

ADMINISTRATION REPORT

OF THE

PUBLIC WORKS DEPARTMENT.

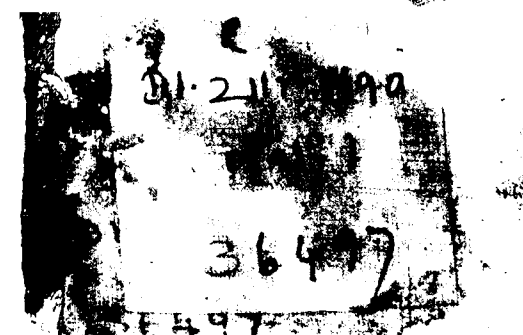
(GENERAL, BUILDINGS AND ROADS BRANCH.)

MADRAS PRESIDENCY

FOR THE YEAR

1890-91.

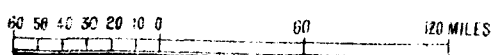
MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.
1891.



MAP OF THE MADRAS PRESIDENCY

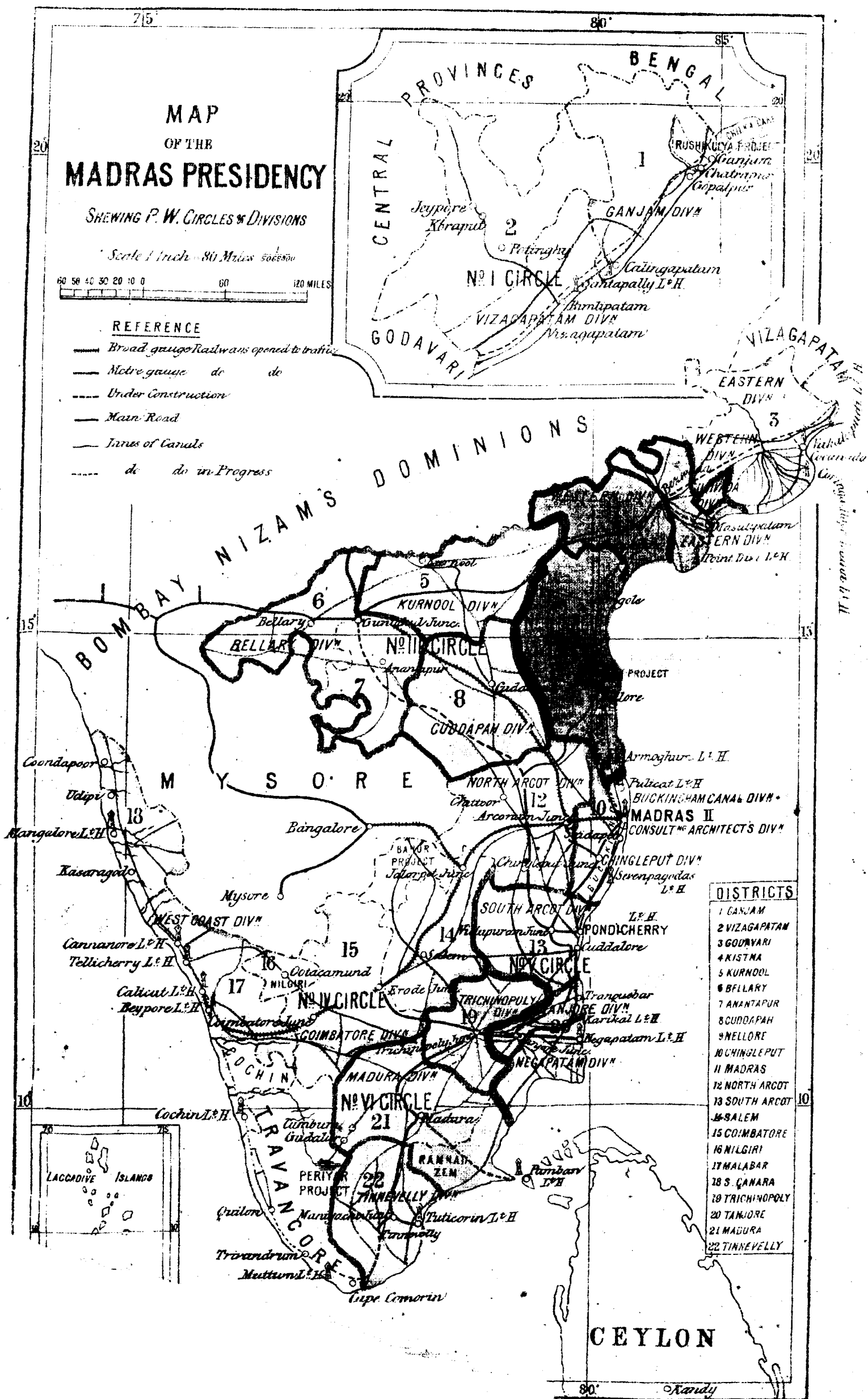
SHOWING P. W. CIRCLES & DIVISIONS

Scale 1 inch = 80 Miles 500000



REFERENCE

- Broad gauge Railways opened to traffic
- Metre gauge do do
- Under Construction
- Main Road
- Lines of Canals
- do do in Progress



ADMINISTRATION REPORT

OF THE

PUBLIC WORKS DEPARTMENT, MADRAS,

(GENERAL, BUILDINGS AND ROADS BRANCH)

FOR THE YEAR 1890-91.

I.—GENERAL REMARKS.

Administration.—The charge of the General, Buildings and Roads Branch was held by Lieut.-Colonel R. R. E. Drake-Brockman, R.E., as Acting Chief Engineer and Joint Secretary to Government until near the end of July 1890, when Colonel J. O. Hasted, R.E., the permanent Chief Engineer and Secretary, retired from the service while on furlough in England. Colonel J. Pennycook, R.E., was then appointed Chief Engineer and Secretary to Government and assumed charge of the office on the 29th July 1890. Mr. G. T. Walsh, M.L.S.R.C.E., who continued to administer the Irrigation Branch throughout the year, held the appointment of Acting Secretary until Colonel Pennycook joined, when he reverted to his substantive office of Joint Secretary.

The following is an extract from the Proceedings of Government recorded on Colonel Hasted's retirement from the department:—

“His Excellency the Governor in Council avails himself of the occasion of the retirement of Colonel J. O. Hasted, R.E., to express his sense of the important and faithful services rendered in the Public Works Department to the State by that able and meritorious officer during the long period of 34 years, in the course of which he occupied, always with credit, every appointment from the lowest to the highest of the executive grades, distinguishing himself particularly in connection with the execution and management of the great irrigation works of the Northern Delta, with which his name will be long associated.

The circle charges were as follows:—the I Circle, with head-quarters at Dowlaish-weram, was held by Mr. J. W. Martin, Superintending Engineer, temporary rank, until September 1890, when he was succeeded by Mr. G. D. Wybrow on the return of the latter from furlough. The II Circle, head-quarters, Bezwada, and the III Circle, head-quarters, Bellary, were throughout the year in charge of Mr. J. Hannan and Colonel H. Smalley, R.E., respectively. The IV Circle, head-quarters, Coimbatore, was held by Major D. McN. Campbell until July 1890, when he was transferred to the charge of the Periyar project. Lieut.-Colonel R. R. E. Drake-Brockman, R.E., then assumed charge of the circle and administered it for the remainder of the year. The V Circle, head-quarters, Madras, was held by Colonel W. H. Burton, R.E., until his retirement in December 1890, when he was succeeded by Major D. McN. Campbell, R.E. The VI Circle, head-quarters, Trichinopoly, was administered by Colonel A. C. Smith, R.E., until February 1891, when he proceeded on privilege leave, and the charge of the circle then devolved on Mr. J. W. Martin as Officiating Superintending Engineer. The office of Consulting Architect remained in the hands of Mr. H. Irwin, C.I.E., throughout the year. The charge of the Periyar project works was held by Colonel J. Pennycook with the rank of Chief Engineer, II Class, until July 1890, when he was succeeded by Major D. McN. Campbell, R.E., Superintending Engineer. In December 1890, on Major Campbell's transfer to the V Circle, the charge of the project was placed in the hands of Mr. H. S. Taylor, Executive Engineer, who holds it with the rank of Superintendent of Works, under the direct orders of the Chief Engineer, Public Works Department.

2. *Grants and expenditure.*—The following statement shows the grants and expenditure of the year under the different finance heads:—

Fund and finance heads.	Original grant.	Revised estimate.	Actual expenditure.
1	2	3	4
	Rs.	Rs.	Rs.
Imperial, Military works	1,00,400	1,12,900	1,14,590
Do. Civil works	22,400	27,900	25,654
Provincial do.	28,50,000	26,50,000	24,84,960
Local Incorporated funds	1,13,000	87,000	94,787
Do. Excluded do.	...	15,510	18,357
Estate works	1,75,519	92,160	93,078
Total ...	32,61,319	29,85,470	28,31,426

3. *Madras Harbour works.*—The progress on the reconstruction of the Madras Harbour works during the year was satisfactory. The advance of the superstructure was not so great as in the previous year, but this was due to the wider walls necessary in the pier heads. The work will, it is hoped, proceed much more rapidly when the new all-round titan crane, ordered from England, has been brought into use. A careful record kept during the year shows that there were only 112 days on which the sea was calm enough to allow of work on the rubble base by divers below the surface. On 87 of these days concrete blocks were set in the superstructure of the north and south piers.

North pier.—The progress made was rapid so long as construction was confined to the building of the ordinary 24-feet section of the superstructure, for work on which the present titan cranes are well adapted; but, after the pier head was commenced, progress was unavoidably slower.

Five hundred and eighty-three blocks were set in position, 103 of these being special blocks for the north pier head. The total advance in the north arm was 337½ lineal feet, of which the 24-feet wall took up 300 feet, the remaining 37½ feet being on the pier head superstructure which is of a wider and deeper section. The end of the north pier was thus brought up to 3,616½ feet from the commencement of the concrete block work begun in the year 1876.

The wave-breaker protection to the north pier was extended to the end of the completed superstructure with a width of 28 feet seaward of the pier. The ultimate width will be 40 feet at a foot above high-water level, and this extension will be commenced after the arrival of the large crane. The blocks in the wave-breaker weigh 30 tons each, and 661 of these blocks, equal to 19,830 tons of concrete, were deposited. 11,321¼ tons of rubble stone were deposited from boats into the north pier base as a foundation for the blocks, in addition to some of the old rubble foundation from the south pier raised by the grab dredger. The north pier rubble base was also paved or consolidated with Portland cement concrete for a length of 743 feet and a width of 20 feet, over which area was spread 825½ cubic yards of concrete.

South pier.—An advance of 68½ lineal feet was made to the pier head superstructure. The section of the block work reached 38 feet in width and was founded at 34 feet below water-level. A total of 201 blocks were set in eleven courses and the pier head was advanced 75 feet. The total length of the south pier inclusive of pier head is to be 3,968½ feet, and, at the close of the year, 3,775 feet had been completed. The iron caisson, which is to contain the solid mass of concrete forming the end of the pier head and upon which a light-house can eventually be erected, was received from England, the cost being Rs. 19,878.

One hundred and thirty-four blocks of 30 tons each were deposited to form the wave-breaker, the width being 40 feet from the pier. A deficiency of 5,305½ tons of rubble in the south pier rubble base was supplied by the special stone

boats in use for receiving the surplus stone raised by the grab dredger. The rubble base of the pier was paved with concrete along the inner face of the stone base, as at the north pier, for a length of 722 feet by 20 feet width, over which area 802½ cubic yards of concrete were spread.

The rubble revetment protecting the foreshore to the north of the harbour had to be extended, the erosion of the shore having continued to a serious extent. An estimate, amounting to Rs. 1,55,462, for this work was accordingly sanctioned. This outlay will continue the revetment to a further length of about one thousand yards, after which all attempts at protection will probably cease, as it seems certain that, wherever the revetment ends, the eroding action of the sea will form a bay of more or less extent. The revetment lengthened as proposed will protect all property of any value in this locality, the land to the north being of comparatively little worth.

Concrete block-making.—It was not necessary to continue block-making throughout the year, there having been a large number of blocks on hand from the previous year. 1,577 blocks were made, of which 631 were the ordinary 30-ton wave-breaker blocks, 124 superstructure blocks for the 24-feet section of the wall, and 822 special-shaped blocks for the north and south pier heads. 25,662 cubic yards of concrete were employed in this outturn.

Portland cement.—5,043½ tons of Portland cement were received on the works through the India office. Each consignment was tested on arrival in India and found to be suitable and in accordance with specification. 3,758½ tons were consumed in block-making, 278½ tons on reconstruction works, and 161½ tons on subsidiary works, making a total consumption of 4,138½ tons, and leaving a balance on hand of 3,529 tons, inclusive of the balance of the previous year.

Quarries.—The outturn was 74,161 tons of stone and this quantity was conveyed to the works in 12,075 wagons by the South Indian Railway. The quarry railway lines were maintained in good order throughout the year.

Iron pier.—The renewal of the decking of the iron screw pile pier and the bracing of the structure were completed. The pier is now rigid and in efficient order.

Expenditure.—The expenditure on the works was Rs. 7,01,475, and the total expenditure to the end of the official year was Rs. 44,40,777 as against the total estimate of Rs. 45,90,051.

4. *Negapatam harbour.*—The state of the bar at the mouth of the Negapatam harbour came under discussion during the year. The position of the channel across the bar is affected by the changes in the sand spits which form or disappear at the mouth of the river in accordance with the force and direction of the wind, sea, and current, and the depth of the water in the channel depends on the river current having sufficient force to scour a passage. The encroachment of the sea during the year caused some anxiety to the mercantile community, and the Port authorities threw out some groynes to protect a spit of land which was being eroded to a dangerous extent. This work served the immediate purpose in view, but the impediments to the trade of the port owing to the state of the bar seemed to call for more effective treatment, and a committee, consisting of the Chief Engineer, the Presidency Port officer, and two members chosen by the mercantile community of Negapatam, was formed under orders of Government to take the whole circumstances into consideration after local investigation. The committee visited the port accordingly and drew up a report, the consideration of which did not fall within the official year under review.

5. *Artesian boring.*—The result of the experimental boring at Tuticorin referred to in the previous report has unfortunately been unsuccessful. The boring was started with an 8-inch pipe. After going through some sand and sandy clay, loose kunker was met with at a depth of 17.5 feet and limestone at 18.5 feet. The boring then passed through grey sand and clay until a depth of 53 feet was reached when limestone was again met with. This layer, only one foot thick, was bored through, and, after going through five feet of grey clay, limestone was for the third time met with at a depth of 59 feet. The stone brought to the surface from a depth of 62 feet was hard compact limestone of a reddish colour. A layer of sandstone, nearly three feet

thick was encountered at a depth of 74.62 feet, and below this layers of different colored clays and laterite were penetrated until at a depth of 116.5 feet trap was reached, and then gneiss or granite at 117.5 feet. The sample of rock brought up from this depth had every appearance of being primary rock. It was therefore considered useless to continue boring any further and the attempt was abandoned after an outlay of Rs. 6,253 had been incurred.

In September 1890, the Geological Department was referred to for an opinion as to the possible existence of water-bearing strata near the town of Ongole, and, in reply, the Superintendent stated that, judging from the geological features of the country, there was a probability of water in quantity large enough to yield a very important supply being found. He also suggested the most convenient site for boring. Acting on this advice, the Municipal Council has resolved to undertake the boring of an artesian well, the boring plant from Tuticorin being transferred to Ongole for the purpose.

6. *Gopálpur pier.*—The circumstances under which the abandonment of the pier at Gopálpur was decided on were noticed in the previous report. Further inquiry showed that there would be great difficulty in dismantling the structure and that to do so without any definite object in the disposal of the materials would involve an expenditure disproportionate to any sum likely to be realised. A proposal to utilise the pier for landing stores for the East Coast Railway also came up subsequently, but to render the pier quite serviceable it was thought that an additional length of 500 feet, so as to place the head beyond the outer line of surf, would be required. No intention was expressed by the Railway authorities of meeting the cost of this extension from Railway funds, and the Provincial Government was not prepared to spend any more money on the improvement of the structure. Hopes are entertained that it may still be found practicable to utilise the materials elsewhere. The maintenance of the pier has been entrusted to the Marine Department.

7. *Improvements to Ryves' canal at Bezvada.*—Traffic has greatly increased in recent years at the Bezvada wharf, where passenger and cargo boats from Madras on the south and from the Godavari on the north concentrate their cargoes on less than half a mile of landing space. To the trade of the canal has been added that of two railways, the Nizam's and the South Mahratta, and it is anticipated that a further impetus to trade will shortly be given by the Nellore extension from the south and the East Coast Railway to the north. In order to relieve the congestion of traffic thus arising and allow room for its expansion, it is proposed to widen Ryves' canal, to remove the regulator lower down, and to build a bridge across the canal which will make Buckinghampett and the triangle of land between the Ryves' and the Ellore canals readily accessible both to boat and cart traffic, and thus divert to the new suburb much of the traffic which is now concentrated on the present crowded, low-lying, unhealthy town. This change is called for on sanitary no less than on mercantile grounds. The following estimates, providing for the requisite works, have been sanctioned accordingly:—

	RS.
Widening first mile of Ryves' canal	11,000
Constructing a new regulator lower down the canal	9,100
Constructing a bridge	17,600
Total ...	37,700

8. *Erosion of the foreshore at Cochin.*—The action of the sea on the foreshore on either side of the mouth of the harbour at Cochin causes periodical erosion more or less serious during the prevalence of the south-west monsoon, notwithstanding the protection afforded by a series of groynes constructed along the coast. Such an erosion took place during the south-west monsoon of 1890. It was at one time thought that considerable damage was likely to occur. The Superintending Engineer was accordingly directed to visit Cochin and report on the circumstances. Meanwhile, the action of the sea was being carefully watched by the Port officer and Executive Engineer, but no remedial measures could be adopted during the height of the monsoon. It was, however, decided that what was required was the reconstruction

of the northernmost and last of the series of groynes. At the period of the Superintending Engineer's visit in October, an improvement had taken place from natural causes and very little beyond attention to some of the existing groynes was then needed. He also recommended the planting of screw pine, rabbit wort, and other protective vegetation at certain places within the limits of the Cochin State. This suggestion was duly referred to the proper quarter.

9. *Bridge over the Vaigai near Madura.*—The importance of throwing a bridge across the Vaigai near the populous town of Madura so as to give the old trunk road a more convenient means of crossing the river than the existing causeway was generally admitted. The Local Fund Board and Municipality each offered a substantial contribution as an addition to local subscriptions and appealed to the Government to supplement these donations by a grant from Provincial funds. The Government acceded to the appeal on certain conditions, one of which was that the work was to be carried out under the supervision of an officer in whom they had confidence. The original estimate for the work amounted to Rs. 1,15,810, but subsequent revisions raised it to Rs. 3,33,050, (including Rs. 59,507 for Public Works supervision and tools and plant) of which the Government contribution was Rs. 60,000. In 1886, the execution of the work was transferred from the Local Fund Board Engineer to the Public Works Department, by which it was finally completed at a cost of Rs. 2,76,994, exclusive of the charges, amounting to Rs. 56,085, for Public Works supervision and tools and plant, and handed over to the District Board for future maintenance in April 1890.

10. *Bridges over the Ponnai and Gadilam near Cuddalore.*—During the north-east monsoon of 1884, the country in the neighbourhood of Cuddalore was flooded by the overflow of the Ponnai and Gadilam, and the two bridges over those rivers were carried away. After careful investigation of local conditions it was decided to replace these bridges by improved structures under the supervision of officers of the Public Works Department. The bridge across the Ponnai was estimated to cost Rs. 1,66,000, for which a masonry structure of 16 arches of 60-feet span was provided, the waterway allowed being 22 per cent. in excess of the waterway of the old bridge. Over the Gadilam an iron girder bridge also estimated to cost Rs. 1,66,000 was recommended. This bridge was to consist of 13 bays of 62-feet span each and a roadway of 18 feet clear. The waterway allowed approximated with that of the railway bridge constructed above and was considered sufficient.

The estimates for both bridges were subsequently revised. That for the Ponnai bridge was raised to Rs. 1,75,300 and the estimate for the Gadilam bridge to Rs. 2,04,750. The total cost against these revised estimates to the end of the year was—Ponnai bridge Rs. 1,79,779 and Gadilam bridge Rs. 2,01,434. Both bridges were successfully completed and opened for traffic before the close of the official year.

The future maintenance of the bridges devolves on the District Board.

11. *New Law Courts, Madras.*—The outlay on these buildings up to the close of the previous official year amounted to Rs. 4,52,159 and during the year under review a sum of Rs. 2,62,140 was expended. All the brick work in the three stories was completed and the towers above were commenced. The outer verandahs, a portion of the tiled flooring and the dados were finished, and considerable progress was made with plastering and the preparation of materials for the ceilings. Nearly all the doors and windows required for the building were completed and the stained glass work, internal fittings, and ornamental iron work got ready. It is intended that the upper part of the main tower shall be adapted to receive a new and improved port light, and, when this has been fixed, the present column in the vicinity of the buildings will be removed.

12. *Victoria Technical Institute and Connemara Free Library.*—The institute has been established with the view of fostering technical education in this Presidency. The building is estimated to cost Rs. 3,56,255 and will, it is expected, not only afford proper facilities for the advancement of scientific knowledge but will be an ornament to the town of Madras. The foundations were laid during the year and the entire building raised to basement level. The wood work and roofing materials were also under preparation. The total outlay to the close of the year was Rs. 83,917.

13. *Inspection of light-houses.*—The undermentioned light-houses were inspected by superior officers of the Public Works Department :—

Calingapatam.	Manapad.
Santopalli.	Cochin.
Vakalapudi.*	Calicut.
Hope Island.†	Tellicherry.
Negapatam.	Cannanore.
Tuticorin.	Mangalore.

* On 7th April 1891.

† On 8th April 1891.

An inspection of all light-houses on the coasts of the Madras Presidency was also made by Mr. W. T. Douglass, an expert specially sent out from England, and a full report submitted to the Government of India. This report was forwarded to the Madras Government for consideration. The various suggestions made were reviewed in detail and such orders passed as the circumstances seemed to require.

14. *Works in wards' estates.*—The following statement shows the grant and outlay on works in wards' estates placed under the charge of the Public Works Department :—

	Original grant.	Revised grant.	Outlay.
	RS.	RS.	RS.
Ganjam division—			
Parlakimedi	92,250	24,577	24,593
Chinna Kimedi		57	71
Jarada	13,530	2,645	2,420
Bodagada	4,920	5,535	5,478
Utlam	216	6	—43
Dharakot	7,380	7,072	6,988
Chakapalli	1,230	131	130
Tarlapetta	1,230		
Aska	1,230	5,830	5,828
Kurla	3,567	4,945	4,919
Attagada and Kallikot	45,510	33,825	37,255
Vizagapatam division—			
Chidikada and Jaganathapuram	3,420	6,824	4,927
Godavari Western division—			
Lakkavaram	323		403
Salem division—			
Erumaipati	713	713	809

Of the above, the following estates were handed over to the proprietors before half the year had elapsed, viz., Parlakimedi, Chinna Kimedi, and Utlam, and to this cause was due the reduction of the original grants at the disposal of the Public Works Department for expenditure on works.

The Jarada estate was in debt and expenditure had in consequence to be curtailed. The short outlay in Chakapalli and Tarlapetta was due to delay in settling the scheme of works to be undertaken. A sum of Rs. 10,000 was surrendered under "Original works, communications" in the Attagada and Kallikot estates, as the amount was in excess of requirements. In other cases the grants were fairly well utilized.

15. *Presidency Public Works Stores.*—Mr. L. L. Wickham, Assistant Engineer, 1st grade, assumed charge of the stores and workshops during the year from Colonel S. C. Clarke, R.E. Stock was taken by both officers prior to the transfer of charge :—

	RS.	A.	P.
The opening balance of the year was	1,58,966	2	6
The receipts during the year were—			
From London	22,013	8	2
" Public Works divisions	4,063	8	2
" local purchase	187	15	2
	26,264	15	6
Total	1,85,231	2	0

The issues were—

	RS.	A.	P.	RS.	A.	P.
To Public Works divisions	10,712	10	11			
" Public Works Workshops, Madras	17,500	10	1			
" Military Works division	1	8	0			
" Civil Departments	28	9	6			
" Military Department	739	10	0			
" Harbour Trust Board	51	4	0			
" Municipality	10	0	0			
" Private sales	819	5	6			
				29,663	10	0
Leaving a closing balance of				1,55,567	8	0

Though less than the opening balance by Rs. 3,398-10-6, the closing balance of the year was in excess of the sanctioned stock reserve (Rs. 1,50,000) by more than Rs. 5,000. The excess is explained to be due to a large accumulation of obsolete stores, for which the demand has hitherto been small.

The original grant for purchase of "tools and plant," stock materials, and carriage and repairs was Rs. 17,410, which was subsequently raised to Rs. 25,000. The actual expenditure was Rs. 25,679.

There were 22 consignments of stores from England and 31 shipments to Indian ports and Rangoon as against 28 inward and 50 outward consignments in the previous year.

16. *Presidency Public Works Workshops.*—The following is a statement of the work done in the shops including centages during the year under review as compared with the previous year :—

	1890 91.	1889 90.	More than 1889 90.	Less than 1889 90.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Work done for Public Works Department including the Military Works Department and State Railways	68,725 14 1	77,257 12 2		9,027 13 0
Work done for other departments	50,877 3 9	43,167 6 8	7,902 5 2	
Do. for private parties	3,307 9 7	3,391 5 2		523 11 7
Total	1,22,970 11 5	1,24,316 8 0	7,902 5 2	9,551 8 7

It will thus be seen that there has been a large decrease in the amount of work done for the Public Works Department and this decrease has been continuous for some time. As the existence of these shops imposes an annual loss to the State of no inconsiderable amount, while the value of work done for the department is comparatively small, the question of their continued maintenance is again engaging attention. It may also be noticed that, since the matter was considered last, there has been an extension of private enterprise in the Presidency town, where several foundries are now at work. The increase in the value of work done for other departments is due to an exceptional cause, steam machinery having been provided during the year for the Government Printing Press and set up by the agency of the Public Works Workshops.

The value of machinery and plant in the shops at the beginning of the year was Rs. 1,06,347-10-11. After deducting the book value of articles transferred to other departments, viz., Rs. 133-8-11, and the usual 4 per cent. for depreciation and adding receipts, amounting to Rs. 1,864-3-9, the balance at the close of the year amounted to Rs. 1,03,829-12-9. The expenditure on tools and plant and machinery was Rs. 2,069 and that on new plant was Rs. 1,731, while the balance of materials on hand at the end of the year was Rs. 18,924-13-10 as against a sanctioned reserve limit of Rs. 25,000.

The workshops afford gratuitous instruction of a practical character to students of the College of Engineering who elect mechanical engineering as their profession.

17. *Government brick and tile, &c., manufacture.*—Operations at the Government Brickfields at Madras were continued during the year. The demand for bricks for the public works under construction has greatly increased, so that an extension of the brickfields was found necessary. An estimate of Rs. 8,139 was also sanctioned for

pugging machinery to be worked by steam power, and a shed, to cost Rs. 4,317, with foundations for the machinery, was ordered to be erected. Earth is obtained from the bed of the Spur tank and it was decided that between this spot and the moulding sheds a light tramway should be laid. An indent on the Home Government for the requisite material with twelve wagons was accordingly sent forward. The outturn during the year was 5,579,719 bricks, 134,895 flooring tiles, and 78,287 roofing tiles, besides a large quantity of terra cotta, all of which was for Government works. A small number of bricks at an enhanced rate was also supplied to private persons.

18. *River Cooum improvements scheme.*—The insanitary condition of the river Cooum owing to the low level of the water during the dry months of the year was felt to be a nuisance and a serious menace to public health. The Sanitary Engineer was accordingly called on in February 1890 to prepare and submit, with as little delay as possible, a detailed scheme for the improvement of the river. The scheme prepared in accordance with these orders was laid before Government in December 1890.

Mr. Jones' scheme consists of two parts. The first part dealing with the lower portion of the river provides for closing the northern of the two branches, into which it divides near its mouth; for improving, deepening and re-sectioning the remainder of the bed; and for obtaining a constant communication between the river-bed and the sea.

For the upper portion of the river above the Harris' bridge, it is proposed to construct three weirs, in addition to that between the tidal and non-tidal portions of the river, for the purpose of maintaining a maximum depth of four feet of water in the bed.

In both portions the banks are to be improved and strengthened, training walls and groynes are to be constructed where necessary, and sewage is to be diverted from the river, while wharves for the convenience of boat traffic are to be constructed in the tidal portion.

For the first or tidal portion of the river two alternative schemes are presented—No. 1, in which it is proposed to admit the tide through the present mouth of the river, the bar being removed by the action of a groyne which it is proposed to construct to the south of the Napier bridge; No. 2 being for the excavation of a canal from the harbour to join the river near the St. Mary's bridge.

The first scheme is estimated to cost Rs. 12,25,000, the second to cost Rs. 10,90,000; about Rs. 2,50,000 in each case being due to the non-tidal portion of the river and the remainder to the lower or tidal portion.

The Chief Engineer, to whom the scheme was referred for review, recommended the adoption for the tidal portion of the river of Mr. Jones' scheme No. 2, including the weir at the Harris' bridge with certain modifications in details explained fully in a separate note and with the addition of sluice gates at the Napier bridge. For the non-tidal portion, the Chief Engineer was of opinion that nothing should be done beyond slight improvements to the bed and banks. The matter was under the consideration of Government at the close of the year.

19. *Famine relief.*—The periodical reports of the condition of districts showed towards the close of the year that, owing to insufficient rainfall, the prospects in several localities were by no means re-assuring. The Government, accordingly, in anticipation of scarcity, impressed upon Collectors the necessity for at once preparing programmes of works for all the affected tracts and directed that selections should be made from the lists of irrigation works, both major and minor, in communication with the Public Works Department. Estimates for the works thus selected were to be got ready, so that there might be no delay in starting them when necessary. Where the irrigation works available in any affected tract were insufficient to meet all the demand for employment likely to arise therein, a sufficient number of suitable Local Fund works were to be added. Portions of the following districts showed signs of impending scarcity more or less severe and works were accordingly started therein as necessity arose, viz., North Arcot, Chingleput, Coimbatore, Cuddapah, Nellore, Tinnevely and Malabar. The review of operations consequent on this scarcity will fall more appropriately into the report of the following year. The preliminary arrangements for affording relief and the starting of works are all that come within the period embraced by this report.

20. *Divisional changes.*—The only changes of importance were the transfer of the North Arcot division from the V to the IV Circle and the Tanjore and Negapatam divisions from the VI to the V Circle, and the incorporation of the No. II Periyár division in the VI Circle. The amalgamation of the Central Godavari division with the Western division, which was carried out on 1st April 1890, was noticed in the previous year's report.

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

22. *Roads.*—The following statement shows the length of road communication maintained by public authorities in Madras during the year 1890-91:—

Name of division.	Name of district.	Length of metalled roads maintained by the Public Works Department.	Length of unmetalled roads maintained by the Public Works Department.	Length of metalled roads maintained by Local authorities.	Length of unmetalled roads maintained by Local authorities.	Total of metalled roads.	Total of unmetalled roads.
		MILES.	MILES.	MILES.	MILES.	MILES.	MILES.
Ganjam and Rushikulya ..	Ganjam ..	10½	1½	696	31	706½	32½
Vizagapatam ..	Vizagapatam ..	48½	2	308	488	356½	490
Godavari (Eastern, Central and Western) ..	Godavari ..	4	..	703	228	707	228
Kistna (Eastern and Western) ..	Kistna ..	26½	..	480	411	480½	437½
Nellore ..	Nellore ..	..	..	911	109	911½	109
Bellary ..	Anantapur ..	..	..	166	520	166	520
Cuddapah ..	Bellary ..	33	..	44	475	77	475
Kurnool ..	Cuddapah ..	..	..	322	878	322	878
Coimbatore ..	Kurnool ..	..	..	466	124	466	124
	Nilgiris ..	39	51½	54	450	93	501½
	Salem ..	..	..	554	1,352	554	1,352
	Coimbatore ..	..	..	974	564	974	564
West Coast ..	South Canara ..	..	..	148	803	148	803
	Malabar ..	35	..	459	852	494	852
North Arcot ..	North Arcot ..	..	..	1,435	..	1,435	..
Chingleput ..	Chingleput ..	..	..	608	75	608	75
South Arcot ..	South Arcot ..	..	47	687	427	687	474
Tanjore and Negapatam ..	Tanjore ..	..	146½	160	1,305	160	1,451½
Trichinopoly ..	Trichinopoly ..	20	..	513	133	533	133
Madurai ..	Madurai ..	..	..	570	692	570	692
Tinnevely ..	Tinnevely ..	..	..	817	129	817	129
	Total ..	191½	274½	11,075	10,946	11,266½	10,320½

NOTE.—This statement does not include roads and streets within municipal limits.

II.—PROGRESS OF WORKS.

I.—IMPERIAL—MILITARY WORKS.

23. *Ganjam.*—The expenditure under military minor original works was Rs. 916 against an allotment of Rs. 1,250. The number of works were three, as follows:—

	Estimate.
	RS.
1. Constructing a well at Berhampore for the use of the public	920
2. Do. in the military cholera camp at Ampava	830
3. Providing padlocks to solitary cells of 27th Regiment, M.I.	42

In work No. 1 rock was met at a depth of 10 feet; the excavation was, however, carried down to a depth of 45 feet, and, as only a small quantity of water was found, the work was stopped; an alternative site settled by the Collector was objected to by the Commanding officer. The Executive Engineer explained that the Municipal Council offered no opinion regarding the new site and the grant was not, therefore, fully utilised.

Work No. 2.—The first site chosen had to be abandoned, as hard rock was met with near the surface. The work was commenced at a second site and completed except the beam and platform. There is now about 20 feet of water in the well. The estimate was exceeded by Rs. 100 for the above reasons.

Work No. 3 was completed.

24. The works in progress under repairs during the year were 9 in number, all of which were completed.

25. **Godavari (Eastern).**—Improvements to the existing drainage and the enlargement of the latrine in M.I. detachment lines at Sámalkót were carried out at a cost of Rs. 343, against a grant of Rs. 400, under minor original works. Other sanitary repairs were finished from the grant for repairs. Repairs to the military hospital building and cook room were nearly finished. The expenditure under repairs, including compensation for quarters, amounted to Rs. 840 against a grant of Rs. 800.

26. **Vizagapatam.**—Re-roofing the military hospital at Vizianagrum; estimate Rs. 6,220; work completed at a cost of Rs. 6,057 against an allotment of Rs. 6,220. The expenditure under minor original works was Rs. 46 against an allotment of Rs. 500. This short outlay was due to the late receipt of allotment and to the Railway Department having drawn away a great deal of the available labour. The expenditure on repairs was Rs. 5,572 against an allotment of Rs. 5,000 for repairing roads and military buildings, &c., in the cantonment of Vizianagrum and those at Vizagapatam.

27. **West Coast.**—The following works were completed or in progress:—

(1) Transport lines at Calicut.—The bullock sheds were fully completed and occupied. The sheds for mules and elephants were also completed, but not occupied pending the execution of sundry improvements suggested by the Chief Commissariat officer. The outlay on the work up to the end of the year was Rs. 13,452 against an estimate of Rs. 12,980.

(2) Constructing a bakery at West Hill barracks at Calicut.—Completed but not taken over, as the Chief Commissariat officer wished to have some alterations and additions executed; outlay Rs. 5,202 against an estimate of Rs. 4,300.

(3) Slaughter-house at West Hill, Calicut.—This work was also completed, but was not taken charge of owing to the Chief Commissariat officer requiring to have certain alterations and additions done to it; estimate Rs. 3,465; outlay Rs. 4,482.

(4) New barracks for 30 men at West Hill, Calicut.—Foundation was in fair progress and sufficient materials for masonry and wood work for roofing were at site. The allotment of Rs. 10,000 was fully spent.

(5) A soldiers' institute for the European Infantry at Malapuram commenced last year was completed at a cost of Rs. 1,535.

(6) The old infectious disease ward at Malapuram was converted into quarters for the Commissariat Sergeant; estimate Rs. 2,270; outlay Rs. 2,651.

(7) Three additional latrines for the Madras Native Infantry at Mangalore were built at an aggregate cost of Rs. 1,000.

(8) A stable to Sergeant Instructor's quarters, Malabar Volunteer Rifles, was erected at a cost of Rs. 230.

28. **Coimbatore.**—The purchase of Mr. Stephens house at Yercaud for adaptation as quarters for the Sergeant Instructor and an armoury for the Yercaud Rifle Volunteers was effected for Rs. 4,800.

29. The following minor works were completed or in progress:—

(1) Constructing a magazine on Stonehouse Hill for the use of the Saluting Battery and the Nilgiri Volunteer Rifles at Ootacamund; estimate Rs. 1,650; outlay during the year Rs. 1,515.

(2) Compound wall to the west and north side of rest-house at Pódanúr; work nearly completed; estimate Rs. 493; outlay Rs. 404.

(3) Constructing a sick cart shed for the rest camp at Pódanúr; work completed; estimate Rs. 450; outlay Rs. 120.

30. The outlay under repairs, including compensation in lieu of quarters and rent of hired buildings for Medical and Military subordinates, amounted to Rs. 5,701.

II.—IMPERIAL—CIVIL WORKS.

31. **Ganjam.**—The only work commenced during the year was repairs to the Post office building at Parlákimedi; estimate Rs. 620 and expenditure Rs. 362. This work was not completed for want of funds.

32. **Godavari (Eastern).**—The expenditure under repairs was Rs. 1,001 against an allotment of Rs. 1,220. Materials were collected for a compound wall to the Post office at Kunavaram, but the work was stopped for want of funds. Rs. 812 were spent during the year on repairs to the Telegraph office and signaller's quarters, Cocanada, and to the Telegraph office, Rajahmundry, and Rs. 189 were expended on repairs to postal buildings at Sámalkót and Peddápúram.

33. **Vizagapatam.**—The Post offices at Vizagapatam and Bimlipatam were repaired at a cost of Rs. 449 against an allotment of Rs. 450. The Telegraph office at Vizagapatam was repaired at a cost of Rs. 540 against an allotment of Rs. 300. Additional funds were applied for but not sanctioned.

34. **Kistna (Eastern).**—The Post office building at Bezváda was repaired at a cost of Rs. 62.

35. The Telegraph offices at Masulipatam and Bezváda were repaired at a cost of Rs. 215 and 182, respectively.

36. **Kistna (Western).**—Alterations to the Post office and repairs to Sub-Postmaster's quarters at Duggirala and the Post office at Vinukonda were carried out at a cost of Rs. 881.

37. Repairs to the Telegraph office at Guntúr were completed at a cost of Rs. 158.

38. **Coimbatore.**—Two minor new works were undertaken at a cost of Rs. 51 under Postal and sums of Rs. 1,120 and Rs. 94, respectively, were spent on repairs to Post and Telegraph buildings.

39. **West Coast.**—A sum of Rs. 855 was spent on repairs to postal buildings.

40. **North Arcot.**—An outlay of Rs. 100 was incurred on repairs to the Post office building at Vellore.

41. **Chingleput.**—The repairs to the Váyalúr salt factory flood bank, which were commenced in the previous year, were completed at a cost of Rs. 8,203.

42. **Tanjore.**—The Post offices at Tanjore and Kumbakónam were repaired at an outlay of Rs. 123.

43. **Negapatam.**—The Post office building at Patukóta and the Government Telegraph office at Negapatam were repaired at a cost of Rs. 19 and Rs. 145 respectively.

44. **Trichinopoly.**—Alterations and repairs to the old cutcherry at Trichinopoly for the use of the Postal and Telegraph departments were carried out at a cost of Rs. 1,373.

45. **Madura.**—The opening of windows in the City Post office at Madura was carried out and alterations to a room in the Sub-Magistrate's cutcherry at Usilampatti to locate the Sub-Post office were in progress, the expenditure on both being Rs. 92. The Post offices at Peermade, Kovilur and Butlagundu were repaired at an outlay of Rs. 493.

46. **Tinnevely.**—The latrine in the compound of the Post office at Palamecottah was built at a cost of Rs. 182 and the Post offices at Vasudevanallúr, Virudupatti, Sátúr, Palamecottah and at Trivandrum were repaired at an outlay of Rs. 459.

47. **Presidency.**—The following works were completed:—

(1) Improving signallers' water closets and urinals, Telegraph office, Madras; expenditure Rs. 954.

(2) Constructing additional sheds at the Telegraph stores; expenditure Rupees 1,142.

- (3) Alterations and improvements to the General Post office, Madras; expenditure Rs. 724.
- (4) Alterations to the Post office at Mylapore; expenditure Rs. 92.
- (5) Alterations and improvements to the General Telegraph office, Madras; expenditure Rs. 388.
- (6) Providing sun-shades to the Railway Mail Service department, General Post office; expenditure Rs. 78.
- (7) Providing shelves to counters, Money Order department, General Post office; expenditure Rs. 143.

III.—PROVINCIAL—CIVIL BUILDINGS.

48. Ganjam.—The following works were completed or in progress :—

- (1) Constructing 26 police huts for the Reserve Police at Parlákimedi; estimate Rs. 7,150; work completed.
- (2) Constructing District Munsif's court at Berhampore; estimate Rs. 11,450. The main building was practically completed during the year. The latrine was under construction.
- (3) Constructing District Munsif's court at Aska; estimate Rs. 12,730. Materials to the value of Rs. 4,000 were collected, but work was stopped in February 1891, pending inquiry regarding the state of the present court-house building and the necessity for a new one; orders were received at the close of the year to resume the work. Excavating foundations was nearly completed by the end of March.
- (4) Constructing District Munsif's court at Sompét; estimate Rs. 12,360. With the exception of dais and glazed windows, the main building and compound walls were practically completed. The latrine was under construction.
- (5) Demolishing and renewing the verandah roof of the Native College at Berhampore; original estimate Rs. 1,650. Work was completed at a cost of Rs. 1,743. Owing to the uncertainty whether the amount of the revised estimate (Rs. 2,240) would be sanctioned and to the necessity of the building being completed before the end of June 1890, the revised estimate was not fully worked out.
- (6) Constructing masonry drains in the District jail, Berhampore; estimate Rs. 1,480; work completed.
- (7) Constructing Post office at Udayagiri; estimate Rs. 2,500. Work was commenced in October 1890, but the contractor failed to complete it on account of the feverish character of the locality. Special arrangements were made for the supply of the wood work.
- (8) Constructing Post office at Balliguda; estimate Rs. 2,500. Work commenced in October 1890. Most of the materials were collected.
- (9) Constructing a dead-house in lieu of the existing one at Chicacole; estimate Rs. 660; work completed and handed over in January 1891.
- (10) Making record-racks with wooden shelves for the District court, Berhampore; estimate Rs. 590. The racks received in the previous year were fitted up and the work completed.
- (11) Constructing second-class police station-house at Jaganathapur; estimate Rs. 1,470. The completion of this work was delayed for want of iron work for doors, for which no arrangements had been made.
- (12) Constructing Sub-Magistrate's cutcherry and sub-jail at Berhampore. No estimate was sanctioned for this work, but a sum of Rs. 1,000 was granted for the collection of materials. Further work was delayed pending receipt of the revised type design.

49. The number of works in progress under repairs during the year was 11, and 10 of these were completed.

50. Godavari (Eastern).—The following works were completed or in progress :—

- (1) Additional buildings to the Rajahmundry college; revised estimate Rupees 13,600; work completed except flooring with asphalt and fitting pipes, &c.

- (2) Quarantine ward, Central jail, Rajahmundry; estimate Rs. 9,650; work completed except roofing, for which materials were collected.
- (3) Close prison, Central jail, Rajahmundry; estimate Rs. 29,260; outlay Rs. 16,317 against a grant of Rs. 16,500; superstructure, block No. 2, built up to a height of 6 feet on the average; block No. 3 to a height of 4 feet all round; and block No. 4 to a height of 3 feet; other blocks built up to ground level.
- (4) School-house at Bhadrachalam; estimate Rs. 6,000. Materials were being collected and wood work in progress in the Dowlaishweram workshops. The expenditure during the year amounted to Rs. 1,538 against a grant of Rs. 1,500.
- (5) Church at Cocanada; a sum of Rs. 933, the balance of the Government grant-in-aid, was allotted during the year, against which Rs. 840 were spent by the Local Fund Engineer in completing the tower of the church.
- (6) Additions and alterations to the Sub-Magistrate's office, Pithápuram; estimate Rs. 1,370; work completed and handed over to the Revenue Department at a cost of Rs. 1,270.
- (7) Additional accommodation, a treasury room, ryot's shed and record-racks to the Sub-Magistrate's cutcherry at Tuni; estimate Rs. 1,180; work completed and handed over to the Revenue Department at a cost of Rs. 1,198.
- (8) Addition of a room to the Sub-Magistrate's cutcherry at Tuni for Sub-Registrar's office; estimate Rs. 1,590; expenditure Rs. 1,500; work completed and handed over to the Sub-Magistrate before 31st March 1891.
- (9) Well for the Police force at Kota; Rs. 151 were spent on earthwork. The work could not be proceeded with further owing to the difficulty in getting laborers.
- (10) Constructing a third-class police station-house at Chintur; estimate Rs. 1,850; expenditure Rs. 530. Materials were under collection.
- (11) Alterations to the Rajahmundry Central jail well pump; estimate Rupees 230; expenditure Rs. 1,118; work nearly completed.

51. The following repair works were carried out during the year :—

	Estimate. Rs.	Outlay. Rs.
Quarters and office of Special Assistant Agent, Kunavaram.	1,400	1,173
Aloe fence round do. do. ...	420	344
Police Head-quarters office Rajahmundry ...	660	742
Fencing round do. do. ...	600	495
Deputy Superintendent's quarters, Dowlaishweram workshops ...	540	587
Buildings in Central jail, Rajahmundry ...	910	867

52. Petty repairs to Public Works buildings at Dowlaishweram were carried out at a cost of Rs. 1,948.

53. Godavari (Western).—The following works were completed or in progress :—

- (1) Constructing Sub-Registrar's office at Bhímavaram; estimate Rs. 3,420; work completed.
- (2) Constructing District Munsif's court at Amalápuram; estimate Rupees 3,800; outlay Rs. 3,898 against a grant of Rs. 4,418; materials collected and work commenced.
- (3) Constructing District Munsif's court at Ellore; estimate Rs. 17,110; expenditure Rs. 8,586 against an allotment of Rs. 8,500. Roofing was in progress.
- (4) Constructing first-class Taluk cutcherry at Ellore; estimate not yet sanctioned; expenditure Rs. 1,103 against a grant of Rs. 1,291. Materials to the extent of grant were collected.
- (5) Constructing Deputy Tahsildar's cutcherry at Razole; estimate Rs. 10,870; outlay Rs. 6,906 against a grant of Rs. 7,000. Concrete laid in and foundation walls raised 8 feet high in places, but works stopped for want of bond stones.
- (6) Reconstructing the Divisional office at Chettipet; estimate Rs. 13,900; expenditure Rs. 897 against a grant of Rs. 1,100; materials collected.
- (7) Erecting a verandah on the west side of late Central Division office building; estimate Rs. 255; work completed.

(5) Constructing tools shed in the Sub-division office at Anantapur; estimate Rs. 2,940; outlay Rs. 2,202. All the work, except roofing, was completed.

(6) District Surgeon's quarters at Anantapur; estimate Rs. 11,435; outlay Rs. 1,162. The work is in good progress.

(7) First-class Taluk office at Kúddligi; estimate Rs. 26,225; outlay Rupees 24,625. The building was completed except the well.

(8) Deputy Tahsildar's office at Kampli; estimate Rs. 11,199; outlay Rupees 6,948.

(9) Constructing new Subsidiary jail and making certain improvements to the Taluk office at Hospet; estimate Rs. 9,775; outlay Rs. 5,646. The work was in good progress and will be soon completed.

(10) Municipal school-house at Anantapur (contribution work); estimate Rs. 15,777; outlay Rs. 1,939. Foundation trenches for the eastern wing were dug out, Mangalore tiles, teak-wood scantlings and a quantity of building stones were brought to site. The work was stopped for selection of a new site.

65. **Cuddapah**.—(1) Additions and alterations to the District jail at Cuddapah; estimate Rs. 73,295; outlay Rs. 57,171. The progress on the work was satisfactory.

(2) Combined office for the Tahsildar and Sub-Magistrate at Cuddapah; estimate Rs. 25,400; outlay Rs. 10,000. The walls of the main building were all raised to full height and wood work for roof was in progress.

(3) District Munsif's court at Proddatur; estimate Rs. 12,798; outlay Rs. 6,000. Walls of the main building were built up to 10 feet high and almost all archworks over doors and windows were finished.

(4) Taluk cutcherry at Badvel; estimate Rs. 23,150; outlay Rs. 23,348; building completed except well and handed over to the Tahsildar. The well was deepened to full depth and parapet walls, &c., remained to be built.

(5) Additions and improvements to Gurramkondah Mahal; estimate Rs. 3,277; outlay Rs. 2,951. The heaviest portion of the work was completed. Plastering, ceiling of roof, &c., remained to be completed.

(6) Sub-Registrar's office at Jammalamadugu; estimate Rs. 2,509; outlay Rs. 351. Foundation and basement were completed and wall above raised to 2 feet.

(7) Sub-Registrar's office at Sidhout; estimate Rs. 2,650; outlay Rs. 967. Foundations and basement were completed and wood and other materials collected.

66. **Kurnool**.—(1) Head Assistant Collector's office at Nandyál; estimate Rs. 19,500; outlay Rs. 19,147. This work was completed in the previous official year and handed over. The roadway was completed during the year under review. The Mangalore tiles of the roof were blown away by heavy gales that occurred shortly after completion and a revised estimate was sanctioned in November 1890 which provided for relaying the tiles.

(2) Residence for the Assistant Superintendent of Police at Nandyál; estimate Rs. 5,752; outlay Rs. 5,482. The work was almost completed.

(3) Taluk cutcherry at Márkápúr; estimate Rs. 23,398; outlay Rs. 4,966. The allotment was given only in November 1890. Nothing could be done beyond collecting materials.

(4) Purchase and improvement of railway building at Nandyál for a residence for the Sub-divisional officer; estimate Rs. 4,994; outlay Rs. 5,034. The improvements were completed.

67. **Coimbatore**.—The following major works were completed:—

(1) Constructing District Munsif's court at Karúr; estimate Rs. 17,420; outlay up to 31st March 1891 Rs. 16,220.

(2) Constructing Sub-Registrar's office at Sálúr; estimate Rs. 2,750; outlay Rs. 2,265.

68. The following works were in progress:—

(1) Constructing Government House at Ootacamund; estimate Rs. 7,79,150; outlay during the year Rs. 14,108; expenditure up to 31st March 1891 Rs. 7,26,457.

The principal items of the above work on which the outlay was incurred are detailed below:—

(a) Constructing quarters with out-houses for an European coachman and a cook; estimate Rs. 12,710.

(b) Six additional quarters for native servants; estimate Rs. 1,035.

(c) Erecting lamp posts and lamps for new road of approach; estimate Rs. 1,060.

(d) Fitting a Moule's patent earth closet; estimate Rs. 120.

(2) Improvements to the Secretariat offices on Stonehouse hill, Ootacamund; estimate Rs. 5,300; outlay Rs. 4,802.

(3) Constructing a Deputy Tahsildar's office at Aravakurehi; estimate Rs. 9,540; outlay Rs. 7,973.

(4) Constructing a Sub-Registrar's office at Gopichettipálaiyam; estimate Rs. 2,680; outlay Rs. 1,479.

(5) Constructing a Sub-Registrar's office at Thathiengarpett. Walls were built to a height of 1½ feet and some wood work brought to site; estimate Rs. 2,770.

(6) Constructing a first-class police station-house at Salem; work nearly completed; estimate Rs. 2,629; outlay Rs. 2,513.

(7) Improvements to the Accounts branch of the Collector's office, Coimbatore. Work completed, but accounts not yet closed; estimate Rs. 15,840; expenditure Rs. 15,789.

69. A sum of Rs. 13,988 was spent under minor original works against an allotment of Rs. 16,846.

70. The principal works carried out during the year are detailed below:—

(1) Constructing record-room to the Sub-Registrar's office at Avanashi; outlay Rs. 743.

(2) Providing record-racks to the District Court-house at Coimbatore; outlay Rs. 440.

(3) Constructing a stable and coach-house in the compound of the Superintending Engineer's office at Coimbatore; outlay Rs. 1,376.

(4) Constructing two verandahs to the District Court-house at Salem; outlay Rs. 1,371.

(5) Providing a lightning conductor to the Taluk cutcherry at Námakal; outlay Rs. 227.

(6) Providing a lightning conductor to the Christ's church at Salem; outlay Rs. 201.

(7) Reconstructing the quarters of the Deputy Chief Warders at Salem; outlay Rs. 125.

(8) Constructing a dead-house at Vániyambadi; outlay Rs. 554.

(9) Improvements to the Taluk treasury at Uttankarai; outlay Rs. 566.

(10) Improvements to the overseer's shed at Tirupatúr; outlay Rs. 355.

(11) Constructing a second-class police station-house at Dharmapuri; outlay Rs. 1,511.

(12) Improving the detached buildings in the compound of Police Assistant Superintendent's quarters at Tirupatúr; outlay Rs. 523.

(13) Improvements to the cemetery at Kótagiri; outlay Rs. 372.

(14) Additions and improvements to Westmere at Ootacamund; outlay Rs. 670.

(15) Improvements to the police buildings at Gúdahúr; outlay Rs. 754.

(16) Constructing a lock-up in the rear of police station, Kandul, Ootacamund; outlay Rs. 365.

(17) Connecting garden cottage with Government House water-supply at Ootacamund; outlay Rs. 332.

(18) Improvements to the police huts at Kótagiri; outlay Rs. 334.

(19) Fencing in police station premises at Ootacamund; outlay Rs. 774.

(20) Constructing out-houses for the Bench Magistrate's court and Police station at Kótagiri; outlay Rs. 429.

(21) Providing new record-racks for Army Head-quarters offices at Ootacamund; outlay Rs. 471.

71. A sum of Rs. 20,345 was spent on repairs against an allotment of Rs. 21,500.

72. **North Arcot.**—The construction of a Sub-Registrar's office at Arkónam was put in hand during the year. Rs. 1,973 were expended against an estimate of Rs. 2,575.

73. The reconstruction of the record-room of the Gudiyátam Taluk cutcherry was completed at an outlay of Rs. 2,792.

74. The construction of the Sub-Registrar's offices at Ambur and Kuppam was commenced and Rs. 940 and Rs. 2,233 were spent on them against estimates of Rs. 4,000 and Rs. 3,030, respectively.

75. The improvements to the bastion cells, which were left incomplete in 1889-90, were resumed and completed at a cost of Rs. 2,356.

76. District Munsif's court at Tirupati.—The work was commenced late in the year with an allotment of Rs. 3,000, the foundation trenches were dug and concrete laid.

77. Eight minor works were commenced, of which one was an incomplete work of the previous year and seven were completed. The total outlay under this head was Rs. 6,999.

78. Under repairs, twenty-five works were commenced, of which 18 were completed. The outlay was Rs. 8,077.

79. **West Coast.**—The Collector's cutcherry at Calicut made good progress. The main building was raised up to second floor (15 feet) with flooring joists and beams fitted up. The record-room was completed with the exception of roofing, the wood-work of which was half fitted up. The tiffin room was fully completed. For the press office concrete was laid, but the work was stopped pending the settlement of a proposal from the Revenue Department to convert the building into a currency office. The masonry work of the out-houses was completed and roofing in progress. The outlay to end of the year was Rs. 1,16,800 against an estimate of Rs. 1,89,970.

80. The law courts at Pálghat, which were in progress in the previous year, were completed and handed over to the Judicial Department for occupation in August 1890; estimate Rs. 28,790; outlay Rs. 29,534.

81. The District Munsif's court at Chowghat, on which Rs. 2,500 were spent in the previous year, made satisfactory progress. The masonry was almost completed and materials for roofing were ready at site. The year's grant of Rs. 11,000 was fully spent; total outlay Rs. 13,542 against an estimate of Rs. 19,245.

82. District Munsif's court at Manjeri.—The masonry was almost completed and roofing materials brought to site; outlay Rs. 10,023 against an estimate of Rs. 15,087.

83. Taluk cutcherry at Perintalamana.—There was some delay in the transfer of the site from the Revenue Department and thus a good portion of the working season was lost. Concrete for foundation was almost complete and materials for the masonry and roofing under collection. Rs. 15,048 were spent against a grant of Rs. 15,000 and estimate of Rs. 34,070.

84. Powder magazine for the police at Malapuram completed except the lightning conductor materials for which were indented for; estimate Rs. 1,820; outlay Rs. 1,476.

85. Police station at Nilambúr.—Work in fair progress; masonry work completed and roofing in hand; outlay Rs. 987; grant Rs. 1,434.

86. A sum of Rs. 1,616 was spent in constructing out-houses for the supervisor's and overseer's quarters at Luckady; work completed.

87. The Police Inspector's and Chief Constable's quarters at Vayitri were improved at a cost of Rs. 421 and Rs. 381, respectively.

88. Wire fencing was erected to the Sub-Registrar's quarters at Vayitri at a cost of Rs. 385.

89. The undermentioned Sub-Registrar's offices were completed and handed over for occupation:—

(1) **Kondotty**, estimate Rs. 3,020; outlay Rs. 3,370.

- (2) **Malapuram**, estimate Rs. 2,785; outlay Rs. 2,992.
 (3) **Tamracherry**, estimate Rs. 2,926; outlay Rs. 3,124.
 (4) **Manjeshwar**, estimate Rs. 2,872; outlay Rs. 2,820.

90. The following incomplete works were completed and handed over to the departments concerned for occupation:—

(1) Improvements to the second and third blocks of Collector's office at Mangalore; estimate Rs. 15,060; outlay Rs. 17,755.

(2) Improvements and additions to the District Munsif's court at Kásaragód; estimate Rs. 7,200; outlay Rs. 7,473.

(3) Ten police huts at Puthur; estimate Rs. 3,651; outlay Rs. 3,681.

91. Tahsildar's cutcherry at Coondapoor.—The main building, treasury room and sub-jail were almost completed and materials for roofing and flooring, &c., were ready; estimate Rs. 32,950; grant Rs. 12,576; outlay up to date Rs. 28,750.

92. Additions and alterations to the District Court at Tellicherry were carried out at a cost of Rs. 5,446.

93. Third-class police station at Irritty was built at a cost of Rs. 1,542.

94. Taluk cutcherry at Badagara.—The court wing and clerk's and sheristadar's rooms were raised up to 11 feet and record-room up to 10½ feet. Five 18-foot trusses, purlins, &c., for the roof were ready. The current year's grant of Rs. 17,000 was fully spent; estimate Rs. 31,000.

95. Constructing 50 close prison cells in the Central jail at Cannanore; block of 24 cells and block of 4 cells, lodge and store room completed except the fitting of door shutters; for block of 12 cells superstructure raised to 9 feet; wall enclosure completed; grant and outlay Rs. 20,000; estimate Rs. 26,080.

96. Two lifts at the new Custom House wharf at Cochin were erected at a cost of Rs. 1,021.

97. Latrine to the District Munsif's court at Malapuram was built at a cost of Rs. 440.

98. Certain additions were made to the Police hospital at Mangalore; outlay Rs. 832.

99. Police Superintendent's office at Mangalore.—Plank ceiling was put in at a cost of Rs. 450.

100. Constructing a latrine to the Government college at Calicut.—The work was stopped pending the removal by the Revenue Department of some trees on the site belonging to a private individual; outlay Rs. 122; estimate Rs. 1,305.

101. Improvements to the Government college at Calicut.—Work put in hand; expenditure Rs. 701; estimate Rs. 2,226.

102. A sum of Rs. 9,094 was spent in repairing fifty works.

103. **Chingleput.**—The construction of 30 police huts for the Reserve Police constables at the Mount was commenced on an estimate of Rs. 5,680 and the foundation excavated, but the Military authorities objected to the proximity of the site to an old magazine, and the work had to be stopped.

104. The Sub-Registrar's office at Uttramallúr, an incomplete work of the previous year, was completed. The expenditure was Rs. 2,874 against an estimate of Rs. 2,800.

105. Six minor new works were completed during the year.

106. Under repairs, renewing the roof of the Reformatory hospital, estimate Rs. 5,884, was finished besides petty repairs to the Reformatory buildings.

107. Repairs to Government House, Guindy, were completed at a cost of Rs. 8,128.

108. Repairs were also executed to the Roman Catholic church at Poonamallee and the Executive Engineer's office at the Mount, and the roads and grounds and the pump and engine at Guindy Government House were maintained in good order.

109. **South Arcot.**—Fair progress was made on the new Taluk cutcherry at Villupuram, which was commenced in 1890. Superstructure, terracing and wood work were completed. The outlay was Rs. 13,568 on an estimate of Rs. 15,720.

110. A new Taluk office at Tindivanam was commenced; estimate Rs. 22,640; foundations up to ground level completed and wood work for roofing collected. The expenditure was Rs. 6,851.

111. At the new Taluk cutcherry at Tirukoilūr the concrete foundations were laid, brickwork was raised to basement level for the main building and out-houses, all wood work was ready and a large supply of bricks was collected. The outlay was Rs. 9,016 on an estimate of Rs. 20,680.

112. A grant of Rs. 5,000 was given in the budget for a new Taluk cutcherry at Chidambaram. The estimate, however, had not been sanctioned and the site selected had not been made over to the department. An outlay of Rs. 4,813 was incurred from the above grant in the collection of materials.

113. Work on the new District Munsif's court-house at Chidambaram, commenced in the previous year, was continued and the building was very nearly completed. The outlay was Rs. 5,226 on an estimate of Rs. 11,155.

114. A new Sub-Registrar's office at Merkánam was started and an outlay of Rs. 2,033 incurred on an estimate of Rs. 3,196.

115. A new Sub-Registrar's office at Vanoor was commenced, but very small progress made; outlay Rs. 685 against an estimate of Rs. 3,080.

116. Under minor new works the expenditure was Rs. 2,436.

117. **Tanjore.**—A new Taluk cutcherry at Kumbakónam was commenced. The foundations were completed and basement raised to floor level; a large quantity of materials were collected. The expenditure was Rs. 5,820 on an estimate of Rs. 21,275.

118. The extension of the vernacular record-room at the Treasury office at Tanjore was completed with the exception of a few petty items; outlay Rs. 4,744; estimate Rs. 4,730.

119. A new Sub-Registrar's office, Swamimalai, was completed; outlay Rs. 2,702; estimate Rs. 2,730.

120. Improvements to the District Press office, Tanjore, commenced in 1889-90, were completed at a total cost of Rs. 2,555; estimate Rs. 2,920.

121. The rebuilding a portion of the Taluk cutcherry at Kumbakónam to adapt it for an office for the Sub-Collector, also a work of the previous year, was completed; expenditure Rs. 5,188; estimate Rs. 4,862.

122. Twelve minor new works and twelve repair works were in progress.

123. **Negapatam.**—Improvements to the sub-jail were completed at a cost of Rs. 3,346. A compound wall around the sub-jail was also built at a cost of Rs. 383.

124. Improvements to the District Munsif's court and Sub-court were completed at a cost of Rs. 2,740.

125. The construction of office and quarters for the Sub-divisional officer at Tiruturaipúndi was completed on an estimate of Rs. 7,416. The total cost was Rs. 7,388.

126. The construction of office and quarters for the Sub-divisional officer at Mannárgudi was commenced on an estimate of Rs. 6,375 and Rs. 3,949 were spent.

127. An additional room was built in the District Munsif's court-house at Patukóta at a cost of Rs. 4,522.

128. An extension to the record-room and improvements to the sheristadar's and cashier's offices in the Taluk cutcherry at Negapatam were completed at a cost of Rs. 1,480.

129. The construction of a verandah to the Taluk cutcherry at Patukóta was commenced on an estimate of Rs. 1,900 and Rs. 986 were spent.

130. The expenditure under repairs was Rs. 2,156.

131. **Trichinopoly.**—The following works were completed or in progress :—

(1) Converting the Artillery barracks at Trichinopoly into offices for the Collector, the Superintendent of Police, and the District Forest officer; estimate Rs. 24,900. The work was completed and handed over and the buildings are now occupied.

(2) Providing wooden record-racks to the Collector's cutcherry at Trichinopoly; estimate Rs. 3,450; expenditure Rs. 3,289; work completed.

(3) Constructing Sub-Registrar's office at Ariyalūr; estimate Rs. 2,880; outlay Rs. 2,034; nearly completed.

(4) Constructing a circular kitchen in the Central jail, Trichinopoly; estimate Rs. 4,400; expenditure Rs. 3,662; roofing in progress.

(5) Constructing drains in the Central jail at Trichinopoly; estimate Rs. 6,160; outlay Rs. 2,426; portions of drains finished.

(6) Alterations and improvements to the District jail at Trichinopoly; estimate Rs. 3,000; expenditure Rs. 515; a portion of cross wall was done.

(7) Renewing the old floor of the District Munsif's court at Ariyalūr; estimate Rs. 2,080; work completed at a total outlay of Rs. 1,844; construction of five police huts at Arasangudi; estimate Rs. 1,680; outlay Rs. 1,540; work completed.

(8) Constructing a third-class police station-house at Arasangudi; estimate Rs. 1,150; outlay Rs. 629; work nearly completed.

(9) Constructing Sub-Registrar's office at Perambalūr; estimate Rs. 2,220; outlay Rs. 1,839; the work was nearly completed.

(10) Construction of six police huts at Jamboonadapuram was completed at an outlay of Rs. 1,965 and a second-class police station-house at Manapárai was in progress.

132. **Madura.**—The following five works were completed :—

(1) Sub-Magistrate's office at Sivaganga; estimate Rs. 12,570; outlay Rs. 12,540.

(2) New court-room for the Madura Tahsildar; estimate Rs. 4,210; outlay Rs. 4,402.

(3) Taluk cutcherry at Tirumangalam; estimate Rs. 23,114; expenditure Rs. 23,730.

(4) Sub-Registrar's office at Sholavandan; estimate Rs. 2,570; expenditure Rs. 2,649.

(5) Sub-Registrar's office at Nellakóta; estimate Rs. 2,770; outlay Rs. 2,880.

133. The following works were in progress :—

(1) Sub-Registrars' offices at Paramakudi, Mudukolatúr and Devikóta.

(2) District Munsif's court-house at Paramakudi; estimate Rs. 14,055; expenditure Rs. 8,000.

(3) Sub-Magistrate's cutcherry at Madura; estimate Rs. 5,790; expenditure Rs. 2,169.

(4) Steps to the Sea Custom's office at Kilakarai; estimate Rs. 3,260; outlay Rs. 531.

(5) Police station-house at Tandigudi; estimate Rs. 5,090; outlay Rs. 1,668.

(6) Improvements to Tirumal Naick's palace; expenditure Rs. 1,072.

134. **Tinnevely.**—The following works were completed :—

(1) Taluk cutcherry with out-houses at Srívaikuntham; outlay Rs. 25,805.

(2) Sub-Registrar's office at Velathikulam; estimate Rs. 2,970; expenditure Rs. 2,734.

(3) Sub-Registrar's office at Alvarthirunagari; estimate Rs. 3,900; expenditure Rs. 3,647.

(4) Sub-Registrar's office at Sivakási; estimate Rs. 3,080; expenditure Rs. 3,016.

(5) Circular kitchen and drain in the District jail at Palamcottah; estimate Rs. 2,977; expenditure Rs. 3,000.

135. Protestant church at Tuticorin.—The old roof was removed and some materials collected at an outlay of Rs. 1,042. The work was stopped pending sanction to a revised estimate, as the wood work of the old roof was found to be quite decayed and an entirely new roof was found necessary.

136. The following minor works were completed :—

- (1) Police station-house at Palamecottah; expenditure Rs. 2,358.
- (2) Sub-Registrar's office at Palamecottah; expenditure Rs. 2,131.
- (3) Improvements to travellers' bungalow and its out-houses at Virudupati; expenditure Rs. 2,144.
- (4) Police huts at Karungulam; outlay Rs. 1,357.

137. A second-class police station at Sálúr was in progress at an outlay of Rs. 1,453 and a sum of Rs. 3,730 was spent in acquiring sites for Sub-Registrar's offices at Sivakási and Otapidáram and for a District Munsif's court at Ambásamudram, and also in providing lightning conductors to the Police hospital at Palamecottah, Collector's cutcherry at Kockarakulam, Sub-Magistrate's cutcherry and Sub-Registrar's office at Palamecottah, Head Assistant Collector's cutcherry at Shermádévi and the Taluk cutcherry and Munsif's court at Srivilliputur.

138. A sum of Rs. 1,142 was spent on petty repairs to the Head Assistant Collector's bungalow at Shermádévi, Sub-Registrar's office at Sattankulam and nine other works.

139. **Presidency.**—The following major works were in progress or completed :—

- (1) New Law Courts, Madras; estimate Rs. 9,97,069; total expenditure Rs. 7,14,300.
- (2) Victoria Technical Institute and Connemara Free Library; estimate Rupees 3,56,255; expenditure Rs. 83,917.
- (3) Additional ward at the Lying-in hospital; estimate Rs. 39,299; expenditure Rs. 40,266.
- (4) Improving the strong room at the Paper Currency office; estimate Rs. 14,173; expenditure Rs. 12,509; work completed.
- (5) Constructing a shed in the wine yard, Sea Custom's office; estimate Rs. 13,645; expenditure Rs. 8,481.
- (6) Laying pipes to carry Red Hills water to the Lunatic Asylum; estimate Rs. 7,230; expenditure Rs. 6,472; work completed.
- (7) Constructing four cottages for isolating patients at the Lunatic Asylum; estimate Rs. 8,080; expenditure Rs. 7,368; work completed.
- (8) Laundry for the General Hospital; estimate Rs. 9,880; expenditure Rs. 7,740. This work was almost completed, the plastering and pointing only remained to be executed.
- (9) Constructing two cells at the General Hospital for patients suffering from mental diseases; estimate Rs. 3,350; expenditure Rs. 2,903; work completed.
- (10) Additions to the General Hospital, consisting of retiring room for female students; estimate Rs. 5,365; expenditure Rs. 4,042. This work will be completed shortly.
- (11) New operating room for the General Hospital; estimate Rs. 11,590; expenditure Rs. 13,842.
- (12) Office-room for the Principal, Medical College; estimate Rs. 3,110; expenditure Rs. 2,470; work completed.
- (13) Latrine for European and Hindu male students at the Medical College; estimate Rs. 7,125; expenditure Rs. 2,544.
- (14) Constructing a new ward and extending the existing No. 5 block at the Leper Hospital; estimate Rs. 6,013; expenditure Rs. 3,976.
- (15) Constructing a police station on the old Ice House road, Triplicane; expenditure Rs. 2,720; work completed.
- (16) Erecting compound wall round the Reserve Police lines at Puduket; estimate Rs. 3,513; expenditure Rs. 3,043; work almost completed.
- (17) Extending the St. George's Cathedral cemetery; estimate Rs. 4,240; expenditure Rs. 4,101; work completed.
- (18) Improvements to the Presidency Training School for Mistresses; estimate Rs. 26,370; expenditure Rs. 29,690. The excess outlay was due to additions not originally contemplated and to extra labour in sliding shutters.
- (19) Additions and improvements to the Civil Orphan Asylum; total expenditure Rs. 22,615. All the works were completed and made over.

(20) Constructing 12 stable stalls for the Mounted Police at the Egmore Magistrate's court; expenditure Rs. 5,454; work completed.

(21) New police station and fire engine shed on the Wallajah road; estimate Rs. 15,845; total expenditure Rs. 11,646; work completed.

(22) Improvements to the Examination Hall, Presidency College; estimate Rs. 5,135; expenditure Rs. 4,884; work completed.

(23) New court for Presidency Magistrate; estimate Rs. 49,830; expenditure during 1890-91 Rs. 179; amount previously expended Rs. 48,850; total expenditure Rs. 49,029. This work was fully completed during 1889-90 and some payments were made during 1890-91.

(24) Removing the old photographic room and constructing a terrace roof, Madras Observatory; estimate Rs. 2,772; expenditure Rs. 2,512; work completed.

(25) Reconstructing tread mills at the Government Penitentiary; estimate Rs. 5,210; expenditure Rs. 1,670.

140. The expenditure during the year on minor original works was Rs. 46,799 and a sum of Rs. 1,02,215 was expended on repairs to civil buildings.

IV.—PROVINCIAL—COMMUNICATIONS.

141. **Ganjam.**—Mahasingi bridge; estimate Rs. 41,200; outlay Rs. 11,986 against a grant of Rs. 14,000. Preliminary arrangements were completed and a part of the materials collected, sheds, &c., built. The greater portion of the iron work was landed at Gopálpur and paid for. The lapse of grant (Rs. 2,014) was due to failure of Messrs. Burn & Co. to supply the iron work as first promised.

142. **Vizagapatam.**—Completing the road from Pottinghi to Koraput; estimate Rs. 2,80,205. The outlay during the year was Rs. 53,279 against a grant of Rs. 51,500. The following work was finished :—

	MILES.
Total length of road	30
Metal collected	30
Earthwork done	28
Metal spread and rammed	28
Gravel collected	30
Road open for traffic	28

The following are the principal works on the road :—

The break from 24th to 38th mile was completed and this made the road practically open from Pottinghi to Koraput and free for traffic all the year round.

The Sepoyputti bridge was completed.

The Maliaputti bridge masonry work was completed and iron work put up. The Kundali bridge left abutment up to 22 feet, and right abutment to 20 feet completed and half of the floor and retaining wall completed.

The Pongar bridge masonry work completed, iron work up, and little more was required to open it for traffic.

The Duliam bridge; right abutment raised 16 feet and left abutment foundations put in 2 feet in height; and $\frac{3}{4}$ of floor and retaining wall completed.

Gerru Gedda; both abutments built to 1½ feet high.

Golla Gedda; right abutment put in and left abutment excavated full depth.

Domiriput bridge; the heavy blasting was completed and the right abutment marked out.

Poolachi bridge completed except metalling on road way.

Gopalaputti bridge abutments built up to 3 feet high; floor and retaining wall completed.

Durrugonda bridge; abutments built up to 12 feet high; floor and retaining wall completed.

The whole length of the road from Pottinghi to Koraput is practically completed and metalled, except about 2 miles, in short lengths, at the sites of the several bridges still under construction. The traffic along this road is now considerable; as many as 11,276 carts used the road in April last.

143. The outlay on the Potinghi ghât road was Rs. 4,836 against a grant of Rupees 5,500. The following work was executed during the year:—Putting up iron work for Sunki bridge and completing approaches; turning arches of Rallagedda bridge. The Sunki bridge was completed except the pedestals at ends of hand rails. The Potinghi ghât road, 20 miles 6 furlongs in length, is now completely bridged and metalled. The road was maintained in an efficient state and the traffic was considerable.

144. **West Coast.**—Calicut-Vayitri road.—This road was maintained in good order and kept open for traffic during the year at a cost of Rs. 36,733 and a very considerable improvement was visible all along. Depôts were made at the side of the road where metal for repair was stacked. All parapet walls were repaired with large stones and on the ghât a curb-stone wall was made on the inside to confine the drainage water and prevent any erosive action on the road; where the road was overgrown with *lantana*, the latter was removed and uprooted to a breadth of 66 feet from the centre of the road on each side. Surveys of the departmental claim for a margin of land on either side of the road were made and submitted to the Collector of the district for the restoration of the correct boundaries. Bandy-stands were made at Adivaram (26th mile 6th furlong), Luckady (36th mile) and Talapoya (37th mile 5th furlong). New toll-gates were put up at Vayitri, Luckady and Tagarapady, and sign-boards at the cross roads at Vayitri, Talapoya, Tamracherri and Ravandur. The usual repairs were executed to the inspection houses.

145. Improvements to the Vayitri-Gúdalúr road.—All the tunnels were built except those situated between Devála and Nadgani (4 miles). Metal was collected at miles 3 to 20, 21, 22, 23, 24, 25 to 29, 30, 31, 32, 34, 35 and 5 furlongs beyond Devála, or a total of 151 furlongs; 62½ furlongs were consolidated. All earthwork was finished except that provided for in the revised estimate between Devála and Pundalúr and a little at a few bridges. Bridges Nos. 3, 21, 34, 46, 93, 97, 99, 101, 103, 169, 243 were ready for their iron girders; 241, 249, 381, 388, 408, 424 and 437 had their foundations in. Culvert No. 45 of 6-feet span was completed and for culvert No. 295 of 10-feet span arch abutments were finished. For the better execution of the abutments for bridges and to ensure order and ease of building at each bridge, surveys were taken of the site and site plans of materials made. Cut stone was obtained from Coimbatore; but attempts were made to quarry it locally, and, though not successfully in the beginning, all mile and furlong stones from Vayitri to Sholadi (22 miles) were obtained locally; expenditure Rs. 1,59,856 against an allotment of Rs. 1,81,000. The total outlay to the end of the year amounted to Rs. 3,33,408 against the estimate of Rs. 5,50,000.

146. Repairs to Vayitri-Gúdalúr road.—These were of the usual description and call for no remark except the improvements in the Meppadi and Vayitri bazaars. A wide road has been made through these bazaars by continuing the road between curb-stone walls and metalling the whole of the width so obtained; total outlay Rs. 12,444.

147. **Coimbatore.**—The following works were completed during the year:—

(1) Constructing eight cart-stands on the road from Kullar to Ootacamund; estimate Rs. 6,100; expenditure Rs. 5,940.

(2) Metalling two miles of roadway to a width of 12 feet on the Ootacamund-Gúdalúr road from 1st furlong in the 3rd mile stone to 1st furlong in the 5th mile; estimate Rs. 9,650; outlay Rs. 9,431.

148. Reconstructing the Farewell bridge at the 14th mile, Ootacamund-Kullar road, was in progress; estimate Rs. 18,100; grant for the year Rs. 5,000; outlay during the year Rs. 2,686. The work was commenced in February 1891. Masonry for the right and left abutments was built up to about 2 feet above the flood level. Foundations for the pier on the Ootacamund side are ready for rebuilding.

149. Rupees 1,788 were spent on minor works against an allotment of Rs. 1,650.

150. The following works were executed at a cost of Rs. 47,235:—

(1) Remetalling 5 miles and 2 furlongs of the Coonoor ghât road from Kullar to Benhope; outlay Rs. 10,090.

- (2) Annual maintenance of the Kullar-Gúdalúr road; outlay Rs. 35,324.
- (3) Repairing new road on Mountstuart at Ootacamund; outlay Rs. 539.
- (4) Rebuilding revetment in 7th furlong 19th mile of the Ootacamund-Gúdalúr road; outlay Rs. 325.
- (5) Repairs to bridge in the 1st furlong of the 3rd mile, Ootacamund-Gúdalúr road; outlay Rs. 705.

151. The road from Ootacamund to Gúdalúr was retransferred to the District Board in September 1890.

152. **Madura.**—A sum of Rs. 147 was disbursed on account of certain liabilities on the Cumbum-Gúdalúr road which had been finished in the previous year.

153. **Presidency.**—A sum of Rs. 13,501 was paid to the Madras Municipality for maintaining the bridges on the Cooum river in proper order during the year 1890–91.

V.—PROVINCIAL—MISCELLANEOUS PUBLIC IMPROVEMENTS.

154. **Kistna (Eastern).**—Widening Ryves' canal; estimate Rs. 11,000 and outlay Rs. 6,586 against a grant of Rs. 10,000. The work was commenced only in December 1890 and very nearly completed.

155. Regulator, Ryves' canal; estimate Rs. 9,100; allotment Rs. 2,000 and expenditure during the year Rs. 3,851. Foundations were nearly completed by the end of the year.

156. **Coimbatore.**—A sum of Rs. 907 was spent on improvements to the water-supply at Gúdalúr.

157. **Madura.**—The only work in progress was "cutting a rough trace from Kodaikanal to Pillar rock." The trace was completed except 3,600 feet, which cannot be put in hand until land is acquired; the expenditure incurred was Rs. 466.

158. **Presidency.**—Putting self-acting shutters to the Munro, Anderson and Commander-in-Chief's bridges on the Cooum and training the river; total amount sanctioned Rs. 39,360; expenditure during 1890–91 Rs. 1,131; amount previously expended Rs. 14,735; total expenditure Rs. 15,866. No actual work was executed during 1890–91 and the work was stopped. The outlay in the year was an adjustment.

159. Rupees 11,778 were expended in maintaining the Chépák Park and Marina, maintaining trees and grass plots in the old fishing village and conservancy of the Cooum river.

VI.—LOCAL—INCORPORATED.

160. **Rushikulya.**—The Aska and Suradá road was maintained at a cost of Rs. 500 against a grant of Rs. 500.

161. **Godavari (Eastern).**—(1) Aqueduct over Chollangi salt creek; estimate Rs. 6,500. The work was completed during the year at a cost of Rs. 6,794.

(2) The ordinary repairs to the Kovur-Manjair junction canal were carried out at a cost of Rs. 2,691.

162. **Godavari (Western).**—The following works were executed or in progress during the year:—

(1) Construction of an iron girder bridge over the Gunnaram canal at 33rd mile near Mattam; estimate Rs. 5,000; work completed.

(2) Constructing culvert over Pallivella drain; estimate Rs. 780; work almost completed.

(3) Constructing road culvert across Bodasakurru channel; estimate Rs. 480; work completed.

(4) Constructing Komaragiripatnam road culvert; estimate Rs. 770; work almost completed.

163. **Kistna (Eastern).**—Under civil buildings the most important work undertaken was the Jubilee Museum and Technical Institute at Bezvada; estimate Rs. 12,006; grant Rs. 10,000; and outlay Rs. 6,737. Foundation and basement were completed and superstructure raised to a height of 10 feet.

164. Bridge over Ryves' canal; estimate Rs. 17,600; grant Rs. 2,119; outlay Rs. 1,988; the excavation of foundation and laying concrete completed; superstructure commenced.

165. **Coimbatore.**—Completing the Talavasal bridge in the Atir taluk, Salem district. The iron work was completed with the exception of one floor plate which was ordered from Madras. Plastering was in progress; metal for approaches under collection; pointing and gravelling the road could not be done until the rivetting work was inspected and passed by the Executive Engineer; grant for the year Rs. 10,634. The total outlay to the end of the year was Rs. 43,702 against an estimate of Rs. 47,700.

166. **South Arcot.**—The roads along Coleroon bank, Khan Sahib's canal, Veeram tank bank and Vadavaur bank were repaired at an outlay of Rs. 2,608.

167. For the restoration of the Shatiatope anicut bridge the ironwork did not arrive till late in the year, so little or nothing could be done towards actual construction.

168. **Tanjore.**—An outlay of Rs. 5,668 was incurred in maintaining 101 miles of roads on river embankments; these roads are not metalled, but they were in fairly good condition throughout the year.

169. **Negapatam.**—A sum of Rs. 5,343 was spent in maintaining 45½ miles of roads on river embankments.

170. **Madura.**—An outlay of Rs. 31 was incurred in closing the accounts of the annual maintenance of the 10 miles of the Cumbum-Gudalur road for 1889-90.

171. **Tinnevely.**—Raising Perungulam surplus channel and road No. 23; estimate Rs. 7,805; Local Fund share Rs. 3,935; expenditure Rs. 3,628, of which Rs. 965 were spent during the year; work completed but final payment not made.

172. Rupees 108 were spent on improving the Kulasekharaperi tank.

173. **Trichinopoly.**—Road No. XX from Siruduyur to lower anicut *via* Senkarayur (20 miles) was maintained at an outlay of Rs. 978.

VII.—LOCAL—EXCLUDED.

174. **Ganjam.**—Fixing lightning conductor to the light-house at Calingapatam; estimate Rs. 190; materials collected and orders issued to put the work in hand.

175. Constructing a cook house for light-keepers at Calingapatam; estimate Rs. 290. At the request of the Presidency Port officer the building was divided into two rooms instead of one room as originally intended. The work was completed.

176. **Godavari (Eastern).**—Repairs to Marine Villa, Cocanada, and to the red buoy of the port were completed at a cost of Rs. 315 and Rs. 167, respectively.

177. **Godavari (Western).**—The obelisk at Thirthalamondy, was raised and that at Antaravedi was repaired.

178. **Vizagapatam.**—A sum of Rs. 50 was spent in repairing the head light-keeper's quarters at Santapalle.

179. **Buckingham Canal.**—The following buildings were repaired:—

(1) Light-house Superintendent's quarters and out-houses and lascars' lines at Armeghon; outlay Rs. 735.

(2) Light-house at Pulicat; outlay Rs. 33.

(3) Pulicat Light-house Superintendent's quarters and lascars' lines, &c.; outlay Rs. 376.

(4) Removing and repairing the door of Seven Pagodas light-house; outlay Rs. 20.

180. **West Coast.**—The flagstaff at Badagara was completed; outlay Rs. 1,610.

181. A new flagstaff was erected at Calicut at a cost of Rs. 1,381.

182. Building a revetment to prevent the erosion of the sea near the Marine office at Beypore was completed; outlay Rs. 1,679.

183. A sum of Rs. 539 was spent on urgent repairs to the boat jetty at Cannanore.

184. The wooden platform of the light-house at Tellicherry was repaired at a cost of Rs. 137.

185. The light-house at Calicut was repaired; expenditure Rs. 177.

186. The light-house at Cannanore was provided with a lightning conductor at a cost of Rs. 100.

187. **South Arcot.**—The construction of two additional wings to the jetty and repair of the existing wharf at Porto Novo were completed; outlay Rs. 3,284; estimate Rs. 3,320.

188. **Negapatam.**—The construction of quarters for the keeper of the light-house at Point Calimere, an incomplete work of the previous year, was completed at a cost of Rs. 1,679.

189. Iron struts were put up to support the eastern gaff of the light-house at Negapatam at a cost of Rs. 135. The lantern of the light-house was repaired at a cost of Rs. 28.

190. The jetty wall of the Negapatam harbour was repaired at a cost of Rs. 118 and iron stays to protect the corner of the new jetty wall were erected at a cost of Rs. 62.

191. **Madura.**—Repairs to the Port officer's bungalow at Pamban were in progress.

192. **Tinnevely.**—The provision of a wooden covering to the light and a wooden ladder and lightning conductor to the light-house at Manapad was in progress at an outlay of Rs. 404. The work was not completed owing to the late receipt of the additional copper tape indented for. The construction of a cook-house attached to the Light Superintendent's quarters and a compound wall in front of the light-keeper's quarters were completed with the exception of plastering at a cost of Rs. 571.

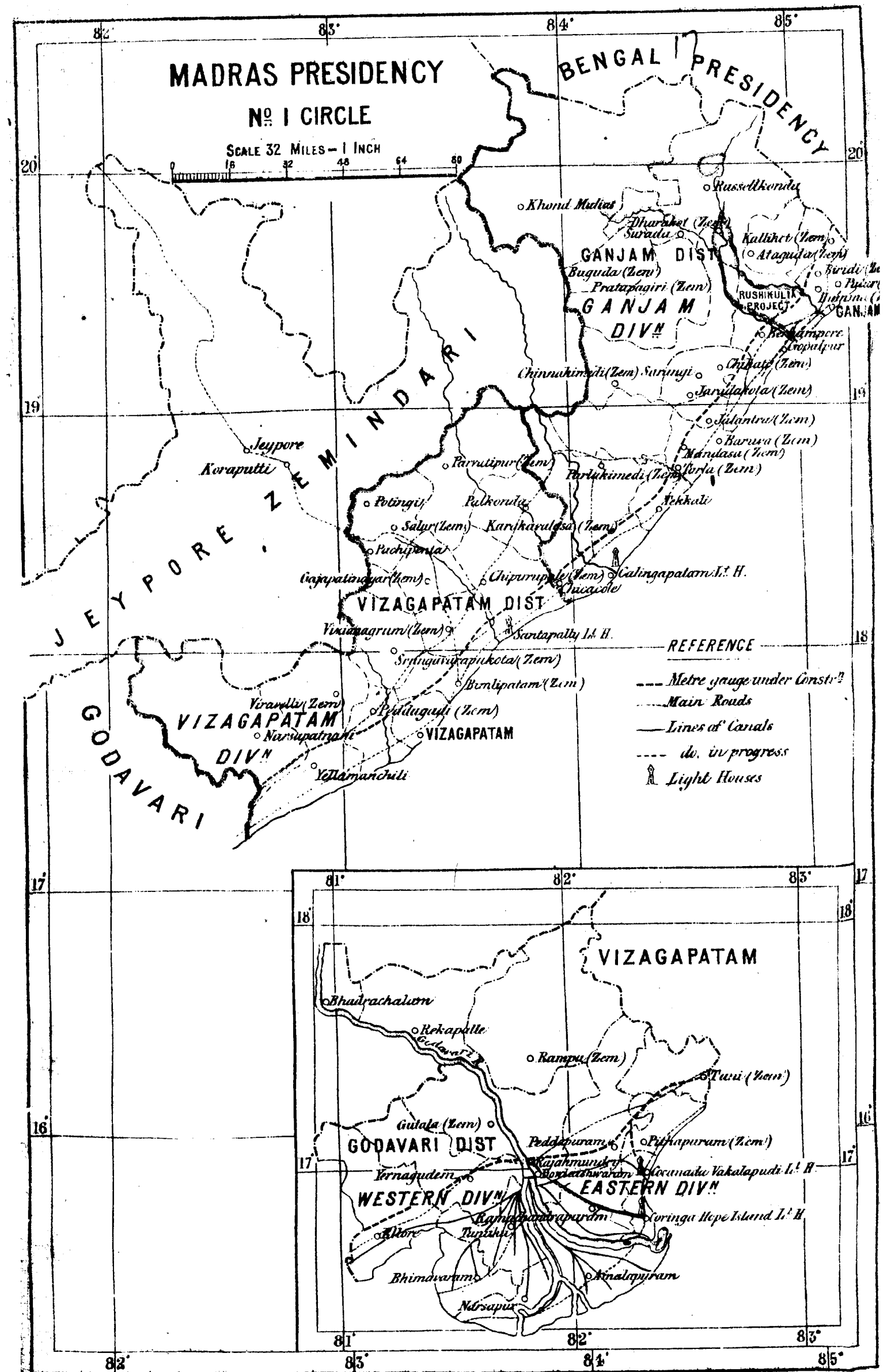
193. A sum of Rs. 430 was spent on repairs to the light-house on Hare island, Tuticorin, and to the Superintendent's quarters and the lightning conductor of the light-house at Muttum.

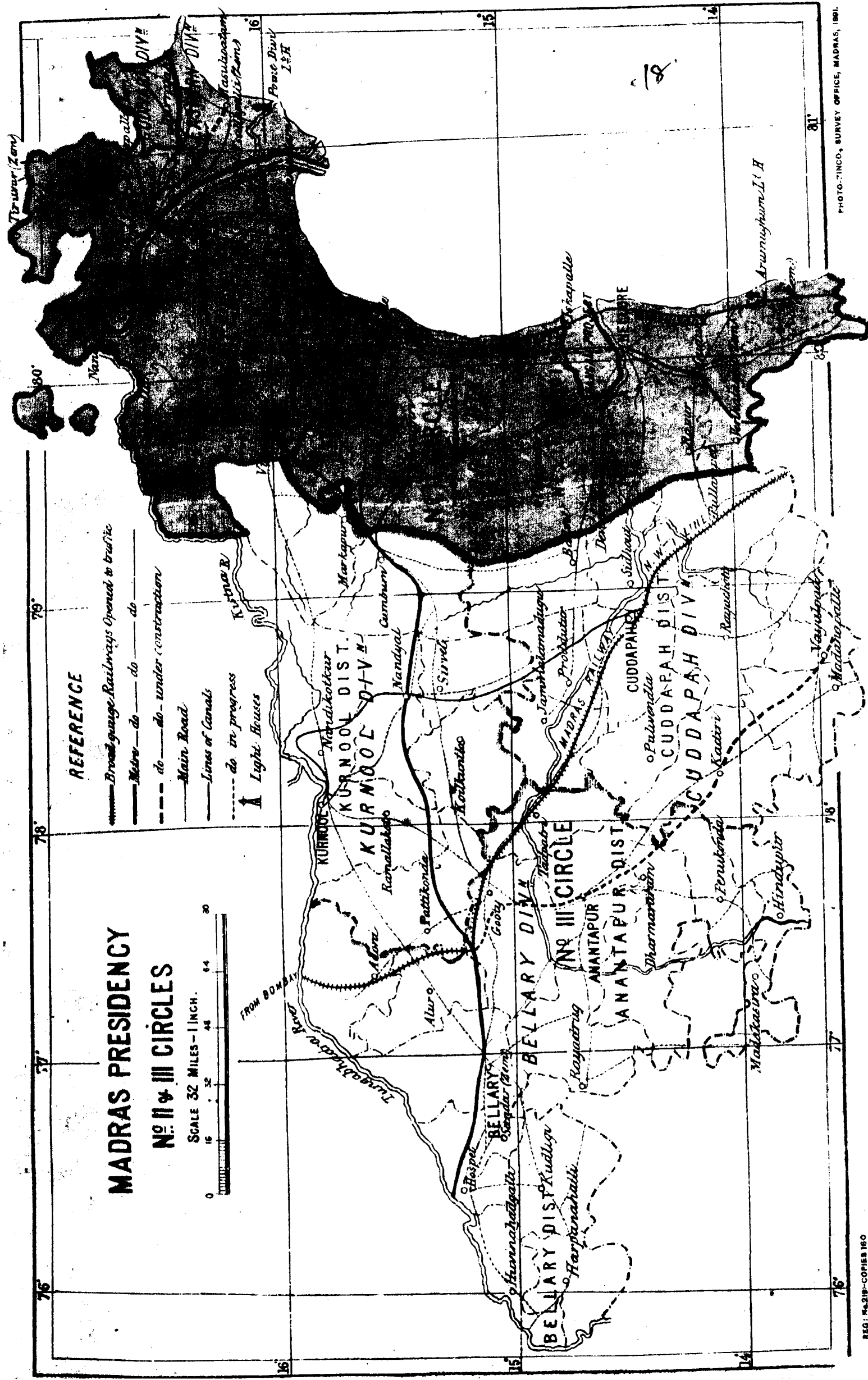
194. **Presidency.**—Rupees 1,783 were expended under this head on original works and repairs to Senate House and Master Attendant's office.

VIII.—MISCELLANEOUS—DEPOSIT CONTRIBUTIONS.

195. **Presidency.**—Constructing Victoria Hospital for caste and gosha women; total sanctioned estimate Rs. 89,550; expenditure during 1890-91 Rs. 16,331; amount previously expended Rs. 60,182; total expenditure Rs. 76,513. The whole of the building, including the Superintendent's quarters, was completed; some work in improving the drainage of the grounds remained to be done.

196. Cricket Pavilion at Chepak; amount of estimate Rs. 13,440; expenditure during 1890-91 Rs. 3,058. The foundations were executed and partly laid; materials for superstructure collected.



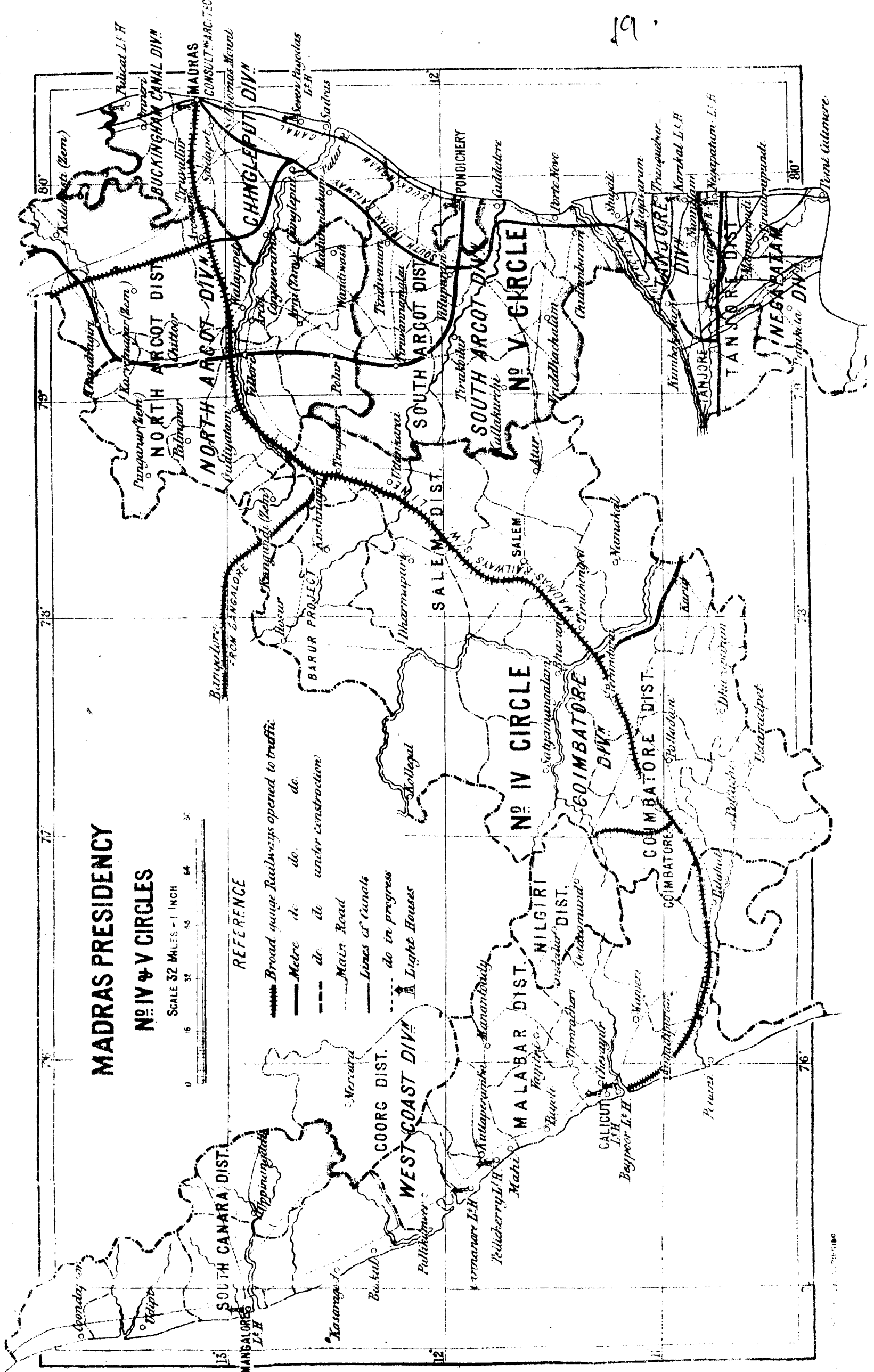


MADRAS PRESIDENCY
No. 1 & III CIRCLES

SCALE 32 MILES - 1 INCH.
0 8 16 24 32

REFERENCE

- Broad gauge Railways Opened to traffic
- Metro do do do
- do do under construction
- Main Road
- Lines of Canals
- do in progress
- ▲ Light Houses

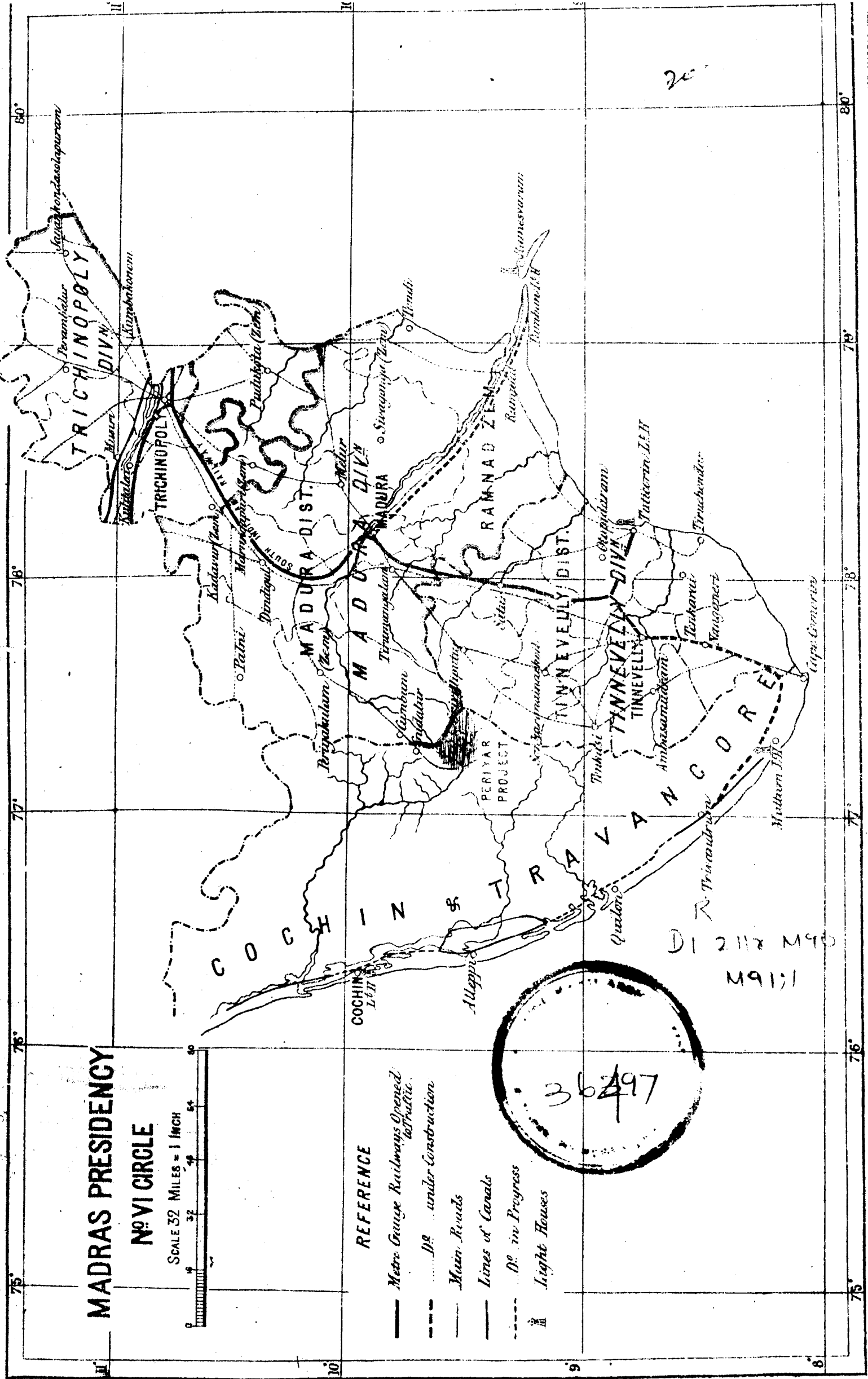


MADRAS PRESIDENCY

No IV & V CIRCLES

SCALE 32 MILES = 1 INCH

- REFERENCE
Broad gauge Railways opened to traffic
Metre do do do
do do under construction
Main Road
Lines of Canals
do in progress
Light Houses



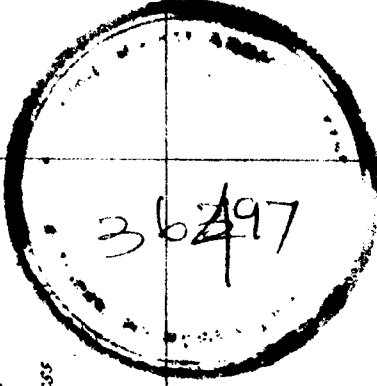
MADRAS PRESIDENCY

No VI CIRCLE

SCALE 32 MILES = 1 INCH

REFERENCE

- Metre Gauge Railways Opened to Traffic
- Do under Construction
- Main Roads
- Lines of Canals
- Do in Progress
- Light Houses



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ADMINISTRATION REPORT

OF THE

PUBLIC WORKS DEPARTMENT.

(GENERAL, BUILDINGS AND ROADS BRANCH.)

MADRAS PRESIDENCY

FOR THE YEAR

1890-91.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.
1891.

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MAP OF THE MADRAS PRESIDENCY

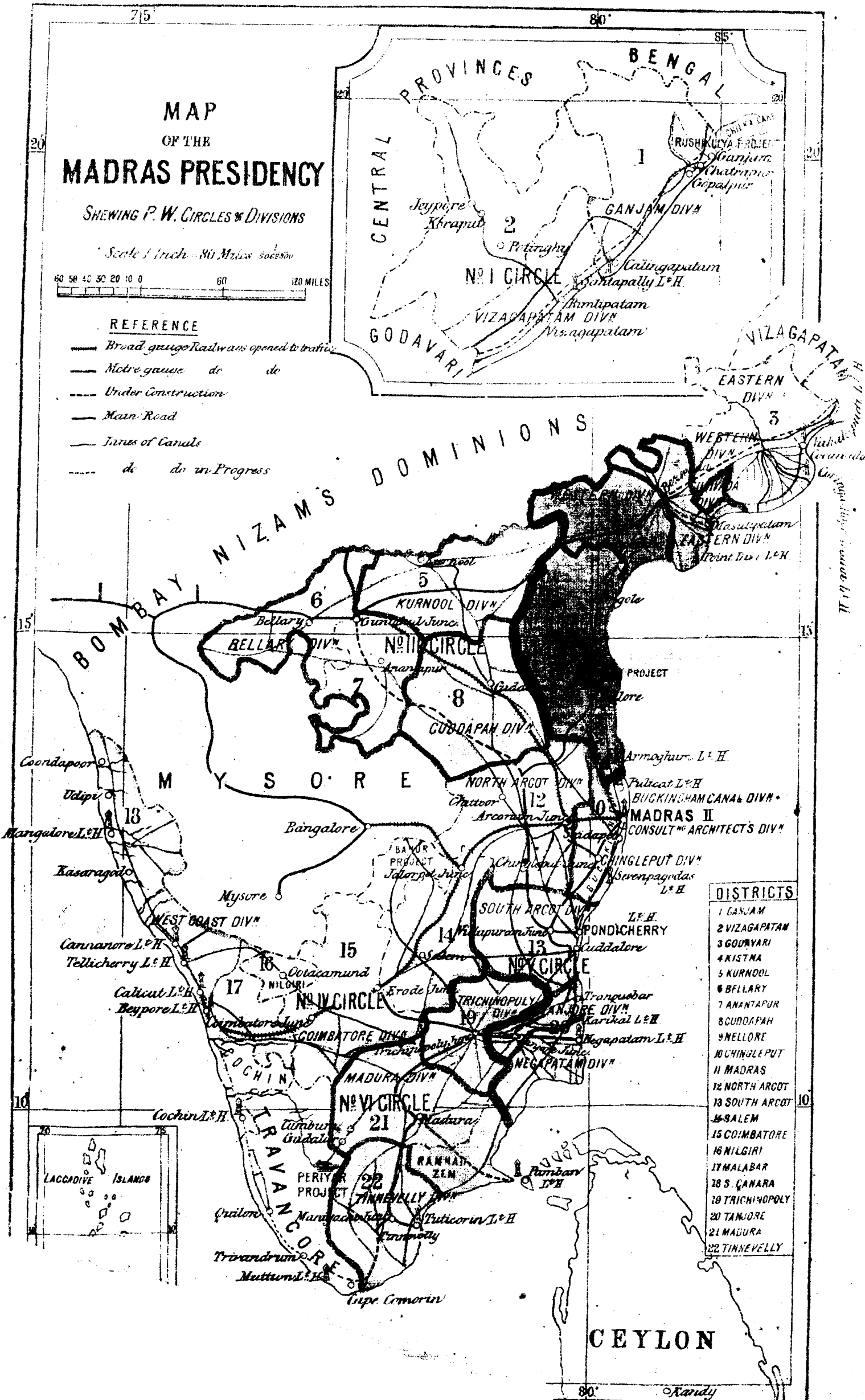
SHOWING P. W. CIRCLES & DIVISIONS

Scale 1 inch = 80 Miles 500000

60 50 40 30 20 10 0 60 120 MILES

REFERENCE

- Broad gauge Railways opened to traffic
- Metre gauge do do
- Under Construction
- Main Road
- Lines of Canals
- do do in Progress



ADMINISTRATION REPORT

OF THE

PUBLIC WORKS DEPARTMENT, MADRAS,

(GENERAL, BUILDINGS AND ROADS BRANCH)

FOR THE YEAR 1890-91.

I.—GENERAL REMARKS.

Administration.—The charge of the General, Buildings and Roads Branch was held by Lieut.-Colonel R. R. E. Drake-Brockman, R.E., as Acting Chief Engineer and Joint Secretary to Government until near the end of July 1890, when Colonel J. O. Hasted, R.E., the permanent Chief Engineer and Secretary, retired from the service while on furlough in England. Colonel J. Pennycook, R.E., was then appointed Chief Engineer and Secretary to Government and assumed charge of the office on the 29th July 1890. Mr. G. T. Walsh, M.L.S.R.C.E., who continued to administer the Irrigation Branch throughout the year, held the appointment of Acting Secretary until Colonel Pennycook joined, when he reverted to his substantive office of Joint Secretary.

The following is an extract from the Proceedings of Government recorded on Colonel Hasted's retirement from the department:—

"His Excellency the Governor in Council avails himself of the occasion of the retirement of Colonel J. O. Hasted, R.E., to express his sense of the important and faithful services rendered in the Public Works Department to the State by that able and meritorious officer during the long period of 34 years, in the course of which he occupied, always with credit, every appointment from the lowest to the highest of the executive grades, distinguishing himself particularly in connection with the execution and management of the great irrigation works of the Northern Delta, with which his name will be long associated.

The circle charges were as follows:—the I Circle, with head-quarters at Dowlaish-weram, was held by Mr. J. W. Martin, Superintending Engineer, temporary rank, until September 1890, when he was succeeded by Mr. G. D. Wybrow on the return of the latter from furlough. The II Circle, head-quarters, Bezwada, and the III Circle, head-quarters, Bellary, were throughout the year in charge of Mr. J. Hamman and Colonel H. Smalley, R.E., respectively. The IV Circle, head-quarters, Coim-batore, was held by Major D. McN. Campbell until July 1890, when he was transferred to the charge of the Periyar project. Lieut.-Colonel R. R. E. Drake-Brockman, R.E., then assumed charge of the circle and administered it for the remainder of the year. The V Circle, head-quarters, Madras, was held by Colonel W. H. Burton, R.E., until his retirement in December 1890, when he was succeeded by Major D. McN. Campbell, R.E. The VI Circle, head-quarters, Trichinopoly, was administered by Colonel A. C. Smith, R.E., until February 1891, when he proceeded on privilege leave, and the charge of the circle then devolved on Mr. J. W. Martin as Officiating Superintending Engineer. The office of Consulting Architect remained in the hands of Mr. H. Irwin, C.I.E., throughout the year. The charge of the Periyar project works was held by Colonel J. Pennycook with the rank of Chief Engineer, II Class, until July 1890, when he was succeeded by Major D. McN. Campbell, R.E., Superintending Engineer. In December 1890, on Major Campbell's transfer to the V Circle, the charge of the project was placed in the hands of Mr. H. S. Taylor, Executive Engineer, who holds it with the rank of Superintendent of Works, under the direct orders of the Chief Engineer, Public Works Department.

2. *Grants and expenditure.*—The following statement shows the grants and expenditure of the year under the different finance heads:—

Fund and finance heads.	Original grant.	Revised estimate.	Actual expenditure.
1	2	3	4
	RS.	RS.	RS.
Imperial, Military works	1,00,400	1,12,900	1,14,590
Do. Civil works	22,400	27,900	25,654
Provincial do.	28,50,000	26,50,000	24,84,960
Local Incorporated funds	1,13,000	87,000	94,787
Do. Excluded do.	...	15,510	18,357
Estate works	1,75,519	92,160	93,078
Total ...	32,61,319	29,85,470	28,31,426

3. *Madras Harbour works.*—The progress on the reconstruction of the Madras Harbour works during the year was satisfactory. The advance of the superstructure was not so great as in the previous year, but this was due to the wider walls necessary in the pier heads. The work will, it is hoped, proceed much more rapidly when the new all-round titan crane, ordered from England, has been brought into use. A careful record kept during the year shows that there were only 112 days on which the sea was calm enough to allow of work on the rubble base by divers below the surface. On 87 of these days concrete blocks were set in the superstructure of the north and south piers.

North pier.—The progress made was rapid so long as construction was confined to the building of the ordinary 24-foot section of the superstructure, for work on which the present titan cranes are well adapted; but, after the pier head was commenced, progress was unavoidably slower.

Five hundred and eighty-three blocks were set in position, 103 of these being special blocks for the north pier head. The total advance in the north arm was 337½ lineal feet, of which the 24-foot wall took up 300 feet, the remaining 37½ feet being on the pier head superstructure which is of a wider and deeper section. The end of the north pier was thus brought up to 3,616¾ feet from the commencement of the concrete block work begun in the year 1876.

The wave-breaker protection to the north pier was extended to the end of the completed superstructure with a width of 28 feet seaward of the pier. The ultimate width will be 40 feet at a foot above high-water level, and this extension will be commenced after the arrival of the large crane. The blocks in the wave-breaker weigh 30 tons each, and 661 of these blocks, equal to 19,830 tons of concrete, were deposited. 11,321½ tons of rubble stone were deposited from boats into the north pier base as a foundation for the blocks, in addition to some of the old rubble foundation from the south pier raised by the grab dredger. The north pier rubble base was also paved or consolidated with Portland cement concrete for a length of 743 feet and a width of 20 feet, over which area was spread 825½ cubic yards of concrete.

South pier.—An advance of 68½ lineal feet was made to the pier head superstructure. The section of the block work reached 38 feet in width and was founded at 34 feet below water-level. A total of 201 blocks were set in eleven courses and the pier head was advanced 75 feet. The total length of the south pier inclusive of pier head is to be 3,968½ feet, and, at the close of the year, 3,775 feet had been completed. The iron caisson, which is to contain the solid mass of concrete forming the end of the pier head and upon which a light-house can eventually be erected, was received from England, the cost being Rs. 19,878.

One hundred and thirty-four blocks of 30 tons each were deposited to form the wave-breaker, the width being 40 feet from the pier. A deficiency of 5,305½ tons of rubble in the south pier rubble base was supplied by the special stone

boats in use for receiving the surplus stone raised by the grab dredger. The rubble base of the pier was paved with concrete along the inner face of the stone base, as at the north pier, for a length of 722 feet by 20 feet width, over which area 802½ cubic yards of concrete were spread.

The rubble revetment protecting the foreshore to the north of the harbour had to be extended, the erosion of the shore having continued to a serious extent. An estimate, amounting to Rs. 1,55,462, for this work was accordingly sanctioned. This outlay will continue the revetment to a further length of about one thousand yards, after which all attempts at protection will probably cease, as it seems certain that, wherever the revetment ends, the eroding action of the sea will form a bay of more or less extent. The revetment lengthened as proposed will protect all property of any value in this locality, the land to the north being of comparatively little worth.

Concrete block-making.—It was not necessary to continue block-making throughout the year, there having been a large number of blocks on hand from the previous year. 1,577 blocks were made, of which 631 were the ordinary 30-ton wave-breaker blocks, 124 superstructure blocks for the 24-foot section of the wall, and 822 special-shaped blocks for the north and south pier heads. 25,662 cubic yards of concrete were employed in this outturn.

Portland cement.—5,043½ tons of Portland cement were received on the works through the India office. Each consignment was tested on arrival in India and found to be suitable and in accordance with specification. 3,758½ tons were consumed in block-making, 278½ tons on reconstruction works, and 101½ tons on subsidiary works, making a total consumption of 4,138½ tons, and leaving a balance on hand of 3,529 tons, inclusive of the balance of the previous year.

Quarries.—The outturn was 74,161 tons of stone and this quantity was conveyed to the works in 12,075 wagons by the South Indian Railway. The quarry railway lines were maintained in good order throughout the year.

Iron pier.—The renewal of the decking of the iron screw pile pier and the bracing of the structure were completed. The pier is now rigid and in efficient order.

Expenditure.—The expenditure on the works was Rs. 7,01,475, and the total expenditure to the end of the official year was Rs. 44,40,777 as against the total estimate of Rs. 45,90,051.

4. *Negapatam harbour.*—The state of the bar at the mouth of the Negapatam harbour came under discussion during the year. The position of the channel across the bar is affected by the changes in the sand spits which form or disappear at the mouth of the river in accordance with the force and direction of the wind, sea, and current, and the depth of the water in the channel depends on the river current having sufficient force to scour a passage. The encroachment of the sea during the year caused some anxiety to the mercantile community, and the Port authorities threw out some groynes to protect a spit of land which was being eroded to a dangerous extent. This work served the immediate purpose in view, but the impediments to the trade of the port owing to the state of the bar seemed to call for more effective treatment, and a committee, consisting of the Chief Engineer, the Presidency Port officer, and two members chosen by the mercantile community of Negapatam, was formed under orders of Government to take the whole circumstances into consideration after local investigation. The committee visited the port accordingly and drew up a report, the consideration of which did not fall within the official year under review.

5. *Artesian boring.*—The result of the experimental boring at Tuticorin referred to in the previous report has unfortunately been unsuccessful. The boring was started with an 8-inch pipe. After going through some sand and sandy clay, loose kunker was met with at a depth of 17.5 feet and limestone at 18.5 feet. The boring then passed through grey sand and clay until a depth of 53 feet was reached when limestone was again met with. This layer, only one foot thick, was bored through, and, after going through five feet of grey clay, limestone was for the third time met with at a depth of 59 feet. The stone brought to the surface from a depth of 62 feet was hard compact limestone of a reddish colour. A layer of sandstone, nearly three feet

thick was encountered at a depth of 74.62 feet, and below this layers of different colored clays and laterite were penetrated until at a depth of 116.5 feet trap was reached, and then gneiss or granite at 117.5 feet. The sample of rock brought up from this depth had every appearance of being primary rock. It was therefore considered useless to continue boring any further and the attempt was abandoned after an outlay of Rs. 6,253 had been incurred.

In September 1890, the Geological Department was referred to for an opinion as to the possible existence of water-bearing strata near the town of Ongole, and, in reply, the Superintendent stated that, judging from the geological features of the country, there was a probability of water in quantity large enough to yield a very important supply being found. He also suggested the most convenient site for boring. Acting on this advice, the Municipal Council has resolved to undertake the boring of an artesian well, the boring plant from Tuticorin being transferred to Ongole for the purpose.

6. *Gopālpur pier.*—The circumstances under which the abandonment of the pier at Gopālpur was decided on were noticed in the previous report. Further inquiry showed that there would be great difficulty in dismantling the structure and that to do so without any definite object in the disposal of the materials would involve an expenditure disproportionate to any sum likely to be realised. A proposal to utilise the pier for landing stores for the East Coast Railway also came up subsequently, but to render the pier quite serviceable it was thought that an additional length of 500 feet, so as to place the head beyond the outer line of surf, would be required. No intention was expressed by the Railway authorities of meeting the cost of this extension from Railway funds, and the Provincial Government was not prepared to spend any more money on the improvement of the structure. Hopes are entertained that it may still be found practicable to utilise the materials elsewhere. The maintenance of the pier has been entrusted to the Marine Department.

7. *Improvements to Ryves' canal at Bezvāda.*—Traffic has greatly increased in recent years at the Bezvāda wharf, where passenger and cargo boats from Madras on the south and from the Godāvāri on the north concentrate their cargoes on less than half a mile of landing space. To the trade of the canal has been added that of two railways, the Nizam's and the South Mahratta, and it is anticipated that a further impetus to trade will shortly be given by the Nellore extension from the south and the East Coast Railway to the north. In order to relieve the congestion of traffic thus arising and allow room for its expansion, it is proposed to widen Ryves' canal, to remove the regulator lower down, and to build a bridge across the canal which will make Buckinghampett and the triangle of land between the Ryves' and the Ellore canals readily accessible both to boat and cart traffic, and thus divert to the new suburb much of the traffic which is now concentrated on the present crowded, low-lying, unhealthy town. This change is called for on sanitary no less than on mercantile grounds. The following estimates, providing for the requisite works, have been sanctioned accordingly:—

	RS.
Widening first mile of Ryves' canal	11,000
Constructing a new regulator lower down the canal	9,100
Constructing a bridge	17,600
Total ...	37,700

8. *Erosion of the foreshore at Cochin.*—The action of the sea on the foreshore on either side of the mouth of the harbour at Cochin causes periodical erosion more or less serious during the prevalence of the south-west monsoon, notwithstanding the protection afforded by a series of groynes constructed along the coast. Such an erosion took place during the south-west monsoon of 1890. It was at one time thought that considerable damage was likely to occur. The Superintending Engineer was accordingly directed to visit Cochin and report on the circumstances. Meanwhile, the action of the sea was being carefully watched by the Port officer and Executive Engineer, but no remedial measures could be adopted during the height of the monsoon. It was, however, decided that what was required was the reconstruction

of the northernmost and last of the series of groynes. At the period of the Superintending Engineer's visit in October, an improvement had taken place from natural causes and very little beyond attention to some of the existing groynes was then needed. He also recommended the planting of screwpine, rabbit wort, and other protective vegetation at certain places within the limits of the Cochin State. This suggestion was duly referred to the proper quarter.

9. *Bridge over the Vaigai near Madura.*—The importance of throwing a bridge across the Vaigai near the populous town of Madura so as to give the old trunk road a more convenient means of crossing the river than the existing causeway was generally admitted. The Local Fund Board and Municipality each offered a substantial contribution as an addition to local subscriptions and appealed to the Government to supplement these donations by a grant from Provincial funds. The Government acceded to the appeal on certain conditions, one of which was that the work was to be carried out under the supervision of an officer in whom they had confidence. The original estimate for the work amounted to Rs. 1,15,810, but subsequent revisions raised it to Rs. 2,33,050, (including Rs. 59,507 for Public Works supervision and tools and plant) of which the Government contribution was Rs. 60,000. In 1886, the execution of the work was transferred from the Local Fund Board Engineer to the Public Works Department, by which it was finally completed at a cost of Rs. 2,76,994, exclusive of the charges, amounting to Rs. 56,085, for Public Works supervision and tools and plant, and handed over to the District Board for future maintenance in April 1890.

10. *Bridges over the Ponnai and Gadilam near Cuddalore.*—During the north-east monsoon of 1884, the country in the neighbourhood of Cuddalore was flooded by the overflow of the Ponnai and Gadilam, and the two bridges over those rivers were carried away. After careful investigation of local conditions it was decided to replace these bridges by improved structures under the supervision of officers of the Public Works Department. The bridge across the Ponnai was estimated to cost Rs. 1,66,000, for which a masonry structure of 16 arches of 60-feet span was provided, the waterway allowed being 22 per cent. in excess of the waterway of the old bridge. Over the Gadilam an iron girder bridge also estimated to cost Rs. 1,66,000 was recommended. This bridge was to consist of 13 bays of 62-feet span each and a roadway of 18 feet clear. The waterway allowed approximated with that of the railway bridge constructed above and was considered sufficient.

The estimates for both bridges were subsequently revised. That for the Ponnai bridge was raised to Rs. 1,75,300 and the estimate for the Gadilam bridge to Rs. 2,04,750. The total cost against these revised estimates to the end of the year was—Ponnai bridge Rs. 1,79,779 and Gadilam bridge Rs. 2,01,434. Both bridges were successfully completed and opened for traffic before the close of the official year.

The future maintenance of the bridges devolves on the District Board.

11. *New Law Courts, Madras.*—The outlay on these buildings up to the close of the previous official year amounted to Rs. 4,52,159 and during the year under review a sum of Rs. 2,62,140 was expended. All the brick work in the three stories was completed and the towers above were commenced. The outer verandahs, a portion of the tiled flooring and the dados were finished, and considerable progress was made with plastering and the preparation of materials for the ceilings. Nearly all the doors and windows required for the building were completed and the stained glass work, internal fittings, and ornamental iron work got ready. It is intended that the upper part of the main tower shall be adapted to receive a new and improved port light, and, when this has been fixed, the present column in the vicinity of the buildings will be removed.

12. *Victoria Technical Institute and Connemara Free Library.*—The institute has been established with the view of fostering technical education in this Presidency. The building is estimated to cost Rs. 3,56,255 and will, it is expected, not only afford proper facilities for the advancement of scientific knowledge but will be an ornament to the town of Madras. The foundations were laid during the year and the entire building raised to basement level. The wood work and roofing materials were also under preparation. The total outlay to the close of the year was Rs. 83,917.

13. *Inspection of light-houses.*—The undermentioned light-houses were inspected by superior officers of the Public Works Department :—

Calingapatam.	Manapad.
Santopalli.	Cochin.
Vakalapudi.*	Calicut.
Hope Island.†	Tellicherry.
Negapatam.	Cannanore.
Tuticorin.	Mangalore.

* On 7th April 1891.

† On 8th April 1891.

An inspection of all light-houses on the coasts of the Madras Presidency was also made by Mr. W. T. Douglass, an expert specially sent out from England, and a full report submitted to the Government of India. This report was forwarded to the Madras Government for consideration. The various suggestions made were reviewed in detail and such orders passed as the circumstances seemed to require.

14. *Works in wards' estates.*—The following statement shows the grant and outlay on works in wards' estates placed under the charge of the Public Works Department :—

	Original grant.	Revised grant.	Outlay.
	RS.	RS.	RS.
Ganjam division—			
Parlakimedi	92,250	24,577	24,593
Chinna Kimedi		57	71
Jarada	13,530	2,645	2,420
Bodagada	4,920	5,535	5,478
Utlam	216	6	—43
Dharakot	7,380	7,072	6,988
Chakapalli	1,230	131	130
Tarlapetta	1,230		
Aska	1,230	5,830	5,828
Kurla	3,567	4,945	4,919
Attagada and Kallikot	45,510	33,825	37,255
Vizagapatam division—			
Chidikada and Jaganathapuram	3,420	6,824	4,227
Godavari Western division—			
Lakkavaram	323		403
Salem division—			
Erumaipati	713	713	809

Of the above, the following estates were handed over to the proprietors before half the year had elapsed, viz., Parlakimedi, Chinna Kimedi, and Utlam, and to this cause was due the reduction of the original grants at the disposal of the Public Works Department for expenditure on works.

The Jarada estate was in debt and expenditure had in consequence to be curtailed. The short outlay in Chakapalli and Tarlapetta was due to delay in settling the scheme of works to be undertaken. A sum of Rs. 10,000 was surrendered under "Original works, communications" in the Attagada and Kallikot estates, as the amount was in excess of requirements. In other cases the grants were fairly well utilized.

15. *Presidency Public Works Stores.*—Mr. L. L. Wickham, Assistant Engineer, 1st grade, assumed charge of the stores and workshops during the year from Colonel S. C. Clarke, R.E. Stock was taken by both officers prior to the transfer of charge :—

	RS.	A.	P.
The opening balance of the year was	1,58,966	2	6
The receipts during the year were—			
	RS.	A.	P.
From London	22,013	8	2
" Public Works divisions	4,063	8	2
" local purchase	187	15	2
	26,264	15	6
Total	1,85,231	2	0

The issues were—

	RS.	A.	P.	RS.	A.	P.
To Public Works divisions	10,712	10	11			
" Public Works Workshops, Madras	17,500	10	1			
" Military Works division	1	8	0			
" Civil Departments	28	9	6			
" Military Department	739	10	0			
" Harbour Trust Board	51	4	0			
" Municipality	10	0	0			
" Private sales	819	5	6			
				29,663	10	0
Leaving a closing balance of				1,55,567	8	0

Though less than the opening balance by Rs 3,398-10-6, the closing balance of the year was in excess of the sanctioned stock reserve (Rs. 1,50,000) by more than Rs. 5,000. The excess is explained to be due to a large accumulation of obsolete stores, for which the demand has hitherto been small.

The original grant for purchase of "tools and plant," stock materials, and carriage and repairs was Rs. 17,410, which was subsequently raised to Rs. 25,000. The actual expenditure was Rs. 25,679.

There were 22 consignments of stores from England and 31 shipments to Indian ports and Rangoon as against 28 inward and 50 outward consignments in the previous year.

16. *Presidency Public Works Workshops.*—The following is a statement of the work done in the shops including centages during the year under review as compared with the previous year :—

	1890 91.	1889 90.	More than 1889 90.	Less than 1889 90.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Work done for Public Works Department including the Military Works Department and State Railways	68,725 14 1	77,257 12 2		9,027 13 0
Work done for other departments	50,877 3 9	43,167 6 8	7,902 5 2	
Do. for private parties	3,367 9 7	3,391 5 2		523 11 7
Total	1,22,970 11 5	1,24,316 8 0	7,902 5 2	9,561 8 7

It will thus be seen that there has been a large decrease in the amount of work done for the Public Works Department and this decrease has been continuous for some time. As the existence of these shops imposes an annual loss to the State of no inconsiderable amount, while the value of work done for the department is comparatively small, the question of their continued maintenance is again engaging attention. It may also be noticed that, since the matter was considered last, there has been an extension of private enterprise in the Presidency town, where several foundries are now at work. The increase in the value of work done for other departments is due to an exceptional cause, steam machinery having been provided during the year for the Government Printing Press and set up by the agency of the Public Works Workshops.

The value of machinery and plant in the shops at the beginning of the year was Rs. 1,06,347-10-11. After deducting the book value of articles transferred to other departments, viz., Rs. 133-8-11, and the usual 4 per cent. for depreciation and adding receipts, amounting to Rs. 1,864-3-9, the balance at the close of the year amounted to Rs. 1,03,829-12-9. The expenditure on tools and plant and machinery was Rs. 2,069 and that on new plant was Rs. 1,731, while the balance of materials on hand at the end of the year was Rs. 18,924-13-10 as against a sanctioned reserve limit of Rs. 25,000.

The workshops afford gratuitous instruction of a practical character to students of the College of Engineering who elect mechanical engineering as their profession.

17. *Government brick and tile, &c., manufacture.*—Operations at the Government Brickfields at Madras were continued during the year. The demand for bricks for the public works under construction has greatly increased, so that an extension of the brickfields was found necessary. An estimate of Rs. 8,139 was also sanctioned for

pugging machinery to be worked by steam power, and a shed, to cost Rs. 4,317, with foundations for the machinery, was ordered to be erected. Earth is obtained from the bed of the Spur tank and it was decided that between this spot and the moulding sheds a light tramway should be laid. An indent on the Home Government for the requisite material with twelve wagons was accordingly sent forward. The outturn during the year was 5,579,719 bricks, 134,895 flooring tiles, and 78,287 roofing tiles, besides a large quantity of terra cotta, all of which was for Government works. A small number of bricks at an enhanced rate was also supplied to private persons.

18. *River Cooum improvements scheme.*—The insanitary condition of the river Cooum owing to the low level of the water during the dry months of the year was felt to be a nuisance and a serious menace to public health. The Sanitary Engineer was accordingly called on in February 1890 to prepare and submit, with as little delay as possible, a detailed scheme for the improvement of the river. The scheme prepared in accordance with these orders was laid before Government in December 1890.

Mr. Jones' scheme consists of two parts. The first part dealing with the lower portion of the river provides for closing the northern of the two branches, into which it divides near its mouth; for improving, deepening and re-sectioning the remainder of the bed; and for obtaining a constant communication between the river-bed and the sea.

For the upper portion of the river above the Harris' bridge, it is proposed to construct three weirs, in addition to that between the tidal and non-tidal portions of the river, for the purpose of maintaining a maximum depth of four feet of water in the bed.

In both portions the banks are to be improved and strengthened, training walls and groynes are to be constructed where necessary, and sewage is to be diverted from the river, while wharves for the convenience of boat traffic are to be constructed in the tidal portion.

For the first or tidal portion of the river two alternative schemes are presented—No. 1, in which it is proposed to admit the tide through the present mouth of the river, the bar being removed by the action of a groyne which it is proposed to construct to the south of the Napier bridge; No. 2 being for the excavation of a canal from the harbour to join the river near the St. Mary's bridge.

The first scheme is estimated to cost Rs. 12,25,000, the second to cost Rupees 10,90,000; about Rs. 2,50,000 in each case being due to the non-tidal portion of the river and the remainder to the lower or tidal portion.

The Chief Engineer, to whom the scheme was referred for review, recommended the adoption for the tidal portion of the river of Mr. Jones' scheme No. 2, including the weir at the Harris' bridge with certain modifications in details explained fully in a separate note and with the addition of sluice gates at the Napier bridge. For the non-tidal portion, the Chief Engineer was of opinion that nothing should be done beyond slight improvements to the bed and banks. The matter was under the consideration of Government at the close of the year.

19. *Famine relief.*—The periodical reports of the condition of districts showed towards the close of the year that, owing to insufficient rainfall, the prospects in several localities were by no means re-assuring. The Government, accordingly, in anticipation of scarcity, impressed upon Collectors the necessity for at once preparing programmes of works for all the affected tracts and directed that selections should be made from the lists of irrigation works, both major and minor, in communication with the Public Works Department. Estimates for the works thus selected were to be got ready, so that there might be no delay in starting them when necessary. Where the irrigation works available in any affected tract were insufficient to meet all the demand for employment likely to arise therein, a sufficient number of suitable Local Fund works were to be added. Portions of the following districts showed signs of impending scarcity more or less severe and works were accordingly started therein as necessity arose, viz., North Arcot, Chingleput, Coimbatore, Cuddapah, Nellore, Tinnevely and Malabar. The review of operations consequent on this scarcity will fall more appropriately into the report of the following year. The preliminary arrangements for affording relief and the starting of works are all that come within the period embraced by this report.

20. *Divisional changes.*—The only changes of importance were the transfer of the North Arcot division from the V to the IV Circle and the Tanjore and Negapatam divisions from the VI to the V Circle, and the incorporation of the No. II Periyar division in the VI Circle. The amalgamation of the Central Godavari division with the Western division, which was carried out on 1st April 1890, was noticed in the previous year's report.

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

22. *Roads.*—The following statement shows the length of road communication maintained by public authorities in Madras during the year 1890-91:—

Name of division.	Name of district.	Length of metalled roads maintained by the Public Works Department.	Length of unmetalled roads maintained by the Public Works Department.	Length of metalled roads maintained by Local authorities.	Length of unmetalled roads maintained by Local authorities.	Total of metalled roads.	Total of unmetalled roads.
		MILES.	MILES.	MILES.	MILES.	MILES.	MILES.
Ganjam and Rushikulya ..	Ganjam ..	10½	1½	696	31	706½	32½
Vizagapatam ..	Vizagapatam ..	48½	2	308	488	356½	490
Godavari (Eastern, Central and Western) ..	Godavari ..	4	26½	703	228	707	228
Kistna (Eastern and Western) ..	Kistna ..	..	..	480	411	480½	437½
Nellore ..	Nellore ..	..	..	911	109	911½	139
Bellary ..	Bellary ..	..	..	166	520	166	520
Cuddapah ..	Cuddapah ..	33	..	44	475	77	475
Kurnool ..	Kurnool ..	..	..	322	878	322	878
Coimbatore ..	Kurnool ..	..	..	466	124	466	124
	Nilgiris ..	39	51½	54	450	93	501½
	Salem ..	..	..	554	1,352	554	1,352
	Coimbatore ..	..	..	974	564	974	564
West Coast ..	South Canara ..	..	..	148	803	148	803
	Malabar ..	35	..	459	852	494	852
North Arcot ..	North Arcot ..	..	..	1,435	..	1,435	..
Chingleput ..	Chingleput ..	..	..	608	75	608	75
South Arcot ..	South Arcot ..	..	47	687	427	687	474
Tanjore and Negapatam ..	Tanjore ..	..	146½	169	1,305	169	1,451½
Trichinopoly ..	Trichinopoly ..	20	..	513	133	533	133
Madura ..	Madura ..	..	..	570	692	570	692
Tinnevely ..	Tinnevely ..	..	..	817	129	817	129
	Total ..	191½	274½	11,075	10,946	11,266½	10,320½

NOTE.—This statement does not include roads and streets within municipal limits.

II.—PROGRESS OF WORKS.

I.—IMPERIAL—MILITARY WORKS.

23. *Ganjam.*—The expenditure under military minor original works was Rs. 916 against an allotment of Rs. 1,250. The number of works were three, as follows:—

	Estimate.	RS.
1. Constructing a well at Berhampore for the use of the public	...	920
2. Do. in the military cholera camp at Ampava	...	330
3. Providing padlocks to solitary cells of 27th Regiment, M.I.	...	42

In work No. 1 rock was met at a depth of 10 feet; the excavation was, however, carried down to a depth of 45 feet, and, as only a small quantity of water was found, the work was stopped; an alternative site settled by the Collector was objected to by the Commanding officer. The Executive Engineer explained that the Municipal Council offered no opinion regarding the new site and the grant was not, therefore, fully utilised.

Work No. 2.—The first site chosen had to be abandoned, as hard rock was met with near the surface. The work was commenced at a second site and completed except the beam and platform. There is now about 20 feet of water in the well. The estimate was exceeded by Rs. 100 for the above reasons.

Work No. 3 was completed.

24. The works in progress under repairs during the year were 9 in number, all of which were completed.

25. **Godavari (Eastern).**—Improvements to the existing drainage and the enlargement of the latrine in M.I. detachment lines at Sámalkót were carried out at a cost of Rs. 343, against a grant of Rs. 400, under minor original works. Other sanitary repairs were finished from the grant for repairs. Repairs to the military hospital building and cook room were nearly finished. The expenditure under repairs, including compensation for quarters, amounted to Rs. 840 against a grant of Rs. 800.

26. **Vizagapatam.**—Re-roofing the military hospital at Vizianagrum; estimate Rs. 6,220; work completed at a cost of Rs. 6,057 against an allotment of Rs. 6,220. The expenditure under minor original works was Rs. 46 against an allotment of Rs. 500. This short outlay was due to the late receipt of allotment and to the Railway Department having drawn away a great deal of the available labour. The expenditure on repairs was Rs. 5,572 against an allotment of Rs. 5,000 for repairing roads and military buildings, &c., in the cantonment of Vizianagrum and those at Vizagapatam.

27. **West Coast.**—The following works were completed or in progress:—

(1) Transport lines at Calicut.—The bullock sheds were fully completed and occupied. The sheds for mules and elephants were also completed, but not occupied pending the execution of sundry improvements suggested by the Chief Commissariat officer. The outlay on the work up to the end of the year was Rs. 13,452 against an estimate of Rs. 12,980.

(2) Constructing a bakery at West Hill barracks at Calicut.—Completed but not taken over, as the Chief Commissariat officer wished to have some alterations and additions executed; outlay Rs. 5,202 against an estimate of Rs. 4,300.

(3) Slaughter-house at West Hill, Calicut.—This work was also completed, but was not taken charge of owing to the Chief Commissariat officer requiring to have certain alterations and additions done to it; estimate Rs. 3,465; outlay Rs. 4,482.

(4) New barracks for 30 men at West Hill, Calicut.—Foundation was in fair progress and sufficient materials for masonry and wood work for roofing were at site. The allotment of Rs. 10,000 was fully spent.

(5) A soldiers' institute for the European Infantry at Malapuram commenced last year was completed at a cost of Rs. 1,535.

(6) The old infectious disease ward at Malapuram was converted into quarters for the Commissariat Sergeant; estimate Rs. 2,270; outlay Rs. 2,651.

(7) Three additional latrines for the Madras Native Infantry at Mangalore were built at an aggregate cost of Rs. 1,000.

(8) A stable to Sergeant Instructor's quarters, Malabar Volunteer Rifles, was erected at a cost of Rs. 230.

28. **Coimbatore.**—The purchase of Mr. Stephens house at Yercaud for adaptation as quarters for the Sergeant Instructor and an armoury for the Yercaud Rifle Volunteers was effected for Rs. 4,800.

29. The following minor works were completed or in progress:—

(1) Constructing a magazine on Stonehouse Hill for the use of the Saluting Battery and the Nilgiri Volunteer Rifles at Ootacamund; estimate Rs. 1,650; outlay during the year Rs. 1,515.

(2) Compound wall to the west and north side of rest-house at Pódanúr; work nearly completed; estimate Rs. 493; outlay Rs. 404.

(3) Constructing a sick cart shed for the rest camp at Pódanúr; work completed; estimate Rs. 450; outlay Rs. 120.

30. The outlay under repairs, including compensation in lieu of quarters and rent of hired buildings for Medical and Military subordinates, amounted to Rs. 5,701.

II.—IMPERIAL—CIVIL WORKS.

31. **Ganjam.**—The only work commenced during the year was repairs to the Post office building at Parlákimedi; estimate Rs. 620 and expenditure Rs. 362. This work was not completed for want of funds.

32. **Godavari (Eastern).**—The expenditure under repairs was Rs. 1,001 against an allotment of Rs. 1,220. Materials were collected for a compound wall to the Post office at Kunavaram, but the work was stopped for want of funds. Rs. 812 were spent during the year on repairs to the Telegraph office and signaller's quarters, Cocanada, and to the Telegraph office, Rajahmundry, and Rs. 189 were expended on repairs to postal buildings at Sámalkót and Peddápúram.

33. **Vizagapatam.**—The Post offices at Vizagapatam and Bimlipatam were repaired at a cost of Rs. 449 against an allotment of Rs. 450. The Telegraph office at Vizagapatam was repaired at a cost of Rs. 540 against an allotment of Rs. 300. Additional funds were applied for but not sanctioned.

34. **Kistna (Eastern).**—The Post office building at Bezváda was repaired at a cost of Rs. 62.

35. The Telegraph offices at Masulipatam and Bezváda were repaired at a cost of Rs. 215 and 182, respectively.

36. **Kistna (Western).**—Alterations to the Post office and repairs to Sub-Postmaster's quarters at Duggirala and the Post office at Viuukonda were carried out at a cost of Rs. 881.

37. Repairs to the Telegraph office at Guntúr were completed at a cost of Rs. 158.

38. **Coimbatore.**—Two minor new works were undertaken at a cost of Rs. 51 under Postal and sums of Rs. 1,120 and Rs. 94, respectively, were spent on repairs to Post and Telegraph buildings.

39. **West Coast.**—A sum of Rs. 855 was spent on repairs to postal buildings.

40. **North Arcot.**—An outlay of Rs. 100 was incurred on repairs to the Post office building at Vellore.

41. **Chingleput.**—The repairs to the Váyalúr salt factory flood bank, which were commenced in the previous year, were completed at a cost of Rs. 8,203.

42. **Tanjore.**—The Post offices at Tanjore and Kumbakónam were repaired at an outlay of Rs. 123.

43. **Negapatam.**—The Post office building at Patukóta and the Government Telegraph office at Negapatam were repaired at a cost of Rs. 19 and Rs. 145 respectively.

44. **Trichinopoly.**—Alterations and repairs to the old cutcherry at Trichinopoly for the use of the Postal and Telegraph departments were carried out at a cost of Rs. 1,373.

45. **Madura.**—The opening of windows in the City Post office at Madura was carried out and alterations to a room in the Sub-Magistrate's cutcherry at Usilampatti to locate the Sub-Post office were in progress, the expenditure on both being Rs. 92. The Post offices at Peermade, Kovilur and Butlagundu were repaired at an outlay of Rs. 493.

46. **Tinnevely.**—The latrine in the compound of the Post office at Palamecottah was built at a cost of Rs. 182 and the Post offices at Vasudevanallúr, Virudupatti, Sátúr, Palamecottah and at Trivandrum were repaired at an outlay of Rs. 459.

47. **Presidency.**—The following works were completed:—

(1) Improving signallers' water closets and urinals, Telegraph office, Madras; expenditure Rs. 954.

(2) Constructing additional sheds at the Telegraph stores; expenditure Rupees 1,142.

- (3) Alterations and improvements to the General Post office, Madras; expenditure Rs. 724.
- (4) Alterations to the Post office at Mylapore; expenditure Rs. 92.
- (5) Alterations and improvements to the General Telegraph office, Madras; expenditure Rs. 388.
- (6) Providing sun-shades to the Railway Mail Service department, General Post office; expenditure Rs. 78.
- (7) Providing shelves to counters, Money Order department, General Post office; expenditure Rs. 143.

III.—PROVINCIAL—CIVIL BUILDINGS.

48. **Ganjam.**—The following works were completed or in progress :—

- (1) Constructing 26 police huts for the Reserve Police at Parlakimedi; estimate Rs. 7,150; work completed.
- (2) Constructing District Munsif's court at Berhampore; estimate Rs. 11,450. The main building was practically completed during the year. The latrine was under construction.
- (3) Constructing District Munsif's court at Aska; estimate Rs. 12,730. Materials to the value of Rs. 4,000 were collected, but work was stopped in February 1891, pending inquiry regarding the state of the present court-house building and the necessity for a new one; orders were received at the close of the year to resume the work. Excavating foundations was nearly completed by the end of March.
- (4) Constructing District Munsif's court at Sompét; estimate Rs. 12,360. With the exception of dais and glazed windows, the main building and compound walls were practically completed. The latrine was under construction.
- (5) Demolishing and renewing the verandah roof of the Native College at Berhampore; original estimate Rs. 1,650. Work was completed at a cost of Rs. 1,743. Owing to the uncertainty whether the amount of the revised estimate (Rs. 2,240) would be sanctioned and to the necessity of the building being completed before the end of June 1890, the revised estimate was not fully worked out.
- (6) Constructing masonry drains in the District jail, Berhampore; estimate Rs. 1,480; work completed.
- (7) Constructing Post office at Udayagiri; estimate Rs. 2,500. Work was commenced in October 1890, but the contractor failed to complete it on account of the feverish character of the locality. Special arrangements were made for the supply of the wood work.
- (8) Constructing Post office at Balliguda; estimate Rs. 2,500. Work commenced in October 1890. Most of the materials were collected.
- (9) Constructing a dead-house in lieu of the existing one at Chicacole; estimate Rs. 660; work completed and handed over in January 1891.
- (10) Making record-racks with wooden shelves for the District court, Berhampore; estimate Rs. 590. The racks received in the previous year were fitted up and the work completed.
- (11) Constructing second-class police station-house at Jaganathapur; estimate Rs. 1,470. The completion of this work was delayed for want of iron work for doors, for which no arrangements had been made.
- (12) Constructing Sub-Magistrate's cutcherry and sub-jail at Berhampore. No estimate was sanctioned for this work, but a sum of Rs. 1,000 was granted for the collection of materials. Further work was delayed pending receipt of the revised type design.

49. The number of works in progress under repairs during the year was 11, and 10 of these were completed.

50. **Godavari (Eastern).**—The following works were completed or in progress :—

- (1) Additional buildings to the Rajahmundry college; revised estimate Rupees 13,600; work completed except flooring with asphalt and fitting pines. &c.

(2) Quarantine ward, Central jail, Rajahmundry; estimate Rs. 9,650; work completed except roofing, for which materials were collected.

(3) Close prison, Central jail, Rajahmundry; estimate Rs. 29,260; outlay Rs. 16,317 against a grant of Rs. 16,500; superstructure, block No. 2, built up to a height of 6 feet on the average; block No. 3 to a height of 4 feet all round; and block No. 4 to a height of 3 feet; other blocks built up to ground level.

(4) School-house at Bhadrachalam; estimate Rs. 6,000. Materials were being collected and wood work in progress in the Dowlaishweram workshops. The expenditure during the year amounted to Rs. 1,538 against a grant of Rs. 1,500.

(5) Church at Cocanada; a sum of Rs. 933, the balance of the Government grant-in-aid, was allotted during the year, against which Rs. 840 were spent by the Local Fund Engineer in completing the tower of the church.

(6) Additions and alterations to the Sub-Magistrate's office, Pithapuram; estimate Rs. 1,370; work completed and handed over to the Revenue Department at a cost of Rs. 1,270.

(7) Additional accommodation, a treasury room, ryot's shed and record-racks to the Sub-Magistrate's cutcherry at Tuni; estimate Rs. 1,180; work completed and handed over to the Revenue Department at a cost of Rs. 1,198.

(8) Addition of a room to the Sub-Magistrate's cutcherry at Tuni for Sub-Registrar's office; estimate Rs. 1,590; expenditure Rs. 1,500; work completed and handed over to the Sub-Magistrate before 31st March 1891.

(9) Well for the Police force at Kota; Rs. 151 were spent on earthwork. The work could not be proceeded with further owing to the difficulty in getting laborers.

(10) Constructing a third-class police station-house at Chintur; estimate Rs. 1,850; expenditure Rs. 530. Materials were under collection.

(11) Alterations to the Rajahmundry Central jail well pump; estimate Rupees 1,230; expenditure Rs. 1,118; work nearly completed.

51. The following repair works were carried out during the year :—

	Estimate. RS.	Outlay. RS.
Quarters and office of Special Assistant Agent, Kunavaram.	1,400	1,173
Aloe fence round do. do. ...	420	344
Police Head-quarters office Rajahmundry ...	660	742
Fencing round do. do. ...	600	495
Deputy Superintendent's quarters, Dowlaishweram work-shops ...	540	587
Buildings in Central jail, Rajahmundry ...	910	867

52. Petty repairs to Public Works buildings at Dowlaishweram were carried out at a cost of Rs. 1,948.

53. **Godavari (Western).**—The following works were completed or in progress :—

(1) Constructing Sub-Registrar's office at Bhimavaram; estimate Rs. 3,420; work completed.

(2) Constructing District Munsif's court at Amalapuram; estimate Rupees 13,800; outlay Rs. 3,898 against a grant of Rs. 4,418; materials collected and work commenced.

(3) Constructing District Munsif's court at Ellore; estimate Rs. 17,110; expenditure Rs. 8,586 against an allotment of Rs. 8,500. Roofing was in progress.

(4) Constructing first-class Taluk cutcherry at Ellore; estimate not yet sanctioned; expenditure Rs. 1,103 against a grant of Rs. 1,291. Materials to the extent of grant were collected.

(5) Constructing Deputy Tahsildar's cutcherry at Razole; estimate Rs. 10,870; outlay Rs. 6,906 against a grant of Rs. 7,000. Concrete laid in and foundation walls raised 8 feet high in places, but works stopped for want of bond stones.

(6) Reconstructing the Divisional office at Chettipet; estimate Rs. 13,900; expenditure Rs. 897 against a grant of Rs. 1,100; materials collected.

(7) Erecting a verandah on the west side of late Central Division office building; estimate Rs. 255; work completed.

(5) Constructing tools shed in the Sub-division office at Anantapur; estimate Rs. 2,940; outlay Rs. 2,202. All the work, except roofing, was completed.

(6) District Surgeon's quarters at Anantapur; estimate Rs. 11,435; outlay Rs. 1,162. The work is in good progress.

(7) First-class Taluk office at Kúdligi; estimate Rs. 26,225; outlay Rupees 24,625. The building was completed except the well.

(8) Deputy Tahsildar's office at Kampli; estimate Rs. 11,199; outlay Rupees 6,948.

(9) Constructing new Subsidiary jail and making certain improvements to the Taluk office at Hospet; estimate Rs. 9,775; outlay Rs. 5,646. The work was in good progress and will be soon completed.

(10) Municipal school-house at Anantapur (contribution work); estimate Rs. 15,777; outlay Rs. 1,939. Foundation trenches for the eastern wing were dug out, Mangalore tiles, teak-wood scantlings and a quantity of building stones were brought to site. The work was stopped for selection of a new site.

65. **Cuddapah.**—(1) Additions and alterations to the District jail at Cuddapah; estimate Rs. 73,295; outlay Rs. 57,171. The progress on the work was satisfactory.

(2) Combined office for the Tahsildar and Sub-Magistrate at Cuddapah; estimate Rs. 25,400; outlay Rs. 10,000. The walls of the main building were all raised to full height and wood work for roof was in progress.

(3) District Munsif's court at Proddatur; estimate Rs. 12,798; outlay Rs. 6,000. Walls of the main building were built up to 10 feet high and almost all archworks over doors and windows were finished.

(4) Taluk cutcherry at Badvel; estimate Rs. 23,150; outlay Rs. 23,348; building completed except well and handed over to the Tahsildar. The well was deepened to full depth and parapet walls, &c., remained to be built.

(5) Additions and improvements to Gurramkondah Mahal; estimate Rs. 3,277; outlay Rs. 2,951. The heaviest portion of the work was completed. Plastering, ceiling of roof, &c., remained to be completed.

(6) Sub-Registrar's office at Jammalamadugu; estimate Rs. 2,509; outlay Rs. 351. Foundation and basement were completed and wall above raised to 2 feet.

(7) Sub-Registrar's office at Sidhout; estimate Rs. 2,650; outlay Rs. 967. Foundations and basement were completed and wood and other materials collected.

66. **Kurnool.**—(1) Head Assistant Collector's office at Nandyál; estimate Rs. 19,500; outlay Rs. 19,147. This work was completed in the previous official year and handed over. The roadway was completed during the year under review. The Mangalore tiles of the roof were blown away by heavy gales that occurred shortly after completion and a revised estimate was sanctioned in November 1890 which provided for relaying the tiles.

(2) Residence for the Assistant Superintendent of Police at Nandyál; estimate Rs. 5,752; outlay Rs. 5,482. The work was almost completed.

(3) Taluk cutcherry at Márkápúr; estimate Rs. 23,398; outlay Rs. 4,966. The allotment was given only in November 1890. Nothing could be done beyond collecting materials.

(4) Purchase and improvement of railway building at Nandyál for a residence for the Sub-divisional officer; estimate Rs. 4,994; outlay Rs. 5,034. The improvements were completed.

67. **Coimbatore.**—The following major works were completed:—

(1) Constructing District Munsif's court at Karúr; estimate Rs. 17,420; outlay up to 31st March 1891 Rs. 16,220.

(2) Constructing Sub-Registrar's office at Sálúr; estimate Rs. 2,750; outlay Rs. 2,265.

68. The following works were in progress:—

(1) Constructing Government House at Ootacamund; estimate Rs. 7,79,150; outlay during the year Rs. 14,108; expenditure up to 31st March 1891 Rs. 7,26,457.

The principal items of the above work on which the outlay was incurred are detailed below:—

(a) Constructing quarters with out-houses for an European coachman and a cook; estimate Rs. 12,710.

(b) Six additional quarters for native servants; estimate Rs. 1,035.

(c) Erecting lamp posts and lamps for new road of approach; estimate Rs. 1,060.

(d) Fitting a Moule's patent earth closet; estimate Rs. 120.

(2) Improvements to the Secretariat offices on Stonehouse hill, Ootacamund; estimate Rs. 5,300; outlay Rs. 4,802.

(3) Constructing a Deputy Tahsildar's office at Aravakurchi; estimate Rs. 9,540; outlay Rs. 7,973.

(4) Constructing a Sub-Registrar's office at Gopichettipálaiyam; estimate Rs. 2,680; outlay Rs. 1,479.

(5) Constructing a Sub-Registrar's office at Thathiengarpett. Walls were built to a height of 1½ feet and some wood work brought to site; estimate Rs. 2,770.

(6) Constructing a first-class police station-house at Salem; work nearly completed; estimate Rs. 2,629; outlay Rs. 2,513.

(7) Improvements to the Accounts branch of the Collector's office, Coimbatore. Work completed, but accounts not yet closed; estimate Rs. 15,840; expenditure Rs. 15,789.

69. A sum of Rs. 13,988 was spent under minor original works against an allotment of Rs. 16,846.

70. The principal works carried out during the year are detailed below:—

(1) Constructing record-room to the Sub-Registrar's office at Avanáshi; outlay Rs. 743.

(2) Providing record-racks to the District Court-house at Coimbatore; outlay Rs. 440.

(3) Constructing a stable and coach-house in the compound of the Superintending Engineer's office at Coimbatore; outlay Rs. 1,376.

(4) Constructing two verandahs to the District Court-house at Salem; outlay Rs. 1,371.

(5) Providing a lightning conductor to the Taluk cutcherry at Námakal; outlay Rs. 227.

(6) Providing a lightning conductor to the Christ's church at Salem; outlay Rs. 201.

(7) Reconstructing the quarters of the Deputy Chief Warders at Salem; outlay Rs. 125.

(8) Constructing a dead-house at Vániyambadi; outlay Rs. 554.

(9) Improvements to the Taluk treasury at Uttankarai; outlay Rs. 566.

(10) Improvements to the overseer's shed at Tirupatúr; outlay Rs. 355.

(11) Constructing a second-class police station-house at Dharmapuri; outlay Rs. 1,511.

(12) Improving the detached buildings in the compound of Police Assistant Superintendent's quarters at Tirupatúr; outlay Rs. 523.

(13) Improvements to the cemetery at Kótagiri; outlay Rs. 372.

(14) Additions and improvements to Westmere at Ootacamund; outlay Rs. 670.

(15) Improvements to the police buildings at Gúdahúr; outlay Rs. 754.

(16) Constructing a lock-up in the rear of police station, Kandul, Ootacamund; outlay Rs. 365.

(17) Connecting garden cottage with Government House water-supply at Ootacamund; outlay Rs. 332.

(18) Improvements to the police huts at Kótagiri; outlay Rs. 334.

(19) Fencing in police station premises at Ootacamund; outlay Rs. 774.

(20) Constructing out-houses for the Bench Magistrate's court and Police station at Kótagiri; outlay Rs. 429.

(21) Providing new record-racks for Army Head-quarters offices at Ootacamund; outlay Rs. 471.

71. A sum of Rs. 20,345 was spent on repairs against an allotment of Rs. 21,500.

72. **North Arcot.**—The construction of a Sub-Registrar's office at Arkónam was put in hand during the year. Rs. 1,973 were expended against an estimate of Rs. 2,575.

73. The reconstruction of the record-room of the Gudiyátam Taluk cutcherry was completed at an outlay of Rs. 2,792.

74. The construction of the Sub-Registrar's offices at Ambur and Kuppam was commenced and Rs. 940 and Rs. 2,233 were spent on them against estimates of Rs. 4,000 and Rs. 3,030, respectively.

75. The improvements to the bastion cells, which were left incomplete in 1889-90, were resumed and completed at a cost of Rs. 2,356.

76. District Munsif's court at Tirupati.—The work was commenced late in the year with an allotment of Rs. 3,000, the foundation trenches were dug and concrete laid.

77. Eight minor works were commenced, of which one was an incomplete work of the previous year and seven were completed. The total outlay under this head was Rs. 6,999.

78. Under repairs, twenty-five works were commenced, of which 18 were completed. The outlay was Rs. 8,077.

79. **West Coast.**—The Collector's cutcherry at Calicut made good progress. The main building was raised up to second floor (15 feet) with flooring joists and beams fitted up. The record-room was completed with the exception of roofing, the wood-work of which was half fitted up. The tiffin room was fully completed. For the press office concrete was laid, but the work was stopped pending the settlement of a proposal from the Revenue Department to convert the building into a currency office. The masonry work of the out-houses was completed and roofing in progress. The outlay to end of the year was Rs. 1,16,800 against an estimate of Rs. 1,89,970.

80. The law courts at Pálghat, which were in progress in the previous year, were completed and handed over to the Judicial Department for occupation in August 1890; estimate Rs. 28,790; outlay Rs. 29,534.

81. The District Munsif's court at Chowghat, on which Rs. 2,500 were spent in the previous year, made satisfactory progress. The masonry was almost completed and materials for roofing were ready at site. The year's grant of Rs. 11,000 was fully spent; total outlay Rs. 13,542 against an estimate of Rs. 19,245.

82. District Munsif's court at Manjeri.—The masonry was almost completed and roofing materials brought to site; outlay Rs. 10,023 against an estimate of Rs. 15,087.

83. Taluk cutcherry at Perintalamana.—There was some delay in the transfer of the site from the Revenue Department and thus a good portion of the working season was lost. Concrete for foundation was almost complete and materials for the masonry and roofing under collection. Rs. 15,048 were spent against a grant of Rs. 15,000 and estimate of Rs. 34,070.

84. Powder magazine for the police at Malapuram completed except the lightning conductor materials for which were indented for; estimate Rs. 1,820; outlay Rs. 1,476.

85. Police station at Nilambúr.—Work in fair progress; masonry work completed and roofing in hand; outlay Rs. 987; grant Rs. 1,434.

86. A sum of Rs. 1,616 was spent in constructing out-houses for the supervisor's and overseer's quarters at Luckady; work completed.

87. The Police Inspector's and Chief Constable's quarters at Vayitri were improved at a cost of Rs. 421 and Rs. 381, respectively.

88. Wire fencing was erected to the Sub-Registrar's quarters at Vayitri at a cost of Rs. 385.

89. The undermentioned Sub-Registrar's offices were completed and handed over for occupation:—

- (1) Kondotty, estimate Rs. 3,020; outlay Rs. 3,370.

- (2) Malapuram, estimate Rs. 2,785; outlay Rs. 2,992.
- (3) Tamracherri, estimate Rs. 2,926; outlay Rs. 3,124.
- (4) Manjeshwar, estimate Rs. 2,872; outlay Rs. 2,820.

90. The following incomplete works were completed and handed over to the departments concerned for occupation:—

- (1) Improvements to the second and third blocks of Collector's office at Mangalore; estimate Rs. 15,060; outlay Rs. 17,755.
- (2) Improvements and additions to the District Munsif's court at Kásaragód; estimate Rs. 7,200; outlay Rs. 7,473.
- (3) Ten police huts at Puthur; estimate Rs. 3,651; outlay Rs. 3,681.

91. Tahsildar's cutcherry at Coondapoor.—The main building, treasury room and sub-jail were almost completed and materials for roofing and flooring, &c., were ready; estimate Rs. 32,950; grant Rs. 12,576; outlay up to date Rs. 28,750.

92. Additions and alterations to the District Court at Tellicherry were carried out at a cost of Rs. 5,446.

93. Third-class police station at Irritty was built at a cost of Rs. 1,542.

94. Taluk cutcherry at Badagara.—The court wing and clerk's and sheristadar's rooms were raised up to 11 feet and record-room up to 10½ feet. Five 18-feet trusses, purlins, &c., for the roof were ready. The current year's grant of Rs. 17,000 was fully spent; estimate Rs. 31,000.

95. Constructing 50 close prison cells in the Central jail at Cannanore; block of 24 cells and block of 4 cells, lodge and store room completed except the fitting of door shutters; for block of 12 cells superstructure raised to 9 feet; wall enclosure completed; grant and outlay Rs. 20,000; estimate Rs. 26,080.

96. Two lifts at the new Custom House wharf at Cochin were erected at a cost of Rs. 1,021.

97. Latrine to the District Munsif's court at Malapuram was built at a cost of Rs. 440.

98. Certain additions were made to the Police hospital at Mangalore; outlay Rs. 832.

99. Police Superintendent's office at Mangalore.—Plank ceiling was put in at a cost of Rs. 450.

100. Constructing a latrine to the Government college at Calicut.—The work was stopped pending the removal by the Revenue Department of some trees on the site belonging to a private individual; outlay Rs. 122; estimate Rs. 1,305.

101. Improvements to the Government college at Calicut.—Work put in hand; expenditure Rs. 701; estimate Rs. 2,226.

102. A sum of Rs. 9,094 was spent in repairing fifty works.

103. **Chingleput.**—The construction of 30 police huts for the Reserve Police constables at the Mount was commenced on an estimate of Rs. 5,680 and the foundation excavated, but the Military authorities objected to the proximity of the site to an old magazine, and the work had to be stopped.

104. The Sub-Registrar's office at Uttramallúr, an incomplete work of the previous year, was completed. The expenditure was Rs. 2,874 against an estimate of Rs. 2,800.

105. Six minor new works were completed during the year.

106. Under repairs, renewing the roof of the Reformatory hospital, estimate Rs. 5,884, was finished besides petty repairs to the Reformatory buildings.

107. Repairs to Government House, Guindy, were completed at a cost of Rs. 8,128.

108. Repairs were also executed to the Roman Catholic church at Poonamallee and the Executive Engineer's office at the Mount, and the roads and grounds and the pump and engine at Guindy Government House were maintained in good order.

109. **South Arcot.**—Fair progress was made on the new Taluk cutcherry at Villupuram, which was commenced in 1890. Superstructure, terracing and wood work were completed. The outlay was Rs. 13,568 on an estimate of Rs. 15,720.

110. A new Taluk office at Tindivanam was commenced; estimate Rs. 22,640; foundations up to ground level completed and wood work for roofing collected. The expenditure was Rs. 6,851.

111. At the new Taluk cutcherry at Tirukoilūr the concrete foundations were laid, brickwork was raised to basement level for the main building and out-houses, all wood work was ready and a large supply of bricks was collected. The outlay was Rs. 9,016 on an estimate of Rs. 20,680.

112. A grant of Rs. 5,000 was given in the budget for a new Taluk cutcherry at Chidambaram. The estimate, however, had not been sanctioned and the site selected had not been made over to the department. An outlay of Rs. 4,813 was incurred from the above grant in the collection of materials.

113. Work on the new District Munsif's court-house at Chidambaram, commenced in the previous year, was continued and the building was very nearly completed. The outlay was Rs. 5,226 on an estimate of Rs. 11,155.

114. A new Sub-Registrar's office at Merkánam was started and an outlay of Rs. 2,033 incurred on an estimate of Rs. 3,196.

115. A new Sub-Registrar's office at Vanoor was commenced, but very small progress made; outlay Rs. 685 against an estimate of Rs. 3,080.

116. Under minor new works the expenditure was Rs. 2,436.

117. **Tanjore.**—A new Taluk cutcherry at Kumbakónam was commenced. The foundations were completed and basement raised to floor level; a large quantity of materials were collected. The expenditure was Rs. 5,820 on an estimate of Rs. 21,275.

118. The extension of the vernacular record-room at the Treasury office at Tanjore was completed with the exception of a few petty items; outlay Rs. 4,744; estimate Rs. 4,730.

119. A new Sub-Registrar's office, Swamimalai, was completed; outlay Rs. 2,702; estimate Rs. 2,730.

120. Improvements to the District Press office, Tanjore, commenced in 1889-90, were completed at a total cost of Rs. 2,555; estimate Rs. 2,920.

121. The rebuilding a portion of the Taluk cutcherry at Kumbakónam to adapt it for an office for the Sub-Collector, also a work of the previous year, was completed; expenditure Rs. 5,188; estimate Rs. 4,862.

122. Twelve minor new works and twelve repair works were in progress.

123. **Negapatam.**—Improvements to the sub-jail were completed at a cost of Rs. 3,346. A compound wall around the sub-jail was also built at a cost of Rs. 383.

124. Improvements to the District Munsif's court and Sub-court were completed at a cost of Rs. 2,740.

125. The construction of office and quarters for the Sub-divisional officer at Tiruturaipundi was completed on an estimate of Rs. 7,416. The total cost was Rs. 7,388.

126. The construction of office and quarters for the Sub-divisional officer at Mannárgudi was commenced on an estimate of Rs. 6,375 and Rs. 3,949 were spent.

127. An additional room was built in the District Munsif's court-house at Patukóta at a cost of Rs. 4,522.

128. An extension to the record-room and improvements to the sheristadar's and cashier's offices in the Taluk cutcherry at Negapatam were completed at a cost of Rs. 1,480.

129. The construction of a verandah to the Taluk cutcherry at Patukóta was commenced on an estimate of Rs. 1,900 and Rs. 986 were spent.

130. The expenditure under repairs was Rs. 2,156.

131. **Trichinopoly.**—The following works were completed or in progress:—

(1) Converting the Artillery barracks at Trichinopoly into offices for the Collector, the Superintendent of Police, and the District Forest officer; estimate Rs. 24,900. The work was completed and handed over and the buildings are now occupied.

(2) Providing wooden record-racks to the Collector's cutcherry at Trichinopoly; estimate Rs. 3,450; expenditure Rs. 3,289; work completed.

(3) Constructing Sub-Registrar's office at Ariyalūr; estimate Rs. 2,880; outlay Rs. 2,034; nearly completed.

(4) Constructing a circular kitchen in the Central jail, Trichinopoly; estimate Rs. 4,400; expenditure Rs. 3,662; roofing in progress.

(5) Constructing drains in the Central jail at Trichinopoly; estimate Rs. 6,160; outlay Rs. 2,426; portions of drains finished.

(6) Alterations and improvements to the District jail at Trichinopoly; estimate Rs. 3,000; expenditure Rs. 515; a portion of cross wall was done.

(7) Renewing the old floor of the District Munsif's court at Ariyalūr; estimate Rs. 2,080; work completed at a total outlay of Rs. 1,844; construction of five police huts at Arasangudi; estimate Rs. 1,680; outlay Rs. 1,540; work completed.

(8) Constructing a third-class police station-house at Arasangudi; estimate Rs. 1,150; outlay Rs. 629; work nearly completed.

(9) Constructing Sub-Registrar's office at Perambalur; estimate Rs. 2,220; outlay Rs. 1,839; the work was nearly completed.

(10) Construction of six police huts at Jamboonadapuram was completed at an outlay of Rs. 1,965 and a second-class police station-house at Manapárai was in progress.

132. **Madura.**—The following five works were completed:—

(1) Sub-Magistrate's office at Sivaganga; estimate Rs. 12,570; outlay Rs. 12,540.

(2) New court-room for the Madura Tahsildar; estimate Rs. 4,210; outlay Rs. 4,402.

(3) Taluk cutcherry at Tirumangalam; estimate Rs. 23,114; expenditure Rs. 23,730.

(4) Sub-Registrar's office at Sholavandan; estimate Rs. 2,570; expenditure Rs. 2,649.

(5) Sub-Registrar's office at Nellakóta; estimate Rs. 2,770; outlay Rs. 2,880.

133. The following works were in progress:—

(1) Sub-Registrars' offices at Paramakudi, Mudukolatūr and Devikóta.

(2) District Munsif's court-house at Paramakudi; estimate Rs. 14,055; expenditure Rs. 8,000.

(3) Sub-Magistrate's cutcherry at Madura; estimate Rs. 5,790; expenditure Rs. 2,169.

(4) Steps to the Sea Custom's office at Kílakarai; estimate Rs. 3,260; outlay Rs. 531.

(5) Police station-house at Tandigudi; estimate Rs. 5,090; outlay Rs. 1,668.

(6) Improvements to Tirumal Naick's palace; expenditure Rs. 1,072.

134. **Tinnevely.**—The following works were completed:—

(1) Taluk cutcherry with out-houses at Srívaikuntham; outlay Rs. 25,805.

(2) Sub-Registrar's office at Velathikulam; estimate Rs. 2,970; expenditure Rs. 2,734.

(3) Sub-Registrar's office at Alvarthirunagari; estimate Rs. 3,900; expenditure Rs. 3,647.

(4) Sub-Registrar's office at Sivakási; estimate Rs. 3,080; expenditure Rs. 3,016.

(5) Circular kitchen and drain in the District jail at Palamecottah; estimate Rs. 2,977; expenditure Rs. 3,000.

135. Protestant church at Tuticorin.—The old roof was removed and some materials collected at an outlay of Rs. 1,042. The work was stopped pending sanction to a revised estimate, as the wood work of the old roof was found to be quite decayed and an entirely new roof was found necessary.

136. The following minor works were completed :—

- (1) Police station-house at Palamcottah; expenditure Rs. 2,358.
- (2) Sub-Registrar's office at Palamcottah; expenditure Rs. 2,131.
- (3) Improvements to travellers' bungalow and its out-houses at Virudupati; expenditure Rs. 2,141.
- (4) Police huts at Karungulam; outlay Rs. 1,357.

137. A second-class police station at Sálúr was in progress at an outlay of Rs. 1,453 and a sum of Rs. 3,730 was spent in acquiring sites for Sub-Registrar's offices at Sivakási and Otapidáram and for a District Munsif's court at Ambásamudram, and also in providing lightning conductors to the Police hospital at Palamcottah, Collector's cutcherry at Kockarakulam, Sub-Magistrate's cutcherry and Sub-Registrar's office at Palamcottah, Head Assistant Collector's cutcherry at Shermádévi and the Taluk cutcherry and Munsif's court at Srivilliputur.

138. A sum of Rs. 1,142 was spent on petty repairs to the Head Assistant Collector's bungalow at Shermádévi, Sub-Registrar's office at Sattankulam and nine other works.

139. **Presidency.**—The following major works were in progress or completed :—

- (1) New Law Courts, Madras; estimate Rs. 9,97,069; total expenditure Rs. 7,14,300.
- (2) Victoria Technical Institute and Connemara Free Library; estimate Rupees 3,56,255; expenditure Rs. 83,917.
- (3) Additional ward at the Lying-in hospital; estimate Rs. 39,299; expenditure Rs. 40,266.
- (4) Improving the strong room at the Paper Currency office; estimate Rs. 14,173; expenditure Rs. 12,509; work completed.
- (5) Constructing a shed in the wine yard, Sea Custom's office; estimate Rs. 13,645; expenditure Rs. 8,481.
- (6) Laying pipes to carry Red Hills water to the Lunatic Asylum; estimate Rs. 7,230; expenditure Rs. 6,472; work completed.
- (7) Constructing four cottages for isolating patients at the Lunatic Asylum; estimate Rs. 8,080; expenditure Rs. 7,368; work completed.
- (8) Laundry for the General Hospital; estimate Rs. 9,880; expenditure Rs. 7,740. This work was almost completed, the plastering and pointing only remained to be executed.
- (9) Constructing two cells at the General Hospital for patients suffering from mental diseases; estimate Rs. 3,330; expenditure Rs. 2,903; work completed.
- (10) Additions to the General Hospital, consisting of retiring room for female students; estimate Rs. 5,365; expenditure Rs. 4,042. This work will be completed shortly.
- (11) New operating room for the General Hospital; estimate Rs. 11,590; expenditure Rs. 13,842.
- (12) Office-room for the Principal, Medical College; estimate Rs. 3,110; expenditure Rs. 2,470; work completed.
- (13) Latrine for European and Hindu male students at the Medical College; estimate Rs. 7,125; expenditure Rs. 2,544.
- (14) Constructing a new ward and extending the existing No. 5 block at the Leper Hospital; estimate Rs. 6,013; expenditure Rs. 3,976.
- (15) Constructing a police station on the old Ice House road, Triplicane; expenditure Rs. 2,720; work completed.
- (16) Erecting compound wall round the Reserve Police lines at Pudupet; estimate Rs. 3,513; expenditure Rs. 3,043; work almost completed.
- (17) Extending the St. George's Cathedral cemetery; estimate Rs. 4,240; expenditure Rs. 4,101; work completed.
- (18) Improvements to the Presidency Training School for Mistresses; estimate Rs. 26,370; expenditure Rs. 29,690. The excess outlay was due to additions not originally contemplated and to extra labour in sliding shutters.
- (19) Additions and improvements to the Civil Orphan Asylum; total expenditure Rs. 22,615. All the works were completed and made over.

(20) Constructing 12 stable stalls for the Mounted Police at the Egmore Magistrate's court; expenditure Rs. 5,454; work completed.

(21) New police station and fire engine shed on the Wallajah road; estimate Rs. 15,845; total expenditure Rs. 11,646; work completed.

(22) Improvements to the Examination Hall, Presidency College; estimate Rs. 5,135; expenditure Rs. 4,884; work completed.

(23) New court for Presidency Magistrate; estimate Rs. 49,830; expenditure during 1890-91 Rs. 179; amount previously expended Rs. 48,850; total expenditure Rs. 49,029. This work was fully completed during 1889-90 and some payments were made during 1890-91.

(24) Removing the old photographic room and constructing a terrace roof, Madras Observatory; estimate Rs. 2,772; expenditure Rs. 2,512; work completed.

(25) Reconstructing tread mills at the Government Penitentiary; estimate Rs. 5,210; expenditure Rs. 1,670.

140. The expenditure during the year on minor original works was Rs. 46,799 and a sum of Rs. 1,02,215 was expended on repairs to civil buildings.

IV.—PROVINCIAL—COMMUNICATIONS.

141. **Ganjam.**—Mahasingi bridge; estimate Rs. 41,200; outlay Rs. 11,986 against a grant of Rs. 14,000. Preliminary arrangements were completed and a part of the materials collected, sheds, &c., built. The greater portion of the iron work was landed at Gopálpur and paid for. The lapse of grant (Rs. 2,014) was due to failure of Messrs. Burn & Co. to supply the iron work as first promised.

142. **Vizagapatam.**—Completing the road from Pottinghi to Koraput; estimate Rs. 2,80,205. The outlay during the year was Rs. 53,279 against a grant of Rs. 51,500. The following work was finished :—

	MILES.
Total length of road	30
Metal collected	30
Earthwork done	28
Metal spread and rammed	28
Gravel collected	30
Road open for traffic	28

The following are the principal works on the road :—

The break from 24th to 38th mile was completed and this made the road practically open from Pottinghi to Koraput and free for traffic all the year round.

The Sepoyputti bridge was completed.

The Maliaputti bridge masonry work was completed and iron work put up. The Kundali bridge left abutment up to 22 feet, and right abutment to 20 feet completed and half of the floor and retaining wall completed.

The Pongar bridge masonry work completed, iron work up, and little more was required to open it for traffic.

The Duliam bridge; right abutment raised 16 feet and left abutment foundations put in 2 feet in height; and $\frac{3}{4}$ of floor and retaining wall completed.

Gerru Gedda; both abutments built to 1½ feet high.

Golla Gedda; right abutment put in and left abutment excavated full depth.

Domiriput bridge; the heavy blasting was completed and the right abutment marked out.

Poolachi bridge completed except metalling on road way.

Gopalaputti bridge abutments built up to 3 feet high; floor and retaining wall completed.

Durrugonda bridge; abutments built up to 12 feet high; floor and retaining wall completed.

The whole length of the road from Pottinghi to Koraput is practically completed and metalled, except about 2 miles, in short lengths, at the sites of the several bridges still under construction. The traffic along this road is now considerable; as many as 11,276 carts used the road in April last.

143. The outlay on the Potinghi ghât road was Rs. 4,836 against a grant of Rupees 5,500. The following work was executed during the year:—Putting up iron work for Sunki bridge and completing approaches; turning arches of Rallagedda bridge. The Sunki bridge was completed except the pedestals at ends of hand rails. The Potinghi ghât road, 20 miles 6 furlongs in length, is now completely bridged and metalled. The road was maintained in an efficient state and the traffic was considerable.

144. **West Coast.**—Calicut-Vayitri road.—This road was maintained in good order and kept open for traffic during the year at a cost of Rs. 36,733 and a very considerable improvement was visible all along. Depôts were made at the side of the road where metal for repair was stacked. All parapet walls were repaired with large stones and on the ghât a curb-stone wall was made on the inside to confine the drainage water and prevent any erosive action on the road; where the road was overgrown with *lantana*, the latter was removed and uprooted to a breadth of 66 feet from the centre of the road on each side. Surveys of the departmental claim for a margin of land on either side of the road were made and submitted to the Collector of the district for the restoration of the correct boundaries. Bandy-stands were made at Adivaram (26th mile 6th furlong), Luckady (36th mile) and Talapoya (37th mile 5th furlong). New toll-gates were put up at Vayitri, Luckady and Tagarapady, and sign-boards at the cross roads at Vayitri, Talapoya, Tamracherri and Ravandur. The usual repairs were executed to the inspection houses.

145. Improvements to the Vayitri-Gúdalúr road.—All the tunnels were built except those situated between Devála and Nadgani (4 miles). Metal was collected at miles 3 to 20, 21, 22, 23, 24, 25 to 29, 30, 31, 32, 34, 35 and 5 furlongs beyond Devála, or a total of 151 furlongs; 62½ furlongs were consolidated. All earthwork was finished except that provided for in the revised estimate between Devála and Pundalúr and a little at a few bridges. Bridges Nos. 3, 21, 34, 46, 93, 97, 99, 101, 103, 169, 243 were ready for their iron girders; 241, 249, 381, 388, 408, 424 and 437 had their foundations in. Culvert No. 45 of 6-feet span was completed and for culvert No. 295 of 10-feet span arch abutments were finished. For the better execution of the abutments for bridges and to ensure order and ease of building at each bridge, surveys were taken of the site and site plans of materials made. Cut stone was obtained from Coimbatore; but attempts were made to quarry it locally, and, though not successfully in the beginning, all mile and furlong stones from Vayitri to Sholadi (22 miles) were obtained locally; expenditure Rs. 1,59,856 against an allotment of Rs. 1,81,000. The total outlay to the end of the year amounted to Rs. 3,33,408 against the estimate of Rs. 5,50,000.

146. Repairs to Vayitri-Gúdalúr road.—These were of the usual description and call for no remark except the improvements in the Meppadi and Vayitri bazaars. A wide road has been made through these bazaars by continuing the road between curb-stone walls and metalling the whole of the width so obtained; total outlay Rs. 12,444.

147. **Coimbatore.**—The following works were completed during the year:—

(1) Constructing eight cart-stands on the road from Kullar to Ootacamund; estimate Rs. 6,100; expenditure Rs. 5,940.

(2) Metalling two miles of roadway to a width of 12 feet on the Ootacamund-Gúdalúr road from 1st furlong in the 3rd mile stone to 1st furlong in the 5th mile; estimate Rs. 9,650; outlay Rs. 9,431.

148. Reconstructing the Farewell bridge at the 14th mile, Ootacamund-Kullar road, was in progress; estimate Rs. 18,100; grant for the year Rs. 5,000; outlay during the year Rs. 2,686. The work was commenced in February 1891. Masonry for the right and left abutments was built up to about 2 feet above the flood level. Foundations for the pier on the Ootacamund side are ready for rebuilding.

149. Rupees 1,788 were spent on minor works against an allotment of Rs. 1,650.

150. The following works were executed at a cost of Rs. 47,235:—

(1) Remetalling 5 miles and 2 furlongs of the Coonoor ghât road from Kullar to Benhope; outlay Rs. 10,090.

- (2) Annual maintenance of the Kullar-Gúdalúr road; outlay Rs. 35,324.
- (3) Repairing new road on Mountstuart at Ootacamund; outlay Rs. 539.
- (4) Rebuilding revetment in 7th furlong 19th mile of the Ootacamund-Gúdalúr road; outlay Rs. 325.
- (5) Repairs to bridge in the 1st furlong of the 3rd mile, Ootacamund-Gúdalúr road; outlay Rs. 705.

151. The road from Ootacamund to Gúdalúr was retransferred to the District Board in September 1890.

152. **Madura.**—A sum of Rs. 147 was disbursed on account of certain liabilities on the Cumbum-Gúdalúr road which had been finished in the previous year.

153. **Presidency.**—A sum of Rs. 13,501 was paid to the Madras Municipality for maintaining the bridges on the Cooum river in proper order during the year 1890-91.

V.—PROVINCIAL—MISCELLANEOUS PUBLIC IMPROVEMENTS.

154. **Kistna (Eastern).**—Widening Ryves' canal; estimate Rs. 11,000 and outlay Rs. 6,586 against a grant of Rs. 10,000. The work was commenced only in December 1890 and very nearly completed.

155. Regulator, Ryves' canal; estimate Rs. 9,100; allotment Rs. 2,000 and expenditure during the year Rs. 3,851. Foundations were nearly completed by the end of the year.

156. **Coimbatore.**—A sum of Rs. 907 was spent on improvements to the water-supply at Gúdalúr.

157. **Madura.**—The only work in progress was "cutting a rough trace from Kodaikanal to Pillar rock." The trace was completed except 3,600 feet, which cannot be put in hand until land is acquired; the expenditure incurred was Rs. 466.

158. **Presidency.**—Putting self-acting shutters to the Munro, Anderson and Commander-in-Chief's bridges on the Cooum and training the river; total amount sanctioned Rs. 39,860; expenditure during 1890-91 Rs. 1,131; amount previously expended Rs. 14,735; total expenditure Rs. 15,866. No actual work was executed during 1890-91 and the work was stopped. The outlay in the year was an adjustment.

159. Rupees 11,778 were expended in maintaining the Chepak Park and Marina, maintaining trees and grass plots in the old fishing village and conservancy of the Cooum river.

VI.—LOCAL—INCORPORATED.

160. **Rushikulya.**—The Aska and Suradá road was maintained at a cost of Rs. 500 against a grant of Rs. 500.

161. **Godavari (Eastern).**—(1) Aqueduct over Chollangi salt creek; estimate Rs. 6,500. The work was completed during the year at a cost of Rs. 6,794.

(2) The ordinary repairs to the Kovur-Manjair junction canal were carried out at a cost of Rs. 2,691.

162. **Godavari (Western).**—The following works were executed or in progress during the year:—

(1) Construction of an iron girder bridge over the Gunnaram canal at 33rd mile near Mattam; estimate Rs. 5,000; work completed.

(2) Constructing culvert over Pallivella drain; estimate Rs. 780; work almost completed.

(3) Constructing road culvert across Bodasakurru channel; estimate Rs. 480; work completed.

(4) Constructing Komaragiripatnam road culvert; estimate Rs. 770; work almost completed.

163. **Kistna (Eastern).**—Under civil buildings the most important work undertaken was the Jubilee Museum and Technical Institute at Bezvada; estimate Rs. 14,006; grant Rs. 10,000; and outlay Rs. 6,737. Foundation and basement were completed and superstructure raised to a height of 10 feet.

164. Bridge over Ryves' canal; estimate Rs. 17,600; grant Rs. 2,119; outlay Rs. 1,988; the excavation of foundation and laying concrete completed; superstructure commenced.

165. **Coimbatore.**—Completing the Talavásal bridge in the Atúr taluk, Salem district. The iron work was completed with the exception of one floor plate which was ordered from Madras. Plastering was in progress; metal for approaches under collection; pointing and gravelling the road could not be done until the rivetting work was inspected and passed by the Executive Engineer; grant for the year Rs. 10,634. The total outlay to the end of the year was Rs. 43,702 against an estimate of Rs. 47,700.

166. **South Arcot.**—The roads along Coleroon bank, Khan Sahib's canal, Veeram tank bank and Vadavaur bank were repaired at an outlay of Rs. 2,608.

167. For the restoration of the Shatiatope anicut bridge the ironwork did not arrive till late in the year, so little or nothing could be done towards actual construction.

168. **Tanjore.**—An outlay of Rs. 5,668 was incurred in maintaining 101 miles of roads on river embankments; these roads are not metalled, but they were in fairly good condition throughout the year.

169. **Negapatam.**—A sum of Rs. 5,943 was spent in maintaining 45½ miles of roads on river embankments.

170. **Madura.**—An outlay of Rs. 31 was incurred in closing the accounts of the annual maintenance of the 10 miles of the Cumbum-Gúdalúr road for 1889-90.

171. **Tinnevelly.**—Raising Perungulam surplus channel and road No. 23; estimate Rs. 7,805; Local Fund share Rs. 3,935; expenditure Rs. 3,628, of which Rs. 965 were spent during the year; work completed but final payment not made.

172. Rupees 108 were spent on improving the Kulasekharaperi tank.

173. **Trichinopoly.**—Road No. XX from Siruduyur to lower anicut *via* Senkara-yur (20 miles) was maintained at an outlay of Rs. 978.

VII.—LOCAL—EXCLUDED.

174. **Ganjam.**—Fixing lightning conductor to the light-house at Calingapatam; estimate Rs. 190; materials collected and orders issued to put the work in hand.

175. Constructing a cook house for light-keepers at Calingapatam; estimate Rs. 290. At the request of the Presidency Port officer the building was divided into two rooms instead of one room as originally intended. The work was completed.

176. **Godavari (Eastern).**—Repairs to Marine Villa, Cocanada, and to the red buoy of the port were completed at a cost of Rs. 315 and Rs. 167, respectively.

177. **Godavari (Western).**—The obelisk at Thirthalamondy, was raised and that at Antaravedi was repaired.

178. **Vizagapatam.**—A sum of Rs. 50 was spent in repairing the head light-keeper's quarters at Santapalle.

179. **Buckingham Canal.**—The following buildings were repaired:—

(1) Light-house Superintendent's quarters and out-houses and lascars' lines at Armeghon; outlay Rs. 735.

(2) Light-house at Pulicat; outlay Rs. 33.

(3) Pulicat Light-house Superintendent's quarters and lascars' lines, &c.; outlay Rs. 376.

(4) Removing and repairing the door of Seven Pagodas light-house; outlay Rs. 20.

180. **West Coast.**—The flagstaff at Badagara was completed; outlay Rs. 1,610.

181. A new flagstaff was erected at Calicut at a cost of Rs. 1,381.

182. Building a revetment to prevent the erosion of the sea near the Marine office at Beypore was completed; outlay Rs. 1,679.

183. A sum of Rs. 539 was spent on urgent repairs to the boat jetty at Cannanore.

184. The wooden platform of the light-house at Tellicherry was repaired at a cost of Rs. 137.

185. The light-house at Calicut was repaired; expenditure Rs. 177.

186. The light-house at Cannanore was provided with a lightning conductor at a cost of Rs. 100.

187. **South Arcot.**—The construction of two additional wings to the jetty and repair of the existing wharf at Porto Novo were completed; outlay Rs. 3,284; estimate Rs. 3,320.

188. **Negapatam.**—The construction of quarters for the keeper of the light-house at Point Calimere, an incomplete work of the previous year, was completed at a cost of Rs. 1,679.

189. Iron struts were put up to support the eastern gaff of the light-house at Negapatam at a cost of Rs. 135. The lantern of the light-house was repaired at a cost of Rs. 28.

190. The jetty wall of the Negapatam harbour was repaired at a cost of Rs. 118 and iron stays to protect the corner of the new jetty wall were erected at a cost of Rs. 62.

191. **Madura.**—Repairs to the Port officer's bungalow at Pámban were in progress.

192. **Tinnevelly.**—The provision of a wooden covering to the light and a wooden ladder and lightning conductor to the light-house at Manapad was in progress at an outlay of Rs. 404. The work was not completed owing to the late receipt of the additional copper tape indented for. The construction of a cook-house attached to the Light Superintendent's quarters and a compound wall in front of the light-keeper's quarters were completed with the exception of plastering at a cost of Rs. 571.

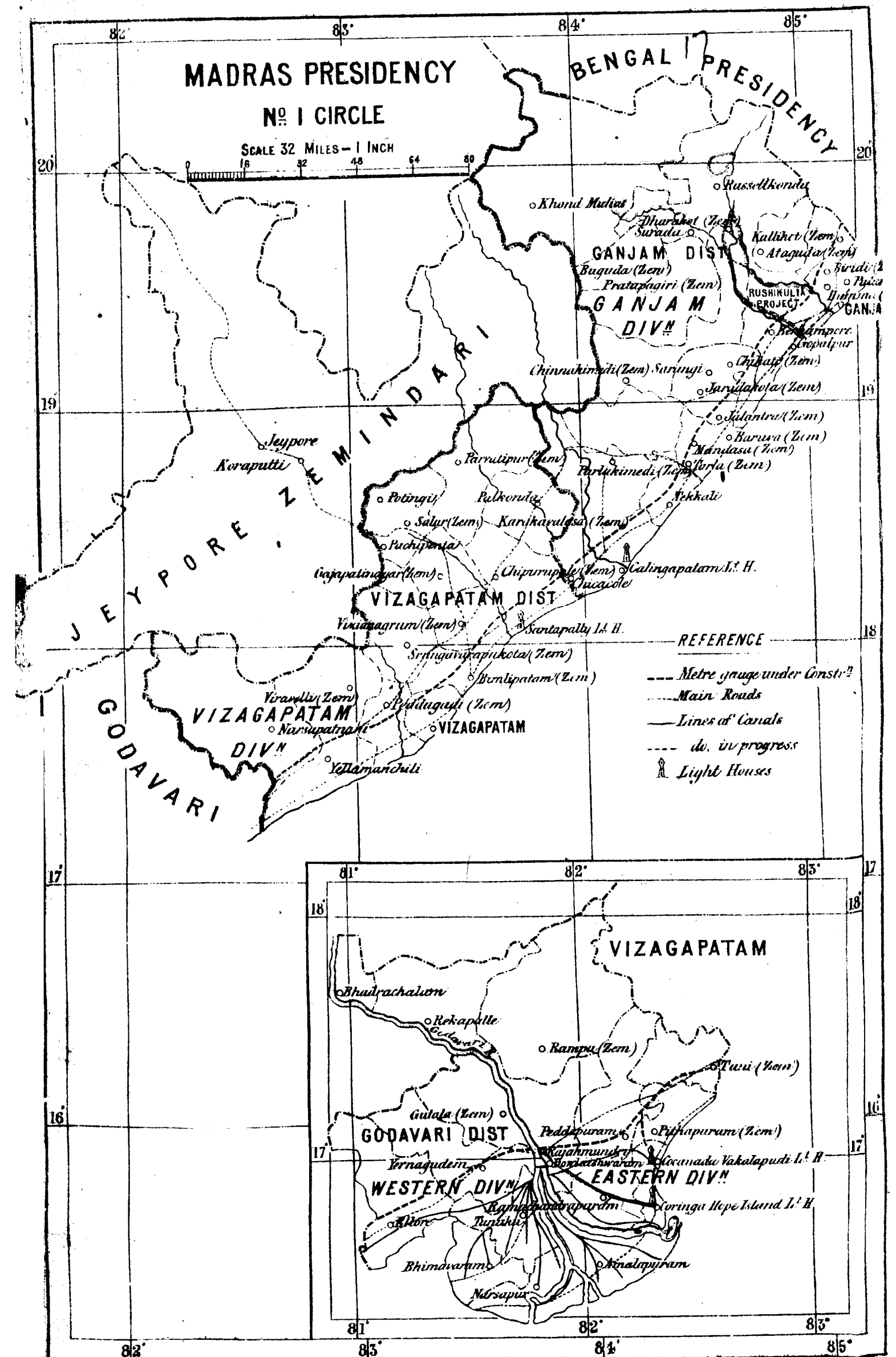
193. A sum of Rs. 430 was spent on repairs to the light-house on Hare island, Tuticorin, and to the Superintendent's quarters and the lightning conductor of the light-house at Muttum.

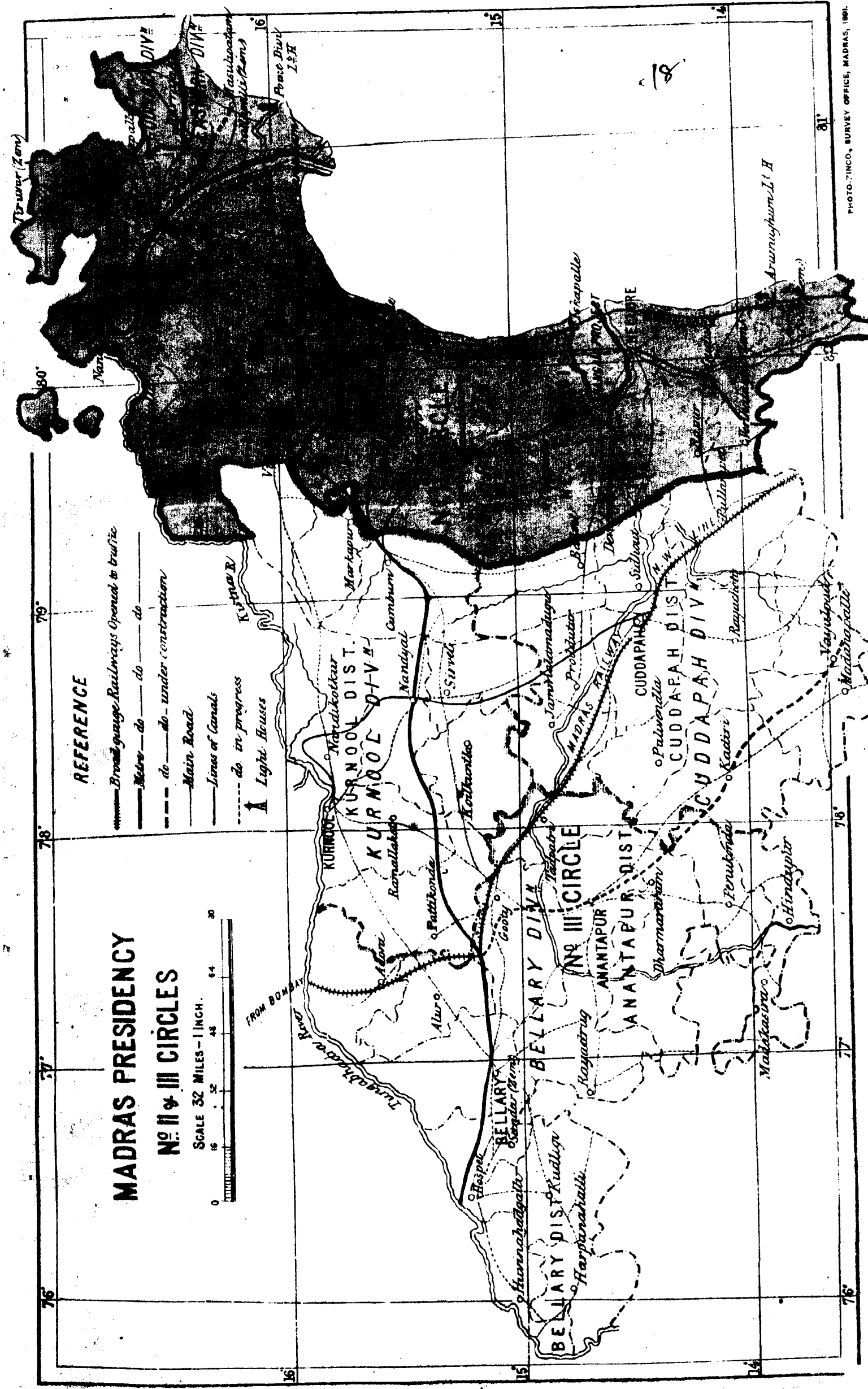
194. **Presidency.**—Rupees 1,783 were expended under this head on original works and repairs to Senate House and Master Attendant's office.

VIII.—MISCELLANEOUS—DEPOSIT CONTRIBUTIONS.

195. **Presidency.**—Constructing Victoria Hospital for caste and gosha women; total sanctioned estimate Rs. 89,550; expenditure during 1890-91 Rs. 16,331; amount previously expended Rs. 60,182; total expenditure Rs. 76,513. The whole of the building, including the Superintendent's quarters, was completed; some work in improving the drainage of the grounds remained to be done.

196. Cricket Pavilion at Chepák; amount of estimate Rs. 13,440; expenditure during 1890-91 Rs. 3,058. The foundations were executed and partly laid; materials for superstructure collected.



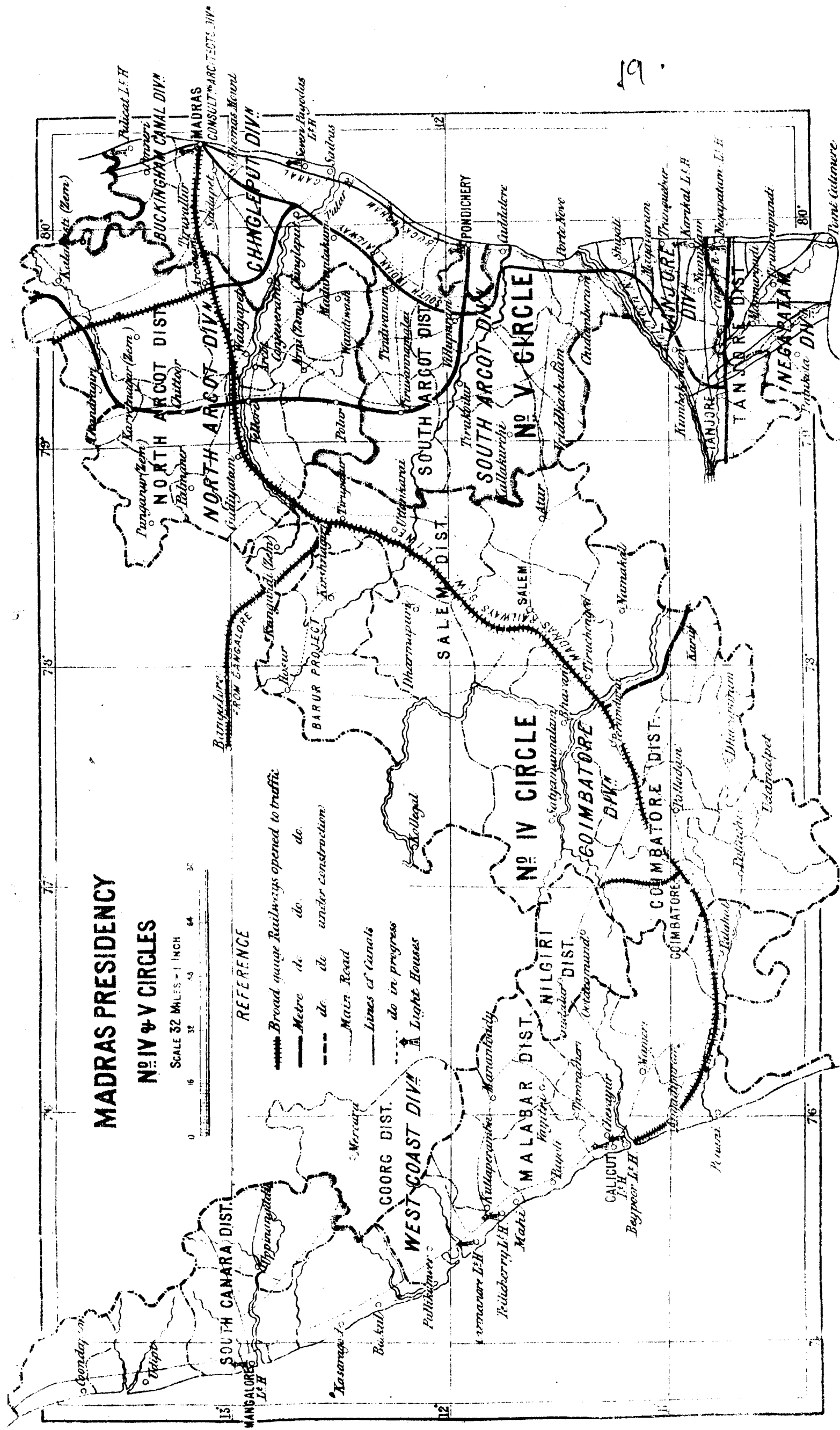


MADRAS PRESIDENCY
No. II & III CIRCLES

SCALE 32 MILES - 1 INCH.
0 16 32 48 64 80

REFERENCE

- Broad gauge Railways Opened to traffic
- do do do
- - - do - under construction
- Main Road
- Lines of Canals
- - - do in progress
- ▲ Light Houses



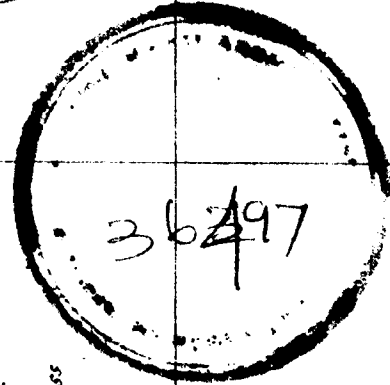
MADRAS PRESIDENCY

Nº VI CIRCLE

SCALE 32 MILES = 1 INCH

REFERENCE

- Metre Gauge Railways Opened
- Do under Construction
- Main Roads
- Lines of Canals
- Do in Progress
- Light Houses



DI 2118 M90
M91/1

