| (3) Constructing two additional huts and providing courtyards to the existing huts at Kótagiri ... .. | 2,203 |
| (4) Making alterations to Secretariat peons' quarters on Stonehouse hill, Ootacamund ... ..           | 1,882 |
| (5) Constructing outhouses to Police Inspectors' quarters at Nella-kóta ... ..                        | 676   |
| (6) Repairs to Police station and huts at Wellington ... ..                                           | 791   |

161. A sum of Rs. 16,020 was spent on repairs, the chief items being—

|                                                                | RS.   |
|----------------------------------------------------------------|-------|
| (1) Repairing Government House and subsidiary buildings ... .. | 2,940 |
| (2) Government office on Stonehouse hill ... ..                | 931   |
| (3) All Saints' church, Coonoor ... ..                         | 739   |
| (4) St. Thomas' church, Ootacamund ... ..                      | 624   |
| (5) Deputy Tahsildar's cutcherry, Coonoor ... ..               | 1,262 |
| (6) Place-of-arms on Mountstuart ... ..                        | 1,240 |

162. **Coimbatore.**—The following works were completed:—

- (1) Constructing a Sub-Registrar's office at Kollégal; estimate Rs. 2,630, outlay during the year Rs. 1,558, outlay up to date Rs. 2,458.

- (2) Repairs to the Sub-Collector's bungalow at Hosúr; estimate Rs. 2,780, outlay during the year Rs. 2,800.

163. The following major works were in progress:—

- (1) Additions to the Central Jail at Salem; estimate Rs. 6,340, outlay during the year Rs. 4,627 against a grant of Rs. 4,955. A sum of Rs. 328 was not utilized owing to an outbreak of cholera which led to the work being stopped for two months at the request of the Jail authorities.
- (2) Constructing District Munsif's Court at Karúr; estimate Rs. 17,420, outlay during the year Rs. 6,385 against a grant of Rs. 6,000. The short outlay was due to want of exertion on the part of the contractor who was fined Rs. 50.
- (3) Repairs and improvements to the Government taluk school at Námakal; estimate Rs. 4,300, outlay Rs. 2,999 against a grant of Rs. 3,148.
- (4) Constructing a sub-jail at Mettupálaiyam; estimate Rs. 3,220, outlay Rs. 2,940 against a grant of Rs. 3,220.

164. A sum of Rs. 5,008 was spent under minor original works against an allotment of Rs. 5,012.

165. The following works were completed during the year:—

- (1) Repairs to the Overseer's shed at Karúr; outlay Rs. 230.
- (2) Improvements to the late Division office building at Hustampatti; outlay Rs. 156.
- (3) Converting eastern lock-up of the Deputy Tahsildar's cutcherry at Vániyambádi into a jail wall and Police lock-up; outlay Rs. 244.
- (4) Repairs to the taluk office at Tirupatúr; outlay Rs. 1,054.

166. The following works were in progress:—

- (1) Constructing masonry compound wall on two sides of the Superintending Engineer's office, Coimbatore; outlay Rs. 1,080.
- (2) Constructing a Sub-Registrar's office at Vániyambádi; outlay Rs. 1,884.
- (3) Improvements to the quarters of the Assistant Superintendent of Police at Tirupatúr; outlay Rs. 112.

167. A sum of Rs. 4,443 was spent on repairs, the chief items being—

- (1) Repairing the Superintending and Executive Engineers' office, Coimbatore; outlay Rs. 394.
- (2) Repairing the Sub-Collector's bungalow, Erode; outlay Rs. 239.
- (3) Repairing the bungalow of the Assistant Superintendent of Police, Erode; outlay Rs. 269.
- (4) Repairing the Collector's bungalow at Salem; outlay Rs. 115.
- (5) Repairing District Munsif's Court at Tirupatúr; outlay Rs. 601.
- (6) Repairing the late Divisional office building at Hustampatti; outlay Rs. 443.
- (7) Repairing the Deputy Tahsildar's cutcherry at Vániyambádi; outlay Rs. 931.
- (8) Repairing the bungalow of the Assistant Superintendent of Police at Tirupatúr; outlay Rs. 405.

168. **West Coast.**—The following works in connection with the Law Courts at Calicut were completed during the year:—

- (1) Passages to the District and Sub-Courts.
- (2) Providing planked screen and buttresses to the Vakils' chambers.
- (3) Constructing surface drains in the compound.

The grant of Rs. 13,350 for the year was utilised.

169. The outhouses of the public offices at Ponáni were completed and wire-fencing around the building commenced; outlay during the year Rs. 4,685, grant Rs. 5,337.

170. The Sea Custom-house and store-shed at Cochin were completed and handed over to the Revenue Department. Total outlay Rs. 12,368 against the estimate of Rs. 12,680.

171. A wharf wall of sheeted timber piles for the Sea Custom-house, Cochin, was constructed and nearly completed at a cost of Rs. 4,695.

172. The residence of the Assistant Superintendent of Police, Malapuram, was completed and handed over for occupation; some additional work done during the year consisted of—

- (1) Raising a new carriage road around the building.
- (2) Constructing a tiled covered way from the main building to the outhouses.
- (3) Opening drains and constructing masonry culverts.
- (4) Providing matting for floor.

The expenditure during the year was Rs. 1,645, total outlay from the commencement of the work being Rs. 14,245 against an estimate of Rs. 14,380.

173. A new Sub-Judge's and District Munsif's Court at Pálghat was commenced, and the year's grant, Rs. 7,200, utilised in collecting materials. The excavation for foundation was completed and laying concrete in the foundation begun.

174. The work in connection with the new Collector's cutcherry at Calicut—sanctioned estimate Rs. 1,89,970—was begun late in the year, and Rs. 8,000 spent in collecting materials and Rs. 6,000 in paying compensation; that paid by the Revenue Department up to March had not been communicated; clearing the site and collection of material could alone be undertaken.

175. A sum of Rs. 7,491 against a grant of Rs. 7,480 and estimate of Rs. 9,280 was expended in building 12 solitary cells for lunatics and 4 condemned cells in the District Jail, Calicut. The former were completed and handed over to the Jail Department and the condemned cells were in progress.

176. The construction of a new Sub-Court at Tellicherry was commenced towards the end of the year, and Rs. 2,000 spent in the collection of materials.

177. The additions and improvements to the office of the Superintendent of Police, Mangalore, an incomplete work of the previous year, was finished. Estimate Rs. 10,545, outlay Rs. 10,485.

178. A Deputy Collector's cutcherry at Puthur was nearly completed, the full grant of Rs. 9,000 being spent against an estimate of Rs. 10,960.

179. A new Police hospital at Mangalore was far advanced towards completion; grant Rs. 9,000, which was spent against an estimate of Rs. 11,745.

180. The following works were in progress:—

- (1) Constructing a Tahsildar's office at Coondapoor; estimate Rs. 32,950, grant Rs. 4,000, outlay Rs. 4,357.
- (2) Improvements to the second and third blocks of the Collector's cutcherry, Mangalore; estimate Rs. 15,060, grant Rs. 2,000, outlay Rs. 2,658.
- (3) Improvements and additions to the District Munsif's Court at Kásaragód; estimate Rs. 4,700, grant Rs. 721, outlay Rs. 724.
- (4) Sinking a well 45 feet deep in the cemetery at Mangalore; estimate Rs. 390, outlay Rs. 250.
- (5) Providing iron gratings to the walls in the District Jail compound, Mangalore; estimate Rs. 420, outlay Rs. 243.
- (6) Constructing a Sub-Registrar's office at Tripayar; estimate Rs. 3,335, outlay Rs. 2,893. Almost finished.
- (7) Constructing a Sub-Registrar's office at Chowghat; estimate Rs. 3,240, outlay Rs. 2,815. Nearly finished.
- (8) Providing additional accommodation in the Sub-Registrar's office, Betut-Pudiangody; estimate Rs. 1,350, outlay Rs. 601. In progress.
- (9) Constructing a compound wall to, and improving the church at, Malapuram; estimate Rs. 770, outlay Rs. 700.
- (10) Supplying and fitting iron safes to the Taluk treasury at Pálghat; estimate Rs. 500, outlay Rs. 417.

181. The following works were completed during the year:—

- (1) Improvements and additions to the Sub-Registrar's office, Quilandi; estimate Rs. 1,010, outlay Rs. 980.
- (2) A 3rd-class Police station, Irrity; estimate Rs. 1,240, outlay Rs. 1,248.
- (3) Providing a planked ceiling to jail wards of Sub-Magistrate's cutcherry, Kutaparamba; estimate Rs. 242, outlay Rs. 241.

- (4) Supplying and fitting iron safes to the Taluk treasury, Chirakal; estimate Rs. 500, outlay Rs. 439.
- (5) Constructing a Sub-Registrar's office at Vittal; estimate Rs. 3,240, outlay Rs. 3,231.
- (6) A wrought iron strong room for the Taluk cutcherry, Kásaragód; estimate Rs. 750, outlay Rs. 777.
- (7) Constructing a masonry drain on the District Court-house hill at Mangalore; estimate Rs. 320, outlay Rs. 321.
- (8) Wire-fencing around the District Munsif's Court, Puthur; estimate Rs. 480, outlay Rs. 487.

182. A sum of Rs. 6,110 was spent on repairs, the following being the principal works:—

- (1) Repairs to the church and belfry at Malapuram; estimate Rs. 1,000, outlay Rs. 899.
- (2) Repairs to St. Mary's church, Calicut; estimate Rs. 1,315, outlay Rs. 549.
- (3) Repairs to roof and godown and drains of new Custom-house, Calicut; estimate Rs. 1,284, outlay Rs. 1,147.
- (4) Repairs to the roof of Police Superintendent's office at Calicut; estimate Rs. 667, outlay Rs. 787.
- (5) Repairing the protective works of the Sub-Collector's bungalow, Tellicherry; estimate Rs. 644, outlay Rs. 595.
- (6) Annual repairs to St. John's church, Cannanore; estimate Rs. 400, outlay Rs. 327.
- (7) Annual repairs to Supervisor's and Overseer's quarters, Vayitri; estimate Rs. 504, outlay Rs. 537.

183. **Presidency and Bangalore**—*City Reserve Police Lines at Pudupet*, commenced in 1886-87, were finally completed and handed over to the Police Department on the 1st April 1889. The total outlay was Rs. 31,336 against an estimate of Rs. 32,725.

184. *Additions and improvements to the Presidency Training School for Mistresses* was commenced during the year, but the progress of the work was unsatisfactory. The outlay was Rs. 4,310 and the grant Rs. 10,000.

185. *New operation room at the General Hospital, Madras*, was commenced during the year, but on this work too the progress was unsatisfactory. The year's outlay was only Rs. 2,535 against an estimate of Rs. 11,590 and grant of Rs. 7,000.

186. *The conversion of two of the work-sheds at the Lunatic Asylum, Madras, into single rooms* was commenced during the year, and an outlay of Rs. 2,820 was incurred on the estimate of Rs. 7,100.

187. *The construction of quarters for Assistant Matron and for the second-class European servants at the Lunatic Asylum, Madras*, was commenced and Rs. 1,196 were spent on an estimate of Rs. 12,445.

188. Thirty-nine minor new works were carried out at a cost of Rs. 9,504.

189. One hundred and thirteen repair works at Madras and 16 in Bangalore were carried out, and a sum of Rs. 2,829 was spent on account of furniture for Government houses at Madras, Guindy and Ootacamund.

190. None of the repair works at Bangalore were of much importance.

191. The following were the principal repair works carried out in Madras:—

- (1) Thorough repairs to Government House, Madras, and subsidiary buildings; estimate Rs. 7,300, expenditure Rs. 6,395.
- (2) Plastering with cement the outside of the Secretariat office, Fort St. George, an incomplete work of the previous year; estimate Rs. 13,500 and outlay Rs. 12,171.
- (3) General repairs to the office of the Inspector-General of Police; estimate Rs. 1,410, outlay Rs. 978.
- (4) Thorough repairs to Presidency Magistrates' Court; estimate Rs. 1,123, outlay Rs. 1,014.

- (5) General repairs to Public Works Stores and Workshops, an incomplete work of the previous year; estimate Rs. 9,392 and outlay Rs. 4,203.
- (6) Repairing punkahs, &c., of St. Mathias' Church, Vepery; estimate Rs. 1,210, expenditure Rs. 1,101.

192. **North Arcot.**—*Condemned cells, wards for male and female lunatics and construction of gallows at the Central Jail, Vellore*, were commenced and completed in the year. The total outlay was Rs. 3,983 on an estimate of Rs. 4,188.

193. Seven minor new works were in progress, of which six were completed. The year's expenditure was Rs. 4,257.

194. Nine repair works were in progress, of which five were completed. The outlay was Rs. 981.

195. **Chingleput.**—*Improvements to laboratory of the Madras Agricultural College* were in progress on the revised estimate of Rs. 9,920 and an outlay of Rs. 3,223 was incurred in the year. Works in lower storey completed and also terrace roof of verandah all round, except portion of staircase.

196. *Additional accommodation and improvements to Teachers' College at Saidāpet* were commenced on an estimate of Rs. 14,460 and an outlay of Rs. 2,999 was incurred. Work on additions was completed up to basement level.

197. Waiting and tiffin rooms for students of the Agricultural College were completed at a total cost of Rs. 3,456 on an estimate of Rs. 3,500.

198. Six minor new works were carried out at a total cost of Rs. 731.

199. The buildings and roads at Government House, Guindy Park, the Deputy Collector's office at Guindy and other buildings, churches, &c., were repaired at a total outlay of Rs. 11,345.

200. Three minor new works were in progress one of which, an incomplete work of last year, was completed. The total outlay incurred was Rs. 761.

201. **Public Works Stores and Workshops**—In the Public Works Stores and Workshops under original works the extension of the smiths' shop, walling-in and improving the drainage of the store-yard, reroofing the stable and outhouses, and the construction of two fire engine sheds were commenced and the two last-mentioned works were completed.

202. **Trichinopoly**—*Constructing District Jail at Trichinopoly*.—So far as this department was concerned, the work was completed. To block No. 5 A, which is being carried out by the Jail Department, much was not done. The expenditure during the year was Rs. 3,539 against the final grant of Rs. 4,110; the total expenditure was Rs. 73,944 against the revised estimate of Rs. 85,244.

203. *Registrar's office at Trichinopoly* was completed and handed over. Expenditure Rs. 4,842, estimate Rs. 5,000.

204. *Conversion of the Royal Artillery Barracks into an office for the Collector* was in progress. Estimate Rs. 5,300, outlay Rs. 2,537. The estimate was under revision.

205. *Construction of a compound wall and a latrine for the District Munsif's Court at Ariyalūr* was completed at a cost of Rs. 1,260, of which Rs. 872 were spent during the year. Estimate Rs. 1,230.

206. The Central Jail at Trichinopoly was repaired at an outlay of Rs. 2,402 and Rs. 220 were spent on repairs to the store-room, Executive Engineer's office, Ariyalūr Munsif's Court and St. John's church.

207. **Tanjore.**—*Combined Court-house for the District Munsifs of Kumbakónam and Valangiman* was completed at an outlay of Rs. 34,841, of which Rs. 24,470 were spent up to the preceding year against the estimate of Rs. 34,342. The excess over estimate and appropriation was due to extra work found necessary.

208. *Improvements to the Taluk Cutcherry at Māyavaram* were completed at a total cost of Rs. 12,703 against an estimate of Rs. 11,680, the outlay during the year having been Rs. 7,166. In this case also the excess was due to additional work which had to be done.

209. *Six huts at Nalludy for the Land Custom Police* were completed at a cost of Rs. 1,970, of which Rs. 1,830 were spent in the year against an estimate of Rs. 1,950.

210. *Police station-house at Vallam* was in progress during the year at an outlay of Rs. 982 against a grant of Rs. 1,000 and estimate of Rs. 2,260.

211. A sum of Rs. 1,392 was spent on repairs to the Juruthkana in the Tanjore palace, the taluk cutcherry at Kumbakónam, Division office, Tanjore, Sub-Registrar's office, Police station and store-shed at Kumbakónam.

212. **Negapatam.**—*Improvements to the District Munsif's Court-house at Mannārgudi*, which remained incomplete at the close of the preceding year, were completed at a cost of Rs. 5,234, of which Rs. 1,175 were spent during the year, the estimate being Rs. 5,010.

213. *The District Munsif's Court-house at Tiruvālūr*, for which materials were collected in the preceding year, was nearly completed, the total outlay being Rs. 12,892, of which Rs. 7,758 were spent during the year. Estimate Rs. 14,230. A portion of plastering, flooring and roofing remained incomplete.

214. *Alterations and improvements to St. Joseph's College buildings at Negapatam to fit them for use of public offices*, partly carried out in the preceding year, were all completed and accounts closed, with the exception of one sub-work, viz., general improvements to the main building; estimate Rs. 2,900, as in this case some small items of work had to be rejected. The expenditure during the year was Rs. 15,388 and the total outlay, including the purchase of the buildings, was Rs. 53,358 against an estimate of Rs. 53,505.

215. *Improvements to the Executive Engineer's bungalow at Negapatam* were nearly completed at an outlay of Rs. 898 against an estimate of Rs. 976.

216. A sum of Rs. 1,620 was spent in repairing the taluk cutcherry at Pattukóta, Sub-Division office at Mannārgudi, Executive Engineer's bungalow at Negapatam, and old District Munsif's Court, and in paying municipal taxes for certain buildings.

217. **Madura.**—In connection with the "preservation of Tirumal Naick's palace and adaptation for public offices," the only works that remained incomplete at the end of the preceding year were "locating the Collector's office," estimate Rs. 44,640, and "providing wooden record-racks to the District Court," estimate Rs. 2,830. These two sub-works were completed, the former at a cost of Rs. 42,645 and the latter at Rs. 2,702, the outlay during the year being Rs. 2,031 and Rs. 270, respectively. The total outlay on the palace works was Rs. 3,36,020.

218. *Improvements to the District Munsif's Court at Dindigul* were completed at a cost of Rs. 2,703 against the estimate and grant of Rs. 2,680.

219. *Providing wire-netting, &c., to the District Jail at Madura* was also completed at an outlay of Rs. 4,247, of which Rs. 357 were spent in the preceding year, the estimate being Rs. 4,482.

220. *The construction of a 3rd-class Police station-house at Virapandi*, which remained unfinished at the end of the preceding year, was completed at a cost of Rs. 3,062, of which Rs. 1,007 were spent during the year, the estimate being Rs. 2,930.

221. *The construction of a 3rd-class Police station at Samayanallūr* was also completed at an outlay of Rs. 2,888, of which Rs. 846 were spent during the year, the estimate being Rs. 2,690.

222. *The construction of Sub-Registrar's office at Tirumangalam*, which remained incomplete at the end of March 1888, was completed during the year at a cost of Rs. 3,259, of which Rs. 2,407 were spent in the preceding year, the estimate being Rs. 2,864.

223. *Improvements to the Deputy Tahsildar's office at Usilampatti*, estimate Rs. 2,420, were only partly carried out at an outlay of Rs. 2,011 owing to the failure of the contractor.

224. *The construction of four Reserve Police huts at Madura* was completed at a cost of Rs. 1,126 against an estimate of Rs. 1,166.

225. A sum of Rs. 3,142 was spent in repairing and maintaining Tirumal Naick's palace at Madura and in repairing District Munsif's Court at Dindigul, Deputy

Tahsildar's office at Usilampatti, Sub-Collector's office and residence at Dindigul, and in paying municipal taxes for certain buildings.

226. **Tinnevely**—*Tahsildar's office at Srivaikuntham*.—Estimate Rs. 25,940. The walls all round were built to the top of the doorways or to an average height of 8 feet, and Rs. 9,570 spent from the grant of Rs. 10,000. The progress was slow owing to the neglect of the contractor.

227. *Construction of subsidiary jail and outhouses to the Deputy Tahsildar's office at Kulasekharapatnam* was in progress. Walls fully raised, trusses and rafters put in, and Rs. 2,778 spent against the estimate of Rs. 3,900 and grant of Rs. 2,780. The work being situated in an out-of-the-way place was not completed.

228. *The reconstruction of Sub-Division and Overseer's office at Puthugudi* was nearly completed; the outlay was Rs. 1,924 from the final grant of Rs. 2,230 and against the estimate of Rs. 2,630. The contractor made slow progress.

229. *The reconstruction of the Printing office at Kokarakulam* was completed at a cost of Rs. 8,620, the grant and estimate being Rs. 8,960.

230. *The construction of a 3rd-class Police station-house at Masurapatty*, estimate Rs. 1,260, and *the construction of a Police station-house at Nanguneri*, estimate Rs. 1,800, were partly carried out, and Rs. 759 and 694 spent thereon, respectively. The former was not completed as it is in an out-of-the-way place and the latter was started late in the year.

231. *Improvements to the District Court-house at Kokarakulam* were completed at a cost of Rs. 21,819, of which Rs. 4,926 were spent during the year, the estimate being Rs. 21,030. The excess of Rs. 789 over the estimate was due to the workshop liabilities having exceeded the amount provided for the lightning conductors in the estimate.

232. *The construction of Police huts at Virudupati* was completed at a cost of Rs. 1,274, the estimate being Rs. 1,340.

233. A sum of Rs. 950 was expended on petty repairs, &c., to eleven works, of which nine were completed.

234. **Ramnad**—*District Munsif's Court-house at Paramagudi*.—Estimate Rupees 12,693. Foundation and basement were completed and walls raised to 10 feet height, and door and window frames fixed; materials for roofing collected. Rs. 7,861 were spent against the final grant of Rs. 7,000.

235. The Police Assistant Superintendent's bungalow at Ramnad and the Sea Custom office at Devipatam were repaired at a cost of Rs. 994.

236. **Consulting Architect**—*New Law Courts, Madras*.—This was the most important work in progress. An estimate, amounting to Rs. 1,44,131, was sanctioned in March 1888 for the preparation and collection of materials, and a sum of Rs. 2,15,000 was provided for expenditure during the year. In September 1888 an approximate estimate of Rs. 9,45,000 was accepted, and the commencement of the buildings was authorised. At the close of the year the foundations had been laid and the work completed up to level of basement floor. The progress of the work was very satisfactory, although some delay was caused by the slowness in diverting the line of railway, the failure of the contractor to supply bricks, and the non-arrival of English stores indented for, in consequence of which the entire grant for the year was not expended. The design includes provision for the High Court, Original and Appellate Sides, the Court of Small Causes, and the following Law officers:—

|                     |                        |
|---------------------|------------------------|
| Advocate-General.   | Official Assignee.     |
| Clerk of the Crown. | Official Trustee.      |
| Crown Prosecutor.   | Administrator-General. |
| Law Reporter.       |                        |

237. *New Court-house for the Presidency Magistrate, Police station and Fire-Engine room, Madras*.—This building was completed, with the exception of some exterior decorative work, and occupied by the Magistrates in March 1889. The total expenditure was Rs. 45,437 against an estimate of Rs. 49,830.

238. *Additions to the College of Engineering, Madras*.—This work was completed and occupied in August 1888. The additions have greatly improved the appearance of the Chepâk buildings. The estimate amounted to Rs. 90,066, but the work was completed at a total outlay of Rs. 76,786.

239. *Additions to the Medical College, Madras*.—This comprised seven separate items of work aggregating Rs. 75,326, viz.—

|                                                                                                           | RS.    |
|-----------------------------------------------------------------------------------------------------------|--------|
| (1) Dissecting house ... ..                                                                               | 36,830 |
| (2) Improving light and ventilation of and adding galleries to the three lower rooms of north wing ... .. | 9,026  |
| (3) Improving, lighting and ventilation of present anatomical theatre ... ..                              | 196    |
| (4) Erecting galleries, &c., in library ... ..                                                            | 5,425  |
| (5) Adding an upperstorey to the north wing ... ..                                                        | 13,999 |
| (6) Completing verandah round front and sides of building ... ..                                          | 8,775  |
| (7) Improving outhouse rooms ... ..                                                                       | 1,075  |
| Total ... ..                                                                                              | 75,326 |

Items Nos. (4), (5) and (7) were almost completed. Item (6) was in progress. Items (1), (2) and (3) are not now required. A revised estimate for the work, amounting to Rs. 27,904, was sanctioned in May 1889.

240. *Constructing an intermediate floor in the Library, Presidency College*.—This work was successfully completed and the new floor occupied by the Professor of Biology at the end of the vacation in July 1888. The total outlay was Rs. 7,702 against an estimate of Rs. 8,517.

241. *Police Station, Vaccination Depot and Registrar's office at Madras*.—This work was completed and occupied in July 1888. The total outlay was Rs. 11,558 against an estimate of Rs. 12,000.

242. *Constructing a large shed in the grounds of the building lately occupied by the office of Director, Public Instruction, to accommodate the Army Clothing Department*.—The large shed and other minor additions were completed. The two sheds to accommodate the Bombay Clothing Agency remained to be executed. The expenditure amounted to Rs. 15,915 against an estimate of Rs. 31,429.

243. *Alterations to the old Mint Buildings, Madras, to fit them for the Government Press*.—This work was completed at a cost of Rs. 16,541 and the building was occupied in December 1888. The sanctioned estimate amounted to Rs. 20,733.

244. *Constructing an additional ward at the Ophthalmic Hospital, Madras, to accommodate Native Military Patients*.—The foundations were laid and the walls raised to the required height; roof timbers, doors and windows were being prepared. The estimate amounted to Rs. 5,506 and the outlay during the year was Rs. 3,181.

245. *Additions to the Ophthalmic Hospital, Madras*.—These consist of a new kitchen for the apothecary, which was almost completed, and altering the old kitchen into a coach-house and stall for the Superintendent; also ceilings for the wards, the planking for which was under preparation, and one ward almost ceiled. The estimate amounted to Rs. 4,517 and the outlay Rs. 2,422.

246. *Minor Original Works*.—A sum of Rs. 9,132 was expended on twenty different works under this head, the most important of which consisted in improving the Revenue Board building, Chepâk; fitting up a room for the Forest Department Museum and providing iron record racks; constructing a shed at the School of Arts for drawing classes, and other improvements to the building.

#### IV.—PROVINCIAL—COMMUNICATIONS.

247. **Vizagapatam**—*New Pottinghi ghât road*.—Estimate Rs. 4,56,581. The outlay to end of the year was Rs. 4,54,060, and the expenditure during the year was Rs. 5,068. The abutments of the 70 feet span iron girder bridge over the Sunki river were carried up to girder platform level and ironwork was conveyed to site and teak planking purchased.

218. *Road from Potinghi to Koraput.*—Estimate Rs. 2,81,940. The outlay to end of the current year was Rs. 1,39,902. The expenditure during the year was Rs. 37,384 against an allotment of Rs. 40,500. Earthwork was nearly completed excepting 7th, 8th and 20th miles. The first four miles of the road were metalled, consolidated and opened for traffic; 5th, 6th, 13th to 19th miles metalling for the most part completed but not consolidated. The abutments of the bridge over Potinghi nulla were raised to 4 feet in height; 12 drainage culverts and 2 irrigation culverts were built. The inspection house at Dholiam was under construction and the walls raised to a height of 10 feet. This road, from May 1886 to November 1888, was under the charge of Mr. W. Knowles, Assistant Engineer, a young officer who showed the greatest devotion to his work under trying circumstances. Notwithstanding frequent severe attacks of fever, he remained at his post throughout, and on several occasions he was left without any assistance, every one of his subordinates having been incapacitated by fever. He died at Koraput on the 25th November 1888 after two days' illness, brought on by hard work and exposure. The following order of Government was passed on the occasion:—

“His Excellency the Governor in Council has learnt with much regret of the death of Mr. William Knowles, Assistant Engineer, First grade, who was a most hardworking and promising young officer. His death is a great loss to the service.”

249. *Surveying road from Koraput to Frontier of Central Provinces.*—Estimate Rs. 7,545. Outlay to end of current year was Rs. 7,208. The expenditure during the year was Rs. 2,829 against an allotment of Rs. 3,000 and the work was completed.

250. The following roads were maintained at a cost of Rs. 10,353:—

- (1) Road from Itikivalasa to Potinghi.
- (2) Agency fair-weather road from Potinghi to Koraput.

251. **Godavari (East).**—The navigation works at Dumagudem were maintained at a cost of Rs. 7,191 during the year. Protective works at head of channel leading from river to Dumagudem lock were carried out at a cost of Rs. 3,024. The stone bund across ruined scouring sluices was built at a cost of Rs. 1,408. The canal was closed for repairs from 15th March to 15th June 1888. 685 boats passed through the canal during the year against 445 in the previous year.

## 252. Nilgiris.—

|                          | RS.    |
|--------------------------|--------|
| Grant for original works | 35,000 |
| Outlay during the year   | 35,145 |

This was all spent on improving the road from Vayitri to Gúdálúr.

253. The following are the principal works:—

|                           | RS.    |
|---------------------------|--------|
| (1) Earthwork             | 18,000 |
| (2) Collection of metal   | 5,300  |
| (3) Choladi bridge        | 8,500  |
| (4) Meppadi rest-house    | 1,100  |
| (5) Constructing culverts | 2,280  |

254. Rupees 2,820 were spent on minor works against an allotment of Rs. 3,071, the chief items being:—

- (1) Improving the approaches and widening the roadway of Pykara bridge; outlay Rs. 1,038.
- (2) Improving the rest-house at Gúdálúr; outlay Rs. 415.
- (3) Renewal of the mile and furlong stones on the Ootacamund and Mettupálaiyam road; outlay during the year Rs. 482, total expenditure up to date Rs. 1,576.
- (4) Toll-house on Kullar-Gúdálúr road; outlay Rs. 394.

255. **Presidency.**—On the widening of the Elephant Gate bridge, which had been almost completed in the previous year, an outlay of Rs. 5,252 was incurred and the work was fully completed at a total cost of Rs. 15,682 against an estimate of Rs. 20,200.

256. Under repairs a sum of Rs. 9,058 was paid to the Madras Municipality for the maintenance of the roads leading from the Fort to the Mount and Poonamallee. Rs. 3,381 and Rs. 1,062 were also paid to the municipality for the maintenance of bridges over the Coom and the Buckingham canal.

257. **South Arcot.**—The construction of a masonry bridge across the Ponniár and of an iron girder bridge on masonry abutments and piers across the Gadilam, in place of bridges which were destroyed in the monsoon floods of 1884, were in progress during the year.

Work on the Gadilam bridge could not be commenced till late in the year owing to some unavoidable delay in fixing upon a site for it. The progress made on the bridge was—

- No. 2 Pier from south abutment—Wells built 12 feet and sunk 4 feet,
- „ 3 Pier—Wells built 12 feet and sunk 7 feet average,
- „ 4 Pier—Wells built 12 feet and 8 feet sunk,
- „ 5 Pier—Wells built 16 feet and 9 feet sunk,
- „ 6 Pier—Wells built 6 feet,
- „ 12 Pier—Wells built 12 feet and sunk 6 feet

on the north and south abutments and the remaining piers no work was done.

On the Ponniár bridge the south abutment was raised  $5\frac{1}{2}$  feet high above floor level. Nos. 1 and 2 piers from that end were raised  $4\frac{1}{2}$  feet above floor level; the floor of No. 1 archway was completed and that of No. 2 archway in progress. For all the remaining piers and north abutment wells were built and sunk to various depths, and the construction of retaining walls and floors and hearting of the wells were in various stages of satisfactory progress.

258. **Madura.**—Completion of the road from Cumbum to the foot of the Peermaad ghát.—Estimate Rs. 90,507. Rs. 10,827 were spent against the final grant of Rs. 11,329. The progress of the work during the year was not satisfactory owing to difficulty in procuring labor in consequence of progress of works at the Periyár dam. The Kuruvanuth bridge was completed except parapets. Some Rs. 4,000 worth of work remained to be done.

## V.—PROVINCIAL—MISCELLANEOUS PUBLIC IMPROVEMENTS.

259. **Buckingham Canal.**—An estimate of Rs. 21,496 (inclusive of Rs. 4,000 chargeable to the Capital account of the Buckingham canal) for training the banks of the Adyár river was sanctioned in April 1887, and an expenditure, amounting to Rs. 4,852, was incurred up to the end of March 1889. A portion of the training bank, 2,218 feet long, was constructed, but during the floods of 1st November last about 250 feet of it was breached, which necessitated an alteration in the line of embankment which now extends over a length of 2,828 feet. This bank was completed and turfing alone remained to be done to a length of 860 feet; all further work was stopped under orders from the Chief Engineer for Irrigation, and a separate estimate for the completion of the right flood bank was under preparation.

260. The lands taken up for archæological research at Mahabalipuram were demarcated. Estimate Rs. 210, outlay Rs. 183.

261. **Kistna (East).**—The repairs to the sea dyke at Masulipatam were carried out.

262. **Nilgiris.**—Completing the Ootacamund north water-supply scheme cost Rs. 22,095 and the total expenditure on this estimate reached Rs. 1,65,107 at the close of the year against an estimate of Rs. 1,71,365. Some fencing, pillar fountains, and a few minor items still remained to be done. Rs. 6,539 were spent in improvements to Hobart Park. A new road and grass-ride, levelling, draining, &c., and the fencing and improvements to the Ootacamund lake margin were completed at a total cost of Rs. 25,788 (estimate Rs. 26,150), the year's expenditure being Rs. 10,002.

263. A sum of Rs. 2,542 was spent on minor works against an allotment of Rs. 2,476. The principal items were—

- (1) Alterations to the road near Adam Memorial Fountain; outlay Rs. 780.
- (2) Improvements to the road at Charing Cross; outlay Rs. 397.
- (3) Erecting an arbour at Lady Canning's seat; outlay Rs. 370.
- (4) Fencing the trees planted on Mount Stuart; outlay Rs. 718.

264. Under repairs Rs. 382 were spent in clearing weeds in Ootacamund lake.

265. **Presidency.**—The construction of self-acting shutters under three bridges on the Cooum river was in progress, and Rs. 6,686 were spent on the work during the year. Four earthen bunds were put up across the same river at a cost of Rs. 208 in order to cover the otherwise insanitary bed with water. Under repairs, Rs. 735 were spent on the conservancy of the Cooum, and Rs. 685 in opening and closing the bar, and four other petty works were carried out at a cost of Rs. 608.

266. **South Arcot.**—An expenditure of Rs. 3,826 was incurred under original works in payment of compensation for lands taken up for the embankment of the Gudilam river for the protection of the town of Tirupapuliyur from floods, a work which had been completed in the previous year.

#### VI.—LOCAL—INCORPORATED.

267. **Rushikulya.**—The Aska and Surada road was maintained at a cost of Rs. 472.

268. **Godavari (East).**—Ordinary repairs were carried out to Kovur-Manjair junction canal at a cost of Rs. 3,562.

269. The ferry steamer for the Godavari river was completed during the year at a cost of Rs. 59,931 and handed over to the Revenue Department on the 15th March 1889.

270. **Godavari (Central).**—The construction of an iron girder bridge over the Gummaram canal at 33 miles near Mattam, estimate Rs. 5,000, was put in hand and Rs. 3,274 were spent during the year.

271. A sum of Rs. 1,000 was adjusted during the year on account of contribution from local funds towards the construction of the following works:—

- (1) Widening roadway on sluice to Kadali channel.
- (2) Do. do. on sluice to Manapalle channel.
- (3) Do. do. over Vepachettu drain under-tunnel.
- (4) Do. do. over Peddapudi channel sluice.

272. **Kistna (East).**—The landing stage at Bezvada was completed. The expenditure amounted to Rs. 21,737 against an estimate of Rs. 25,925.

273. The ferry road at Bezvada was repaired during the year.

274. **Kistna (West).**—Rs. 1,293 were spent against a grant of Rs. 1,325 for the annual maintenance of the river and canal banks used as roads by the public. The banks were kept in fair and trafficable order.

275. The construction of a culvert under the good-water channel at Nizampatam, estimate Rs. 900, was completed.

276. A sum of Rs. 8,169 was spent on the bridge to be combined with the Iskápalle aqueduct over the Bhattiprolu drain.

277. **Nellore.**—The Pennér ancient roadway was gravelled at a cost of Rs. 399.

278. **Coimbatore.**—Completing the Talayasal bridge in the Atūr taluk, Salem district—

|  | Estimate | Grant for the year | Outlay | Rs.    |
|--|----------|--------------------|--------|--------|
|  | ...      | ...                | ...    | 58,500 |
|  | ...      | ...                | ...    | 10,000 |
|  | ...      | ...                | ...    | 5,457  |

The grant was given in January 1889. The work was commenced in the following month. Concrete laid and 2½ feet superstructure built to retaining walls above bridge for spans 1 and 9; walls for protecting abutments in progress; also excavated foundations for retaining walls to spans 3 and 6. Approaches nearly completed.

279. **Madura.**—Construction of a bridge over the Vaigai river. —Estimate Rupees 3,21,460, grant Rs. 70,475, outlay during the year Rs. 68,083, and total expenditure Rs. 2,64,088. At the beginning of the year the bridge had been completed to the top of the piers and one arch had been turned. During the year the remaining 14 arches were completed, the face walls were finished to the top of the arches, and the blocking course above was almost completed. The approaches were almost finished with the exception of the gap left for the Melūr road, and two culverts were constructed on the road.

280. Ten miles of the Cumbum-Gudalūr road were repaired at an outlay of Rs. 1,245.

281. **Tanjore.**—One hundred and fifteen miles of road on river banks were maintained at a cost of Rs. 5,652.

282. **Trichinopoly.**—Twenty miles of road No. 20 from Sankarayur to lower ancient were maintained at a cost of Rs. 883.

283. **Negapatam.**—Forty-three and a half miles of road on river banks were maintained at a cost of Rs. 4,039.

284. **Tinnevelly.**—Rs. 3,935, the Local Fund share, were granted for raising Perungolum surplus channel and road No. 23, of which Rs. 1,663 were paid for compensation for land required. The work could not be put in hand owing to wet cultivation on both sides of the channel.

285. A training wall to Thamarakulam supply channel was constructed, the expenditure from the Local Fund share having been Rs. 109 against the estimate of Rs. 235.

#### VII.—LOCAL—EXCLUDED.

286. **Vizagapatam.**—The buildings attached to the lighthouse at Santapalle were repaired, and a detached cook-house for the Assistant Superintendent's house was partly completed.

287. **Godavari (East).**—The quarters for the lascars at Vakalapudi lighthouse were completed except a small portion of tiling. The outlay during the year was Rs. 2,231.

288. **Ganjam.**—Constructing an iron pier at Gopālpur. —Estimate Rs. 3,08,200. The expenditure during the year was Rs. 8,471. This work was completed in July 1888 at a cost of Rs. 2,83,408 and handed over to the Marine Department.

289. Emergent repairs to the pier (replacing tie rods, straps, bolts and screws which had fallen into the sea) were carried out during the year.

290. **Improvements to lighthouse at Calingapatam.**—Estimate Rs. 1,600. Expenditure to end of the year was Rs. 1,273. This work was commenced in January 1889, but not completed as special labor had to be obtained.

291. **Buckingham Canal.**—Alterations and improvements to the Superintendent's quarters, Armeghon lighthouse, were completed during the year. The total expenditure amounted to Rs. 1,112 against an estimate of Rs. 1,128.

292. The following repairs were carried out:—

- (1) Repairing Lighthouse Superintendent's quarters at Pulicat.
- (2) Repairs to Pulicat lighthouse.

293. The lighthouses at Pulicat and Armeghon were efficiently maintained during the year.

294. **West Coast.**—The lightning conductor of the lighthouse at Mangalore was improved at a cost of Rs. 437.

295. The wire-fencing round the lighthouse at Calicut and improvements to the store-shed were nearly completed. Estimate Rs. 1,412, outlay Rs. 1,306.

296. The store-room at the lighthouse at Tellicherry and the watchman's room at the lighthouse, Cannanore, were repaired at a cost of Rs. 93.

297. Rupees 495 were spent in constructing a roughstone revetment between groynes B and C near the lighthouse, Cochin, to protect the Coast road.

298. **Presidency.**—Repairs to the Madras lighthouse were completed at an outlay of Rs. 1,023.

299. **Chingleput.**—The construction of a lighthouse at the Seven Pagodas, commenced in 1886-87, was completed during the year, with the exception of a well for the Superintendent's quarters and a lightning conductor for the lighthouse. The year's outlay was Rs. 5,006 and the total outlay to the end of the year was Rs. 11,259, the estimate amount being Rs. 11,952.

300. **Tinnevely.**—*Lighthouse-keeper's quarters at Manapad.*—Walls were raised very near to full height and woodwork in progress; Rs. 1,980 were spent from the revised grant of Rs. 2,279 and against the estimate of Rs. 3,679. As no contractor would take up the work for a long time owing to the inaccessibility of the situation rendering it very difficult to obtain labor and materials, the progress of work was much retarded.

301. The construction of staging and wooden house for the Tidal Observatory at Tuticorin was completed at a cost of Rs. 1,576.

302. *The construction of a lighthouse at Manapad*, which was commenced in the preceding year, was completed at a total cost of Rs. 1,294, of which Rs. 486 were spent during the year.

303. A temporary shed was also built at a cost of Rs. 83 as temporary quarters for the lighthouse-keeper at Manapad.

304. **Negapatam.**—*Extension of the jetty wall at Negapatam*, though slow in progress at first on account of rains, was subsequently pushed on vigorously and the work was completed with the exception of the gap of superstructure at mouth of town drain. This was delayed owing to non-supply of cutstone. Rs. 10,499 were spent against the estimate of Rs. 17,590 and grant of Rs. 10,500.

305. *Improvements to the lighthouse at Negapatam* could not be completed, the estimate having been sanctioned late in the year, but only Rs. 136 could be utilised on account of work done in the Public Works Workshops out of the grant of Rs. 470.

306. *Filling in boat basin and diverting the main town drain*, which were commenced in the preceding year, were partly carried out this year, and Rs. 1,628 and 2,658 were spent against the estimates of Rs. 2,284 and 2,900. These works cannot be finished until the extension of the jetty wall is completed. Repairs to the jetty wall, commenced in the preceding year, were also completed at a total cost of Rs. 847, of which Rs. 211 were spent in the year. The drainage channel at the jetty wall was improved at a cost of Rs. 519, and damages caused to the jetty wall by the cyclone were repaired at an outlay of Rs. 211.

