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SELECTIONS
FROM
THE RECORDS
OF THE
MADRAS GOVERNMENT.

Published by Authority.

No. XXV.

REPORTS
ON
IMPORTANT PUBLIC WORKS.

FOR

1854.

MADRAS.

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1856.

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No. 1542.

Department of Public Works,

4th October, 1853,

FROM CAPTAIN G. C. COLLYER,

*late Secretary to the Board of Revenue**in the Department of Public Works.*

To J. D. BOURDILLON, Esq.

*Secretary to Government,**Public Works Department.*

SIR,

1. I am directed by the Board of Revenue D. P. W. to forward the Statements of works executed in the various Collectorates in this Presidency during the year 1854.

2. In forwarding them, the Board has made some observations in the way of explaining the Statements, and in so doing has followed the order in which the Divisions occur; and the information called for by the Supreme Government has been added to the Report in the prescribed form, forwarding the sums expended to the end of the Official year April 1855; but it is less full than could have been desired, and the profits derived have not been procured, a desideratum which shall not take place hereafter. Of the Divisions the first in order is

1 Statement.
10 Reports with
3 Statements
2 Letters.

RAJAHMUNDRY.

3. In this district the works reported upon by the Civil Engineer more particularly, are those connected with extending and perfecting, the irrigation, navigation, and drainage of the Delta of the Godavery.

4. The first of these works is the Coringa Canal, the main line of communication from Rajahmundry and the upper part of the District through the centre of the Eastern Delta to the port of Coringa; the work

this year consisted of completing the 2nd lock, the lock at tide water at Munjair, the Embankments and the excavations; with the exception of widening a portion of the Canal between Alamoore and Vellah, the navigation has been thrown open, the irrigation still requires the excavation of numerous small channels for its developement.

* * * BANK CHANNEL TO YANAM AND BRANCHES.

5. This Channel also commenced in 1853; is formed as its name implies of Embankments, the water being kept up by two locks, at Cow-laisweram and Coda, above the level of the subjacent ground; when the Coda lock is completed there will be a navigable canal extending to Muskapilly a distance of 26 miles; the estimate for this work has been greatly exceeded and is likely to be still further so from reasons explained in the report. It is proposed to connect this channel eventually with Yanam.

6. These channels are on the left Bank of the northern arm of the Godavery, and by means of branch channels irrigate a large tract of ground between the river and the Coconada channel. But little progress has been made with the Samulcottah channel, from its being necessary to keep it full for irrigation purposes.

7. Branches have been cut from the Coconada channel with the greatest benefit; the Civil Engineer reports with satisfaction the comfortable and independant circumstances of the ryots under these channels, whom he remembers but a few years ago as depressed and impoverished.

8. In the central Delta, the Ralee channel, the main head of the channels of irrigation, has been widened; the Puleavella channel, originally intended simply as an irrigation channel, has been converted into a navigation channel; the section of the Amlapoor channel, a channel taken from the Eastern bank channel at Vandapolam, has been increased from a change in the distribution of water consequent on making the Pullavel-la a navigable canal.

9. The channels in the lower part of the central Delta near Nayeram have been considerably extended; two branches have been taken from the Cuddoly main channel and have proved of the greatest benefit, especially in the early part of the year; the Civil Engineer notices that in this Talook the culture of the Sugar cane so decidedly on the increase.

10. In the western Delta the principal work consisted in improving the Venkiah channel, by raising its banks, and in building sluices for irrigating the land of the neighbouring villages.

11. The soil of the embankments being of very inferior description, unremitting attention and outlay is necessary, and it is proposed to construct a low lift lock at the head of this channel, to obviate the necessity of keeping so great a depth of water in it as 6 feet, and will also allow of a greater depth of water on the lower side of the Nundamoor lock; the Ondee high channel has been extended, but still requires several branch channels from it, that this some of the richest position of the Delta, may be fully supplied; the remaining channel called Uttelee main channel, conveys water for 40,000 acres of the Oondée talook, but from a want of Superintendence it has not been possible to excavate branch channels.

DRAINAGE.

12. The drainage works during the year under review have been confined to the western Delta, which is exposed to the floods of several small rivers lying between the Godavery and the Kistnah: these works consist first of the Doovah Calingulah, a work to relieve the Weyairoo from the floods of the Yerra Calvah; it has a waterway of 100 yards, it has been built larger and more substantially than was originally intended, and has exceeded the estimate very materially.

YANAMADOOROO DRAINAGE CUT.

13. This cut is intended to convey the water escaping over the Doovah Calingulah to the salt water creek at the village of Yanamadoorah. Colair calingulah intended to regulate the water in the Colair Lake has a water way of 100 yards; this work has also exceeded the estimate. The surplus water from this Calingulah is received by the Mullumpoondy channel, which conveys it away in a more direct line than did the Oopootair.

CUT ACROSS THE MOGULTORE SAND RIDGE.

14. This channel was excavated to drain the low swamps in the neighbourhood of Nursapoor, and is cut direct from the village of Seetarampoorani to the nearest salt water creek; the area drained is about 50 square miles formerly overflowed by the surplus waters of the Kistnah as well as of the Godavery, and further to protect the navigable canal under construction from Palcole to Nursapoor, an embankment has been thrown up from the high ridge near Mogultoor to meet the ridge at Velvannoo Agraharum, to the East of the Gonair drainage, which is conducted to the sea by a creek from the Oopootair.

NUCKKOLA CHANNEL EMBANKMENTS.

15. This large drainage channel is to be embanked to make it navigable; at present but small progress has been made from a deficiency of labourers.

• PALCOLE CANAL.

16. Some progress has been made in this work; the Peravella lock and Calingulah have been finished; other two Calingulahs are also completed.

17. It is an important work, but requires a fifth lock to ensure a depth of water of 3 feet on the lower sills of each lock; these locks are of novel construction the only solid masonry being the walls in which the gates are fixed, the sides and head and tail walls; the chamber is simply excavated with sloping sides covered with rough stone.

18. In addition to these works of irrigation, navigation, and drainage, the river embankments have been strengthened and groynes thrown out at different places, to regulate the course of the stream.

19. Of the embankments one reaches from Rajahmundry to the boundary of the French settlement at Yanam, and it will be necessary to continue it beyond it as the river flood being confined rises to a height of two feet higher than formerly, on its approach to the Sea; for the same reason the embankments on the East side of the Central Delta ought to be extended, and the Godavery must be embanked.

AN EMBANKMENT TO SAKENATAPILLY.

20. A continuation of the East side embankment and an embankment on the East side of the Nagaram Talook are also in progress, and are well and substantially constructed, but will eventually have to be raised another yard. Groynes at Todapooty, Muskapilly, &c. have been constructed and with success as to their results, others will have to be constructed at those places where the river sets against the natural bank, to prevent encroachment and destruction of the large channels.

SAKENATAPILLY CUT.

21. This cut has been made of an awkward bend of the river to draw off the set of the current against the town of Modapalem, and also to relieve the aqueduct.

22. The repairs to the ancient amounting to Rs. 7758-15-4 = 13½ per cent on the cost of the work, have been carried on most satisfactorily,

by the ancient manager V. Veeranah, whose intelligence, activity and zeal, the Civil Engineer desires may be commended to Government.

23. The workshop has been actively employed in all its branches; it has supplied 35 tons of castings for Government purposes, and 39 for private persons; the Autographic presses have been used to the great diminution of the labor of writing.

24. The Civil Engineer remarks that as the irrigation is more and more perfected, the increase of cultivation is most marked, and the supply of water for increased cultivation without additional taxation and the easy access to the best markets has improved the condition of the Ryot in a most gratifying manner.

25. On the lines of canal through Dowlaisweram, Rallee, and Vejaisweram, 23,340 loaded boats registered, representing 90,000 tons, ply during the year.

26. In addition to these three canals, the navigation across the Colair Lake has exercised a most beneficial effect on the towns and talooks at its extremities; the trade here has not been registered, but it is estimated at 50,000 tons.

27. The navigation of the Eastern Delta is now nearly completed; the other Deltas only wait the sanction of the estimates of the Budget of 55-56, to be provided with water communication.

28. The roads in this district are in a very imperfect state; the Harbour of Coringa will not, until Major F. Cotton's plans for its improvement have been completed, be improved; the partial completion of the Coconada Groynes having as yet produced no beneficial result; but while Coringa must, it is believed, to be the main port of this District, the Civil Engineer draws attention to the Port of Nursapore; the bar at the mouth of the river, which is deep enough within for a ship of the Line, might doubtless be removed, so affording not only a great outlet for commerce but a most desirable place for Docks, and a refuge, of which there is so much need, on the Coromandel Coast.

29. The Civil Engineer finishes his report on this most interesting district by pointing out the utter lawlessness of the cultivators as to water rights, a subject the Board of Revenue regrets to say, not confined to this Division, but one prevalent and brought to notice continually, requiring as a remedy either a change of system to a sale of water, a change involving a deep and close investigation of the rights of indi-

viduals in all its bearing, or an act which will enable the Magistrate effectually to prevent theft of water by some serious punishment.

KISTNAH DIVISION.

30. The attention of the Civil Engineer department has been of necessity principally occupied by the Kistna Anicut at Beswarah. These works only which had been commenced were completed or carried on, and smaller works absolutely necessary for the preservation of existing irrigation, were repaired. Of these the Amcherla tank on an estimate of Rupees 3286-15-5, had been proceeded with, leaving the Calingulahs to be completed next year.

31. The Coppararum tank repairs have been completed on estimate of Rupees 3312-12-4 at an expense of Rupees 2693; the collection under these tanks amounts in two years to Rupees 2584-13-0.

32. The Majaloor tank has also been completed this year at an expense of Rupees 1396-11-2, and the result has been a collection in the two years of Rupees 1348-9-2. 21-12-74

KISTNAH ANICUT.

33. As the four large sluices and the two locks attached to this anicut were sufficiently advanced last year to permit of their completion during the monsoon notwithstanding the occurrence of the greatest flood known, operations for the construction of the anicut itself were resumed, and were carried on successfully; and by making use of large sized stones weighing from one to four tons no difficulty was experienced in closing the dam; the dam having been closed, an earthen dam was made in front and into it, foundations having been dug wells were sunk for the retaining wall which was completed across the river, the deposition of rough stones was then actively proceeded with till put a stop to by the rising of the waters in May, compelling the taking up of the railway; the lock was completed in a most creditable manner by Mr. Sage, Assistant Overseer at Seetanagram; the season was particularly favorable, and enable the deposition of an immense mass of stone to be got in behind the retaining wall, thus to form a dam of unprecedented dimensions, the height being $5\frac{1}{2}$ yards and the breadth 55 yards, the Mass being 350,000 tons and much of it in pieces of from 1 to 4 tons weight.

34. The Officers employed on this work besides the Civil Engineer, were Lieutenants Humfrays (deceased) and Farewell, Assistant Supervisor Finnigan, Assistant Overseers Porter, Sage, Campbell, Wilkie,

and Fletcher; the sum expended Rupees 607,536-13-8, and the supervision Rupees 22,306-9 being 3.6 per Cent. on the outlay.

35. In connection with the project of irrigating the Kistnah Delta, the following channel works have been undertaken.

I. The excavation of a channel to connect the Poolairoo at Palamata, with the left flank of the anicut at Bezoarah.

36. This work, estimated to cost Rupees 68,462, of such magnitude as to occupy all the available labour in the Masulipatam district, was commenced and carried out, and will, even in the unfinished state of the anicut, be most advantageous.

The Estimate, Rupees 68,462, Cost 6,985 4.

Superintendents.....	} 2241. per Centage 32.
Lieut. Lane	
Asst. Overseer McGuire.	

II. Enlarging, deepening, and straightening the old Poolairoo from Patamatee to Beegom, and constructing a lock and Calingulah.

37. This old Channel required deepening and improving and widening to a width of 15 yards, to enable it to carry a supply of water for about $\frac{3}{4}$ of the Masulipatam portion of the Delta; this channel will not only be an irrigation, but eventually a navigable canal, connecting the Port of Masulipatam with the anicut; five locks and Calingulahs are required for this purpose at a cost of Rupees 24,592-7-3, and will be constructed next year.

38. For this channel and locks the estimate is Rupees 87,851, amount of work done 18,463-5, Superintendents, Lieutenant Lane, Captain Allan, Lieutenant Vertue, salary, 2719 Rupees, being 14.4 per cent on the outlay.

III. Enlarging, deepening, and straightening the Boodemenan..

39. This natural watercourse was last year connected with the flank of the anicut; but being of small capacity, tortuous, and on too high a level, it was necessary to improve it by widening and deepening its bed and straightening its numerous sinuosities, where its course coincided with that of the large irrigating and navigable Canal leading from the anicut Northward to Ellore; to do this as far as Casarapillay, (the spot where the high level Northern Canal will take off) an estimate was framed for 40,277 Rupees; but from the excessive hardness of the soil and the paucity and inefficiency of the Coolies, little progress has been made.

GENERAL REPORT.

Estimate Rupees 40,277 work done Rupees 13,969.

Superintendent Captain Allan } Rupees 1,412. per Cent. 10.1.
Assistant Overseer McGuire..... }

IV. Cutting a new head to, and enlarging and deepening the Toombudra Channel to Pedda Vadalapoody.

40. This Channel, though much improved of late, had still to be widened, deepened and enlarged, to carry the water considered by the Engineer as necessary for the irrigation of the large tract of land in Guntoor; the determined disinclination of the inhabitants of Guntoor to assist in the work, and again, the quantity of water rising in it, (inducing, as the labourers believed, Cholera) rendered it no easy matter to proceed; still, enough has been done to carry the Channel into partial operation during the high freshes.

Estimate..... Rupees 56,160 work done 50,766-4 Rupees.

Captain Pollard, { Lee, } Rupees 2,997-14. per Cent.
Assistant Overseer..... { Conolly, Boyd } 5.9 on outlay.

41. Excavating and irrigating a navigable Canal from near Pedda Nullapoody to the Coast at Nizampatam, and constructing in it the necessary locks, calingulabs, and sluices.

42. As the Toongaboodra is a drainage Channel flowing on too low a level for an extensive system of irrigation, and being essentially required for its natural purpose, it is intended to leave all the lower portion of it open, as a simple drainage, and to make use of the upper six miles only as a main feeder from the anicut to the several large irrigating branches, to be taken off at Reddavadlapoo; the principal of these branches will run in nearly a direct line along a ridge giving off water for irrigation on either side, and terminate in the tidal backwater of the Port of Nizampatam; the scheme with its subsidiary works is estimated to cost 2,20,417 Rupees, and was commenced by Lieutenant Ryves, but at so late a period that but little more than a beginning was made.

Estimate..... Rupees 2,20,417 work done 8,023 Rupees.

Superintendent Lieutenant Ryves... } 2,225 Rupees per Cent. 27.7.
Captain Crewe..... }

The embankments of the Kistnah having suffered so severely by the unusual floods of 1853, it became necessary to reconstruct them, and a better alignment of bank having been selected, it was so made that the earth taken from the embankments should form an important irrigating Channel to join the main duct from the anicuts at Pedda Badlapoody;

GENERAL REPORT.

the estimate for this amounted to Rupees 78,520, and being ordinary, was trusted to the Collector's departments. From the disinclination of the Guntoor people to work, and the indifference of Tasildars and other revenue subordinates combined, little of this most important work, important as averting danger by floods from the crops of the entire Delta, only 18,000 Rupees of work was executed.

BRIDGES AND ROADS.

43. The district road from Guntoor to the Coast as far as Munchallah has been improved, and the work done under the supervision of the judge of Guntoor, who has, as far as practicable, employed the convict labor at his disposal.

DISTRICT ROAD FROM GUNTOOR AND CUMBUM.

44. This road has also for a considerable distance been thoroughly made by the Judge, aided by a sum of 900 Rupees sanctioned by Government.

45. Bridge at Bezoarah over the main channel from the anicut.

46. At the junction of the Hyderabad, Masulipatam, and High Northern Road, a suitable bridge at a cost of Rupees 7,584-14-10, has been erected.

47. In reviewing the proceedings in this district, the skill and energy of the Civil Engineer in the progress of the anicut are highly satisfactory, and in most cases the per centage of superintendence is very small; but this applies simply to the cost of European Agency, and it is supposed that here, as in some other districts, the cost of Native Agency is debited to the work; the Civil Engineer's Office and other establishments should however be debited to the supervision.

48. The Civil Engineer remarks that no material improvements having taken place to the roads of this district during the year, they are as unsatisfactory as heretofore.

2ND DIVISION. CUDDAPAH AND NELLORE.

49. The works in the district of Cuddapah have been for the most part improvements to the communications. Two bridges over the Ralla and Booga rivers respectively, have been built up to the springing of the arches at an expenditure of Rupees 14,909-3-9, and at a cost in Superintendence of Rupees 1,078 being 7.2 per Cent. on the outlay.

NUNDY CUNNAMAH GHAUT.

50. The work was discontinued in April from the Cholera having broken out in a most deadly form, carrying off the labourers after a two hours' illness; the work was again renewed in December; the sum expended was Rupees 14,703-8-9, the supervision charged to the general superintendence of the division.

51. In consequence of the greater or less prevalence of the famine, the Government sanctioned in January 1,000 Rupees a mile for the preservation of the poor from starvation, to be expended on the 3 following roads, the first extending from the foot of the Nundy Cunnamah Ghaut to Cumbum, and thence Eastward to Sheemakoollee, branching off thence N. E. to the Salt pans of Chinna Ganjam and S. E. to Ongole and the Salt pans at Padurty.

2nd. A central line commencing near Cuddapah at Chennai and taking the line of the Budwail and Dorenal pass (for which there is an Estimate sanctioned) proceeding to Nellore thence to the coast at Kistnapatam.

3rd. The Southern line extending from the Cuddapah and Madras road near Ootkooor down the Raupoor ghaut to Guntoor on the great northern road.

52. 1st Line 130 miles at Rs. 1000 per mile	Rs.	1,30,000	0	0
Expended	„	48,089	0	0
Superintendence	„	4,370	3	0
Per Centage	„	909	0	0

of this line, 15 miles from Cumbum in a southerly direction being over black cotton soil, and being moreover common to three routes viz. Bellary and Ongole, Bellary and Guntoor, and Cuddapah and Guntoor, were made into a first class road; the line has been traced for about 25 miles between Kistina Chettypullu, and the east part of the ghaut and Cumbum; other portions of the road were also traced, but not much appears to have been done, portions of the line not having been finally determined upon on the central line.

2nd. An Estimate of 100 miles at 1000 Rupees a mile	Rupees	100,000	0	0
Expended	Rs.	1,38,995	13	4
Superintendence	„	6,159	6	4

In this route an entirely new line has been selected, and the

communication nearly completed by temporary bridges; the pressure of the famine was so grievous and the superintendence so inadequate, that but little efficient control could be kept over the people; hence a heavy expenditure for the work done; but the main object of the expenditure, the prevention of starvation, has happily been accomplished.

3rd. The Southern line and Raupoor Ghaut.

Estimate	Rs.	65,009	0	0
Expended	„	47,370	12	1
Superintendence	„	1,687	14	9

53. Of this, 7 miles of the Raupoor Ghaut were nearly completed; at the west of this Ghaut, a new pass, the Umbalainee Cunnamah, was partially opened; a second class road was also opened Eastward to Goodlore, to which place the Engineer proposes that the Kistnapatam backwater shall be made navigable.

CUDDAPAH AND BELLARY FRONTIER ROAD.

Expended	Rs.	40,585	6	7
Superintendence	„	2,933	14	0

54. No specific sum was allotted to this work; it was ordered to be carried out to employ the famishing poor; 40 miles of road embankment were constructed, and a few miles gravelled.

DORENAL PASS ON THE CUDDAPAH AND NELLORE ROAD.

Estimate	Rs.	16,296	6	10
Expended	„	16,062	5	7

55. The Civil Engineer reports that about 6 miles of this road were nearly completed by the month of April, when the officer in charge, Ensign Innes, became alarmingly ill and died on his way down to Nellore for medical aid; in him the Department lost a zealous and intelligent officer; subsequent to this, some progress was made by Overseer Doherty; a further sanction of 1,000 Rupees a mile has been granted for this work; the superintendence has been charged to other works.

PODALOOR BRANCH FROM CUDDAPAH AND NELLORE ROAD.

Estimate	Rs.	20,000	0	0
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56. On this line (the trace has been made out) nothing further than advances for tools has been done.

BRIDGE OF 5 ARCHES OVER THE BEEROPAIRCOO.

Estimate..... Rs. 12,554 1 0

Expended..... „ 6,581 9 4

57. Great difficulties have been experienced in building the foundations of this bridge; the bridge is built nearly up to the springing of the arches.

CUDDAPAH AND CHENNOOR ROADS.

Estimate..... Rs. 6,435 10 4

Money expended..... „ 4,625 5 8

58. This work was carried on by the Collector, and being principally embankment, seems to have been much cut up by the peculiar formation of the wheels of the Cuddapah carts, whose tires are very narrow and act like a knife; some legislative or even local enactment might put a stop to this.

59. The roads above described diverging from Cuddapah, will, when completed, be most advantageous to that district, giving it a free access to the coast; the roads have been costly and are still far from complete; they require Bridges, Tunnels &c. and metalling; they were undertaken to provide food for the poor in a year of famine, and have, it is believed, been the preservation from starvation of thousands; the department is far too weak to carry out efficiently the ordinary wants of this district.

60. Of the other works in this district, it may be remarked that tho' of no very large amount, they have been important as improving the supplies of water to the tanks and irrigation generally; they consist of opening new entrances, widening, deepening, and strengthening existing channels of supply, and the results are reported by the Collectors as satisfactory.

ANICUT ACROSS THE PENNAIR.

Estimate..... Rs. 85,547 4 6

Expended..... „ 58,495 13 10

61. On recommencing this work it was found that from its having been subjected to the action of the river during the monsoon in an unfinished state, some of the aprons were disarranged; the stones carried so as to make it a troublesome and difficult operation to sink wells for the re-

maining portion of the work; considerable progress has nevertheless been made; 150 yards of anicut raised to a height of 6 feet, the remainder being left at 3 feet till the aprons were completed, the abutments on the north bank and other piers and of the centre and south sluice were finished off to six feet; here the work, (from the river having come down) necessarily terminated.

CANARA, BELLARY, AND KURNOOL.

62. In the Bellary and Kurnool districts unhappily, famine prevailed to an appalling extent in the year 1854, and to meet the wants of a perishing multitude the energies of the Revenue authorities were exerted to the uttermost, and of the Engineer department, to laying out the roads to be made to alleviate the distress. Lines from Bellary to Kurnool, and to Madaveram, on the Toombuddra, by way of Alloor and Auspary and Alloor and Adony, were first selected, as the Talooks traversed by them had from the nature of their soil, black cotton soil chiefly, suffered from the drought; but the universality of the distress led to the addition of the line from the Mysore boundary at Palsamoodrum by Anantapore and Ghooty, connecting it with the lines at Auspary and Adony.

63. To Mr. Pelly and his assistants, and to Mr. Conway, is due the immediate relief, by their readiness to take any amount of responsibility; and Lieutenant Colonel Henderson C. B. Civil Engineer brought his local knowledge and his knowledge of the peculiarities of the soil greatly to the advantage of Government, by drawing up sections and rules which tended to secure a valuable result to these operations; the brunt of the work fell on the Executive officers, and Overseers, and well did they do their duty in this distressing and most trying season, and their names are given in the Engineer's report which closes with the record of the death of no fewer than 10 Overseers out of the 42 employed, induced by hard work and exposure on men, who tho' no more exposed than their officers, were still from different habits less able to bear it.

64. Amongst the labourers, starved and emaciated tho' they were, the casualties were not sufficient to consider the season altogether an unhealthy one. Cholera, though prevalent, was not except near Anantapoor and Ghooty, of a virulent type; to give some idea of the multitudes fed a month, from totals taken on Saturdays, the annexed table is prepared: the proportion of women and children to men being 3 to 2; the pay of the men being 2 Annas, and that of the women and children, 1½ Annas a day.

Actually employ- ed on the under- mentioned dates	BELLARY ROAD DIVISION.						KURNOOL		
	Bellary.	Adony.	Puttycondah.	Ghootty.	Anantapur.	Pennakonda.	Pharwar Road.	Total of Weeks.	Total of Weeks.
1st July 1854...	23,679	16,057	18,268	19,187	4,815	2,218	2,218	81,323	4,815
8th "	21,754	15,703	15,018	19,016	4,871	2,372	2,372	81,816	4,871
15th "	27,193	19,342	15,076	22,045	5,910	2,679	2,679	93,045	3,931
22nd "	25,474	19,834	14,814	22,443	6,333	1,866	1,866	90,594	3,887
29th "	24,252	20,626	15,664	22,826	7,107	1,825	1,825	93,301	3,887
Monthly Totals	125,652	91,352	75,898	105,547	29,037	12,000	12,000	439,376	6,099
5th August 1854	22,600	16,329	7,014	14,073	7,431	2,479	2,479	69,926	4,202
12th "	22,495	12,403	return	17,162	4,803	1,836	1,836	69,099	4,246
19th "	17,992	14,349	6,568	17,331	4,998	1,815	1,815	59,951	4,247
26th "	21,873	10,470	return	17,444	5,804	return	return	55,691	4,049
31st "	17,412	8,700	6,517	18,104	5,076	2,035	2,035	58,134	3,218
Monthly Totals	102,302	52,351	20,097	81,724	28,203	6,215	6,215	395,611	19,992
5th Sept. 1854	17,171	8,434	6,415	19,196	6,013	2,414	2,414	60,327	4,017
12th "	10,922	6,593	6,547	17,884	6,415	1,989	1,989	56,352	4,117
19th "	17,118	6,211	6,952	18,711	6,574	2,130	2,130	57,723	4,280
26th "	15,161	3,674	6,320	15,129	6,062	2,327	2,327	46,073	4,049
30th "	68,412	21,921	26,444	71,130	25,099	8,800	8,800	230,812	16,493
Monthly Totals	115,558	47,998	6,332	13,368	1,844	1,844	1,844	38,306	None.
7th Oct. 1854	15,307	4,283	6,306	10,004	Work closed.	2,139	2,139	40,777	2,855
14th "	15,660	3,631	3,631	10,004	Work stopped.	1,897	1,897	24,179	2,802
21st "	15,339	4,876	4,876	10,004	Work stopped.	1,775	1,775	24,154	None.
28th "	58,051	29,836	29,836	23,372	23,372	7,585	7,585	1,27,416	5,637
Monthly Totals	58,051	29,836	29,836	23,372	23,372	7,585	7,585	1,27,416	5,637

the result of this effort has been at the rate of 1,760 Rupees per mile on cotton soil, and 550 per mile on common soil, a return to Government of Rupees 5,83,000 worth of roads which only require bridging and maintenance, to afford the means of traversing at all seasons the greater portion of this large tract of country; to meet this, an annual sanction has been granted of 40,900 Rupees for maintenance, and the sum of Rupees 81,800, and Rupees 1,32,880, for minor bridges, drains, and earthwork, respectively, on the undermentioned lines.

BELLARY TO KURNOOL.

65. With branch to Adony, Kurnool to Mysore frontier near Paulsamoodrum, Ghootty to Madavaram.

KURNOOL TO NUNDY CUNNAMA.

66. The length of these roads may be taken as 400 miles, and it is believed that they will be in such a state of forwardness as to allow of the bridges being undertaken in 1856-1857.

67. Leaving the famine roads, which belong to the Eastern portion of the Division, the road from Bellary to Humpsagur, with branches to Darogee and Ramandroog, should be noticed, as having, in spite of many obstacles caused by the scarcity, progressed steadily, to the credit of Ensign Franklin.

CANARA ROADS.

68. From the necessity of concentrating the operation in Bellary and Kurnool, the roads in Canara have made little progress this year; most of the roads having been described at length in the reports of 1853, it will be now necessary to shew the work already completed.

69. Surgawrurree Ghaut and road appear to have been carried on less satisfactorily than could have been desired, and the energies of the superintendents appear to have been misdirected.

Kyaghaut, leading to Sedashegur, the harbour of which seems to promise, if properly attended to, to be of considerable importance, has been traced and will be pushed on as rapidly as can be, the more especially as the Bombay Government have taken up the subject of its in-land extension.

Arbyle Road. Little else appears to have been done here than to collect materials for bridges; the Civil Engineer finding every thing in confusion, appointed Mr. Müller, a German of well known mechanical ability and character, as supervisor; the branch from this road to the small port of Ankolah and forming part of this group of communication was nearly completed this year; bridges are required, as they are also on the Yellapoor and Moondagode Road.

70. On the Dharwar and Coomptah roads by the Devamunny and Neelcoond Ghauts, much good work has been got through, including the entire making, and in a most satisfactory manner, by Lieutenant Babington, for forty miles East and West of Sircy, more especially on the Dharwar

frontier where the improvement could not have been effected without great care and energy.

71. The Neelcoond Ghaut has also been made practicable for carts, and the result of the great pains bestowed by the Sub Collectors Messrs. Hall, Fisher, and Robinson, must be gratifying to them; the opening of this ghaut has in some measure altered the value of the opposed opinions of the Collector and Civil Engineer as to the question of a bridge of boats across the Tuddry river so as to enable carts coming from Sirey by the Davamunny Ghaut to go at once to the warehouses at Comptah, on to unload, and go by a Canal from the opposite side to the small bay of embarkation.

72. The bridging of the river at the foot of the Neelcoond Ghaut which also leads from Sirey, will enable carts to proceed all the way to Coomptah without the interruption of shifting the load.

73. Siddapore Road Bridges. The timber bridges on this line leading from Sirey to Siddapore are not favorably reported upon, but though true that wood is inferior in durability to brick, still with jungles of gigantic trees at hand, and those of various kinds, from which no doubt excellent timber may be procured, it is believed by the Board that wooden bridges may be constructed with ease, expedition, and economy.

74. The Agoomby Ghaut has been very materially improved, and to the satisfaction of the Civil Engineer, by the skill and intelligence of Mr. Mackenzie a resident Coffee planter, who has also exercised his ability with excellent results in improving the Nuggur roads. A work of interest and value, the new Kunderdakul or Coffee ghaut, has this year been undertaken by the co-operation of the Canara and Mysore authorities, and the Collector of Canara paying great attention to the portion of it from Bellalanjooly, made much of it practicable for carts, from the discretionary allowance.

75. On the Mungerabad road but little has been effected from want of Superintendence, and for want of this, the work seems likely to be indefinitely postponed; with the small branch from Oopenangoody to Manee and the approach to Buntwall each in connection with the Trunk Road, good progress has been made by the Collector.

PUBLIC BUILDINGS.

76. But little is recorded in any of the three districts, Canara, Bel-

lary, or Kurnool, of the progress of public buildings; the Jail at Honore has been commenced.

77. In Kurnool, the famine has, by destroying the cattle, cut off the means of procuring materials, as it has also done in Bellary; the progress necessarily is slow.

IRRIGATION WORKS.

78. With the exception of ordinary repairs little is recorded save the commencement of the new Cunnakul channel, a work intended to take off a supply to be kept up by an anicut from the Huggery river; it is part of an extensive project for irrigating a large tract of land on the left bank of the Huggery; this project has not yet been fully investigated and is now under consideration; it is calculated to be most beneficial, and it is hoped that the Civil Engineer of the district will be able under the new system to devote his time to the investigation of the possibility of improving the Bellary district by means of this river, rising in the western ghaut within the influence of the South west monsoon with a constant flow of water, and upon which it is believed there is now not a single work of irrigation; that in short it presents a new field and gives great promise, if properly carried out, of placing a large tract of Bellary beyond the influence of drought.

79. The Electric Telegraph has this year been carried through Bellary; the energy of the Collector on whom the work of actual construction principally fell, has carried it on successfully, notwithstanding the obstacles of famine; and the intelligence of Mr. Denton of the Telegraph department, in the selection of the western part of the line and in the setting up of the wires, is deserving of especial commendation.

4TH DIVISION.

80. In this division the works have been numerous but of no great importance as to magnitude or interest; many old works have been restored, others made more efficient, and thus the prosperity of the district has been increased.

81. The aggregate sum of money expended in the two districts, on Irrigation roads, buildings, Ferry boats, &c. amounts to 1,58,103-15-7, say 1,58,104 Rupees.

82. The works in North Arcot appear to possess no particular interest and nothing deserving of comment; of the larger works may be noticed the restoration of the Nagaputle tank in the Chudrayherry talook,

rendered difficult of execution from being in the gorge of a mountain valley; it has been successfully completed at a cost of 5,150 Rupees by the native Superintendent of Marahmut, Mooneasawmy Moodelliar.

83. The Auknamput tank may also be remarked as the successful restoration of another tank very considerably breached and out of repair for years. It has a large stream, say 20 yards broad, running through the centre of it, which gave considerable trouble during the prosecution of the work, having twice partially carried away the embankment; it was completed at a cost of Rupees 2,259-1-5.

84. The Bomäsamcodrum tank was another ruined tank, its embankment faced with rough stones cut to fit as in native fortifications, as Vellore or Carangooly for instance; it, like the others, had a stream running through its centre and having no provision for outlet of water was some 60 years ago breached to a very considerable extent; this tank has been repaired and has had a large waste weir built to it under the superintendence of Lieutenant Rideout; the estimate for this work was Rupees 7,287-10-3, of which Rupees 4,200 have been expended in the year 1854; just at the close of the year a part of the filling up of the breach and a sluice just commenced were carried away by one of these sudden floods so common in hilly districts, but it was of no great consequence, and the work will be finished early in 1855.

85. Another tank under precisely the same conditions as the Bomäsamcodrum, the Pedda Madengee tank, has also been under repair under Lieutenant Rideout's supervision; the estimate for its restoration amounts to Rupees 8,106-11-5; the sum expended to the end of the year is 3,700 Rupees.

86. The Pallecoudah ruined tank is also undergoing repair under the same Officer on an estimate of Rupees 4,209, the expenditure to end of the year has been Rupees 2,100.

87. The Perancajee tank has been entirely renewed on an estimate of Rupees 2,845-12; this tank is an important one, hitherto dependant on rains, but now supplied by a channel from the Pooney river across which an anicut has been sanctioned; the Pooney channel has been excavated this year at a cost of Rupees 10,079 on an estimate of Rupees 9,985; the head sluice to the channel has been completed at a cost of Rupees 3,268-6 which was the amount of the estimate; these works were

carried out by Mr. Bush. Of roads, there have been repairs made to the Arnee and Tirumally road via Poloor at an estimated cost of Rs. 10,410-7-1, of which 7,101-10-6 have been expended to the end of the year under the supervision of Overseer Lincoln.

88. The road from Wallahjalinuggur to Sholinghur has also been progressed with, but requires further bridging and metalling; the original estimate was Rupees 6,345-2-2; but as this line passes the railway and requires to be of the first order, an additional estimate of Rs. 5,499-10-10 has been prepared; this work was superintended by Mr. Bush.

89. The repairs of the road from Pootulput to Kurumbady have also been proceeded with; the estimate for this work was Rs. 12,823-1-3, but owing to the difficulty of procuring work people, the population being scarce, only, Rs. 3,145-14 have been expended; on the road from Nagery to Balapilly, part of the road from Madras to Cuddapah, but little has been expended, and for the same reason; considerable facilities however have been given to trade by the entire reformation of the Nagery Ghaut, which, if properly kept up, and for which there is an annual allowance, will continue to be an excellent road: these two works were under the immediate supervision of the Superintendent of Marahmut.

90. The road from Conjeveram to Thellar on an estimate of Rupees 11,564-11-8, has had a sum of Rupees 11,564-11-8, expended upon it; this road is part of the old Pilgrim road from Ramisweram via Tindevanura, Wandewash, Conjeveram, and Nillamy, to Tripetty; it is particularly useful as connecting the southern road at Tindevanum with Conjeveram of the Chingleput district; as of north Arcot it may be remarked that the works are of no particular interest; they are for the improvement or conservation of existing works; the facing of tanks with stone, the construction of waste weirs, the building Head sluices to river channels, and the embanking partially the Cortelliar river, has prevented that constant destruction of works in this district, which caused the ordinary repairs to be larger than in any other district save Tanjore.

91. The principal work undertaken was an anicut and head sluice at Coratoor across the Coom river for the better diverting a supply of water to the Chumbrumbankum tank; the original mound being but sand faced with stone with a small waste weir in the centre, was constantly washed away, at just the most important time; the estimate for this work is Rs. 16,875-11-1, and 9,249-3-6 have been expended on it by Lieute-

nant Dansey; another important work is an anicut across the Cortelhar for the purpose of keeping up a head of water for the Bungaroo or golden channel, so supplying the Cooum river and eventually by means of the Coratore anicut the Chumbrambanum tank; the estimate for this work is Rupees 9,233-2-2; but, there has been only Rupees 376 expended, and that for the preparation of materials; both of these works are under Lieutenant Dansey.

92. The Cooum tank has of late years been materially strengthened and improved; it is now a very strong tank.

93. The Gunndavady tank has been faced with stone at an expenditure of Rupees 2,150-9, and its channel very materially improved; a new Calingulah and stone facing has been built to the Pandoor tank at an expenditure of Rupees 1,440. Of the roads in this district which have been under construction this year, the most important is a road from Poonamallee to Saint Thomas' Mount, connecting these two important Military Departments; the distance is six miles; the estimate Rs. 16,484-11-11, of which 7,709-4-9 have been expended; this is under the supervision of Lieutenant Dansey.

94. Road from Yansalre to Tamanjerry, part of the road from Madras to Balapilly, has been unsatisfactorily carried on; the estimate is Rupees 3,982-1-8; the expenditure Rupees 1,224-2; the work has been given on contract to a man who seems determined not to do his work.

95. Road from Chunambut to Tindevanum connecting the salt pans with the southern road is an important work and has been satisfactorily proceeded with; its estimated cost is Rupees 1,784-11.

96. The road from Surapen's Chuttrum to Chingleput has also been completed at an expenditure of Rupees 6,635-5-4.

97. This road connects Chingleput with northern road at Soorapen's Chuttrum passing through Wallahjahbad and Congeveram and numerous villages principally of weavers between these two places, and is of much importance as a district communication.

SALEM AND SOUTH ARCOT.

98. The proceedings in these districts in the year under review shew considerable progress in constructing and improving the communications; of these, one of the most important is an estimate of 66,258 Rupees for a road from Cuddalore to the Salem frontier, by way of Virdachellum; of

this road, 33 miles from Cuddalore to Virdachellum have been opened for bandy traffic, and it is fully believed that the work will be completed, bridged, &c. (except the large bridge over the Maucemodanuddie and for which a separate estimate is required;) within the estimate, and early in 1855.

The cost of work done..... Rs. 42,800 2 8
Superintendence..... „ 2,837 5 0 being 6.3 per cent.

ROAD FROM PORTO NOVO TO BOWANGHERY.

99. This road has been about $\frac{1}{4}$ finished with the exception of metalling, for which a further estimate would be necessary; the work done consists of every thing else constituting a road; the estimate is

Rs. 19,394 5 0
Sum expended..... „ 16,076 15 2
Superintendence..... „ 2,763 5 11 being 17.1 per Ct.

CUDDALORE TO OOLUNDOORPET.

100. This work amounting to Rupees 11,000, has been carried on by the Collector's Department; a portion of the road is much used by bandies to and from by Mr. Pugh's and Mr. Norfor's Sugar factories, and this has been metalled; for the remaining portion an estimate is in preparation.

Pondicherry to Mylum estimate..... Rs. 5,017 11 0

101. This road is being finished within the French territory by the French Government; the portion in South Arcot has been carried out under the supervision of the Sub-Collector, Mr. Gordon Forbes, who, the Board feel gratified in remarking, has given much valuable assistance, and who, in addition to his own laborious duty, has found time to lay out and superintend in addition to the Pondicherry and Mylum road, a road from Villapoorum to French territory at Villiarum Rupees 3,761. Tindevanum to French territory at Kilianore..... Rs. 2,000 0 0
Tindevanum to Mercanum..... „ 9,968 0 0
Tindevanum to Thelhar..... „ 4,786 0 0
all of these roads are represented, as far as they are made, as in very satisfactory order; in some instances owing to the great amount of traffic it will be necessary to metal them.

102. There are minor repairs to various portions of road carried out, some by the executive Officer and others by the Collector's department, from the discretionary allowance of Rupees 5,500. In the

Salem district, the Topoor Ghaut has been improved at an expense of Rupees 3352-15-6, by reducing the slope in some places and by constructing two bridges; the superintendence was Rupees 570 being 16.8 per cent.; as this part of the country is particularly feverish the progress was slow, as the laborers were not very willing to work.

* ROAD FROM SALEM TO YERCAD ON THE SHERVAROY HILLS.

103. Amount sanctioned Rupees 3,500. This work was superintended by Mr. Herbert Richardson who has an extensive coffee plantation there, who volunteered his services and has carried on the work in a most efficient manner; he also volunteered to carry on the works from Yercad to Adamancottah; the sanctioned sum was 10,000 Rupees: the Engineer writes that he had almost despaired of making a good road at any reasonable outlay from the numerous ravines and rocky nature of the soil, but having changed the line in order to carry it direct to the railway at Mullaporam, Lieutenant Puckle, who now has charge, writes that a good carriage road will be made without difficulty; on a rough calculation he considers that it may be completed for 30,000 Rupees.

IRRIGATION.

104. Of irrigation works there is not much to report: the amounts are small and are for the repair of existing works; the state of the division generally is one of improvement, but of slow improvement; many sanctioned estimates both for roads and new works of irrigation, and some of them important, having been delayed in consequence of the inadequate Marramut establishment.

6TH DIVISION.

105. Tanjore may be considered the garden of Southern India: its extensive and intricate irrigation works have had the attention of the ablest of the Corps of Engineers; the year under review has nevertheless in a minor degree brought scarcity and suffering, and yet this has been attended with this advantage, that it enabled the Engineer to turn the labor of the half famished cultivators to account by carrying on drainage projects, which in ordinary years could not be executed.

106. Of these works, there is the drainage by straightening the tortuous course of the Conacodinal river, draining 7,908 acres of land; estimated cost Rupees 5,797-1-3, actual expenditure Rupees 5,498.

107. Improving the drainage of Samoodiavaily and other villages: estimated cost Rupees 9,652-15, expenditure Rupees 9,438. This was

effected by cutting a channel 3 miles long across the swamp to the sea, and has been successful as a discharge for the vast accumulations of water which covered these low lands during the rains.

108. Improvement by drainage of the lands of 32 villages under dry grain cultivation between the rivers Odapaur and Mooliaur. Estimate Rupees 36,167-12, money expended Rupees 23,762-12: the part of this to be completed is a cut to connect the Manancondanaur with the backwater at Codicurray near Point Calymere, and it is believed that this will improve the backwater to the advantage of a small trading community who possess 30 Dhowries and trade with Ceylon, and who, by this cut, will also be enabled to send boats for grain to Triterampoondy on the Cauvery.

109. Of Irrigation works the principal appear to be repairing and improving the regulating dams across the Cauvery and Vennaur at the head of the latter river; estimate Rupees 13,697-8, expenditure Rupees 10,923-10; constructing an anicut and bridge across the Adapaur, estimated cost Rupees 5,449-14, expenditure Rupees 5,128, and constructing a head sluice and two main channels at an expense of Rupees 6,904-15 on an estimate of Rupees 8,579-8.

ROADS AND BRIDGES.

110. Extending the lower Coleroon anicut and erecting a bridge over it. Estimate Rupees 150,000, expenditure Rupees 9,894-5; no progress in the actual construction has taken place in this work.

111. Seven Bridges have been built to connect the large town of Trivalore and Triterampoody under the supervision of Mr. Morris, Special Assistant Collector of Tanjore, at a cost of Rupees 16,809-7.

112. A bridge at a cost of Rupees 5,041-3, and another at a cost of Rupees 1,457-10, were built on the Southern coast road; a bridge costing Rupees 2,803-10 was built on the above road westward from Point Calymere; a bridge across the Ponany river on the road from Triterampoody to Mootoopellah cost Rupees 7,524-1.

113. A bridge at a cost of Rupees 6,484 to complete an important communication from the interior to the port of Trimulwassel; reconstructing a bridge destroyed by the hurricane of 1853, across the Trimulroyen river on the road from Combaconum to Tanjore.

THE PORT OF TRANQUEBAR.

114. The improvement of this port by deepening the Nundalaur; its embouchure was prepared to be effected by turning into it the Semibennar, but this is as yet incomplete; connected with this project is also the improving of the Coast Navigation, but until the dikes are consolidated for the admission of the Umbenaur, neither the deepening of the port or the improvement of the navigation will be effected; the estimate amounts to Rupees 21,091-4, and Rupees 17,098-6 have been expended, and Major Lawford reports favorably on the improved facilities of the river navigation to the coast by the work previously executed.

BEACH DEFENCES OF TRANQUEBAR.

Estimate..... Rs. 24,500- 0-0
Work done..... „ 24,404-13-0

115. The work consisted of improving and repairing existing groynes and placing intermediate groynes, which have had a beneficial effect.

116. In connection with, and in continuation of the cut from Tranquebar to the northward, a canal has been excavated from the Ambenaur to the Port of Teroomilvassil; the work has made good progress; the estimated cost is 25,000 Rupees, the money expended Rupees 18,843-10.

THE JETTY AT NEGAPATAM.

117. The construction of the masonry foundations was proceeded with, but the works could not be completed, so that the effects are not decisive. Estimate Rupees 10,200, work done Rupees 6,892-1.

118. Of public buildings in the Tanjore district there have been built 6 Revenue and Police Cutcheries at a cost of Rupees 11,366-2, and a choultry for native travellers at Trivanuru at Rupees 1,506-4.

TRICHINOPOLY DISTRICT.

119. In this district the works carried on during the year have been nearly all of an ordinary character, and require no particular mention; they were for the improvement and maintenance of existing works.

ROADS AND BRIDGES.

120. The road from Trichinopoly to Madura at a cost of Rupees 22,103-4, of which Rupees 13,857-5 was expended in 1854 comprised in this sum, is an askew bridge of 5 arches.

121. A sum in the aggregate of Rupees 1,19,911-3-3 was expended in irrigation; Rupees 55,400-5-7 in repairing roads, constructing bridges, &c.; Rupees 5,119-0-2 in Public buildings, and Rupees 1,010-6 in Navigation, being a total of Rupees 1,80,441-3-11.

SOUTH ARCOT.

122. No progress of any importance was made in irrigation works or to new works; the usual attention to existing works and their improvement was bestowed by the Civil Engineer.

123. The deepening the course of the Vuddavaur near Manargoody (the lower portion of which was filling up and so causing a deficiency in supply to the tank) has been done on an estimate of Rupees 4,387-8, at a cost of Rupees 4,376-10.

OF ROADS AND BRIDGES.

124. There have been Constructed a Bridge of 3 arches across the Vuddavaur, on the road from Manargoody to Wodiarpollum, at a cost of Rupees 4,386.

125. A road from Veeranum tank joining the high road to Chellumbrum via Pooloor at a cost of Rupees 2,293-10.

126. Repairing the road from Thabatope to Womamp Anoor, Rupees 2,703-6.

ROAD FROM BELLAR TO COLEROON RIVER.

127. Repairing the road from Chellumbrum to Laulpet, Rs. 2,300.

128. Constructing a boat for the Coleroon Ferry at Vullatoray, Rupees 956-4.

129. Of navigation works there has been executed the lock at Porto Novo at a cost of Rupees 1,350, and cutting a channel from Bellicau to Veeranum Aqueduct at a cost of Rupees 1,603-8.

IMPROVEMENT OF THE HARBOUR OF CUDDALORE.

Estimated cost Rs. 53,249 10 6

Expenditure..... „ 33,400 0 0

130. The value of the works and the causes of the deterioration of this harbour are fully treated in the Civil Engineer's report; it may suffice here to remark that the main cause of this deterioration is the confluence of the two principal rivers in opposite directions; when the freshes of the Guddalum river are too feeble to force open the Northern bar, that river turns towards the Southern outlet and thus meets the current of the

Paravennur, from which cause both rivers are checked and their beds loaded with sediment spread over a wide expanse, and lose their power; the tidal action is diminished, and the bar shoaled, and the means taken to remedy this has been to unite these streams so as to direct their unimpaired force on the bar.

7TH DIVISION.

131. In this district, of irrigation works an ancient and channel on the river near Walliar ultimately to be extended on further sanction, has been commenced on an estimate of Rupees 1,429-5 and partially carried out; the Arcanacotia channel improvement by excavating two branch channels with proper sluices has been commenced on an estimate of Rupees 9,997-4.

132. The Tuddapully channel is to be improved at a cost of Rupees 23,630-15-6, but at present but little progress has been made.

BRIDGES.

133. Five Bridges in the limits of Coimbatore on the road from Coimbatore to Sattimungalum have been completed at a cost of Rupees 4,625 on a sanction of Rupees 5,003.

134. A Bridge of 10 feet span, at a cost of Rupees 640-13-1, has been built over the Arcanacotia channel.

135. A Bridge at a cost of Rupees 16,029-4 across the Bowany at Sattimungalum on the road from Coimbatore to Mysore by Sattimungalum and Hassanoor Ghaut, has been commenced; two abutments up to basement even completed; some other small bridges have been constructed; a road from Coimbatore via Polachy to Polamy has been commenced on an estimate of Rupees 32,909-4, of which Rupees 15,000 have been expended.

BUILDINGS.

136. There have been built a Sub-Collector's Cutcherry at a cost of Rupees 626-13-5, a travellers bungalow at Caroor at a cost of Rupees 495-3; a Monsiff's Court at Caroor is in progress on an estimate of Rupees 906.

137. The travellers bungalow at Bowany is undergoing repairs and improvement on an estimate of Rupees 1,912; the bungalow sanctioned at Hassanoor on an estimate of Rupees 1,058-14 was sanctioned in 1853, but has not, (from the paucity of workmen and their dislike to so unhealthy a place) up to this time, been commenced.

138. In addition to the Civil Works, the cantonment of Jackatalla, a Sanatorium on the Neilgherry Hills, has been so far carried on that the roads, water courses, Hospitals, Magazines, Racket Court and out buildings have been completed, and temporary buildings provided to accommodate 5 Companies and the Head Quarters of a Regiment.

ROADS.

139. Great improvements to the intercommunications of the district have been effected; a road from the foot of the Hassanoor Ghaut to Goodaloor, 10 miles from Coimbatore, has been improved at a cost of Rupees 3,278-6-10, and is already of great use.

140. The road from Trichinopoly to Mettapolliem was sanctioned to be repaired in the limits of Coimbatore at an expense of Rupees 12,074, of which Rupees 4,377 have been expended.

141. The Mysore and Seegoor road between the foot of the ghaut and the Mysore limits, has had Rupees 4,871 out of a sanction of Rupees 5,985-4, expended upon it; this is an important line of road, as by it, from the fact of most people going by transit carriages, travellers approach the Neilgherry hills; it is moreover used for the conveyance by carts of Commissariat stores; the Seegoor Ghaut itself is excessively steep as much as 1 in 10, and ought no doubt to be improved; but before doing this, it will be well to ascertain the effect of the railway, as it may be conceived to be most probable that when it is opened to Coimbatore, and the foot of the hills, the Coonoor Ghaut will be the road by which passengers will travel; and with a view to effect the improvement of that Ghaut, the Civil Engineer is now employed in tracing out an almost new line at a slope of not more than 1 in 20.

PROVINCE OF MALABAR.

142. At Gunnothe, on the road from Cannanore to Coorg, via the Perambady Ghaut, a traveller's Bungalow, Soldiers' shed, and native choultry have been erected at a cost of Rupees 3,818-7-6. Rupees 1,476-6 have been expended in improving the road from Cannanore to Caunand, situated on the backwater, at the place where various supplies for the Bazaars and cantonment are landed.

143. On the Muttanoor, Cotaparamba, and Tellicherry road, some Rupees 3,448 have been expended this year in addition to Rupees 6,187 previously laid out; the Civil Engineer observes that owing to a continued

change of Civil Officers under whose charge the work was carried on, less progress has been made than there should have been.

144. Groynes in Ponany for protecting the town have been thrown in and have answered so well, that the Civil Engineer contemplates running some of them out, with a view to form a wharf where country boats may land their cargoes.

BRIDGES.

145. There has been repaired at a cost of Rupees 2,347 a wooden bridge on granite piers near Calicut, a bridge at a cost of Rupees 1,381 for the convenience of approach to the Military station at Malapooram, and a truss bridge over the Poodoor stream on the road from Angaddypoorum to Tiroongady has been commenced on an estimate of Rupees 1,725, of which Rs. 450 have been expended. A Cutcherry at Calicut has also been erected at an outlay of Rupees 1,884.

146. In the Province of Malabar, as in Canara, the artificial works of irrigation are few; the copiousness of the rain and the ever flowing rivers and streams render it independent of reservoirs and other means resorted to in the less favored Eastern coast; the attention of the Civil Engineer therefore is directed in this province to the communications both by land and by canals, and an inland navigation is being gradually developed. On these works there has been expended Rs. 2,646 in part of an estimate of Rs. 5,735-1, for a cut to connect the Tunnor canal with the Vengally backwater; again, a further sum of Rupees 5,020-9 in extending the canal from Coulye on the Ponany backwater via Tunnor and the Vengally backwater to Keeravelloor, and a further sum of Rs. 11,273-15-9 on an estimate of Rs. 16,381-12 has been expended in a canal for the Ponany and Chowghaut backwater being portions in extension of the above, and of the West coast canal.

147. The Civil Engineer has in contemplation the completion of this West coast canal meeting the northern portion of it, for the navigation by light steamers between Cochin and the Railway station a little to the north of the town of Ponany; this work will be no doubt most useful and remunerative, and seems the legitimate high road for the traffic of a country so intersected by rivers, backwaters, &c. as to render from the great expense of bridging, a completely bridged road too costly a machine. Cochin is rapidly increasing in importance, has an increasing and influential body of English merchants, and a large trade, and

the attention of the Civil Engineer will be directed to improving the harbour within the bar of which there is as much as 40 feet of depth of water, and at whose ship building yards vessels of 1200 tons have been built; great attention has been given by Mr. Conolly and other gentlemen in the Civil Service to the improvements of the roads, improving their gradients, metalling, bridging, &c.; still it cannot be said that there is any thing like good road communication, roads 4 and 5 and the coast road being the only communications that can bear that name. The Wynaad country requires to be opened up, two passes at least being required to assist in the encouragement of Coffee Planters of whom there are several Europeans, and whose trade is opening up into importance and likely to be much increased, an enterprising race of Moplahs having lately settled there and gradually taking up forest lands.

8TH DIVISION. TINNEVELLY AND MADURA.

148. The works in these Districts have been during this year chiefly for repairs of existing works; and in proof that the works in the division generally are in excellent working order, it is only to be observed that in a confessedly bad season the cultivation returns do not shew any great falling off either in land or revenue; of the communications and bridges in these Districts there has been constructed a bridge of 6 arches of 30 feet span and 7½ rise across the Goondaur on road No. 4 in the Theroomungalum Talook of Madura, the foundations of which, with the abutments, were finished in 1853 at a cost of Rupees 1,898, the expenditure in 1854 being Rupees 3,106-2; mention is made of the judicious and economical execution of this work by the native Maramut superintendent Polony Velloo Moodelliar; several small bridges and tunnels have been completed in this same road at an aggregate cost of Rupees 1,120-9 being in continuation of the work of 1853; a further sum of Rupees 1,007-1-1 was expended under the head of ordinary for repairing portion of the above road in Ramgherry and Theroomungalum. No. 15 road has also been improved between Madura and Dindigul in the same District at an expenditure of Rupees 880-11, making, with the sums expended in previous years Rs. 7,817-7. Very great benefit to traffic has resulted from this outlay, but further outlay is necessary to complete the road to the Eastward of Madura; this road has also been repaired at a cost of Rupees 1,041-9; the balance of the estimate of Rupees 1,909 will be carried out another year. Road No. 5 be-

tween Mytoor and Tirpatoor has also been improved at an outlay of Rupees 502-4; on road No. 14, Rupees 2,541-7 has been expended; the bridges across the Oôpaur and the supply immediately joining it were completed; the total cost was Rs. 5,555-2 for the bridge over the river, and Rs. 3,600-8 for that on the channel.

*149. These bridges were built by the Maramut superintendent Vencataramiah and are most creditable to him; on the road No. 18 Rupees 1,595-13 was expended out of an estimate of Rupees 1,879-13, and in the construction of some additional tunnels Rupees 431-5 were expended on an estimate of Rupees 501-7, and a further sum of Rupees 1,081-14 was expended in repairs; the Ghaut leading from Perea-colum to the Pulney hills was recommenced under Overseer Bywater, and by the end of the year $4\frac{1}{2}$ miles of new road about $2\frac{1}{2}$ miles broad was completed.

150. In the district of Tinnevely a considerable outlay was made on trunk road No. 4: the Vintooputty bridge was completed at a cost of Rs. 8,243-8, a platform bridge of 22 vents each 6 feet wide across the Katalumputty Oday on an estimate of Rs. 3,990, of which the piers, &c. and 7 platforms have been laid down; a bridge of 15 arches of 40 feet span across the Sautoor river at the Casbah station; the substructure of this bridge was completed at a cost of Rs. 7,366-13; a sum of Rs. 2,561 for various repairs between Lailputtoo and the Arambooly lines a distance of 87 miles; several small sums have been expended on various cross roads in the district, building small bridges, tunnels, &c.

151. The trunk road between Streevellypoothoor and Shevacausee has been completed at a cost of Rupees 7,241-13, making in the aggregate Rs. 17,350-9; the distance is 12 M. 250 Yds.; a continuation of this road extending for 5-M. 1 F. 200 Yds. was made, metalled, and several small bridges built, at a cost of Rupees 10,030-12; on the branch cotton roads within the limits of Madura, a total expenditure of Rs. 27,299-15 has been made; in the Tinnevely limits the road has been repaired and 2 bridges of 3 arches each of 24 feet span have been completed, at a total amount of Rupees 26,175-12.

152. Several public buildings for Revenue and Judicial purposes have been improved or are in course of erection at a cost of Rs. 1,154-7, and 3 Chuttrums have been commenced and Rs. 4,440-2 have been expended upon them; the prospective wants of the district are summed up in detail in the report.

9TH DIVISION.

153. Great efforts have been made in this Division to remedy the defective state of the communications; for up to 1850 it cannot be said that there were any roads at all; cross roads there were none, and the great northern road made many years ago, had with here and there a few exceptions, received no repairs and was in some places nearly obliterated, and in others entirely so.

154. During the year a bridge of 10 arches of 30 feet span has been completed over the Ankapilly river; the estimate amounts to Rupees 10,567-8, the cost of the work is Rupees 9,878-15-7; the traffic during April 1854 was 1,230 laden bandies, 1,800 pack animals, and 7,500 passengers daily.

155. A bridge of 10 arches of 30 feet span at an estimated cost of Rupees 10,567-8 was commenced, and had Rupees 6,467-6-8 expended upon it. The Trunk road from Toone to Yellamunchilly, has been repaired in Earthwork and bridging and Tunnelling to the amount of Rupees 11,707-2-6 this year, making a total sum of Rupees 24,362-13 on an Estimate of Rupees 26,771; a portion of this road from Toonee to Soobarum sustained considerable damage during the extraordinary flood of the year 1853; in several places breaches were made, and in other, portions of the gravelling were washed away, and a supplemental Estimate of Rupees 5,292-10-11 was sanctioned for repairing it.

156. On the road from Soobarum to Chittyvulsah but little has been done, the expenditure being but Rupees 2,042-2-8 out of an Estimate of Rupees 15,709-9-6; Rupees 12,963-6-2 has been expended on the road from Chicacole towards Itchapore for a distance of 30 miles; on this road from Chilacode to Teekaly, Ragonathpoorum, metalling and materials for bridges have been collected, the earthwork having been completed; estimates for Bridges &c., have been forwarded amounting to Rupees 1,14,404-15-6.

A bridge of 25 arches of 12 yards span on an Estimate of Rupees 29,285-2-10, and a supplemental Estimate of Rupees 10,048-8-3 has been commenced; the wing walls, abutments, and piers, to a height of two yards have been built; the sum expended was Rupees 11,614-6-2; no further progress could be made in consequence of continued freshes in the river.

TRUNK ROAD FROM ITCHAPORE TO HOOMNA.

157. On an Estimate of Rupees 51,308-8-1, Rupees 15,264-5-5 have been expended; 3½ miles of the road have been completed; 7 miles further has had the earthwork finished; a bridge of two arches of ten yards span and the foundations of 20 bridges and tunnels have been laid.

158. The Branch roads in the Vizagapatam district have had considerable sums expended on them; the road from Vizagapatam to Vamoolavulsa has been completed at a cost of Rupees 8,565-10-6; this road connects Vizagapatam with the northern trunk road.

159. Three bridges at an estimated cost of Rupees 8,565-10-6, have been commenced, and the sum of Rupees 3,383-12 has been expended upon them.

160. Upon the road from Vizagapatam to join the northern road at Ankapilly Rupees 1,831-7-8 have been expended, making a total expenditure of Rupees 9,917-11-3; by this road the rich talook at Survasiddy is connected with Vizagapatam.

161. An Estimate at the rate of 500 Rupees a mile has been sanctioned to traverse a fertile tract between the northern road and the sea; this was taken up not only for the purpose of opening up these talooks but for employing the starving population; estimates are in course of preparation for bridging and completing it; Rupees 10,496-13-4 have been expended upon this portion of road.

162. Road from the Trunk road at Thalipollem to Nursapatam, a Military station on the borders of the Golcondah Zemindary; the estimate for this is Rupees 500 per mile, and the expenditure in 1854 Rupees 10,057-4; the road has been completed for 7 miles; three miles are in a state of forwardness: from Nursapatam to Golcondah a sum of Rupees 500 per mile has also been sanctioned and the work has been commenced, and Rupees 1,181 have been expended; a road from Nursapatam to the sea coast at Polarum has received sanction at a cost of Rupees 500 per mile, and Rupees 3,633-1 have been expended upon it.

163. A road from the Trunk road between Ankapilly and Cassimcotta to Taudpully at the foot of the Hills near Magole has been begun and Rupees 4,484-7-4 have been expended upon it; the sanction of this is Rupees 500 per mile.

164. These roads will open up the hilly tracts of Nursipatam and Golcondah to each other and the Coast.

165. In the northern part of the Vizagapatam Collectorate a road is under construction from Palcondah to Cheepurpilly on a sanction of Rupees 500 per mile, and has had Rupees 13,940-14-4 expended upon it, and from Cheepurpilly to Vizianagram a road has been constructed by H. H. the Rajah of Vizianagram.

166. A road is under construction on the same sanction of Rupees 500 per mile from Palcondah to Paunlypoore and Rs. 2,131-13-4 has been expended upon it, and 5 miles of the road from Bobily to Parvatapore have been constructed at a cost of Rupees 1,064-6-2, on the same estimate per mile as the others.

167. A pass is being opened into the Jeypore Country from Parvatapore; the jungle has been cleared for 15 miles, and the road made passable for 9 miles, at a cost of Rupees 2,098-13-8 (but the superintendent, having become sick resigned his situation.) Another pass is being opened into the Jeypore country from Taulipaity, and on this Rupees 6,744 have been expended; the road has been cleared of jungle for 9 miles, ¾ of its length.

168. The opening up the Jeypore Country will be attended with the greatest benefit, hitherto inaccessible; that country has been the resort of marauders, and other evil doers of the low country, whence it was impossible to reclaim them, being sheltered and harboured by the Rajah of Jeypore.

169. In the Ganjam District a road has been made from Chicacole to the port of Calingapatam on an Estimate of Rupees 10,946-9; the expenditure in 1854 is Rupees 4,633; the total expenditure is Rupees 12,433; for this extra expenditure together with a supplemental Estimate for thoroughly completing the road, estimates have been submitted to Government.

170. A road from Palcondah to Chicacole at an estimated cost of Rupees 41,452-4-7 has been commenced, and roads have also been commenced from Kimeddy to Poody on an Estimate of Rupees 23,352-11-7, of which Rupees 3,441 have been expended; another from Kimeddy to Nursipella within the limits of the Kimeddy Zemindary on an Estimate of Rupees 26,152-15-2 has been commenced, but very little progress has been made; in the northern part of the district, the road from Berhampore

to Gopalpore on an estimate of Rupees 5,302-5-8 has been completed and is in good order; a road from Berhampore to Russelcondah at an estimated cost of Rupees 1,42,246, and on which a total expenditure has been made up to December of 1854 of Rupees 36,718-14; Rupees 11,383-7 has also been expended on a road from Russelcondah to Komjore which has been made during the year; these roads are useful not only as opening up Aska, where there is a large sugar factory, to the shipping roadstead of Gopalpore, but in a military point of view are valuable as opening up the country of Goomsoor.

171. The state of the roads and irrigation in these districts is steadily improving; the exports from the districts have also very materially increased in the Ganjam district; the chief ports are Ganjam and Calingapatam; the value of exports from the former was in 1852-53 Rupees 1,15,109, and in 1853-54 Rupees 2,29,603; at the latter the exports have fallen from Rs. 5,93,136 in 1852-53 to 4,52,492 in 1853-54.

172. Very considerably more attention than has been hitherto given is now bestowed on these districts, and the anicuts and river embankments in contemplation will, without doubt, materially improve its condition.

173. The above together with the reports are imperfect, as they do not afford either all the information that could be wished, or the information required by the Bengal Government.

174. It is not possible to supply information this year upon the results of the works and their bearing upon the Revenue and Collections; this information has not hitherto been supplied, but in every particular full information will be supplied in the next report made up from 1st May 1855 to the 30th April 1856. There will be some difficulty even here in forwarding Revenue Statements, as the Official year for Revenue accounts ends not on the 30th April but on the 11th June.

I have the honor to be, Sir,

Your Most Obedient Servant,

G. C. COLLYER, Captain.

Deputy Chief Engineer D. P. W.

late Secretary to the Bd. of Rev. D. P. W.

CHIEF ENGINEER'S OFFICE, D. P. W. }

4th October 1855.

To the Secretary to Government,

Public Works Department, Fort St. George.

STATEMENT shewing the expenditure on Public Works in the Provinces during the Year 1854.

	Amount expended during the year 1854.		
KISTNAH DIVISION.			
Kistnah Anicut project a moiety of which belongs to Guntoor.....	9,83,330	15	5
Small irrigation works.....	240	0	2
Widening the Calingulah of the Chatapurroo Tank.....	134	6	5
Small irrigation works.....	744	6	0
Restoring the Cuncherla Tank and constructing Calin- gulah to do.....	2,001	11	4
Restoring the Mundathee Tank and supplying Channel.....	266	14	5
Forming a raised road with Bridges across the wet land fields under the Sandole Tank.....	1,282	2	8
Improving the District Road from Guntoor to the Village of Munchallah (distance 11 miles) leading to Ni- ampatam, Baupetlah, &c.....	4,968	6	10
Constructing Moonsiff's Court House at Baupetlah, &c.....	189	10	6
Do. do. at Kurrumpudy.....	68	4	7
Constructing 4 Bridges and one inverted arch to the Munchallah Road.....	1,728	13	1
Rupees.....	9,94,964	11	5

GODAVERY DIVISION.

Coringa Canal.....	58,322	4	8
Bank Channel to Yanam and Branches.....	10,822	14	2
Widening the Samulcottah Channel.....	17,083	4	4
Branches from the Coconadah Canal.....	4,219	4	5
Widening the Head of Rallee Channel.....	11,718	12	0
Pullavella Channel.....	4,484	7	0
Eastern Bank and Amlapoor Channel and branches.....	14,306	4	5
Venkiah Channel and Embankments.....	12,708	12	0
Oondee High level Channel and Calingulah.....	9,749	13	8
Utteelee Main Channel and Branch.....	960	5	0
Doovah Calingulah.....	9,654	6	4
Yanamudooroo Drainage Cut.....	159	1	3
Colair Calingulah.....	14,484	0	0

	Amount expended during the year 1854.		
Mulumpoody Channel.....	14,454	14	10
Cut across the Mogulloor Sand Bridge.....	9,420	15	7
Embankment of Nukhala Channel.....	951	1	9
Palcole Canal, Perravella Lock, and Calingulah.....	2,857	8	3
Enlargement of Canal.....	31,094	3	0
River Embankment as far as Yanam.....	16,104	10	6
River Embankment in the Eastern side of Central Delta.....	10,055	10	0
River Embankment from Aqueduct to Ramarazunka.....	8,314	2	5
Continuation of do. to Sakenatepilly.....	7,448	8	10
Embankment in the Eastern side of Nagaram Talook.....	8,064	10	8
Groynes at Tatapoody, Muskapilly, &c.....	12,714	5	7
Sakenatepilly Cut.....	2,679	1	1
Rupees.....	2,92,833	5	9

2ND DIVISION.

Bridges across the Ralla and Boogga Rivers.....	14,909	3	9
Nundy Cannamah Ghaut.....	14,717	3	9
1st Northern Line.....	48,089	9	3
2d The Central Line.....	1,38,995	18	4
3d The Southern Line including Paupoor Ghaut.....	47,370	12	1
Cuddapah and Bellary frontier Road.....	40,585	6	7
Dorenall Pass on the Cuddapah and Nellore Road.....	16,062	5	7
Poddatoor Extension Line.....	1,307	2	4
Bridge of 5 Arches across the Beerapairoo.....	6,581	9	4
Anicut across the Pennair River at Nellore.....	58,495	13	10
Cuddalore and Chennoor Road.....	4,625	5	8
Constructing 3 Vauganies and a Dyke to the Paupugnee River near Apprapully.....	2,780	12	10
Constructing Cutwall's Choultry in the Nellore Town.....	1,500	0	0
Do. a New building for the Supt. of Light House.....	1,342	8	1
Partly Do. a New Talook Cutcherry at Cavalry.....	1,080	5	4
Constructing an aqueduct over the Gungupatam River Channel in Nellore Talook.....	493	9	0
Do. do. on Muldavy River for Parlapully in Talumunchy Talook.....	499	14	0
Do. a Calingulah to the Modagoonta Tank in do....	474	12	10

	Amount expended during the year 1854.		
Constructing a Calingulah to Pooreny Tank in Talumunchy Talook.....	474	13	0
Opening a new cut for the Coovor River Channel.....	4,779	15	7
Stone facing, &c. to the bank of Nellore Tank.....	3,228	8	8
Repairing the new River Channel of do.....	3,915	10	0
Do. the Jaffer Saib's Channel.....	2,295	10	0
Do. the Vagoor do.....	2,085	9	7
Do. the Pydaroo supplying Channel of Alloor Village..	1,392	1	9
Do. the Gundavarum River Channel.....	2,768	2	3
Do. the Veeroor do.....	1,843	9	3
Do. the Jungum Reddy River Channel with new mouth	3,175	11	8
Repairing approaches to the Wooppalavagoo, &c. Bridges..	2,036	7	4
Repairing the Sleeping wards, &c. of the Jail at Cuddapah...	1,187	1	0
Constructing a Calingulah to the supplying Channel of the Panta Cuddapah Tank.....	611	5	0
Rupees.....	4,29,656	12	8

3D DIVISION.

Formation of a road from Hullihul to Borebunder via the Shingawaree Ghaut.....	6,561	14	2
Making a 1st Class road from the Town of Hullihul to the Village of Marinkoppah.....	4,520	9	10
Improvement of the Arbyle Ghaut.....	3,750	0	0
Constructing Wooden bridges on the Yellapoor and Ar- byle road.....	2,238	2	1
Formation of a road from the foot of the Arbyle Ghaut to the Town and Sea Port of Ankola.....	6,665	7	4
Do. of a Cart road from Sirey via Ambenhully and the Devimaney Ghaut to Coomptah.....	77,161	8	0
Completing and draining the Devimaney Ghaut road.....	1,301	8	11
Repairs of the Sirey and Dharwar road with drains.....	17,048	0	10
Improvement of the Neelcoond Ghaut.....	5,000	0	0
Improving the line from Coompta to Sumpkund by Neel- coond Ghaut.....	4,932	8	8
Improvement of the road from the Town of Coompta to the Sea Coast.....	1,575	7	6

	Amount expended during the year 1854.
Construction of Wooden bridges on the Sircy and Sidda- poor road.....	4,286 12 10
Improving the Canara portion of the Agoombay Ghaut.....	1,319 0 11
Formation of a road from Perdoor to Oodipy and Mulpay....	5,722 8 9
Tracing a new Ghaut in lieu of the Cuddatakul Ghaut.....	1,379 0 7
Completion of the Munzerabad road and bridges.....	5,271 8 10
Formation of a road from Oopinungaddy to Pane Mangalore	2,872 12 11
Constructing a road from Buntwall to Mangalore includ- ing a bridge.....	2,554 10 9
Construction of wooden bridges on the Jalsoor and Casser- gode road.....	633 12 0
Dharwar and Humpsagur road.....	35,089 6 1
Darjee road.....	4,799 8 10
Ramandroog road.....	2,650 0 0
Heeryhall road.....	26,344 0 0
Famine roads in Bellary.....	12,00,000 0 0
Travellers Bungalow at Dhone.....	1,905 7 8
Ditto ditto at Chinnatakoor.....	2,000 0 0
Ditto ditto at Kurnool.....	1,680 0 0
Constructing a bridge across Wootawagoo to end of 1854....	1,000 0 0
Ditto a Talook Cutcherry at Chagulinurry do.....	1,500 0 0
Ditto do do at Ramullacotta do.....	2,102 8 0
Rebuilding the Town wall at Kurnool do.....	4,600 0 0
Repairing Ooroccoonda Machaveerapah tank do.....	2,100 0 0
Rupees.....	14,40,566 5 1

4TH DIVISION.

Restoration of the Nagaputla tank.....	5,150 11 0
Arkanamputty tank.....	2,263 15 2
Bomasamoodrum do.....	4,200 0 0
Peddamadagoo do.....	3,700 0 0
Palliconda do.....	2,100 0 0
Poiney Channels.....	10,079 0 0
Perancanjee tank.....	2,845 12 0
Head Sluice to the Poiney east channel.....	3,268 6 0
Road from Arnee to Poloor.....	7,101 10 6
Road from Wallajahnugger to Sholinghur.....	6,845 2 2

	Amount expended during the year 1854.
Road from Conjeveram to Tellar.....	5,050 0 0
Do. Pootulputt to Kureumbaddy.....	3,145 0 0
Do. Nagery to Balapilly.....	2,535 13 0
Coratoor Anicut.....	9,249 3 6
Casaveram Anicut.....	376 0 0
Govindavady tank.....	2,150 9 0
Calingulah and stone revetment to the Paundoor tank.....	1,440 0 0
Road from St. Thomas' Mount to Poonamallee.....	7,907 4 9
Do. Chingleput to Soorapien's Choultry.....	6,635 5 4
Do. Ponary to join the northern road at Trichoor.....	693 11 0
Do. from Coralloor to Ramunjary.....	1,224 2 0
Do. Chunambut to Tindevanum.....	1,794 11 2
Rupees.....	89,756 4 7

5TH DIVISION.

Road from Cuddalore to the Salem frontier via Verdachellum.	42,600 2 8
Superintendence.....	2,837 0 5
	45,437 3 1
Do. from Porto Novo to Bawangherry and to Trunk Road, No. 9.....	16,076 15 2
Superintendence...	2,763 5 11
	18,840 5 1

Repairing the road from Cuddalore to Oolundoorpett via Puttumbaukum, Trivaddy and Punrooty.....	11,000 0 0
Road from Pondicherry to Mylum.....	5,017 11 0
Do. Villapoorum to the French territory at Vullianoor.	3,761 2 0
Do. Tindevanum to Mercanum.....	6,458 1 0
Do. Thyar to Tindevanum.....	2,786 9 0
Do. Tricoloor to Chengamah.....	730 8 0
Do. Virdachellum to Chatiatope.....	999 13 8
Do. do to Oolundoorpett.....	1,000 0 0
Do. Cuddalore to Chellumbrum.....	500 0 0
Do. Pondicherry to Kallianore.....	1,390 7 0

	Amount expended during the year 1854.
Improvement to the Topoor Ghaut.....	3,382 15 6
Superintendence.....	570 0 0
	<u>37,597 3 2</u>
Cattle Ghaut from Salem to Yercaud Shervaroy Hills.....	1,491 0 0
New Ghaut from Yercaud to Adamauncottah via Nagalore.....	2,925 0 0
Repairing the Valavanoor Tank bank and clearing out the supplying channel.....	937 13 2
Reconstructing anicut over the Muddumpullum river.....	866 6 10
Stone jetty to the bank of the Cavery at Maganoor.....	3,086 0 0
Repairs to the Punnappetty Rahgavummal anicut.....	1,124 5 0
Rupees.....	<u>1,12,305 4 4</u>

6TH DIVISION.

Expenditure on improving the course of the Conacodingul river.....	5,498 0 0
Do. on Repairing, &c. the Munnyaur Head Sluice and Calingulah.....	2,553 9 0
Do. on Improving the irrigation of the Pillay Voi- kal in 1854.....	1,612 1 0
Do. on Repairing and Improving the Regulating Dams across the Cauvery and Vennaur at the head of the latter river.....	10,923 10 0
Do. on Reconstructing anicut with a Bridge over it across the Adapaur in the Panmany limits in 1854.....	1,284 12 0
Do. on constructing two main channels from the above anicut and a Head Sluice.....	6,904 15 0
Do. on Widening Codachittayaur from the Hur- richundranuddy to the Adapaur.....	3,895 0 0
Do. on Improving the drainage of Samoordravaily and other villages.....	9,438 0 0
Do. on Improving the drainage of thirty two vil- lages under dry cultivation between the rivers Ada- paur and Mooliaur.....	23,762 12 0
Do. on Extending the head of the Yadagody irrigat- ing channel, constructing sluice and cutting the Veerasholen river.....	1,448 3 0

	Amount expended during the year 1854.
Expenditure on Reconstructing an anicut across the Mulli- anaur.....	1,722 9 0
Do. on Extending the lower Coleroon anicut and constructing a bridge over it.....	9,894 5 0
Do. on bridge across the Chundranuddy.....	1,572 7 0
Do. across the Vellayaur River.....	1,235 1 0
Do. the Paundavayaur River.....	3,884 4 0
Do. the Cantaur River.....	3,130 1 0
Do. the Vaulayaur River.....	2,418 13 0
Do. the Hurrichundranuddy River.....	2,730 6 0
Do. on bridge across the Adapaur River.....	4,068 15 0
Do. on constructing a bridge over the Codichittayaur River on the road from Negapatam to Vadarniem.....	5,041 6 0
Do. on constructing a bridge across the Era chan- nel on the above road.....	1,457 10 0
Do. on constructing a bridge across the Mooliaur Ri- ver on the road from Mootoopettah to Vadarniem.....	2,803 10 0
Do. on constructing a bridge across the Panmany River on the road from Triterapoondy to Mootoo- pettah in 1854.....	2,118 8 0
Do. on constructing a bridge across the Palavaur on the road from Punthenellore to Vyde Esorencovil.....	6,484 0 0
Do. on Reconstructing the bridge across the Tri- mulrajem River on the road from Combaconum to Tanjore.....	2,746 13 0
Do. on Improving the Port of Tranquebar and the Veerasholen River in 1854.....	11,218 12 0
Do. on the Beach Defences at Tranquebar in 1854.....	5,954 15 0
Do. on cutting canal from the Umbenaur to the port of Trimulwassell.....	18,843 10 0
Do. on Extending the Jetty & deepening the har- bour of Negapatam in 1854.....	3,201 11 0
Constructing a Cutcherry for the Police Ameen at Coiladdy.....	1,211 14 0
Do. a Moonsiff's Court House at Negapatam.....	1,319 8 0
Do. a Talook Cutcherry at Triterapoondy.....	3,103 14 0
Do. a Moonsiff's Court House at Triterapoondy.....	1,218 8 0
Do. a Choultry at Trivanum.....	1,506 4 0
Do. a Moonsiff's Court House at Sheally.....	1,211 6 0

	Amount expended during the year 1854.
Constructing a Talook Cutcherry at Manargoody.....	4,302 0 0
Expenditure on constructing a Surplus Sluice in the limits of Conasalem.....	1,719 7 0
Do. on constructing the Road No. 5 from Trichi- nopoly to Madura in 1854.....	13,857 5 0
Do. on Reconstructing the Bridge across the Coda- moorty river on the Road from Trichinopoly to Coimbatore.....	5,146 7 5
Repairing the Road No. 1 from Trichinopoly to Tanjore via Towagoody.....	1,217 0 0
Constructing part of the Road No. 2 from Trichinopoly to Tanjore via Sircurpolliam.....	2,148 13 0
Repairing the Road No. 10 from Trichinopoly to Coimbatore.	6,362 7 0
Constructing the Road No. 25 from Trichinopoly to Vialoor.	4,564 12 4
Repairing the Road No. 8 from Trichinopoly to Poodocottai.	1,482 11 4
Do. the Road No. 3 from Trichinopoly to Combaco- num.....	4,874 8 0
Constructing the Road No. 11 from Trichinopoly to Salem from the Coleroon bridge to Moosery, and construct- ing a bridge across the Iyaur river.....	18,344 12 7
Repairing the Road No. 4 from Trichinopoly to Arrealore and Woodarpolliam.....	956 6 0
Constructing part of the Road No. 24 from Trichinopoly to Dindigul via Coolitully.....	4,670 14 0
Constructing a Guard Room in the new Jail.....	140 9 4
Expenditure on deepening the old course of the Vuddavaur channel leading to the Veeranum Tank.....	4,376 10 0
Constructing a bridge of three arches across the Vuddavaur on the road from Manargoody to Woodarpollum.....	4,386 2 5
Do. a Road from the Veeranum Tank joining the high road to Chellumbrum via Pootoor.....	2,293 10 0
Repairing the Road from Shatiatope to Womampillioor.....	2,703 6 0
Do. the Road from the Vellaur to Coleroon River.....	1,725 0 0
Do. the Road from Chellumbrum to Lalupett.....	2,300 0 0
Constructing a boat for the Coleroon ferry at Vullaloray.	956 4 0
Extending the Lock at Porto Novo.....	1,350 0 0

	Amount expended during the year 1854.
Cutting channel for Vellicaul to Veeranuttam Aqueduct.....	1,603 8 0
Expenditure on Improving the harbour of Cuddalore and Porto Novo and connecting them by a Canal.....	33,400 0 0
Rupees.....	2,92,331 9 5

7TH DIVISION.

Expenditure on Caroor Sub Collector's Cutcherry.....	626 13 5
Do. on Bridge over Aulungomloo Bundy stream.....	1,701 0 0
Do. on Bridge on the road from Coimbatore to Trichi- nopoly.....	431 4 0
Do. on Codecairy Bridge.....	640 13 1
Constructing a Dam and Excavating a channel on Attocooly Anicut.....	1,427 15 0
Expenditure on Improvement of Thuddapully channel.....	2,471 11 6
Expended on Travellers' Bungalow, soldiers' shed and native choultry at Gunnoith on the Perembaddy (or Trunk Road No. 4).....	3,818 7 6
Muttanoor, Cotaparamba, and Tellicherry road.....	3,448 1 10
Truss Bridge over the Poodoor stream on the road from An- gaddypoorum to Tirroongady.....	450 0 0
Pooraparamba cut and Head Sluice.....	2,646 10 0
Opening a canal for connecting the Ponany and Choughaut backwaters being a part of the West Coast Canal.....	11,273 15 9
Repairing Calay Bridge at Calicut.....	2,347 14 2
Road from Hassanoor to Goodaloor.....	3,278 6 0
Do. Trichinopoly to Matepollum.....	4,377 14 7
Mysore and Segoor Road.....	4,871 0 0
Rupees.....	43,811 14 10

8TH DIVISION.

Constructing revetment to Meddoovail Coolasagarapairy Tank	1,543 6 0
Anicut across Velladay and excavating channel of supply to Rettacolum Tank.....	903 1 0
Constructing revetment to Keelapavoor Peracolum and build- ing a new sluice in the same.....	2,666 6 0

	Amount expended during the year 1854.
Improvements to Calayacoorchy Anicut channel and Tank...	1,160 14 0
Repairs to Parcanai on the Vigay River.....	1,209 7 0
Nellvoor Tank repairs.....	1,174 15 0
Thenkuray Tank repairs.....	723 2 0
Vencatasamoodrum do do.....	959 5 0
Soodrapandiem Shencolum do do.....	900 0 0
Mannoor channel from the Chittaur.....	1,850 13 0
Arcanoyagapoorum Anicut repairs.....	1,006 14 0
Calungathyeundy Channel.....	1,310 13 0
Keelacul channel from the Merdoor Anicut.....	1,854 7 0
Velloor Tank repairs.....	647 11 0
Thenkurray Tank do.....	891 15 0
Thiroomungalacoorchy Tank do.....	900 7 0
Vizianarranum Pereacolum revetment and earth repairs to bund.....	1,974 1 0
Munnaloor Pereacolum Tank repairs.....	980 8 0
Between Colputty and Kytaur.....	1,964 11 0
Do. Kytaur and Gaingoondan.....	176 0 0
Do. Shady Khan Chuttrum and Palameotta.....	141 14 0
Do. Vulloor and Arambooly.....	278 9 0
Additional Record room and upstairs room to Hoomoor Cut- cherry at Madura.....	1,800 15 0
Talook Cutcherry at Manaparay in the Ramgherry Talook...	1,488 15 0
Travellers Bungalow at Culputty on road No. 1.....	211 3 0
Constructing 2 additional wards adjacent to the Civil Hos- pital at Madura.....	449 11 0
Repairing Sub Collector's Cutcherry at Dindigul and adding tiled communication.....	948 9 0
Police Cutcherry at Wattrap in Streevellapoothoor Talook...	258 7 0
Frontier Chowkey at Ellenjee in the Thencausey Talook.....	308 12 0
Talook Cutcherry at Sautoor.....	2,910 2 0
Do. at Streevellapoothoor.....	300 6 0
New Court House at Tinnevely and repairing old one.....	1,154 7 0
Culputty Chuttrum on Road No. 1.....	1,032 13 0
Sethaparanelloor Chuttrum on road No. 9.....	2,661 5 0
Allaghyapandepooram Chuttrum on Road No. 2.....	746 0 0

	Amount expended during the year 1854.
Bridge of 6 arches across the Goondaur on Road No. 4.....	3,106 2 0
Improvements to Road No. 15 between Madura and Dindigul.	880 11 0
Bridge across the Steeragunny river.....	1,448 15 0
Rupees.....	44,934 8 0

9TH DIVISION.

Pallalagam Hoondah Irrigation channel, Calingulah and sluices.	3,300 0 0
Woddadah Talook Head Sluice across the Polake channel...	3,002 11 8
Head Sluice across the Jullmoor channel.....	2,128 10 7
Repairs to Duggadah Anicut & sluices.....	1,800 0 0
Vizagapatam New Tank in Town.....	2,793 6 0
Bridge of 10 arches of 30 feet span over the Ankapilly River.	9,878 15 7
Commencement of Bridge of 10 arches of 30 feet span each over the Toonce River.....	6,467 6 8
Extensive Repairs to Trunk Road from Toonce to Yellamun- chelly.....	12,580 13 0
Trunk Road from Soobarum to Chittivulsah.....	2,042 2 8
Do. do. from Chicacole towards Itchapore.....	12,963 6 2
Bridge of 25 arches of 12 yards span over the Nangoolea Ri- ver at Chicacole.....	11,614 6 2
Trunk Road from Itchapore to Hoomma.....	15,264 5 5
Completion of Road from Vizagapatam to Vamoolavulsah.....	1,500 0 0
Three bridges viz. Hanoomunthwankah, Markewulsah and Gumbeerum.....	3,388 12 0
The construction of Road from Vizagapatam to the Trunk Road at Ankapilly.....	1,831 7 8
Construction of Road from the Ferry at Vizagapatam via Punchadarlah to Poolapurtee on Trunk Road No. 6.....	10,496 13 4
Do. of Road from Nursapatam to join Trunk Road at Thalapollem.....	10,057 4 0
Do. of Road from Nursipatam to Golgondah.....	1,181 7 0
Do. of Road from Nursingapatam via Uruthlah to the coast at Polarum.....	3,639 1 0
Do. of Road from Tantipurty at the foot of the Hills near Madgole, to join Trunk Road No. 6 be- tween Ankapilly and Cassimecottah.....	4,484 7 4
Road from Palcondah to Cheepurpilly.....	13,940 14 4

	Amount expended during the year 1854.
Road from Palcondah via Veeraghottam.....	2,131 13 4
Road from Parvatepore to Boundary of Bobbili Zemindary...	1,064 6 2
Pass into the Jeypore country from Parvatepore.....	2,098 13 8
Do. do. do. Tantipurty.....	6,744 0 0
The execution of repairs and masonry works to Road from the Town of Chicacole to port of Calingapatam.....	4,633 0 0
Repairs to Road from Berhampore to Gopalpore.....	2,699 12 8
Road from Berhampore to Russelcondah.....	32,946 5 5
Commencement of Road from Russelcondah to Koinjore.....	11,383 7 0
Do. of Road from Kimeddy to Poondy within the Kimeddy Zemindary.....	3,441 6 0
Do. of Road from Kimeddy to Nursipetta within the Kimeddy Zemindary.....	493 1 0
Rupees.....	2,01,981 2 4

G. C. COLLYER, Captain.

Deputy Chief Engineer, D. P. W.

and late Secretary to the Bd. of Rev. D. P. W.

CHIEF ENGINEER'S OFFICE, Fort St. George, 4th October 1855.

ABSTRACT.

	Rs.	A. P.
Kistna Division.....	9,94,964	11 5
Godavery do.	2,92,833	5 9
2nd do.	4,29,656	12 8
3rd do.	14,40,566	5 1
4th do.	89,756	4 7
5th do.	1,12,305	4 4
6th do.	2,92,331	9 5
7th do.	43,811	14 10
8th do.	44,934	8 0
9th do.	2,01,981	2 4
Grand Total Rupees.....	39,43,141	14 5

G. C. COLLYER, Captain.

Deputy Chief Engineer,

and late Secretary, Bd. of Rev. D. P. W.

REPORT upon important Works executed in the Rajahmundry District during 1854.

1st. The most important Works executed during the past year were as follows.

IRRIGATION.

Coringa canal with the Locks and Calingulahs at Vellah and Munjair.

Bank channel to Yanam with its small branches.

Widening the Samulcottah channel.

Branches from Cocanada to do.

Widening the Rallee main channel from the Head sluice to Oochilly.

Excavating Pullevella channel.

Do. Amlapoor do. and branches.

Eastern Bank channel.

Branches from the Kuddally Main Channel to Ponnamongdah and Godapilly.

Main Branch channel to Nagaram.

15 small Branches and Drains from Main channel.

Enlarging the Razole Main channel.

Venkiah channel embankment and sluices.

Oondy High level channel and Calingulah.

Uttelee Main channel and branches.

Kundavellee Calingulah.

DRAINAGE.

Doovah Calingulah.

Yennamuddooroo Drainage cut.

Colair Calingulah.

Mullumpoody Channel.

Channel across the Mogultoor sand Ridge—new embankment from Mogultoor to Vellevernoo Agraharum.

NAVIGATION.

Embankment of the Nukhala channel.

Perrivellee Lock and Calingulah.

Martair do.

Itempoody do.

Enlargement of Pulcole Canal to Nursapore and Mogultoer.

RIVER EMBANKMENTS, &c.

Strengthening embankment to Yanam.

Groynes at Tatapoody Koola and Muskapilly.

Strengthening Eastern embankment in central Delta.

Strengthening embankment from Ramrazlunka to Sukenatapilly in the Nagaram Talook.

Strengthening Embankment from the Gunnaram Aqueduct to Ramrazlunka.

Do. do. Eastern side as far as Audooroo.

Enlarging the Sukenatapilly cut.

Embanking from Lutchmaiswaram to Chinchena.

2nd. In attempting to describe the works which were undertaken during the past year, I feel that it is impossible for me to treat of them satisfactorily, or to do justice towards those who were engaged in their execution, inasmuch as I was only called to the charge of the Division at the early part of this year, after an absence in other Districts of more than 4 years; and consequently had to make myself acquainted with the several great improvements which had meanwhile taken place; a task requiring considerable attention, when it is recollected that these had taken place over an area of no less than 2,000 square miles. My previous acquaintance with the District has however greatly facilitated me in this, and though unable to treat the subject as fully as I would desire, I hope nevertheless to lay before the Board clearly, the principal operations which were carried into effect during the past year.

3rd. Agreeably to the instructions on this subject, I will treat the subject under its different heads of

Irrigation.

Navigation.

Drainage.

Roads and Miscellaneous improvements.

4th. I must however premise by stating, that it is difficult to separate the works of Irrigation and Navigation in many cases, as the Principal canals in this District combine both advantages. In order to secure the benefits of Navigation, the canals are locked up, so as to reduce the current, and therefore the sectional area has to be correspondingly increased, in order to provide the requisite quantity of water for

Irrigation. The whole excavation of the canal cannot therefore be fairly charged to the head of Irrigation, and yet it would be difficult to say exactly how much should be charged to each. Such works therefore as combine both properties, I must describe generally with reference to both, without attempting to discriminate particularly what belongs to each class.

CORINGA CANAL.

Original Estimate.....Rs. 32,270 0 0

Supplemental do. „ 72,659 11 6

1,04,929 11 6

Expenditure in 1853.....Rs. 28,548 4 0

Do. in 1854..... „ 58,322 4 8

Total.....Rs 86,870 8 8

Monthly Pay.

Superintended by Lieut. Grove.....Rs. 293 0 0

Assisted by Mr. Tuke..... „ 200 0 0

and Overseer Eyles..... „ 93 15 1

5th. This important work, which is intended to serve as a main line of communication from Rajahmundry and the upper parts of the District through the heart of the Eastern Delta, to the great Port of Coringa, was commenced in the year 1853. The first Lock in the Line at Aulamore had been completed, and the 2nd at Vellah commenced last year; the latter, as well as the 3rd Lock into tide water at Munjair with their respective Calingulaks, were finished, with the exception of the valve gates. The excavations were also nearly completed; but there remained a good deal of embanking in the latter part of the Canal to be executed, and the portion near the Vellah Lock to be excavated to its full depth. The valves require a little explanation, as the plan in common use at the other Locks has been found to be so slow, that a new method of filling the Lock was devised viz. by having 4 large balanced valves of cast Iron to be worked by a lever, and calculated to discharge at such a rate as would fill the Lock in 2 Minutes, instead of 10, as is generally the case at other Locks. The side chamber to the Lock had therefore to be considerably increased. This has added greatly to the cost in every way; but the advantage to be obtained in the speedier passage of Boats, is a matter of great importance, when the traffic

has increased so largely as it has done in the Cocanada Canal, and which will be as great, if not greater, in the Coringa Line. The accompanying diagram will explain the arrangement of the valves. From want of Iron and other causes, these valves have only just been finished at the workshop for one, out of the two Locks, so that the result produced by them cannot yet be stated.

6th. The irrigation from this Channel has been as yet but partially developed and a number of small branch channels must be excavated, and the regulating sluices to all of them remain to be built.

7th. The Channel is just at this date open for Navigation. The rack and pinion have only to be fitted to the Lock gates, and though the cast Iron valves are not yet all ready, the Lock can be used with the wooden shutters. There still remains a portion of the Canal to be widened between Alamoore and Vellah; but this can be done hereafter, as the opening of the Canal cannot be deferred, it being necessary to close the Cocanada Canal for a few days in order to clear away accumulations, and the traffic of the District cannot afford now to be stopped for a single day.

BANK CHANNEL TO YANAM AND BRANCHES.

Estimate.....	Rs. 10,869 13 6
Expenditure in 1853.....	Rs. 8,499 0 5
Do. in 1854.....	„ 10,822 14 2
Total... „	<u>19,321 14 7</u>

Monthly Pay.

Superintended by Lient. Grove.....	Rs. 293 0 0
Assisted by Overseer Eyles.....	„ 93 15 1

8th. This work was likewise commenced in 1853, but during last year a great deal of work has been done to it, and several small branches for irrigation led off. The amount entered in the monthly statement of expenses has very considerably exceeded the estimate, and until lately I had not been able to ascertain from what cause, as the work was all executed prior to my taking charge; but I have since discovered that the earth removed from the excavation of the Channel, was not nearly sufficient to form the eastern embankment; and as the water is kept above the surface of the country by means of two Locks at Cowlaiswaram and

Koola, a large amount of excavation was required to strengthen the banks which had been badly breached in the previous year. This expense should properly have been charged as ordinary work, and whatever has been expended this year can be transferred accordingly: another item which has occasioned the excess, is the amount of deepening required below the two Locks, and which was not contemplated when the original estimate was framed, as it merely provided for connecting the pits from which the excavated earth was taken to form the River embankments, by their being cut through one into the other, and so to form a continuous channel, but of an irregular section. The lock at Koola is not yet quite finished; it will cost considerably beyond the estimated amount; the foundations having been excavated last year, and the bund in front of the excavation breached and re-made several times, thus increasing the labor of baling, and continually requiring fresh excavation; when the Koola Lock is finished, there will be 26 miles of good water communication as far as Muskapilly; a Lock into the salt water creek will be required to connect the channel with the River, and some further excavation in order to connect the channel with the town of Yanam.

WIDENING THE SAMULCOTTAH CHANNEL.

Estimate.....	Rs. 43,227 2 11
Expenditure in 1853.....	Rs. 0 0 0
Do. in 1854.....	„ 17,083 4 4

Monthly Pay.

Superintended by Mr. R. Smith.....	Rs. 188 8 0
Assisted by Superintendent Wilkinson.....	„ 50 0 0

9th. This estimate has only been partially executed. It has been found impossible to shut off the water for any length of time together on account of the large extent of Dalwa cultivation, and the work consequently proceeds but slowly.

BRANCHES FROM THE COCANADA CANAL.

Estimate.....	Rs. 3,547 13 6
Expenditure.....	Rs. 4,219 4 5

Monthly Pay.

Superintended by Mr. R. Smith.....	Rs. 188 8 0
Assisted by Mr. Overseer Moore.....	„ 93 15 1

10th. Branches from this channel have been carried this year to irrigate the several villages of Valagathodoo, Chintapilly, Sumpurrah, Shapooram, &c. at a total cost of Rs. 4,219-4-5. The channels have been of the greatest benefit, and the Dalwa cultivation of this season, as well of the great Paddy crop of last season, have been most productive. The improved condition of the Ryots under these new channels is most marked. From being, as I well remember them in former years, in a very depressed and impoverished state, they are now amongst the wealthiest and most substantial of any in the District. Their dwelling houses, clothing, and bearing, all indicate the great change they have experienced in their outward condition.

WIDENING THE HEAD OF RALLEE CHANNEL AS FAR AS OCHILLY.

Estimate.....	Rs. 11,718 12 0
Expenditure.....	„ 11,718 12 0

Monthly Pay.

Superintended by Captain Tweedie.....Rs. 193 0 0

11th. This Channel, the main head of the Central Delta, has now a section of 42 square yards. It has yet to be increased to about 100 square yards, as it is only sufficient at present to supply $\frac{1}{3}$ ths of the land dependent upon it. Provision has been made for this in the Budget for 1855-56.

PULLAVEILLA CHANNEL.

Estimate.....	Rs. 9,568 12 0
Expenditure.....	„ 4,484 7 0

Monthly Pay.

Superintended by Captain Stoddard.....Rs. 193 0 0

12th. The Channel was originally estimated for only as an Irrigating Channel, but in the subsequent arrangement it was thought advisable to make it the main line of Navigation instead; and the excavation has been accordingly made in anticipation of sanction, in order to save time and facilitate the conveyance of materials for the Masonry works required to be constructed on it.

EASTERN BANK AND AMLAPOOR CHANNEL AND BRANCHES.

Estimate.....	Rs. 15,000 0 0
Expenditure in 1853.....	Rs. 456 6 8
Do. in 1854.....	„ 14,806 4 5

Monthly Pay.

Superintended by Captain Stoddard.....Rs. 193 0 0

Assisted by Asst. Overseer Johnson.....„ 93 15 1

13th. This Channel is taken off the bank Channel near the village of Vandapalem, and is intended to convey water to 37,500 acres. The extent of land assigned to it is greater than originally intended, as what was to have been watered by the Pallavella Channel is now to be irrigated from it. Its section therefore had to be greatly increased, and hence the cause of increase.

14th. Two Branches have been led off from it, to irrigate the villages of Poolaitekooroo and Peddapoodee, at a cost of Rs. 400.

EASTERN BANK CHANNEL.

Estimate Rs.		
Expenditure in 1853...	} Included in that for Amlapoor Channel.	
Do. 1854...		
Total...		

15th. This Channel, which is led off from near the village of Lolah, reaches the bank of the River near Kottapetta, and thence skirts it as far as Unnumpillee; it is intended to water 54,000 acres, but from the small supply coming down the Head of the main Channel, the lowest lands have as yet only been irrigated by the branch Channels which have been carried to the Villages of Amalapoor, Inavilly, and Magam.

CHANNELS IN THE NAGARUM TALOOK.

16th. The channels in this Talook have been considerably extended during the past year. They have consisted of 2 branches led from the Kuddally Main Channel to Ponnantonda and } Costing Rs. 21,000
Goodapilly Main branch to Nagaram. }

15 small branches to drain from Main Channel costing „ 4,500

Enlarging the Razole Channel at a cost of „ 1,850

17th. These works have been executed under the superintendence of Mr. James Rundall, and have proved of the greatest benefit to the Talook, especially during the early part of last year, when the country was perfectly dried up through the failure of the Monsoon in 1853. The cultivation of the Sugar Cane is decidedly increasing.

VENKIAH CHANNEL AND EMBANKMENTS.

Estimate.....	Rs. 10,914 0 0
Expenditure.....	Rs. 12,708 12 0

Monthly Pay.

Superintended by Supt. H. B. Smith.....Rs. 70 0 0

18th. The principal work in the Western Delta consisted in raising the banks of the Venkiah Channel, and building sluices at the head of the Channel led off for irrigating the land of the neighbouring villages. The water stands 6 ft. above the level of the country near the Perrimalla Lock, and the soil being of a very inferior description, these embankments require constant attention. It is intended to construct a low lift Lock at the head of the Venkiah Channel, which will do away with the necessity of keeping the water at so high a level, while it will improve the navigation of the Channel by keeping a greater depth of water on the lower sill of the Nundamoor Lock.

OONDEE HIGH LEVEL CHANNEL AND CALINGULAH.

Estimate.....Rs. 17,451 9 7
Expenditure in 1853.....Rs. 3,921 8 1
Do. in 1854.....,, 9,749 13 8
Total...,, 13,671 5 9

Monthly Pay.

Superintended by Captain Moloney.....Rs. 193 0 0
and Lieut. Goddard.....,, 293 0 0

19th. This Channel is of great importance; it runs along the ridge between the two drainages, viz. the Pippurroo Drain and the Weyairoo, and waters some of the richest land in the District. It still requires to have several Channels led off from it, and the embankment strengthened.

UTTELLEE MAIN CHANNEL AND BRANCH.

Estimate.....Rs. 19,167 7 4
Expenditure in 1853.....Rs. 3,777 12 3
Do. in 1854.....,, 960 5 0
Total...,, 4,738 1 3

Monthly Pay.

Superintended by Captain Moloney.....Rs. 193 0 0

20th. This Channel is also a very important one, conveying water to 40,000 acres of the Oondce Talook. The smaller branches have not yet been carried out to their full extent, as there has not been sufficient

superintendence available for the duty. In the coming season, however, I trust this Channel will receive especial attention.

DRAINAGE.

21st. The principal drainage works have during the past year been confined to the Western Delta, which receives by far the greatest quantity of water, being exposed to the Floods of the several small Rivers lying between the Godavery and Kistnah. Of these works I will notice first, the DOOVAH CALINGULAH.

Estimate.....Rs. 2,490 0 0
Expenditure.....Rs. 9,654 6 4

Monthly Pay.

Superintended by Captain Moloney.....Rs. 193 0 0
and Supt. H. B. Smith.....,, 70 0 0

22nd. This work was constructed for relieving the Weyairoo from the floods of the Yerra Calwa. It has a waterway of 300 feet. The reason of the great excess of the estimate is given by Major Cotton, as having been occasioned by the work having been built much more substantially than the estimate originally contemplated. The Apron was made with cut stone instead of with rough stone, and the foundations throughout laid on wells instead of simple rubble stone. It is a handsome work and in good order.

YANAMUDOOROO DRAINAGE CUT.

Estimate.....Rs. 22,250 0 0
Expenditure in 1853.....Rs. 22,137 13 0
Do. in 1854.....,, 159 1 3
Total....,, 22,296 14 3

Monthly Pay.

Superintended by Captain Moloney....Rs. 193 0 0

23rd. This cut was intended to carry off the surplus water accumulating in the Pippurroo Drain, and the floods of the Yerra Calwa escaping over the Doovah Calingulah. The surplus water is carried between two high embankments, by a straight cut, to the salt water creek near the village of Yanamudooroo. It is calculated that 130,000 cubic yards per hour escaped along this cut during the freshes of last year.

COLAIR CALINGULAH.

Estimate.....	Rs. 3,570 0 0
Expenditure.....	„ 14,484 0 0

Monthly Pay.

Superintended by Captain Moloney.....	Rs. 193 0 0
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24th. This work has a water way of 300 feet, and is intended to regulate the quantity of water in the Colair Lake; the excess of expenditure above the estimated amount arises from the long distance that materials had to be carried to the work, and the expenses incurred in baling where the foundations lie below the level of low water mark.

MULLUMPOODY CHANNEL.

Estimate.....	Rs. 16,875 0 0
Expenditure.....	„ 14,454 14 10

Monthly Pay.

Superintended by Captain Moloney.....	Rs. 193 0 0
and Lieut. Stewart.....	„ 193 0 0
Assisted by Overseer Bignell.....	„ 93 15 1

25th. This work is intended to carry off a portion of the surplus floods escaping over the Colair Calingulah, and carry them on a more direct line than that afforded by the Ooppootair. The work has not been yet finished, but will be so this season.

CUT ACROSS THE MOGULTOOR SAND RIDGE.

Estimate.....	Rs. 6,875 0 0
Expenditure.....	„ 9,420 15 7

Monthly Pay.

Superintended by Captain A. McNeill.....	Rs. 193 0 0
Assisted by Supt. O'Neill.....	„ 50 0 0

26th. This Channel was excavated for the purpose of draining the low swamps in the neighbourhood of Nursapoor. It is carried from the Village of Seetarampooram direct to the nearest salt water creek, and is about 2½ miles in length. It was commenced in May, and opened early in August, and afterwards widened to 12 yards. The area of Country to be drained is between 40 and 50 square miles. Formerly the whole surplus from the overflow of the Kistnah, as well as that of the Godavery, all collected in the low grounds in the neighbourhood; and as it

became necessary to guard against the recurrence of these destructive floods and protect the banks of the navigation canal under execution from Palcole to Nursapoor, and Mogultoor, an embankment was thrown up from the high ridge near Mogultoor to meet that at Vellevannoo Agraharam, to the east of the Goutair drainage, which was conducted to the sea by one of the creeks from the Ooppootair.

27th. The expenditure under this head was Rs. 9,420-15-7, and the work was superintended by Supt. O'Neill under Captain McNeill's orders.

EMBANKMENT OF NUKHALA CHANNEL.

Estimate.....	Rs. 3,645 13 4
Expenditure.....	„ 951 1 9

Monthly Pay.

Superintended by Lieut. McNeill.....	Rs. 193 0 0
Assisted by Asst. Overseer Bevan.....	„ 113 15 1

28th. The object of embanking this large natural drainage Channel was for the purpose of rendering it navigable, and as it was impossible to get rid of the drainage water accumulating at the time of the highest freshes, it was thought advisable to allow the freshes to stand back as high as they would in the natural Channel, while at the same time they could not swamp any ground. These embankments are not yet quite completed but will be undertaken shortly, as labour becomes procurable.

Estimate. Expenditure.

PALCOLE CANAL.

Perravella Lock and Calingulah..	Rs. 3,108 11 1	Rs. 2,857 8 3
Enlargement of Canal.....	„ 52,113 14 0	„ 31,094 3 0

Monthly Pay.

Superintended by Lieut. D. McNeill.....	Rs. 193 0 0
Assisted by Overseer Conner.....	„ 93 15 1

29th. This Canal was commenced in anticipation of sanction being received for the Estimate submitted in the Budget of 1854-55. The Lock and Calingulah at Perravella have been finished and Calingulahs at Nlem-poodee and Martair also completed. In the Estimate only 4 Locks are entered; it will be necessary in order to ensure a certain depth of 3½ feet on the lower Sill of each Lock, in the event of its being reduced to a still water channel, to build a 5th Lock at Martair. This is a most important line of communication and corresponding attention requires to be

paid to it. The Locks are all of low lifts and made after an economical model which answers perfectly. The only solid masonry in the Lock being the walls in which the gates are fixed, the sills and small head and tail walls. The Chamber is simply excavated with sloping sides which together with the floor of the Lock are reveted with rough stone.

MISCELLANEOUS WORKS.

30th. Besides works of Irrigation, Navigation, and Drainage, the River Embankments have been strengthened and Groynes thrown out at different places, in order to regulate the course of the stream wherever it had made a violent set against a particular place. The following are the particulars of these works.

RIVER EMBANKMENT AS FAR AS YANAM.

Estimate.....	Rs. 24,597 14 8
Expenditure in 1853.....	Rs. 12,266 2 7
Do. in 1854.....	„ 16,104 10 6

Monthly Pay.

Superintended by Lieut. Grove.....	Rs. 193 0 0
and Overseer Eyles.....	„ 93 15 1

31st. This bank runs from Rajahmundry to the boundary of the French Settlement at Yanam. This year this bund must be continued beyond it, as from the flood waters being confined, and not allowed to spread over the country as formerly, the level of the surface of the River in extreme flood has become raised as it approaches the Sea—and it rises now more than 2 feet higher than it used to do formerly at Yanam.

River embankment in the Eastern side of Central Delta.

Estimate.....	Rs. 24,101 15 4
Expenditure in 1853.....	Rs. 14,565 3 7
Do. in 1854.....	„ 10,055 10 0

Monthly Pay.

Superintended by the late Mr. Filler.....	Rs. 93 15 1
and afterwards by Captain Stoddard.....	„ 193 0 0

32d. This Embankment has been continued along that branch of the River which flows past the village of Unnumpillee as far as Kottalunka. It has yet to be continued and the large area of land contained between that River and the large branch of the Godavery ought also to be embanked—A slight bank already exists, but it requires to be much strengthened.

RIVER EMBANKMENT FROM AQUEDUCT TO RAMARAZLUNKA.

Estimate.....	Rs. 7,681 5 4
Expenditure in 1854.....	Rs. 8,314 2 5

Continuation of Do. to Sakenatepilly.

Estimate.....	Rs. 12,405 13 4
Expenditure in 1854.....	Rs. 7,448 8 10

EMBANKMENT IN THE EASTERN SIDE OF NAGARAM TALOOK.

Estimate.....	Rs. 6,967 8 0
Expenditure in 1854.....	Rs. 8,064 10 8

Monthly Pay.

All these were superintended by Mr. J. Rundall...Rs. 100 0 0

33d. These banks have been well made and are in excellent order; but for the reason stated above of the rising of the level of the surface of the River, these banks will, I have no doubt, require eventually to be raised another yard.

GROYNES AT TATAPOODY, MUSKAPILLY, &c.

Estimate.....	Rs. 14,562 9 0
Expenditure in 1853.....	Rs. 6,257 12 9
Do. in 1854.....	„ 12,714 5 7

Monthly Pay.

Superintended by Overseer Eyles.....	Rs. 93 15 1
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34th. The River had set in so violently near the village of Almoor, Kotas and Muskapilly, that large portions of land were annually being swept away, and at one village called Veeravellepalle about 400 yards in breadth of land has actually been washed away in one fresh, and the village itself completely destroyed. The Groynes that have been made consist of a row of strong stakes or poles with an embankment of tough blackearth well rammed down; they vary in length from 100 to 250 yards; the ends are well protected with rough stone, as also the sides.

35th. They are placed at an angle of 60° up stream and they slope gradually down from the top of the natural bank of the River to about 6 feet at the lower end.

36th. Above the embankment a net work of Bamboo matting about 3 or 4 feet high is well laced in between the stakes, which protects the top of the bank from abrasion while at the same time there is sufficient current to allow the sand to be carried over it, and deposited on the

other side. The action of these Groynes has been very satisfactory: places where there were holes 30 feet deep have been completely silted up, and are now far above the level of the bed. These banks are planted with Durbah grass which will intercept the silt brought down in succeeding freshes, and thus cause a deposit of alluvial mud on the top of the sand bank already formed, which will go on continually increasing until an amount of land equivalent to what was washed away, has been restored to the bank of the River.

37th. Several more of these Groynes will be required, and in fact it will be necessary constantly to watch the River to prevent encroachments, as the large channels which run parallel to the bank must be thoroughly protected.

SAKENATEPILLY CUT.

Estimate.....	Rs. 7,623	0	0
Expenditure.....	„ 2,679	1	1

Monthly Pay.

Superintended by Mr. J. Randall.....	Rs. 100	0	0
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38th. This is a cut made through a very bad bend of the River and was intended originally to relieve the heavy set made against the town of Madapolem. It has become now an object of still greater importance—in order to relieve the branch of the River, over which the Aqueduct is thrown, and to discharge the floods more rapidly. This cut, I am of opinion, will have to be increased to twice its present width in order to make it more effective.

39th. The repair to the Anicut during 1854 amounted to only Rs. 7,758-15-4, being but 13 Annas 8 Pice per cent on the original cost of the work. These were executed under the Superintendence of the Anicut Manager V. Veeranah, who in addition to this duty had also the management of the Quarry and the supervision of the accounts. The arrangements made by him in the former were very good and the cost of the stone reduced—the indefatigable activity and exertions in all works entrusted to him merit the approbation of higher authority.

40th. The workshop has been employed actively during the past year in all its branches. In the Foundry 75 tons of castings have been made of which 36 tons have been for the Government works and 39 tons for private parties. The boys under training have been also instructed in reading and writing in a school for 2 hours in the morning—and though

the progress made by them is not such as could be desired, owing to the difficulty of procuring a suitable school Master, yet I trust the instruction has not been without its good effects.

41st. Two Autographic presses have also been worked under the supervision of Draughtsman J. Keeling as well as a small Printing Press which has proved of much assistance to the Office in diminishing the labor of copying, and the preparation of various forms of returns.

42d. Lieut Haig's report for the work executed in 1853, having been submitted only in November last, entered so fully into the more important works which had been executed previously, that it seems unnecessary to enlarge upon them again so soon; and I will therefore merely say that the irrigation from the main channels previously executed, is being more minutely carried out by small branches—and the increase of the Dalwa cultivation is most conspicuous and gratifying.

43d. A vast increase in the cultivation of Oil Seeds has taken place and though the enormously high prices for this article have fallen, yet, the limit still fixed by the merchants is highly remunerative.

44th. This second crop is after deducting the expenses of cultivation clear gain to the Ryots and as there has as yet been no increased rate levied on account of the anicut water—the increasing prosperity of the Ryots can be well imagined, especially when the comparatively low cost of transport and easy access to the best markets is combined with increased produce from the land and good prices.

45th. The Returns of traffic are kept as yet only at the Head locks of the 3 main channels and the intermediate locks in the Cocanada Canal. These give a total of 23,340 loaded boats amounting to 90,000 tons passing respectively through the Dowlaiswaram, Rallee and Vezaishwaram locks.

46th. Besides these there is another important line of Navigation which has been kept open without intermission during the past year, and which must have exercised a most beneficial influence in the Taunkeo and Oondee Talooks in Rajahmundry and of those of Pentapaud and Kykaloor in Masulipatam. I mean the navigation across the Colair Lake—I regret to say no return of the trade to Ellore has as yet been taken, but from what I have observed during my various trips in the direction of the Colair, I feel sure that there cannot be much less than

50,000 tons annually carried in that direction. The line of navigation to the Port of Masulipatam, has not as yet been opened, but as soon as that is completed, and water carriage is provided from the salt pans to Ellore, there can be no doubt but that this will prove one of the most important lines in the district.

47th. The navigation of the Eastern Delta is now almost entirely provided for. That of the Central Delta will be so when the works entered in the Budget for 1855-56 are sanctioned, and the Western Delta will, when the Paloole channel is finished and Low Lift Locks placed at the head of the minor irrigation Channels, be also newly provided for. The additional works recommended in the report lately submitted by me, will, I think, render every portion of the Godavery Division accessible by water.

48th. One of the surest signs of the rapidly advancing state of the District is the difficulty experienced in obtaining the same supply of labor as formerly although the rate of wages has been increased by one third.

49th. The cultivation of the Dalwa crops has given employment to a number of people, who before were for a certain season of the year without work, and therefore glad of the opportunity afforded them by the Government works of gaining a livelihood—Now they find ample occupation near their own villages—The increased profits obtained by the landholders enable them to pay an advanced rate of wages to the labourers, and as agricultural pursuits are more congenial and less laborious, though not so profitable, as employment in the Public Works—yet the difference in profit is now not so great, as to form sufficient inducement to men to come to a distance to seek for work; and the consequence is that we cannot now push on our undertakings so rapidly as hitherto. Those works at least that require a large number of people to be concentrated on them, the minor and isolated works, are still pushed on as rapidly as before, if not more so, as every day the demand for water is becoming more urgent and the applicants in almost every case are ready and eager to execute the channel which is to form their means of supply.

ROADS.

50th. Very little has as yet been done in the way of roads. The towing paths of the main channels and the banks of the smaller branches, do however prove a useful means of communication for foot passengers and bullocks between the villages along which they pass. It will how-

ever be necessary to render the principal market towns of the district more accessible to each other than at present—and as opportunity offers, estimates will be sent in for the necessary lines of road.

PORTS.

51st. I regret to say that I cannot state any thing satisfactory regarding the present condition of the Harbours of this district. The stone which has been conveyed to the Cocanada Groynes has not as yet produced any beneficial effect, neither do I anticipate that any will arise until the whole project, as proposed by Major Cotton, has been thoroughly carried out—before any extensive measures can be taken to prevent the action now taking place and operating unfavorably in the Harbour of Coringa—the survey which the Government have lately ordered to be made must be completed—when this has been finished and we are enabled to compare the past state, with the present condition of the Harbour, we may with the aid of other observations be enabled to judge of the causes, and devise remedies against the further deterioration of the Port.

52d. While Coringa must ever be the main Harbour of the district, I think the Port of Nursapore should not be entirely overlooked. The magnificent River in which the largest ship of the line might float, affords a fine opportunity for the formation of Docks, and the bar itself being not more impracticable than many similar ones on the English coast, should be improved; as by the opening of this Harbour, the produce of the Western Delta and neighbouring Talooks of Masulipatam bordering in the Nizam's Country, would be much more easily shipped from thence, whilst every additional Port and refuge for ships we can open, is so much gained in such a generally inhospitable line as is presented by the Coromandel Coast.

53rd. The state of trade in the District is most encouraging—The exports have risen to nearly 18½ lacs of Rupees, which of itself is sufficient to show how much the prosperity of the District has increased, and what an amount of money has been circulated—nearly the whole of the amount of the land Revenue of the District having thus been paid from extraneous sources, and so leaving scarcely any to be borne by the inhabitants themselves.

54th. One of the principal wants of the District at present, is the establishment of a good system of canal legislation—The subject has now

become one of vast importance. The interests of the District individually and collectively urgently require it, and the present lawless ideas, indifference and want of respect for mutual rights, must be checked, and a wholesome system of restraint exercised on the inhabitants. At present villages and individuals help themselves to water, or else shut off the supply, without the slightest regard to the wants of their neighbours: the River embankment, one of the most important works in the District, is cut through at the pleasure of any man holding a fraction of an acre outside it, who so long as his own chilli garden is brought to perfection has the most supreme indifference to the fact of the lives and property of thousands being destroyed by his reckless proceeding of making a breach to admit the channel water to his own field. These facts when brought to the notice of the Collector are duly noticed by him; but until some code is enacted which shall render such proceedings criminal, a correspondingly adequate punishment cannot be awarded. The mere infliction of a fine of a few Rupees is no punishment. The value of the water has far exceeded the fine levied. I trust therefore this suggestion will meet with the approval of the Government, and lead to the establishment of the necessary remedy.

55th. I have thus endeavoured to point out what has been carried on in this District during the past year. There are certain points laid down in the Board's instructions, which I find it impossible to supply; such as the particular mode in which the various Officers were employed, and value of work performed by each. As there are but 4 Officers remaining in the District out of the 13 employed last year, and it has been impossible to obtain the necessary particulars from themselves, the total amount of work however executed in the District viz. Rs. 6,94,066-5-7 shews that they all must have been actively employed; and I trust the enumeration of the works and the description of the present state of the District will prove satisfactory to the Government.

F. H. RUNDALI, *Captain,*

Civil Engineer Godavery Division.

CIVIL ENGINEER'S OFFICE, GODAVERY DIVISION.
CAMP AT DOWLAISWARAM,
13th June 1855.

CIVIL ENGINEER'S OFFICE,

KISTNAH DIVISION.

Camp Bezoarah, 1st March 1855.

No. 62.

From Captain C. A. ORR,

CIVIL ENGINEER IN CHARGE KISTNAH DIVISION.

To

The Secretary to the Board of Revenue,

D. P. Works, Fort St. George.

SIR,

I. The attention of the Engineer Department and all available labour having been required in the Delta, no works of any importance, unconnected with the project for irrigating that tract by means of an Anicut across the Kistnah at Bezoarah, were undertaken in this Division during the year 1854; but such only as had been commenced and left unfinished were proceeded with, and such repairs as were essentially necessary for the maintenance of existing irrigation were performed.

WORKS OF IRRIGATION.

I. Restoration of the Cuncherlah Tank.

Rupees 1,828-5-7 having been previously spent on the restoration of the bank of this large reservoir, on Estimates of

* 1st Est...	518 14 8	Rs. 3,286-15-5* only	Rs. 578-5-9 were laid out in
Supt. do...	2,771 0 9		the same way this season, leaving the Calingulah to
	<u>Rs. 3,289 15 5</u>		be built and some additional earthwork to be executed with the balance next year, by which time it was expected the bank would be settled sufficiently to permit of water being retained.

II. Repairing the Copparum Tanks.

The thorough repair of these two important tanks was completed under an Estimate of Rs. 3,312-12-4, of which Rs. 2,613-8-0 were expended last year, and Rs. 78-15-7 this. The balance is therefore Rs. 619-12-5, and the results have been the collection in the two years of Rupees 2,584-12-0.

III. Repairing the Magaloor Tank.

This work was also completely repaired this year at a total cost of

Rs. 1,396-11-2 under an Estimate of Rs. 1,613-13-0, and the result has been the collection of Rs. 1,348-9-2 in the two years.

IV. Constructing an Anicut across the Kistnah.

As the four large sluices, and one of the two locks attached to the Kistnah Anicut were so far advanced last year as to permit of their completion during the Monsoon, notwithstanding the occurrence of the greatest flood ever known, operations for the construction of the Anicut itself were resumed this year with every prospect of their being carried out without any great difficulty, as the two under sluices were capable of affording the means of disposing of all the water that would be in the River by the time the closing of the stream became necessary. The season opened very favourably and early and as soon as the level of the deep bed could be reached, a double row of wells 6 feet in diameter, and from 6 to 8 feet in depth were begun to be sunk from each side, and on them, after being filled with broken stone well rammed into a solid mass, was built a front retaining wall to a height of 15½ feet above the deep bed; which was considered as great an elevation as it would be safe to give the dam the first year. Behind the front wall, and simultaneously with its erection, stone was deposited, in such large quantities that so much as 1800 tons were sometimes laid down in one day. In this manner, working from either side, progress was easy and rapid till the stream began to be narrowed, and headed back, when it became necessary to suspend the construction of the wall, and to carry forward stone dams from each side, till meeting, they closed the remaining waterway and pent back the stream till it rose and escaped through the vents of the under sluices. By making use of large sized stones weighing 2 or 3 tons each, no difficulty was experienced in closing the dams, and little delay occurred to the progress of the work, whereas in performing a similar operation at the Godavery, the utmost difficulty was met with, owing to the employment of two small stones. The stone dam being formed across the stream, an earthen dam was made in front, and into it foundations having been dug, wells were sunk, and the retaining wall connected quite across the River. The deposition of rough stone was then continued actively throughout the remainder of the season, till the rising of the water on the 31st May compelled us to take up the railroads from the bed of the River, and to cease operations. The construction of the lock which, by the sudden dispersion of the coolies by sickness last year, was left in too backward a state

to allow of its being finished during the rains, was taken in hand at the earliest moment and completed, in a manner most creditable to Mr. G. Sage the Assistant Overseer in charge at Seetanagram, as the workmanship is excellent and the dressed stone facing especially very good. The season having been an uncommonly dry one, and in other respects very favourable, no interruptions from freshes or sickness took place, and a very large quantity of stone was therefore got in behind the front retaining wall to form with it a dam of unprecedented proportions and solidity, the height being 15½ feet and the breadth varying from 50 to 60 yards. The total quantity of stone used cannot be under 350,000 tons and much of it is in massive pieces weighing from 1 to 4 tons.

Besides the Civil Engineer, Lieutenants Humfrays and Farewell, Assistant Supervisor Finnigan, Assistant Overseers Porter, Sage, Campbell, Wilkie and Fletcher were employed on the Anicut.

The following statement shews the cost of the European Superintendence employed on the Work; and that on the next page exhibits the quantity of work done, and its value in terms of the estimate.

CIVIL PAY OF OFFICERS WITH THEIR ESTABLISHMENTS, AND THAT OF OVERSEERS EMPLOYED ON THE ANICUT.						
NAMES.	Average per Mensm.			Amount per Annum.		
	Rupees.	As.	P.	Rupees.	As.	P.
Captain Orr.....	969	10	8	11,636	0	0
Lieutenant Humfreys...	347	4	0	4,167	0	0
„ Farewell.....	247	4	0	2,967	0	0
Mr. Finnigan.....	75	0	0	900	0	0
„ Porter.....	43	15	1	527	5	0
„ Sage.....	43	15	1	527	5	0
„ Campbell.....	43	15	1	527	5	0
„ Wilkie.....	43	15	1	527	5	0
„ Fletcher.....	43	15	1	527	5	0
Total.	1,858	14	1	22,306	9	0

*STATEMENT Showing the Particulars of the Estimate for the Kistnah Anicut,
and the work done.*

Description of Work.	Estimated.			Work performed up to the end of June 1853, (Vide last Report.)			Work done from July 1853, to June 1854.			Total amount and value of work performed up to the end of June 1854.		
	Cubic Yards.	Rs.	A. P.	Cubic Yards.	Rs.	A. P.	Cubic Yards.	Rs.	A. P.	Cubic Yards.	Rs.	A. P.
Rough Stone.....	2,23,602	1,57,163	14 8	84,000	23,375	0 0	2,37,890	1,63,549	6 0	2,71,890	1,86,924	6 0
Masonry.....	73,231 1/2	2,58,796	13 6	36,255	1,12,443	7 5	19,612	69,772	3 5	55,847	1,82,215	10 10
Earthwork.....	7,75,000	49,437	8 0	5,38,414	35,683	0 13	65,024 1/2	26,431	13 6	79,03,438 1/2	62,195	1 11
Plant.....		1,11,407	0 0		89,877	15 6		34,814	14 6		1,24,692	14 0
Superintendence.....		85,936	0 0		27,911	11 8		23,597	1 3		51,508	12 11
Indries, &c.....		1,03,800	0 0		12,353	8 5		0	0 0		0	0 0
Total.....		7,66,541	4 2		3,01,644	6 1		3,18,165	6 9		6,07,536	13 8
											1,96,674	2 1

Balance of Estimate remaining on hand.

2. In connection with the project for irrigating the Kistnah Delta by means of an Anicut across that River, the following works were undertaken this year.

I. The Excavation of a channel to connect the Poolairoo at Patamata with the left flank of the Anicut at Bezoarah.

An item providing for the cutting of a channel to connect the Boodoomair with the Anicut was included in the estimate for the construction of that work, but no provision having been made for a similar junction with it of the Poolairoo, which is already a highly important channel, irrigating, even in its present unimproved state, lands which have yielded a Revenue of Rupees 39,268 on a portion only of the land under it contained in the Ayacut, I submitted an estimate for the necessary work and it was commenced and carried out this year under the immediate superintendence of Lieut Lane. Owing to the depth of the excavations which varied from 5 to 7 yards, and to the necessity of giving slopes to the sides of 1 1/2 and 2 to 1, the Estimate amounted to Rs. 68,462-6-1 (inclusive of Rupees 10,000 compensation for gardens and houses) and the labour was so heavy as to occupy all the workmen, then procurable in the Masulipatam district, for many months, to the great prejudice of the other works required to give effect to the Anicut.

The junction having been completed, the District must derive considerable benefit immediately on the rising of the River, as the Anicut, even in its unfinished state, will throw an ample supply of water continuously into the Poolairoo for five months at least.

The following statement shows the amount of work done, that which remains to be performed next year, and the cost of European Superintendence.

	Rs.	A.	P.
Amount of Estimate.....	68,462	6	1
Work performed up to the end of June 1854.....	69,855	12	0
Remaining to be done.....	0	0	0

EUROPEAN SUPERINTENDENCE.							
NAMES.	Average Monthly Pay.			Period Employed.	Total Pay on the Work.		
	Rs.	As.	P.		Rs.	As.	P.
Lieutenant Lane ...	247	4	0	8 Months... ..	1,978	0	0
Asst. Over. McGuire.	43	15	1	6 do.	263	10	6
				Total...	2,241	10	6

II. Enlarging, deepening and straightening the old Poolairoo from Patamata to Weeyoor, and constructing in it a lock and Calingulah.

The Poolairoo being narrow, shallow, and like all old native channels somewhat tortuous, was quite unfit for the conveyance of the great quantity of water intended to be thrown into it as the main duct for the irrigation of fully $\frac{3}{4}$ of the Masulipatam portion of the Delta, by means of three large channels to be taken off from it near Weeyoor, and by other small branches. I prepared an Estimate amounting to Rupees 63,269-2-3 for deepening and widening it to a breadth of 15 yards at bottom as a beginning, and for straightening it, as much as possible without entailing too much labour, by cutting off or through bends. The Estimate having been sanctioned, the work was commenced as soon as the cutting from Bezoarah to Patamata was finished, and was carried on, first under the supervision of Lieut Lane, and afterwards of Lieut. Vertue, as far as Pennamaloor 8 miles below the Anicut. As at Pennamaloor commences a cutting four miles in length across an elbow formed by a long sweep of the Poolairoo to the right, it was a convenient point to reach at the end of the season, because the old channel could then be left open for the transmission of water during the freshes, for the irrigation dependent on it, while at the same time the excavation of the new line could be proceeded with without interruption across the bend, as far as the site of the first of the series of five locks and Calingulahs which it will be necessary to place between the Anicut and tide water, to improve the capabilities of the channel for irrigation, and to make it a first class line of navigation to the port of Masulipatam. The Estimate for the first set of these works amounting to Rupees 24,582-7-3 having likewise been sanctioned they will be constructed next year.

The statement below will show the amount and value of work done and the cost of European Superintendence upon it.

	Rs.	A.	P.
Amount of Estimate	87,851	9	6
Work performed up to the end of June 1854. . .	18,463	5	4
Remaining to be done.....	69,388	4	2

COST OF EUROPEAN SUPERINTENDENCE.							
NAMES.	Average Monthly Pay.			Period Employed.	Total Pay on the Work.		
	Rs.	As.	P.		Rs.	As.	P.
Lieutenant Lane.	247	4	0	3 Months.	741	12	0
Captain Allan.	247	4	0	3 do.	741	12	0
Lieutenant Vertue ...	247	4	0	5 do.	1,236	4	0
Total.					2,719	12	0

III. Enlarging, deepening and straightening the Boodoomair from Mootialumpaud to near Casarapilly.

The Boodoomair was connected last year with the flank of the Anicut by a cutting from Bezoarah to Mootialumpaud. Being only a natural water course of small capacity, very crooked, and on a level several feet higher than the floor of the head sluice, it was necessary to improve it by widening and deepening its bed, and by cutting across its numerous windings, as far as its course coincided with that of the large irrigating and navigable canal leading from the Anicut Northwards towards Ellore, and I therefore submitted an Estimate amounting to Rupees 40,277-11-4 for doing so as far as Casarapilly, where the high level northern canal, hereafter to be projected, will take off, and skirting the Delta will irrigate a large tract of country, and connect the Kistnah and Godavery systems of navigation. The Estimate having been sanctioned, workmen were transferred as soon as the head of the Poolairoo was finished, and the work was commenced under the supervision of Captain Allan and Asst. Overseer McGuire; but owing to the small number and inefficiency of the workmen that could be obtained, and to the unusual hardness of the soil after so long continued a drought as prevailed last year, the progress made was scarcely satisfactory, and the work will therefore have to be suspended during the Monsoon, in consequence of the filling of the Boodoomair and the admission of water from the River above the Anicut.

The following statement will show progress made and the cost of superintendence.

	Rs.	A.	P.
Amount of Estimate.....	40,277	11	4
Work performed up to the end of June 1854 . . .	13,969	9	11
Remaining to be done.....	26,308	1	5

COST OF EUROPEAN SUPERINTENDENCE.							
NAMES.	Average Monthly Pay.			Period Employed.	Total Pay on the Work.		
	Rs.	As.	P.		Rs.	As.	P.
Captain Allan.....	247	4	0	5 Months.....	1,236	4	0
Asst. Over. McGuire	43	15	1	4 do.	175	12	4
				Total..	1,412	0	4

IV. Cutting a new head to the Toongaboodra and enlarging and deepening the upper part of that Channel as far as Pedda Vudlapoody.

Although the upper portion of the Toongaboodra, had been much enlarged during late years, it was on too high a level, and was still too small to be suitable for the main duct from the Anicut to the half million of acres contained in the Guntoor division of the Delta, and its head, especially, led off in a wrong direction. It was necessary therefore to cut a new head and to enlarge and deepen the channel for the first six miles of its course where it would become the sole feeder from the Anicut; and the estimate, amounting to Rupees 58,460-1-5, having been sanctioned, the work was early commenced under the Superintendence of Captain Pollard, assisted by Assistant Overseers Lee and Boyd. The inhabitants of the Guntoor district having from the first shown a determined disinclination to assist in our operations, it was not easy to obtain a proper supply of labour, and as, when deepening, so much water was met with that the people had to work in it (which was supposed by them to produce cholera), the utmost difficulty was experienced in carrying on the work and it was not possible to complete it entirely, though enough was done to render the channel available on the rising of the River.

The Statement below shows the extent of work done, that which remains to be performed next year, and the cost of European Superintendence.

	Rs.	A.	P.
Amount of Estimate.....	56,460	1	5
Work performed up to the end of June 1854.....	50,766	4	8
Remaining to be done.....	5,693	12	9

COST OF EUROPEAN SUPERINTENDENCE.									
NAMES.		Average per Mensm.			Time Employed.	Total Amount of Salary for the time employed on the Work.			
		Rs.	A.	P.		Rs.	A.	P.	
Captain Pollard.....		247	4	0	9 Months....	2,225	4	0	
Assist. Overseer Lee.		43	15	1	10 do.	439	6	10	
Do. Conolly		43	15	1	4½ do.	190	6	8	
Do. Boyd....		43	15	1	3½ do.	142	13	0	
					Total....	2,997	14	6	

Excavating an irrigating and navigable channel from near Pedda Vudlapoody to the coast at Nizampatam, and constructing in it the necessary Locks, Calingulahs and Sluices.

The Toongaboodra being a drainage Nullah flowing on too low a level to be adaptable for an extensive system of irrigation, and being essentially required for its natural purpose, it is proposed to leave all the lower portion of it open as a simple drainage, when laying out the new scheme for the irrigation of the Delta, and to make use of the upper six miles only as a main feeder from the Anicut to the several large irrigating branches to be taken off near Pedda Vudlapoody. One of the principal of those branches will be an irrigating channel made navigable by three sets of Locks and Calingulahs, running in almost a direct line to the coast, along a ridge from which the land on either side will be commanded, and terminating in a tidal backwater forming the port of Nizampatam. The Estimate for the formation of this channel with its Locks, Calingulahs and numerous irrigating sluices, amounting to Rupees 2,20,417-2-7, having been sanctioned the execution of the work was commenced under the charge of Lieut. Ryves, but so near the termination of the season that little more than a beginning was made.

The work done and the cost of Superintendence, is shown in the following Abstract Statement of the progress of the Kistnah irrigation project up to the 30th June 1854.

COST OF EUROPEAN SUPERINTENDENCE.						
Name of the Work.	Amount of Estimate.	Amount of Work performed up to the end of June 1884.	Remaining to be done.	Names.	Average amount per Mensem.	Time Employed.
1 Kistnah Aicut.....	7,56,541 4	6,07,536 13	1,96,674 2	Captain Orr..... Lieut. Humfrey..... " Farewell..... Asst. Supr. Finnigan..... " Over. Porter..... " Sage..... " Campbell..... " Wilkie..... " Fletcher..... Total.....	969 10 8 347 4 0 247 4 0 75 0 0 43 15 1 43 15 1 43 15 1 43 15 1 43 15 1 1858 14 1	11,636 0 0 3,167 0 0 2,967 0 0 900 0 0 527 5 0 527 5 0 527 5 0 527 5 0 510 0 0 22,866 9 0
2 Excavating a channel from Beroarah to Patamata to connect with the Poolaroo.....	68,462 0 1	69,855 12 0	0 0	Lieutenant Lane..... Asst. Over. McGuire..... Total.....	247 4 0 43 15 1 291 3 1	8 months... 6 months... 1,978 0 0 263 10 5 2,241 10 6
3 Enlarging, deepening & straightening the old Poolaroo from Patamata to Westoor, and constructing in it a Lock and Casingulsh.....	87,651 9 5	18,463 5 4	69,388 4	Lieutenant Lane..... Captain Arnold..... Lieut.enant Vertue..... Total.....	247 4 0 247 4 0 247 4 0 741 12 0	3 months... 3 months... 3 months... 741 12 0 741 12 0 1,236 4 0 2,719 12 0

Enlarging, deepening and straightening the Broodoomair from Mootalimpaund to near Caserapilly.....	40,277 11 4	13,969 9 11	26,308 1	Captain Allan..... Asst. Over. McGuire..... Total.....	247 4 0 43 15 1 291 3 1	5 months... 4 do. 1,236 4 0 175 12 4 1,412 0 4
5 Cutting a new head to the Toongaboodra, and enlarging and deepening the upper part of the channel as far as Pedda Vadlapoody.....	56,460 1 5	50,756 4 8	5,693 12 9	Captain Pollard..... Asst. Over. Lane..... " Conally..... " Boyd..... Total.....	247 4 0 43 15 1 43 15 1 43 15 1 379 1 3	9 months... 10 do. 4 do. 3 do. 2,927 14 6
6 Excavating an irrigating and navigable canal from Pedda Vadlapoody to Nizamapattan, and constructing in it the necessary Locks, Casingulsh & sluices.....	2,20,417 2 7	8,623 10 1	2,12,393 8	Lieut. Ryves..... Capt. Creve..... Total.....	247 4 0 247 4 0 494 8 0	5 months... 4 do. 1,236 4 0 989 0 0 2,225 4 0 33,903
Total.....	12,40,010 3 1	17,68,615 7	85,10,457 12 11		4,056 9 6	2 4

Repairing the Western Embankments of the River Kistnah.

The great flood of July 1853 having caused so much injury to the Embankments on the Western side of the River as to render their repair a work almost of reconstruction, I took advantage of the circumstance to frame the necessary Estimates so that, while providing for the restoration of the bank on a better and safer alignment, the earth required for it, being taken from a continuous line of pits, might form an excavation within it, which might readily be converted into an important irrigating channel by being connected with the main duct from the Anicut near Pedda Vudlapoody.

The estimates, unavoidably heavy, amounted in the aggregate to Rupees 78,520-9-0. The work, being ordinary, was left under the management of the Collector's department, and the progress made with it was therefore by no means satisfactory, for, as the inhabitants of Guntoor have no inclination to employ themselves on public works, more exertion to get those of any magnitude done is requisite, than suits the Tahsildars and other Minor officers, who, without exception, looking upon the charge of repairs as the very least important of their duties, neglect it when they can. Thus, although the safety of the crops of the entire Delta is dependent on the embankment being made up in time, a trifling proportion of the work to the value of only Rs. 18,393-1-7 has been done, leaving Rs. 60,127-7-5 to be expended next year in making up the bank of such a strength as will enable it to resist even an ordinary fresh.

ROADS AND BRIDGES.

I. Improving the District Road from Guntoor towards the Coast as far as Munchallah.

The formation of this piece of road, which was commenced last year, has been continued; and the construction of four Masonry tunnels having been begun, the whole will be completed next season. The work is under the charge of the Civil Judge of Guntoor, who, as far as possible, has employed upon it the convict labour at his disposal.

II. District Road from Guntoor towards Cumbum.

The Civil Judge having thoroughly repaired, by means of convict labour, several miles of the road leading out of Guntoor towards Cumbum, via Innacondah, &c. a grant of Rs. 900 was obtained from Government to enable him to erect a few necessary drainage tunnels. Some of these

have been built with the money, but others being required, a further sum of Rupees 500 has been applied for.

III. Bridge near Bezoarah over the Main Channel from the Anicut.

As the new Main Channel from the Anicut to the Boodoomair intersects the High Northern, and the Masulipatam and Hyderabad Roads close to Bezoarah, and unless bridged would interrupt the traffic on these important lines of communication, the Government authorized the erection of a suitable bridge at an Estimated cost of Rupees 7,584-14-10. It was accordingly built this year, so much within the Estimate as to allow of convenient approaches being made to it with the balance.

No general repairs, nor any material improvements have this year been made to the roads throughout this Division, and they consequently continue in the same unsatisfactory condition as heretofore.

I have the honor to be,

Sir,

Your most obedient Servant,

BEZOARAH,
1st March 1855.

C. A. ORR, Captain,
Civil Engineer in Charge Kistnah Division.

REPORT ON THE IMPORTANT WORKS EXECUTED IN THE
2d DIVISION DURING THE YEAR 1854.

BRIDGES ACROSS THE RALLA AND BOOGGA RIVERS.

CUDDAPAH DISTRICT.

CHENNOOR TALOOK

LIMITS OF CUDDAPAH.

Expended during the year 1854.....	Rs. 14,623 13 11
Total expended up to the end of 1854.....	„ 14,909 3 9
Balance of Estimate.....	„ 5,253 1 8

The position and the special utility of these works were pointed out in my last Report.

They were carried on under the Superintendence of Ensign Campbell from January to March, and under Lieut. Palmer from March till the end of May, by which time the Abutments, Piers, and Wing Walls, having been built up to the level of the line of spring of the Arches, and the season being advanced, it was not considered prudent to commence with the Arch work, so that the rest of the year was occupied by Mr. Assistant Overseer Dore, in collecting, or rather endeavouring to collect, materials.

The salaries of the Officers and Overseer while employed upon the Bridge in this year amounted to Rupees 1078.

NUNDY CANNAMAH GHAT.

CUDDAPAH DISTRICT.

Expended during the year 1854.....	Rs. 13,961 10 0
Total expended up to the end of 1854.....	„ 14,717 3 9
Balance of Estimate.....	„ 33,681 1 9

This work was prosecuted with energy by Lieut. Marsack from January till April, when cholera in a very severe form appeared among the labourers, carrying them off after only 2 hours illness by scores. The parties were thus broken up, and in a measure reassembled twice, when it was finally found necessary to close the work for the season in June. Meanwhile the Road approach (with some exceptions) on the East side for three miles, and the East Ghat were completed, and about 1½ miles of the West Ghat were cut in widths varying from 3 to 20 feet; the precaution of cutting catch drains not having been adopted, the work sustained very considerable injury during the rains; some of the revetment walls having fallen, and the road way being greatly cut up.

In the month of December the parties were again collected under Lieut. Shuldham, and were employed chiefly in repairing the damage sustained, in cutting catch drains, clearing Jungle, making bricks, &c. Some of the subsidiary Roads which I consider it necessary to recommend in connection with this Ghat were entered in the last Annual Report; I have only to add that from enquiries since made I have reason to think that the line from the Bellary District via the Bogasamoodrum pass to Koilkootla and Madaypoor should be opened, and may perhaps be considered as superseding the Gooty and Banagunpully Line.

The salary of the Officers employed during the year was Rupees 250 - 0 - 0. As the Lieut. Marsack being an Asst. Civil Engineer, his salary was included in the general charges of the Division and not in this work. Overseers were employed for broken periods, it was found more convenient to charge them on the N. Road Accounts, on which they were also employed.

ROADS FOR THE EMPLOYMENT OF THE POOR.

On the 27th January of the year under Report, Government sanctioned 1000 Rupees per mile to be disbursed on the 3 following roads.—

1stly. The Northern line, extending from Kistnama Chettypullu at the foot of the East approach to the Nundy Cannama Ghat to Cumbum, and thence Eastward to Podella and Shemakoortee, where the road is to branch N. E. to Enamanamelloor and the salt pans of Chinna Ganjam, terminating at Motupully and S. E. to Ongole and the salt pans of Padurty.

2dly. The Central line commencing at Chennoor 5 miles north of Cuddapah (between which places a road is already in formation on a sanctioned estimate) and taking the line of Budwail and the Dorenal Pass (for which also a special estimate had been sanctioned) to Nellore; is to be extended to the sea Coast at Kistnapatam.

3dly. The southern line extending from the Cuddapah and Madras road near Ootkoor to Goodoor on the great North road. In this line is included the formation of the Raupoor Ghat.

The work done to each of these lines will be reported on separately.

1st. NORTHERN LINE.

Expended up to and during the year 1854.....Rs.	48,089 9 3
Sum allowed 1000 Rs. per mile on 130 miles..... „	1,30,000 0 0
Balance.....Rs.	81,910 6 9

On Lieutenant Marsack's being obliged to leave the Nundy Cannama Ghat work in June, he proceeded to mark out and start this road; the portion of the line to which attention was first given was that between Kistnum Chettyully at the east foot of the Ghat Approach, and Cumbum, a distance of about 25 miles. Portions of road were also lined out by that officer between Shemakoortee and Ongole, between Shemakoortee and Enamanamelloor, and between Podella and Shemakoortee. Lieut. Marsack's health failing, he was relieved by Lieut. Keyes in July, and leaving the Division, he proceeded to England. *Seven Eu-

* Messrs. Barham.
" Brown.
" Bryan.
" Bird.
" Sears.
" Jeffery.
" Gilbert.

ropean Overseers were posted at several points along the line, suitable for carrying out the road marked out. The allowance of Rs. 1000 per mile was of course quite insufficient to make a first class road, but much of the ground from Cumbum, south and south west, being of cotton soil, it was

thought advisable at once to construct a first class road in that portion—the more so, inasmuch as it is common to 3 separate routes, viz. the Bellary and Ongole, the Bellary and Guntoor, and the Cuddapah and Guntoor. About 15 miles of a well formed road were made during the year, and several miles of a 2d class road in the neighbourhood of the principal villages before adverted to. Between Cumbum and Podella however nothing was effected, as it was not decided whether the present détour round the head of the Ellegonda Range of mountains, or the line of the Vamlapaud Pass should be taken. I have since decided on the latter, as useful also for a Cumbum and Nellore line.

The sanctioned sum will probably be expended during the year 1855, and a further estimate will be required. The salaries of the Officer and Overseers amounted to Rs. 4370 3 0.

2DLY. THE CENTRAL LINE.

Expended during, and up to the end of, 1854.....Rs.	1,38,995 13 4
Sum allowed 1000 Rs. per mile on 100 miles... „	1,00,000 0 0
Balance on sanctioned estimate... „	0 0 0 0

From the sea at Kistnapatam to the foot of the Dorehall Pass at Kadanellypau, a distance of 71 Miles was entrusted to the execution of Lieutenant Palmer; while from Budwail to Chennoor the work proceeded under 3* Overseers under my immediate control. In the whole line the former track was entirely abandoned, and a new and improved line struck out. By the end of the year the new communication was nearly established throughout by means of temporary bridges, or by sloping the sides of Nullahs; but a small portion was gravelled and few masonry drains built. From the great press of the famine stricken population, the work could not be thoroughly superintended, (the Overseers also being quite new to their work) and no pretence of economy is offered. The yard of earth not unusually cost 3 or even 4 annas. Thus the first one thousand Rupees per mile was soon exhausted, and the local Government sanctioned (in anticipation of Supreme Authority being granted) a further expenditure on the Nellore portion of the line of 1000 Rupees per mile; that that will complete the Road, I dare not hope. A correct estimate will be submitted for perfecting the line, and especially for bridging some of the considerable streams which cross it, viz. the Boogairoo, the Katamanairoo, and the Suggleairoo. The Pennair at Nellore is (I am informed) likely to be bridged by the Road Department; there will then only remain a similar work across the same River at Chennoor.

The salaries of the Officers and Overseers employed on this road during the year amounted to Rupees 6,159-6-11.

3DLY. THE SOUTHERN LINE INCLUDING RAUPOOR GHAT.

Expended during, and up to the end of, 1854...Rs.	47,370 12 1
Balance of Estimate..... „	17,629 3 11

The Ghat was traced by Lieutenant Walker in February, and the road was marked out in August, and Captain Watts assumed charge of the Nellore portion of it in September. The Ghat, and the Cuddapah District portion, remained under my own supervision during the year; 7 miles of the Ghat were completed with the exception of some heavy masses of rock which remained to be removed; an approach over a 2d ridge of hill offering for 2 miles peculiar difficulties in construction cannot be completed till 1855. A few miles of Jungle clearing and embankments across paddy fields were made between Raupoor and Goodoor.

On the West of the Ghat a new pass, the Umbalainee Cannama, one mile long, was commenced across a small range of Hills 3 miles west of Chitwail, and a 2d Class road was opened from the Goonjana River towards Ramasamoodrum. On this line, the Kundlairoo, the Goonjana, and the Poolungairoo, will all be recommended for bridging next year.

As a subsidiary work to this Road, and to complete the communication with the Coast, it is proposed to extend the Rampsiroo or Kistnapattam Backwater ultimately to Goodoor; for the present, sanction has been received for removing certain impediments in the navigation and deepening the Channel for 3 miles, but the work has not yet been commenced.

The salary of the Officer* employed on this road amounted to Rupees 956 - 4 - 0, and that of the Overseer† to Rupees 731 - 10 - 9.

* Captain Watts.
† Messrs Conway and Dwyer.

CUDDAPAH AND BELLARY FRONTIER ROAD.

Expended during the year 1854.....Rs. 40,585 6 7
Balance of Estimate.....,, 10,414 9 5

No specific sum was allotted to this work. It was recommended by the Collector to be carried out in order to give employment to the furnishing poor. Five Overseers were posted along the line, one of whom however died shortly after. No marking out was required except here and there, where it was thought advisable to deviate from the Avenue planted in the time of Munro. By the end of the year about 40 miles of road embankment had been formed of earth, and about 3 miles were coated with kunkur. No masonry drains were constructed. The earthwork will require a season to settle, by which time an Estimate will be framed in detail for completing the line, with the exception at present of bridges across the Paupugnee and Chittravutty Rivers, which of themselves would involve an expenditure of about 2 lacs of Rupees.

The salaries of the Officers and Overseers employed on the line of Road amounted during the year to Rs. 2,933 - 14 - 0.

Captain Watts for 3 months. Lt. Shuldham for 1 month.

DORENALL PASS.

On the Cuddapah and Nellore Road.

Expended during, and up to the end of, 1854.....Rs. 16,062 5 7
Balance of Estimate.....,, 234 1 3

This work was traced out by Lieutenant Walker, and commenced under the direction of Ensign Innes, during the month of January; though formerly passable for Bandies, the route consisted of merely a narrow track thro' the Jungle, and for some miles over very rocky ground. By the beginning of the month of April a 2d Class road was nearly completed for about 6 miles, viz. from Peddapolepully Chuttrum to near the foot of the Pass at Kadanellypaud. On the 4th April Ensign Innes' health was so bad as to render it necessary for him to dawk off to Nellore for the purpose of getting medical advice. He did not however live to reach Nellore; having died in his Palankeen on the morning of the 6th. In him the Department lost an active, zealous and intelligent officer. The work was then entrusted to Mr. Assistant Overseer Dore and afterwards to Mr. Assistant Overseer Doheny, and under him the Western portion about 7 miles (including a small Pass* skirting a low range of hills near Budwail) was nearly completed, when it was found that the funds were almost exhausted, and the work was stopped on the 7th September.

A further sanction of Rs. 1,000 per mile has been since granted for this work.

The salary of the Officer employed here during the year amounted to Rs. 480.

The Overseers having been also employed upon other works in the year, their salaries were charged to those works, the Funds being better able to bear the charge.

PODDATOOR EXTENSION LINE.

Expended during, and up to the end of, the year
1851.....Rs. 1,307 2 4
Balance of Estimate.....,, 18,692 13 8

A branch from the Cuddapah and Nellore or Central line of Road before adverted to, was sanctioned at the same time as the Road itself; it is to extend from Nundialumpett to Poddatoor, via Mydekoor.

This line was traced and Overseers were posted on it in December, but the only money expenditure was an advance for tools and the collection of materials for an Overseer's house.

Salary of Overseers.....Rs. 233 7 0

BRIDGE OF 5 ARCHES ACROSS THE BEERAPAIROO RIVER NEAR SUNGUM.

NELLORE DISTRICT.

Sungum Talook.

Expended during the year 1854.....Rs. 5,998 15 1
do. up to the end of 1854....., 6,581 9 4
Balance of Estimate....., 5,972 7 8

The Abutments and Piers were nearly completed in this year. Great difficulties were encountered in the foundations of this work. The want of persons experienced in the details of bridge building was much felt.

The work will be completed in the current year. As the Overseer Mr. Sears was also employed on the central road, his salary has been debited to that road and not to the bridge.

ANNICUT ACROSS THE PENNAIR RIVER AT NELLORE.

Nellore District—Nellore Talook.

Expended during the year 1854.....Rs. 51,089 9 3
Do. up to the end of 1854....., 58,495 13 10
Balance of Estimate....., 27,051 6 8

This work was recommenced in the month of January under the direction of Lieut. Ritherdon. Regarding its progress during the year that officer writes, "on commencing work I found that the end of the work done in 1853 had been left unprotected and stones had been worked out by the action of the water. These stones being buried in the sand at various depths prevented the sinking of several wells, and great trouble and delay arose from having to take them up again; but by the end of July 150 yards of the Annicut had been raised to a height of 6 feet, and the remaining portion was left at 3 feet on account of the rough stone work going on so slowly. The abutment on the north bank was completed, and the Piers &c. of the centre and south sluices were finished off to 6 feet, and in this condition the work had to cease. There was only one small portion of the apron that had

"been carried out to its full extent, and that was only 1 yard in thickness; and although there was a fall of 6 feet for some time, very few stones were displaced. The remainder of the annicut apron was packed at a height of 1 yard, and the width varying from 12 to 35 feet. Circumstances had combined to throw difficulties in the way of accomplishing more work, and appearances were rather against its stability; but the damage done was inconsiderable, amounting only to the loss of rough stones along the edge of the unfinished portion of the apron and in rear of the sluices."

The works needed in connection with the Annicut were generally spoken of in my last Report.

As the Eastern Coast Canal will probably leave Nellore 12 or 15 miles to the Westward, a branch Canal will be needed from the Pennair River above the Annicut so as to complete the water communication between that town and Madras.

CUDDAPAH AND CHENNOOR ROAD.

Chennoor Talook.

Expended during the year 1854.....Rs. 1,073 0 0
Do. up to the end of 1854....., 4,625 5 8
Balance of Estimate....., 1,810 4 8

This road was commenced in 1853 and was carried on under the orders of the Collector in 1854. The kunkur was put on to an unsettled embankment in consequence of which it has not stood well, and the balance in hand will be required for repairing the road.

There is an evil to contend with in preserving made roads in Cuddapah that I have not met with elsewhere, and that is the extremely sharp tires to the wheels of the country carts, which cut like a knife, and would destroy almost any road. I think this is a fair subject for local legislation.

CONSTRUCTING 3 VAUGANIES AND A DYKE TO THE PAUPUGNEE RIVER NEAR APPIAPULLY.

Camalapur Talook.

Expended during the year 1854.....Rs. 28 2 11
Do. up to the end of 1854....., 2,780 12 10
Balance of Estimate....., 811 5 2

These works have acted very favorably, a considerable accumulation of silt having formed in their rear. As the Vauganies are at pre-

sent disconnected with the Dyke, and so liable to have their rear turned by an extraordinary flood, the balance will be disbursed in remedying this evil.

In the Nellore District the following considerable sums were expended during the year on works of less importance than those before enumerated.

NAMES OF WORKS.	Amount.		
Constructing Cutwall's Choultry in the Nellore Town.....	1500	0	0
Do. a New Building for the Superintendent of Light-house.....	1342	8	1
Partly do. a New Talook Cutcherry at Cavalry.....	1030	5	4
Constructing an Aqueduct over the Gungapatain River Channel in Nellore Talook.....	493	9	0
Do. do. on Muldavy River for Parlapully in Talamunchy Talook.....	499	14	0
Do. a Calingulah to the Modagoonta Tank in do.....	474	12	10
Do. do. to Pooreny do. in do.....	474	13	0
Opening a new cut for the Covoor River Channel.....	4779	15	7
Stone facing, &c. to the bank of Nellore Tank.....	3228	8	8
Repairing the new River Channel of do.....	3915	10	0
Do. the Jaffer Saib's Channel.....	2295	10	0
Do. the Vavoor do.....	2085	9	7
Do. the Pydaroo supplying Channel of Alloor Village.....	1392	1	9
Do. the Gundavarum River Channel.....	2768	2	3
Do. the Veeroor do.....	1843	9	3
Do. the Jungum Reddy River Channel with new mouth.....	3175	11	8
AND IN THE CUDDAPAH DISTRICT.			
Repairing approaches to the Wooppalavagoo, &c. Bridges.....	2036	7	4
Repairing the sleeping wards, &c. of the Jail at Cuddapah.....	1187	1	0
Constructing a Calingulah to the supplying Channel of the Panta Cuddapah Tank.....	611	5	0

It appears by a Statement which I have received from the Acting Collector of Nellore, that an increase has been maintained upon the former Revenues in consequence of the new heads to the Veeroor New Channel, and the Caupooloor and Chellumuttoor Coochavada, also upon the Nellore Tank New Supplying Channel, and the Parlapully River Channel. Upon all works a decrease appears in Fusly 1263, which is well known to have been a most unfavorable season throughout the District.

The Collector of Cuddapah generally states "that the works upon which the principal outlay has been made during the last few years have been more for the protection of the Revenue, than for its increase," and adds "that hitherto they have answered the purposes for which they were constructed."

In my letter to Government, No. 740, dated 16th November 1854, (forwarded for the Board's information on the 8th December) I pointed out what appeared to me the principal wants of this Division; they may be again summed up in these words. Mountain Passes and Reservoirs in Cuddapah, regulation of Rivers and formation of Roads in Nellore. We must perfect the roads already commenced on a guess allowance; we must select the Passes now most generally traversed by laden bullocks, and make them available for Country Carts, and we must contrive to store some of the millions of Cubic yards of water, which running athwart the country flow wasted into the sea; but we need an extended agency; to each important River its man; to each set of communications, its own engineer to Estimate and to execute, and when thus served, there may be a hope that this extensive Division will no longer be ranked as one of the most neglected in Southern India.

The general mode of employment of the several members of the Department in this Division will best be shewn in the annexed Tabular Statement.

The total number of Works inspected appears to have been 444.

NAMES		JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.
Lieut. G. W. Walker.....	Acting Civil Engr. and 1st Asst. Civil Engineer.	Tracing Dore null Pass, arranging for commencing the Beera-pairon Bridge	On leave at Madras.....	Tracing the Raupoor Ghat.....	Appointed Civil Engineer 3d Division.	
Captain A. Boileau.....	Civil Engineer	Joined 25th Jan, inspecting Sungum Bridge.....	Marking out road to Kistnapatam and Damarana-doo-goo Nellore new River Channel improvement	Preparing large ordinary Estimate for 3 Channels, marking out new road near Sungum, Superintending bridge work &c.	Estimating for Jaffer Saib's Channel, Superintending new road work, inspecting Sungum bridge, marked out road to Cuddapah frontier, inspected Dore null Pass, and Cuddapah Bridges.	Marked out Cuddapah and Bellary frontier Road and posted Overseers, inspected Cuddapah and Madras Road work, Raupoor Ghat and Cuddapah Bridges.
Lieut. Marsack.....	2d Asst. Civil Engineer.....	Superintending Nundy Cannana Ghat and Northern Line of Road.....				
Lieutenant Rutherford.....	2d Asst. Civil Engineer.....	Superintending the construction of the Pennair Annicut.....				
Mr. W. H. Walton.....	Assistant Surveyor.....	Marching from Cuddapah to Nellore and inspecting Works.....	Inspecting Works.....	Framing ordinary Estimates.....	Taking levels from Nellore to Kistnapatam back water and sick..	Sick.....
Mr. Downes.....	Assistant Surveyor.....	.....	.....	.....	.....	.....
Mr. Rosario.....	Acting Sub Asst. Surveyor.....	Sick.....	Sick.....	Sick.....	Sick.....	Sick and Marching.....

Civil Engineer's Office, 2d Division,
Camp Sydapoor,
19th May 1855.

JUNE.	JULY.	AUGUST.	SEPTEMBER.	OCTOBER.	NOVEMBER.	DECEMBER.
Superintending Kistnapatam Road, estimating for Pennair embankments, & attending to sundry works in the vicinity of Nellore.....	Kistnapatam Backwater, Sungum Bridge, Pennair annicut and certain tanks and channels in Nellore Taluk.....	Inspecting sundry irrigation works, Pennair south side River Channels, and employed reconnoitring for new southern or Chitwail line of Road.....	Reconnoitring and lining out southern line of Road or Chitwail line of Road and starting work under executive Officer and inspecting work at Raupoor Ghat.....	Irrigation works and inspection of Central line of Road.....	Sungum Bridge, Somasala and Work in Cannana Umbalaine Cannana. Marking out southern line in Cuddapah District.....	Southern line of Road, So-day Cannana Sections of 3 Rivers for Bridges, Central line in Cuddapah District. Marking out Poddatoor extension line.
Leave to Madras and England.....						
.....	.....	.....	.....	.....	Framing occasional estimates in Nellore, Survapully and Talamunchy Talooks.	Framing occasional estimates in Nellore and Talamunchy Talooks.
Estimating for ordinary works.....	Surveying Backwater near Goodoor, tracing approach to Raupoor Ghat	Examining Works and Sick.....	Sick.....	Sick.....	Sick.....	Sick.....
.....	.....	.....	.....	.....	Inspecting project for Cuddapah Reservoirs.	Marching and framing estimates.
Framing Estimates and examining Works.....	Framing Estimates examining works and drawing plans.....	Framing Estimates examining works and drawing plans.....	Framing Estimates and drawing plans.....	Framing Estimates inspecting works.....	Marching and inspecting works.....	Inspecting works and framing Estimates.....

A. BOILEAU,
Civil Engineer, 2d Division.

REPORT OF IMPORTANT WORKS OF THE 3D DIVISION FOR THE YEAR 1854.

1. As may be seen by the Tabular Statement hereto annexed, all other works of the Division during this year are on an insignificant scale compared to the Famine Roads. Roads undertaken in the Bellary and Kurnool Districts, to economize as far as possible the labour of the starving population, for whom the Government were compelled to find food and occupation.

2. The lines from Bellary to Kurnool and to Madaveram, on the Toombuddra by way of Alloor and Auspary, and Alloor and Adony, were those first selected, with reference chiefly to their traversing those Talooks in which cotton soil is prevalent, and which therefore had peculiarly suffered for want of the local rains. But the universality of the distress soon led to the addition of the extensive line from the Mysore boundary near Palsamoodrum, by Anantapoor, and Ghooty, to Kurnool, and the branch from Ghooty connecting it with the former lines at Auspary and Adony.

3. On the former, occupation was extensively given at once to many thousands by the exertions of the Revenue authorities in organizing working parties and arranging for their payment, while the scanty Engineer establishment was made available in laying out the lines and promulgating instructions for the proper execution of the work. To Mr. Pelly and his Assistants, and to Mr. Conway, is due the immediate relief afforded to the population of the Bellary and Kurnool Districts, by their readiness to undertake any amount of responsibility without regard to forms or precedents; and Lieutenant Colonel Henderson, C. B. the Civil Engineer, brought to bear his local knowledge of the District and its peculiarities of soil, greatly to the advantage of Government, in drawing up sections of the road adapted to different localities, and practical working instructions, which tended to secure the valuable result of the operations.

4. But on the Executive Officers and Overseers, temporarily appointed for the superintendence of the roads, fell the brunt of the work,

and right well did they discharge the trusts confided to them through a most trying season. The following Lists record their names and services—

Names of Officers and Overseers.	Names of their Regiments.	Dates of their Appointments.	Dates and nature of Casualties.
Capt. W. P. Devereux	2d Eur. L. I.	27th Dec. 1853.	Executive Officer Cud-dapah Bridges.
" J. E. Palmer	4th Regt. N. I.	10th April 1854.	2d Asst. Civil Engr; 3d Dn.
Major W. Bisset	15th do do.		Resigned 29th Feb 1855
Capt. W. J. Jones	4th do do.		Executive Officer Kurnool District.
Lieut. W. S. Davis	15th do do.	20th Mar. 1854.	Do. do. Canara District.
" G. V. Law	14th do do.	10th Feb. 1854.	Asst. Supt. of Trunk Roads.
" W. R. Johnson	39th do do.	10th April 1854.	
" E. H. Harrington	2d Eur. L. I.	3rd Feb. 1854.	Appointed to the 9th Dn.
Capt. G. C. Gill	17th Regt. N. I.	10th Feb. 1854.	Actg. Asst. to the Agent to the Govt. Kurnool.
" W. G. Owen	11th do do.	24th Feb. 1854.	Commanding Golecondah Sibundies.
Private T. Palmer	2d Eur. L. I.	19th Dec. 1854.	Now employed under Ensign Hankin.
" P. Hayes	do.	30th Mar. 1854.	Under Capt. Palmer.
" M. Dorington	do.		Do. Major Bisset.
" P. Gleeson	do.		
" R. Smith	do.	10th Feb. 1854.	Do. Lieut. Davis.
Gunner D. Miller	4th Battalion Artillery.	30th Mar. 1854.	
" C. Sullivan	do.		
Serjt. D. McDonald	do.	11th Mar. 1854.	
" T. Douglas	do.		
Corporal B. Devine	3d Battalion Artillery.	18th Mar. 1854.	Do. Major Bisset.
Gunner P. Neville	do.		Do. Ensign Hankin.
" E. Braniff	do.	30th Mar. 1854.	
" P. McDonald	1st do do.	19th Dec. 1853.	Do. Capt. Palmer.
" T. Prendeville	Horse Artillery.	30th Mar. 1854.	Do. Major Bisset.
Private J. Head	do.	19th Dec. 1853.	Resigned 31st Aug. 1854.
" J. Cluff	do.		Do. 10th Novr. 1854.
" J. King	do.	30th Nov. 1853.	Do. 13th Dec. 1854.
" P. Neill	2d European Light Infantry.	15th June 1854.	Do. do.
" P. J. Hanchard	do.	30th Mar. 1854.	Do. 20th May 1855.
" G. Fletcher	do.	19th Dec. 1853.	
" C. Roots	do.	30th Mar. 1854.	Trunk Road No. 12.
Corporal C. Bowel	do.	10th Feb. 1854.	
Serjeant P. Harrison	Horse Artillery.	19th Dec. 1853.	Canara District.
Bomdr. H. Goodger	do.	10th Feb. 1854.	
Gunner J. Tagg	do.	30th Mar. 1854.	Resigned 31st Dec. 1854.
" J. MacDonagh	2d B. Artillery.	11th Mar. 1854.	Under Superintending Engineer H. S. Force.
" A. Muir	1st do do.	19th Dec. 1853.	Resigned 10th Dec. 1854.
" T. Egan	do.		
" T. Grannon	3d do do.	30th Mar. 1854.	Do. 13th do. 1854.
" C. Kidd	do.	15th do.	Do. 12th May do.

Names of Officers and Overseers.	Names of their Regiments.	Dates of their Appointments.	Dates and Nature of Casualties.
Gunner T. Sullivan..	4th B. Arty.	30th Mar. 1854.	Resigned 5th April 1854
" P. Duffy.....			Died on the 14th Sept. 1854.
Corporal T. White..			Do. 25th June 1854.
Serjeant J. Dolan...	2d Eur. Light	30th March 1854	Died on the 3d May 1854
Corporal T. Taylor..			
Private D. Duffy...	1st Battalion	10th Feb. 1854.	Do. 12th April 1854.
Bombardier J. Heap			
Gunner C. Cox.....	Artillery.	10th do. 1854.	Do. 20th Sept. 1854.
Serj. E. Totterdell..			
Corporal J. Collyer..	Horse Artillery.	5th May 1854.	Do. 26th Jan. 1855.
Serjeant R. Tobbin..			
" F. McGuire.....	4th Batt. A.	30th March 1854	Do. 5th May 1854.
			Do. 22d May 1854.
			Do. 2d June 1854.

It will be seen how fearful has been the mortality amongst the subordinate European Agency, attributable to the hardships and exposure undergone; but not to those alone, for several of the Officers shared that exposure to an eminent degree, and all underwent much fatigue and hard work. But the temperate life and wholesome food of the latter preserved them in good health, while no doubt an intemperate use of vile Country liquor, induced by solitude and hard labour, predisposed the latter to attacks of disease in the shape of Cholera or Fever, and lessened their chances of recovery.

5. Medical attendance could not be supplied to the vast body of the labourers employed; but for a time when things were at the worst, what available assistance was at the disposal of the Military Authorities was afforded by stationing an Apothecary and Dresser at Alloor and Puttykonda, while relief was freely afforded to all patients brought in to the Hospitals at Kurnool, Ghooty, and Anantapoor. Fortunately, though amongst so many thousand starving wretches, casualties were not infrequent from the effects of disease on debilitated frames, still the season cannot be pronounced an unhealthy one. Cholera especially, though widely spread, was not virulent in character, except at times near Anantapoor and Ghooty, and between the latter place and Kurnool.

6. Later in the season as the roads first sanctioned were completed, but the continued failure of the rains necessitated the continu-

ance of employment, other lines were taken in hand; that from Bellary to Ghooty being the most important whether as regards its natural adaptation for a line of traffic or its passing through localities in which it was most desirable to afford relief. Portions of a Southern line from Bellary towards Callian Droog were also undertaken chiefly in the vicinity of the former town where many destitute people of the lower classes had congregated. Ensign Hankin also afforded employment to some thousands on the Bellary and Hosspett road; and a public work of great utility, the clearing out of the Fort ditch at Bellary, was executed with such method and economy as to be very creditable to the Quarter Master General's Department under whom it was carried out. In Kurnool the road through Panium to Nundy Cunnama Ghat was commenced.

7. The following return of the numbers actually present each Saturday throughout four months of the season, though imperfect, will serve to give an idea of the extent of relief afforded; the proportion of women and children to men being about 3 to 2, and the pay of the former 2 annas, of the latter 1½ annas, except in the Bellary Sub Collectorate where the rates were lower.

Statement of Labourers, Men, Women, and Children, employed on the Farmine Roads of Bellary and Kurnool from July to November inclusive.

Actually Em- ployed on the undesignated dates.	BELLARY ROAD DIVISIONS						KURNOOL				
	Bellary.	Adony.	Putty Coudah.	Goody.	Amentapoor.	Pennakonda.	Dhavarar Road.	Total of Weeks.	Nundall Road.	Goody Road.	Total of Weeks.
at July 1854...	23,679	16,057	16,265	19,187	4,815	2,216		81,221	Bellary road.	...	4,814
" " " "	24,704	16,703	16,068	19,046	4,871	2,372		81,815	4,814	8,931	4,417
" " " "	27,403	19,842	15,076	22,015	5,910	2,679		89,046	6,278	2,855	9,162
" " " "	26,474	18,634	14,874	22,448	6,331	1,906		90,094	.....	8,887	3,887
" " " "	24,252	20,626	16,665	22,828	7,107	2,825		93,501	4,114	3,865	8,089
Monthly Totals...	1,25,662	91,832	76,888	105,547	29,037	12,004	.....	4,39,976	14,692	15,598	30,290
at Aug. 1854...	22,600	16,329	7,714	14,073	7,431	2,475		70,024	4,758	4,282	8,991
" " " "	22,495	12,903	No return	17,462	4,803	1,856		58,477	6,208	4,246	9,464
" " " "	17,892	11,949	6,556	17,231	4,968	1,816	No return	69,551	5,928	4,247	9,457
" " " "	21,873	10,470	No return	17,454	5,894	No return		66,523	6,402	4,049	9,551
" " " "	17,242	8,700	6,517	18,604	5,976	2,055		59,641	3,788	3,248	7,081
Monthly Totals...	1,02,202	59,951	20,097	84,724	28,902	8,215	2,823	3,05,614	24,510	19,992	44,502
at Sept. 1854...	17,471	8,438	6,435	19,396	6,043	2,411		61,744	4,017	4,017	8,064
" " " "	15,922	6,565	6,547	17,894	6,416	1,960		58,407	4,117	3,812	7,929
" " " "	17,138	6,214	6,082	18,711	6,578	2,130		60,084	2,750	2,750	7,630
" " " "	15,361	3,674	6,520	15,129	6,069	2,827		50,487	4,049	....	4,049
Monthly Totals...	66,892	24,921	26,454	71,120	25,988	8,890	7,437	2,30,812	16,493	10,579	27,072
at Oct. 1854...	11,533	4,293	6,232	13,368	1,843	1,946		38,306	None.	1,995	1,995
" " " "	15,807	4,283	6,506	10,004	2,139	2,638		40,777	2,836	No return	2,836
" " " "	15,650	3,691	...	work stopped	...	1,827	2,071	24,179	2,808	2,808	5,611
" " " "	15,538	4,876	...	...	...	1,776	1,904	24,164	None.	2,791	3,791
Monthly Totals...	58,054	29,826	...	23,372	...	7,685	8,579	1,27,416	5,637	8,596	14,282

8. The extent of road opened during the operations lasting from January to November, may be set down at 400 miles, of which three parts are over cotton soil of the worst description, and of the amount of earth work performed thereon the following Sections adopted by Lieutenant Colonel Henderson will give an idea.

Sections of Roads to be made in the Bellary District.

Nº1.

Raised Road in Stony and Rocky Soils

Earth to be taken from between the Rocks where procurable. The ground being too rocky for side channels.

Nº2.

In Cotton or Mussub mixed Soil.

Bank channel Bank
This form of side Trench to be always adhered to, viz. with sloping instead of perpendicular sides.

Nº3.

In red or firm Soil

Check channel when necessary.

No distances for throwing up the earth are here given, as they will depend entirely on circumstances.

This gives a slope of five to one; if the height should be increased, the base might be extended, but not in a greater proportion than 2 ft of base for every foot in height.

Scale
feet

At the exceedingly low valuation, (considering the depth of metal-ling and distance it was carried) of Rs. 1,760 per mile in the Cotton soil, and Rs. 550 in the red soil, there is a return to Government of Rs. 5,83,000 worth of roads, which only require maintenance and bridging to afford the means of traversing with perfect ease, at all seasons, the greater portion of this large tract of country. Due acknowledgment of the necessity of so completing them has been made by the most liberal sanction of an annual grant of Rs. 40,900, and of the sums of Rs. 81,800, and Rs. 1,32,880, for minor bridges and drains, and earthworks, respectively, on the undermentioned lines, viz :

- Bellary to Kurnool. With branch to Adony.
- Kurnool to Mysore Frontier near Paulsamoodrum.
- Ghooty to Madaveram.
- Kurnool to Nundy Cunnama Ghat.

It is hoped that such progress will have been made in the proper outlay of these sums by May 1856, that there will then ensue no delay in undertaking the larger Bridges for which estimates will be included in the Budget of 1856-57. The eastern and western lines from Bellary towards the Districts of Cuddapah and Canara will then also be provided for.

9. It may be well to note as results of the last year's experience, that in constructing metalled roads in Cotton soil of the thickness laid down in the Civil Engineer's Sections, the natural surface of the ground should not be touched more than is necessary to eradicate trees and shrubs, and to level inequalities. The uselessness of side drains on level ground was also demonstrated, leading to their discontinuance on the Ghooty and other roads latterly undertaken; even when separated from the roadway by broad berms, as designed by the Civil Engineer, they act as traps for its material by inducing the formation of cracks running perpendicularly to the line. When these side channels are excavated to such a depth as to furnish the material of the roads, as unfortunately was done near Adony and elsewhere, by the Revenue authorities before Executive Officers were appointed, or the Engineer's Sections promulgated, the result is not only that inferior stuff is used, but that enormous chasms are formed, threatening by their extension to engulf the roadway adjacent. Material must be searched for, and dug at any depth, out of regularly shaped pits at a safe distance from the road; and

side or rather check channels are only wanted on the upper edge of a road on sloping ground, and then should be cut to a shallow and wide section, kept sufficiently distant from the road and connected at short intervals with the natural drains of the country.

10. Leaving the Famine Roads, which all appertain to the Eastern portion of the Division of which it has been proposed with great reason to form a separate Civil Engineer's charge, the works on the Bellary and Humpsaugur Road with branches to Darogee and Ramandroog come next in succession. These have all progressed steadily, and in spite of many obstacles caused by the scarcity, do credit to Ensign Hankin, the Executive Officer in charge. Plans and Estimates were prepared and forwarded for bridging great portion of the line.

11. The diversion of the Bellary and Dharwar road from the Humpsaugur route to one direct from Hosspett through Copul to Gud-duck, may be considered settled, and henceforth the two stages from Hosspett to Humpsaugur cease to be of more than local importance. Another western line more central in course through the Bellary Western Talooks and straight in direction for the north Canara ports, is called for, and the geographical formation of the country points out the gorge of the Naree Hulla which intersects the Soondoor Range, as its eastern, and Hollal on the Toombuddra as its western terminus.

12. Canara roads are next to be considered, and the list shews less progress than usual made with them this year, easily accounted for by the want of an efficient agency for the projection and execution of large works, only one out of two Executive Officers, and one Surveyor, having been kept permanently in the District throughout the year, while no Engineer Officer visited it between May 1853 and November 1854. Most of the lines having been treated of at great length in the Report for 1853, a mere cursory notice will suffice in this place.

13. Following the same order as in last year, the Hullial and Sedasheghur Road and Singawurree Ghaut are first for notice. This line, with its small approach numbered 2 in the list, was under Lieutenant Thornton of the Artillery, assisted by Assistant Surveyor Beahan, the latter being employed upon the Ghaut trace, and the former on road work above.

From inexperience in such work, and want of professional assistance, the progress made in tracing and road making was not commensurate with the share of superintendence afforded to the line, the Ghaut not even having been made passable for cattle, but the lower portion only defined by a series of level pegs. The injudicious amount of attention and money bestowed upon the upper and easier portion has also caused a deficiency of the funds for completion of the estimated work which was not fully appreciated by Lieutenant Walker, the Civil Engineer, on his visit of inspection in December, and was not therefore sufficiently noticed in his special report on the work. Unless all operations are to cease throughout 1855-56, it will be necessary to make an emergent advance on the sanctions for the Budget of the following year, to enable this work to be proceeded with.

14. In connection with the Port of Sedasheghur which actual Survey proves to have great natural capabilities, the completion of this line, at least as a fair weather road, is of considerable importance, especially as the Bombay Government have taken up the subject of its extension with apparent earnestness. The Kyga Ghaut and road to Yellapoor on the south side of the Sedasheghur river, now being traced, will be pushed forward simultaneously, and the construction of wharfs, groins and other works for the improvement of the harbour itself, must follow as quickly as the works can be planned and sanctioned.

15. The work performed on the Arbyle Road bridges amounted to little more than the collection of some of the materials; for want of an efficient executive, every thing connected with the works was found by the Civil Engineer on his visit in December in a state of utter confusion. He did his best to introduce order, but trusted far more to see it secured by the appointment of an efficient Superintendent in the person of Mr. Müller, a German of well known mechanical ability and character.

16. The works No. 5, forming part of the Arbyle Group of roads, in connection with the little port of Ankolah, Ankolah Branch, were nearly completed this year; but their execution shews the Talook Executive to have been decidedly incompetent to the charge, the Tahsildar especially, an honest and pains-taking man,

being quite abroad in all Marahout work. Completion of the connection of this branch road with the main Arbyle line, by bridging a large nullah that occurs between them, is the next desideratum below the Ghauts, and measurements have been taken from which to plan the necessary structure. Similar works on the Moondagode road above the Arbyle Ghaut are also much needed. Yellapoor and Moondagode Road. and for that of most consequence, the necessary information has been collected.

17. On the Dharwar and Coomptah roads by the Devamunny and Neelcoond Ghats much good work was got through, including the entire re-making under Lieutenant Babington, of the 10 miles east and north of Sircy, common to both lines, which the Civil Engineer had great satisfaction in inspecting. Nearest the Dharwar Frontier especially, where black Cotton soil is met with, the improvement was remarkable, and could not have been effected without considerable care and energy on the part of the Executive. The under draining of the road west of Sircy, upon a separate estimate, had not been so satisfactorily carried out, and Lieutenant Babington's attention was requested to some improvements in the design and execution of the drains, which might easily be made. The defects are attributable to his continual absences on other duty at the Gairsuppah Ghaut, during which the works were necessarily left to the charge of a European Overseer, new to his duties and ignorant of the language.

18. The Neelcoond Ghaut, and road above and below, were worked from Captain Collyer's traces to a width passable for Carts throughout great part of the entire distance, and much pains have been bestowed on the works by the Sub Collectors, Messrs. Hall, Fisher, and Robinson, who must be pleased at the result of the operations, though not more so than the Civil Engineer who first recommended the undertaking. It is a great satisfaction to think that none of Captain Collyer's skill and pains in working the trace has been thrown away, though such appeared likely to be the case when first the Devamunny line was opened in preference. It remains now to bridge the entire line, without which its use by Carts will be infrequent; and most, if not all, the information requisite for sending in the plans, is recorded.

19. The Kuttigaul Salt Depot and head of the Tuddry River Navigation has latterly become to a very great extent the limit of the land carriage on the Devamunni line, partly to save the last march over ground sparingly supplied with forage and water for Cattle, and partly to avoid the exertions and delay at the Dewgah Ferry. There has long been a difference of opinion between the Collector and Engineer as to the measures to be taken for facilitating the access to Coomptah on the Devamunni line, now obstructed by the Ferry in question; a bridge of boats was advocated by the former, and a Canal by the latter. In a report on Coomptah prepared by the Engineer and dated 13th July 1852, the merits of the two projects were discussed, and a good deal of information respecting them furnished; such as sections of the river, and notes of its tidal and monsoon rise, and an accurate survey of the ground which it was proposed to cut the Canal.

20. The views therein expressed as to the superior advantages of a Canal over a Bridge, are adhered to more strongly than ever, with special reference to the improvements on the Neelcoond Line and the capabilities of the Tuddry River. That stream is known to be affected by the tide as high up as Donyhulla, near the foot of Neelcoond Ghaut, up to which place canoes are able to go, and it is presumed that the removal of portions of rocky barriers at the several fords of the river between it and Kuttigaul might render that point always accessible by water for purposes of trade. Persevering therefore in the prosecution of his project, the Civil Engineer will take measures in the first instance to lay the detailed Surveys, Levels, and Estimates of the Canal before Government, and proposes hereafter to extend his enquiries as to the capabilities of the higher part of the River.

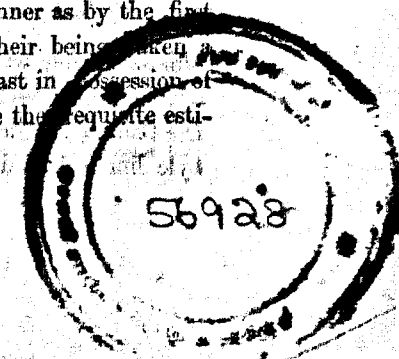
21. The Timber Bridges on the Sirey and Siddapoor Road prospered no better than those of the Arhyle line in the hands of the Revenue Authorities owing to the same defective Executive. The progress made was almost entirely with the Masonry work, leading to the belief that no advantage has been gained by substituting Timber for Stone even in the Canara Jungles, at least under ordinary management. On the Arhyle line, splendid timber was available almost on the Bridge sites, but

neglected that Teak alone might be used; on the Siddapoor Road it is now asserted that Jungle Timber of the requisite length and scantling, is not procurable, although the reverse was officially stated to be the case when the Bridges were originally designed, on reference made to ascertain whether their materials would be forthcoming.

22. The general improvement of the Agoomby Ghaut simultaneously within the Canara and Mysore limits, was conducted much to the Civil Engineer's satisfaction by Mr. Mackenzie, a resident Planter of Agoomby, whose interest in such work and intelligent manner of carrying it out has been well proved on the Nuggur Roads. Within Canara limits the improvement of the drainage by substitution of covered for open drains, and the remodelling of the road surface and slopes, comprised most of the work performed, the width and gradients below being generally adequate and favorable. But above, Mr. Mackenzie was able to introduce considerable improvements in both those particulars, wherein the Mysore portion of Ghaut was defective. By prolonging the ends of zigzags, additional length and consequent ease of slope were gained, and points of rest established by a better construction of the turning platforms; and in one case, by running an additional line of zigzag between two others, this improvement was carried to a very considerable extent.

23. In the opinion of the Civil Engineer the best method of treating the upper portion of this ghaut, which is very precipitous and rocky, with a view to accommodate its large traffic, would be to cut a New Head to it round the southern end of the hill, of moderate width for down traffic only. He has not seen the ground thoroughly, and may be wrong in his conjectures, but proposes to verify them at some future opportunity, and if right, to take further proceedings in a scheme suited to ease the throng of traffic at the narrowest, steepest, and most dangerous part of this valuable ghaut. For Bridging the Rivers below it, a second surveyor was detached to take the necessary sections, but these were prepared in as slovenly a manner as by the first Surveyor noticed in previous Reports, necessitating their being taken a third time by the Civil Engineer himself, who is at last in possession of the information necessary to enable him to prepare the requisite estimates.

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24. A work of great interest and value was this year undertaken by the co-operation of the Canara and Mysore authorities, viz. the Trace of a New Ghaut in supercession of the Kaderdakul Pass, the value of which in a commercial point of view was only surpassed by its extreme unfitness for use by laden Cattle. The Engineer Department of the 3d Division was unfortunately unable in any way to co-operate in this work; but from Mysore a Maistry attached to the Marahmut Superintendent's Department and said to be skilled in such work, was detached for employment on the New Ghaut, and of his progress with its trace the accounts have been very favorable. In the mean time, the Collector of Canara paid great attention to the improvement of the Road from Belkatangady to Buntwal, in connection with the line, and made much of it practicable for Carts, by the expenditure of a portion of his Discretionary Funds.

25. Work on Trunk Road No. 3 has been completely at a stand still this year, as last, and for the same reason. As stated in the Report for 1853, this and No. 2, neighbouring lines, should at once be put into the hands of an active executive Officer with a couple of Overseers at his disposal. Otherwise their completion will be indefinitely delayed, and their maintenance neglected.

With the small branch between Oopinungady and Manny, and new approach to Buntwal, both in connection with these Trunk Roads, good progress appears to have been made by the Collector. The Timber Bridges on the Cassergode Road were likewise commenced by him, and will, it is hoped, be better managed than those in North Canara.

26. The Collector of Canara does not enter on his List of Important works any Public Buildings, and it will suffice to notice that a commencement has been made of the New Jail at Honore under Major MacDonnell of the 27th Regiment Native Infantry, whose exertions are likely to secure the best of materials and workmanship.

27. On the Kurnool list, the Bungalows and Bridge on the Ghooty Road, are decided benefits conferred on the public, but their progress has been very slow,

owing to the scarcity which, by destroying the Cattle of the Country, has cut off the supply of Carriage for conveyance of materials.

28. A similar reason accounts for want of progress with the buildings in Bellary District.

29. Beyond ordinary Tank repairs, much progress with the Irrigation Works of the Division cannot be reported, except in the case of the New Cunnakul Channel in Bellary. This work was originally planned as a portion of a large project long entertained, of damming up the waters of the Huggry by an Anicut at Yaparaul, and distributing them by Channels chiefly on the left bank of the River. It naturally struck Lieutenant Colonel Henderson that in a season of scarcity no more appropriate work could be given as employment to the poor than the excavation of a Channel, whether with reference to its bearing on the future supply of food, or its capability of giving work to large bodies of people simultaneously.

30. But the good intention was almost defeated by the measure adopted of carrying out the work on Estimate, and with the ordinary defective executive of the Talook, hampered more than assisted by the presence of a subordinate of the Engineer Department. Divided authority and responsibility produced their natural effect in bickerings between the Subordinates of both departments; and the want of foresight which led to payment for the top excavation at the rate for which the whole was averaged, resulted in the withdrawal of many when the lower and harder strata were reached, and the strike of the remainder (chiefly Wuddurs for whom the relief was not intended) for higher pay. The work was no doubt under estimated at first, for a good deal of rock was encountered here and there at a few yards depth, but want of management had much effect in causing the great amount of additional sanction required for the work, the original Estimate of Rs. 3,000 being afterwards raised to Rs. 12,000.

31. Had the executive been committed to a single responsible head, whether chosen from qualified men of the Revenue or Engineer Department, and employment given as on the roads to all comers, on daily pay, there is reason to believe that with proper organization of gangs, the expenditure would not have exceeded that actually incurred, while the amount of relief afforded would have been considerably greater.

and the work earlier concluded, to the benefit of the Tank it was meant to supply. As an auxiliary to the Famine Roads, this work cannot be said to have effectually assisted in the relief of distress; but its own usefulness amply justifies its construction and cost, and that will be increased when the entire project is carried out.

32. A Surveyor of the Department was occupied for many Months taking levels and preparing Surveys, Plans, and Estimates, of the Annicut and Channel project. In this task he had not sufficient aid from the Civil Engineers, whose duties on the famine roads detained them elsewhere; and it is especially matter of regret that Lieutenant Colonel Henderson could not have seen the details of his project completed on paper. His successor, though fully satisfied as to the planning of the Annicut, was not equally confident of the correctness of the Channel lines which the Surveyor could not certify to have been laid out on any but his own judgement. Lieutenant Colonel Henderson having left no written memo. of his views on the subject, and time not permitting of Lieutenant Walker's obtaining more than a general acquaintance with the localities, it was thought best to complete the Channel Estimates as commenced by the Surveyor, with some additional series of levels, and to hasten the submission of the project to Government; trusting in the time that would be occupied by the erection of the Annicut, that ample opportunity would be afforded for revising the details of the Channel work.

33. A series of Plans and Estimates for Head Sluices, and new Bridges and Aqueducts to three of the Toombuddra Channels. Toombuddra Channels. dra Channels, having been collected in the Civil Engineer's Office, the opportunity was taken in their transmission of requesting sanction for a Permanent Establishment of a Channel Superintendent, Maistries, and Peons for the management of the new work and maintenance of the 3 Channels. This is intended to be the nucleus of a larger establishment on which eventually will devolve the conservancy of all the Toombuddra Channels and the execution of those Annual Repairs, now most inefficiently performed by the Talook and Village Authorities to the great detriment of the Channels and consequent falling off of the profits derivable from them both to the people and Government.

34. In the absence of an efficient Staff of Assistants of experience or scientific acquirements, it was impossible that more could have been attempted this year than was done in the Division towards the improvement of its Irrigation Works, projects of which demand careful inquiry by duly qualified persons.

35. The construction of a line of Electric Telegraph through the District of Bellary, as a portion of the Main Electric Telegraph. line from Madras to Bombay, forms an era in its Annals. The only share taken by the Engineer Department in this work was by assisting in the determination of the best route and erection of the Flying line of Bamboos, especially through the Town of Bellary, and on the Southern approach to it. Also in carrying out the instructions of the Deputy Superintendent of Electric Telegraphs as to the details of the arrangement of the Bamboo Posts, and Permanent Stone Pillars. But the brunt of the work fell necessarily on the Collector's Department, as the Executive, and it is very creditable to it that the progress of the Telegraph Work through the District was not in any way retarded by the numerous obstacles presented by the scarcity. The intelligence and energy shewn by Mr. Denton, one of the Telegraph Inspectors, in the selection of the Western portion of the line within Bellary limits, and afterwards in the Dharwar Collectorate of Bombay, and in the prosecution of the work of setting up the wires, are also deserving of special commendation.

36. It only now remains to give the strength of the Engineer Dept. 3d Division, exclusive of Executive Officers, and the nature of its employment during the year, as follows viz.

Civil Engineer.—Lieutenant Colonel R. Henderson C. B., of the Engineers. From January to 8th April. On the investigation of a Project for an Annicut and Channels at Yaparaul on the Huggery River in Bellary District. Co-operation with the Revenue Authorities in arrangements for the employment of the distressed population of Kurnool and Bellary Districts. And assisting in preparations for establishing the line of Electric Telegraph through Bellary.

Civil Engineer.—Lieutenant G. W. Walker of the Engineers. From April till December. Employed as above. Inspected the entire range

of the Bellary and Kurnool Famine Roads. Laid out the Nagalapoor and Hosspett Ghauts on the Raman Mullay hill in Bellary District. Planned Bridges on the Dharwar Road. Proceeded to North Canara in November via Dharwar, and made arrangements for resuming operations on the Soopah Roads and Singamurree Ghaut, and for the trace of the Kyga Ghaut, both of them approaches to the Port of Sedasheghur. Thence proceeded by sea to Mangalore on business connected with the Harbour of that place.

2nd Assistant Civil Engineer.—Lieutenant C. M. Thornton of the Artillery. Till June employed on the Soopah Roads and Singawarry Ghaut, afterwards on Sick leave to Dharwar, and eventually to Bombay, previous to embarkation for England on the 15th September 1854.

2nd Assistant Civil Engineer.—Lieutenant R. C. Babington of the 4th Regiment Native Infantry, appointed 13th June 1854.—In charge of the Dharwar and Coomptah Road.

Assistant Surveyor A. P. Kemp.—Survey, Plans, and Estimates of the Cannakul Project and Inspection of the Cannakul Channel work. In attendance with the Civil Engineer for some months, and employed in Office Work. Also assisted the Civil Engineer in taking the levels of the Nagalapoor and Hosspett Ghauts. Employed in Tank Inspections and Estimating for various Talook Works of Bellary District during three months of the year.

Assistant Surveyor B. Kemp.—Kurnool District. Employed in laying out some of the work of the Famine Roads. And subsequently in taking sections of all Nullahs on the three sanctioned lines. Also inspected and estimated for the various minor works of the District.

N. B.—The incapacity, laziness, and deceit, manifested by this Subordinate of the Department during his work of the year, has since led to his dismissal from the Public Service.

Sub Assistant Surveyor W. H. Blacker, joined the Division 1st July at Ghooty. 2 Months occupied in checking the Assessment Survey of the Muddykerra Village, and employed the rest of the time in taking sections of Nullahs on the Bellary Famine Roads, and inspecting and estimating for the public works of the Goolleum, Pattykondah, Ghooty, and Yadakee Talooks of Bellary District.

Sub Assistant Surveyor M. H. Beahan.—Attached to the Canara District. Employed on the Trace of Singawarree Ghaut till the end of May, from which time till November his disobedience of Orders and neglect of Work gave such dissatisfaction as to cause his degradation from the rank of Assistant Surveyor. In December joined the Civil Engineer and commenced the trace of the new Kyga Ghaut near Sedasheghur.

Assistant Overseer C. Palmer.—Marked out portion of Trunk Road No. 12. Superintended the repairs of the Bawihully Ghaut at Ramandroog. Removed to the Hyderabad Superintending Engineer Department in July.

Assistant Overseer W. Milton.—Marked out the Flying line and erected the Bamboos of the Electric Telegraph from Heeryhall to, and through Bellary. Superintended portions of the Hulcondy and Heeryhall Bridge Work. Three Months employed on the Famine Roads under Major Bissett, and 2½ Months under Ensign Hankin on the Road from Bellary to the Ramandroog.

Assistant Overseer D. Riordan.—Joined the Division at Bellary in August. Under the Orders of the Superintendent of the Dharwar Road for employment on the Ramandroog Ghaut Work.

GEO. WARREN WALKER, Lt.

Civil Engr's. Office 3d Divn.
Bellary District.
Ramandroog, 8th June 1855.

Civil Engineer 3d Division.

STATEMENT OF IMPORTANT WORKS UNDER EXECUTION

District.	Number.	NAME OF WORK.
Canara.	1	Formation of a road from Hullihul to Borebunder via the Shingawaree Ghaut.....
	2	Making a 1st. Class road from the Town of Hullihul to the Village of Mavinkoppah.....
	3	Improvement of the Arbyle Ghaut.....
	4	Constructing Wooden bridges on the Yellapoor & Arbyle road.....
	5	Formation of a road from the foot of the Arbyle Ghaut to the Town and Sea Port of Ankola.....
	6	Do. of a Cart road from Sirey via Ambenhully and the Devimaney Ghaut to Coomptah.....
	7	Completing and Draining the Devimaney Ghaut road.....
	8	Repairs of the Sirey & Dharwar road with Drains &c.....
	9	Improvement of the Neelcoond Ghaut.....
	10	Improving the line from Coomptah to Sumpkund by Neelcoond Ghaut.
	11	Improvement of the road from the Town of Coomptah to the Sea Coast.
	12	Construction of Wooden bridges on the Sirey & Siddapoor road.....
Bellary.	13	Improving the Canara portion of the Agoombay Ghaut.....
	14	Formation of a road from Perdeor to Oodipy and Mulpay.....
	15	Tracing a new Ghaut in lieu of the Cuddatakal Ghaut.....
	16	Completion of the Munzerabad road and bridges.....
	17	Formation of a road from Oopinungaddy to Pane Mangalore.....
	18	Constructing a road from Buntwal to Mangalore including a Bridge.
	19	Construction of Wooden bridges on the Jalsoor & Cassergode Road.....
	20	Dharwar and Humpsagur Road.....
	21	Darajee Road.....
	22	Ramandroog Road.....
	23	Heeryhall Road.....
		Total.....
Bellary & Kurnool.	FAMINE ROADS.	
	24	Bellary and Kurnool Road with branch to Adony.....
	25	Road from Mysore Frontier near Paulsamoodrum, by Anantapoor, Ghooty and Adony to Madaverum on the Toombuddra.....
	26	Bellary, Ghooty and Cuddapah Road.....
	27	Kurnool and Ghooty Road.....
	28	Kurnool and Nundy Cunnama Road.....

IN THE THIRD DIVISION DURING THE YEAR 1854.

Amount expended in 1854.			Total expenditure up to 31st December 1854.			Balance of Estimate or probable remaining cost.			Probable time to complete.	Executive Officers and Amount of Salaries while employed.
Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.		
5,114	5	3	6,561	14	2	4,288	1	10	Unknown	Lieut. Thornton, Madras Artillery 5 Months at Rs. 190 Rs. 950 0 0
1,336	3	8	4,520	9	10	.....	.....	.....	completed	Assist. Sur. Beahan, 5 Months at Rs. 141-4 ... Rs. 706 4 0
459	8	11	3,750	0	0	.....	.....	.....	Ditto.	Lieut. Law, 14 Regt. N. I. 2 Months at Rs. 190 Rs. 390 0 0
2,238	2	1	2,238	2	1	29,679	1	4	May 1856.	Assistant Overseer Harrison, 2 Months at Rs. 60 Rupees. 120 0 0
2,597	13	8	6,665	7	4	48	15	5	Ditto.	Lieut. Babington, 4th Regt. N. I. 5 1/2 Months at Rs. 100 Rs. 550 0 0
431	13	2	77,161	8	0	.....	.....	.....	Completed	6 1/2 Do. at Rs. 190 Rs. 1235 0 0
1,301	8	11	1,301	8	11	5,823	9	6	May 1856.	Rs. 1785 0 0
17,048	0	10	17,048	0	10	3,273	3	6	Dec. 1855.	
3,788	10	5	5,000	0	0	.....	.....	.....	Completed	
4,932	8	3	4,932	8	3	2,117	7	9	May 1855.	
22	12	0	1,575	7	6	493	3	6	Suspended	
4,286	12	10	4,286	12	10	5,673	6	11	May 1856.	
1,319	0	11	1,319	0	11	2,430	15	1	Do. 1855.	Mr. Mackenzie, 5 Months at Rs. 150 Rs. 750 0 0
19	3	7	5,722	8	9	265	4	10	Completed	
1,379	0	7	1,379	0	7	1,620	15	5	May 1855.	
110	6	5	5,271	8	10	8,318	4	9	Unknown	
2,464	7	7	2,872	12	11	7,027	3	1	May 1856.	
2,413	8	8	2,554	10	9	751	1	1	Do. 1855.	
633	12	0	633	12	0	2,005	14	0	Do. 1856.	
18,994	3	1	35,089	6	1	15,913	12	3	Dec. 1855.	Ensign Hankin, 2 1/2 Regt. N. I. 12 Months at Rs. 200 Rs. 2400 0 0
4,799	8	10	4,799	8	10	7,925	12	0	Do. 1855.	
2,650	0	0	2,650	0	0	4,939	12	0	May 1855.	
10,922	6	0	26,344	0	0	.....	.....	.....	Completed.	
89,263	13	8	2,23,678	5	5	1,02,598	10	3		
These columns cannot be filled up, as the Kurnool returns have not been furnished. In Bellary District alone nearly 12 lakhs of Rs. were spent on these lines.										Officers' and Overseers' Salaries in Bellary District alone amounted to Rs. 23,005.

STATEMENT OF IMPORTANT WORKS UNDER EXECUTION

District.	Number.	NAME OF WORK.
Kurnool.		TRAVELLERS BUNGALOWS.
	1	Travellers Bungalow at Dhone,.....
	2	Do. Do. at Chinnatakoor,.....
	3	Do. Do. at Kurnool,.....
		Total..
		DETACHED BRIDGES.
	1	Constructing a Bridge across Wootawagoo,.....
		PUBLIC BUILDINGS.
	1	Constructing a Talook Cutcherry at Chagulmurry,.....
	2	Ditto. Do. at Ramullacotta,.....
	3	Re-building the Town wall at Kurnool,.....
		Total..
		WORKS OF IRRIGATION.
	1	Repairing Cooroccoonda Machaveerapah Tank,.....

IN THE THIRD DIVISION DURING THE YEAR 1854.

Amount expended in 1854.		Total expenditure up to 31st December 1854.		Balance of Estimate or probable remaining cost.		Probable time to Complete.	Executive Officers and Amount of Salaries while employed.
Rs.	A. P.	Rs.	A. P.	Rs.	A. P.		
105	7 8	1,905	7 8	.....	.....	30th April 1855.	
2,000	0 0	2,000	0 0	.....	.....	Ditto.	
1,100	0 0	1,689	0 0	.....	.....	Completed.	
3,205	7 8	5,585	7 8	.....	.....		
1,000	0 0	1,000	0 0	1,175	11	31st July 1855.	Memo.—No return of Important works of the Bellary District can be obtained from the Collector in time for this Report.
1,000	0 0	1,500	0 0	602	8 0	July 1855	
1,102	8 0	2,102	8 0	.....	.....	Completed	
1,100	0 0	4,600	0 0	2,225	0 0	Dec. 1855.	
3,202	8 0	8,202	8 0	2,827	8 0		
600	0 0	2,100	0 0	31	1 3	April 1855.	

REPORT UPON THE WORKS EXECUTED DURING THE
YEAR 1854 IN THE FOURTH DIVISION COMPRISING
THE COLLECTORATES OF NORTH ARCOT AND
CHINGLEPUT.

Captain Collyer, *Civil Engineer 4th Division.*

Lieutenant Rideout, *21st M. N. I. 2d and latterly 1st Asst. Civil Engineer.*

Mr. Bush, *Assistant Surveyor.*

„ I. Shaw Lincoln.

„ R. Downie.

The bills for money expended in the Division, amount to Rupees 1,58,103-15-7. as follows—

	North Arcot.			Chingleput.		
Irrigation.....	69,271	15	5	39,737	11	3
Roads.....	28,551	2	„	16,979	13	4
Buildings...	2,199	9	„	409	4	7
Ferry Boats.....	„	„	„	954	8	„
Rs.....	1,00,022	10	5	58,081	5	2

The works estimated for or inspected by the Officers are as follows—

Captain Collyer.....	25,967	5	6
Lieutenant Rideout.....	13,719	11	10
Mr. Dick.....	6,750	10	1
Mr. Bush.....	5,310	3	3

1. The time of the officers of the Department has been employed in various duties connected with the District, levelling and surveying for extension of the Cheyaur channels and surveying for various roads for the purpose of improving the intercommunications in the district, in completing the surveys for the extension of the Poiney channels.

2. The works in the North Arcot District have for the most part been of the usual description, and possess no features of Engineering at all deserving of particular comment.

3. Of the larger works may be noted the restoration of the Naga-putla Tank, a work rendered difficult from its position being in the gorge of a mountain valley; it has been breached for many years, the breach being about 60 yards long and 30 feet deep. The work has been

successfully completed under the supervision of the Superintendent of Marahmut, Moonnoosawmy Moodelliar. Amount of Estimate 7,366-14-3. Cost of work 5,150-11.

4. The Arkanampute tank estimated 2,337-2-4. Cost 2,263-15-2. This work has also been successfully completed under the above Officer. On the Boomasamoodrum tank estimated Rupees 7,287-10-3 considerable progress has been made during the year amounting to Rupees 4,200 under the superintendence of Lieutenant Rideout. Whilst under construction, part of the work was damaged by a sudden fresh; with this exception the work has gone on favorably and will be completed early in 1855.

5. The Peddamadagoo alias Pannamaduncherry tank has also been proceeded with by Lieutenant Rideout, and it also suffered (whilst in progress,) slight damage from a sudden fresh. The work will be finished early in 1855.

6. The Pallicondah tank—Estimate Rupees 4,209-14-4. Cost 2,100-0-0. This work has also been carried on under the superintendence of Lieutenant Rideout and good progress made. It will be completed early in 1855.

7. The Poiney channels—Estimate Rupees 9,985-8. Cost of work 10,079-0 have been successfully completed under the supervision of Assistant Surveyor Bush.

8. The Perancanjee tank has also been completed, and is now in an entirely renovated state. Estimate 2,845-12. Cost 2,845-12.

9. The Head Sluice to the Poiney east channel, has also been completed, and water has been brought through it, and down the channel, but not sufficient to fill the whole of the tanks arising from the short duration of the fresh. Estimate 3,268-6 Cost 3,268-6.

10. Considerable improvement has been made to the road leading from Arnee to Poloor under the superintendence of Overseer Lincoln.

11. The Road from Wallajabnuggur to Sholinghur has also been proceeded with; but requires further bridging and metalling, and which have been estimated for by Mr. Bush. Original Estimate 6,845-2-2 which amount has been expended, and for which a bill will shortly be

sent, an additional Estimate amounting to Rupees 5,499-10-10 has been prepared.

12. The road from Conjeveram to Tellar on an Estimate of Rupees 11,564-11-8. has had a sum of Rupees 5,050-11-8 expended upon it. This road is part of the old Pilgrim road from Ramaisweram via Tindevanum, Wandewash, Conjeveram and Nillamy to Tripetty.

13. Work has also been carried on to the road from Poothulputt Estimate ... 12,822-1-3. to Kurcumbaundy being part of the road from Expenditure 3,145. Chittoor to Kurcumbaundy, and also on the road Estimate ... 6,000. from Naggery to Balapully, but little progress has Expenditure 2,535-13. been made with these works, in consequence of the difficulty of procuring labor and insufficiency of superintendence.

14. The works of irrigation in the District of North Arcot examined by this Department amount to Rupees 16,407-10-3.

15. The works of irrigation in the District of Chingleput examined by this Department amount to Rupees 20,599. 3. 3.

It may be remarked of the works of irrigation in Chingleput as in North Arcot, that they are for the improvement or conservation of existing works, and I am glad to be able to observe that the amount expended in this District on ordinary works has year by year become less, from the greater efficiency of the works themselves, many tanks having been provided with waste escapes, stone facings to their embankments, and Head Sluices to their river channels. These means together with river embankments on the Corteliar have prevented that constant destruction of works from unmanageable overflowing of water which has hitherto caused the ordinary Estimates in this District to be greater than in any other, with the single exception of Tanjore.

16. Of the principal works undertaken, have been the Coratoor Annicut Estimate 16,357. 14. 1 for the purpose of better diverting the waters of the Cooum river into the Chumbrambaucum tank. This work has been carried out by Lieutenant Anseley and the amount expended is 9,241. 3. 6.

The Casaveram Annicut Estimate ... 9,932-3-3. across the Corteliar. This work is intended for Expenditure 376-3-2. the supply of the Chumbrambaucum Tank and also numerous other small tanks and channels from the river Cooum.

17. But little progress has been made with the Casaveram Annicut further than the preparation of materials.

18. The Cooum tank has been very materially improved of late years, its bank having been considerably raised and strengthened: thus a revetment of stone has been placed to the bund, and the tank is now in good order.

19. The Goomdayaddy tank has also been revetted with stone on an estimate of Rupees 2,342. 8 and at an expenditure of Rupees 2,150. 9.

20. The river channel to this tank has also been cleared and much improved. This channel will on the completion of the Palaur Annicut, become one of the principal means of supply to the several tanks and branch channels.

21. Paundoor tank has been under repair, a new calingulah and a stone revetment having been constructed at an expenditure of Rupees 1,440. 0-0.

22. Of the Roads in the District which have been carried out during the year by this Department, the principal Estimate 16,484-11-11. is that leading from Saint Thomas' Mount to Expendr. 7,907-4-9. Poonamallee and intended to improve the communication between the two stations.

23. Road from Chingleput to Soorappien's Choultry. Estimate Rupees 6,917. 13. 2, expenditure Rupees 6,635-5-4. This road connects Chingleput with Northern road at Soorappien's Chuttrum passing through Wallahjabad and Conjeveram and numerous villages principally of weavers between these two places.

24. The road from Ponary to join the northern Road at Trichoor has had but little progress made on it, the sum of Estimate 2,213-3-2. Rupees 693-11 only having been spent upon it during the year.

25. Road from Corottoor to Ramunjary, Estimate Rupees 3,982. 1. 8. Expenditure Rupees 1,224. 2. The progress of this has been most unsatisfactory.

26. Road from Chunambut to Tindevanum. This road connecting the salt platforms with the Southern road is an important work and has been satisfactorily proceeded with; its estimated cost is Rs. 1,794. 11. 2.

27. During this year the northern line of Eastern Coast canal from Doogoorazputtnum to Streehareecodee has progressed very well under the superintendence of Estimate 4. 74-15.

Overseer Howard; the favorable season coupled with his great exertions, has caused much greater progress than I expected, and this extension has been of great service in facilitating the exportation of grain from the Nellore District to Madras, during the latter portion of the year and at a time when very much needed.

28. The Lock of Shadyacopum. This cutting and lock which were commenced early this year have been under the charge of two or three Officers but latterly under the care of Lieutenant Morgan; great difficulty has been experienced in getting in the foundations of this work owing to the unusual force of the springs, which however has been successfully overcome owing in no small degree to a water cement prepared on the spot by Lieutenant Morgan and the work is now in a fair way towards successful completion.

G. C. COLLYER, Captain.
Late Civil Engineer 4th Dn.

26th September 1855.

REPORT ON THE PROGRESS OF THE PUBLIC WORKS IN THE 5TH DIVISION FOR THE YEAR 1854.

The more important
works under execution
during the year.

1. The principal items in the Bills for Public Works in this Division for the past year consist of—

2. No. 1—Rs. 42,600-2-8. For making a road from Cuddalore to the Salem Frontier via Vir-dachellum the whole amount sanctioned being Rupees 66,358 and the distance 66 miles. This road has been under the superintendence of Lieutenant Clay who has had two Overseers Wilkinson and Archer to assist him. When I examined the work in January I found that the trenching and raising of the road for the whole distance was complete, that material was collected for metalling about $\frac{2}{3}$ of the road and was about to be laid down, and that Lieutenant Clay was making every effort to finish all the drains and road dams this season which I should think he would be able to accomplish very easily.	
<i>Superintendence.</i> Lieut. Clay, 2,090-0-0.	
<i>Overseers.</i> Wilkinson, ... 307-9-7. Archer, ... 439-6-10.	
Total.....2,837-0-5.	

3. The remainder of the estimate will be quite sufficient for metalling and bridging the whole line except the large bridge which will be required over Manecmootanuddee.

4. The road has been opened for cart traffic from Cuddalore to Vir-dachellum a distance of 33 miles, with very favorable results, and the remainder to the Salem boundary will be opened in the course of a month.

5. No traffic returns have been kept but whilst I was on the road I took the average for 3 days and found that 150 carts were daily passing on the part that is now opened; this will be greatly increased when the remainder of the line is opened, as all Salem carts will come and go by this line whereas they now go by the old road via Oolundoorpett.

No. 2 Rs. 16,076-15-2. Superintendence Rupees...2,763-5-11.

6. The road from Porto Novo to Bowangherry and Trunk Road	
<i>Superintendence.</i> Capt. Taylor 2,280-0-0	
<i>Overseer</i> Kenedy... 483-5-11.	
Total...2,763-5-11.	

No. 9. The works on this line have been carried on under the superintendence of Captain Taylor assisted by Overseer Kenedy. The estimated amount viz. Rupees 19,394-5-0 will be quite sufficient to finish the embankments, trenching, and bridging of this line, but a further sum will be required should it be decided to metal the road.

7. I believe Major Lawford (under whom the line now is) has entered the sum of Rupees 20,000 for that purpose. The Superintendent of the line writes in very favorable terms of the traffic on the eastern portion of the road from Bowangherry to Porto Novo, being much used by the people in the employ of the Porto Novo Iron Company.

8. No. 3 Rupees 11,000. For repairing the road from Cuddalore to Oolundoorpett via Puttambankum, Trivady and Punrooty. These repairs have been carried out under the superintendence of the Collector's department and the whole sanctioned amount has been expended. As far as Puttambankum the road is metalled and in capital order, but for the remainder little else has been done except building the bridges.

9. An estimate amounting in all to Rs. 36,278-0-0 was forwarded to the Board by the Collector but was not approved of by Captain Ouchterlony. I have since visited the spot and by altering the line considerably from Punrooty to Oolundoorpett I think a good road, metalled the whole way, can be made for Rs. 13,287-14-0. Estimates are being now prepared and will be forwarded shortly.

10. The ten miles of road from Puttambankum to Cuddalore is much used by bandies to and from Mr. Pugh and Mr. Norfor's sugar Factories.

No. 4. Rupees 5017-10-0. Road from Pondicherry to Mylum.

11. This road has been laid out and Superintended by Mr. Forbes additional Sub Collector. The whole line has been trenched, raised and the drains are in course of construction. A further sum of Rs. 5,500 has been sanctioned which I hope will be sufficient to metal the road where required.

12. Mons. Gaerre assures me that the French portion of line will be completed by the end of April.

13. No. 5. Rupees 3,761-2. From Villapooram to the French territory at Killianoor. The amount estimated for this is Rs. 5,542-9-0 which Mr. Forbes tells me will be quite sufficient to finish the drains and road dams.

14. This road has been formed under the orders of Mr. Forbes the additional Sub Collector. I rode over the line with him and it is in capital order. It will not require metal, the soil being hard sand.

15. No. 6. Rs. 6,458-1-0. Road from Tindevanum to Markanum. Under the superintendence of Mr. Forbes, the road is complete except

the drains which are in progress, and a small portion near Markanum. Amount of estimate is Rupees 7,468-5-0 which with Rs. 2,500 since sanctioned, will be sufficient to finish the road without metal. Some parts however cross bad soil and there is such large traffic from the salt pans, that I think it will be necessary to have a further estimate to metal these portions.

16. No. 7. Rupees 2,786-9. Road from Thyar to Tindevanum. This line also has been looked after by Mr. Forbes. The estimate was for Rupees 2,904-10 but Rs. 2,000 more has been since sanctioned.

17. No. 8. Rupees 730-8-0. Road from Tricoloor to Chengamah, estimate Rupees 2,000 being carried out by the Talook Authorities.

18. No. 9. Rupees 999-13-8. Road from Virdachellum to Shattatope. Estimate Rupees 1,000. The amount has been expended under the orders of Captain Taylor executive Officer.

19. No. 10. Rupees 1,000. Road from Virdachellum to Oolundoorpett. Estimate Rupees 1,000. This road was under Lieutenant Clay executive officer.

20. No. 11. Rupees 500. Road from Cuddalore to Chellumbrum. Estimate Rupees 1,500. This road has been since transferred to Major Lawford.

21. No. 12. Rupees 1,390-7-0. Road from Pondicherry to Killianore. Estimate Rupees 2,000. This work has been superintended by Mr. Forbes and a further sum of Rupees 1,500 has been given out of the discretionary grant this year. The line is an important one, by which all traffic between Pondicherry and Madras travels. It will require metalling, several drains, and a large bridge over the river which Captain Ouchterlony has proposed to build at the site of the proposed Annicut at Condamary. Should this road be metalled, I have no doubt that the Mail for Pondicherry and Cuddalore would be carried in carts along it.

22. The four last items Nos. 9, 10, 11 and 12 were expended from the annual discretionary outlay of Rupees 5,500.

23. No. 13. Rupees 3,382-15-6. Improvement to the Tapoor Ghât.

24. The work here is nearly finished, and consisted in building two bridges and improving the slope of the Ghât.

Superintendence.
Lieutenant Hesse
Rs. 570-0-0

There was great delay in carrying out this work, as the part of country in which it is situated is very feverish, and there was consequently great difficulty in procuring coolies.

25. No. 14. Rupees 1,491-0-0. The cattle Ghât from Salem to Yercaud, Sherwaroy Hills. Amount sanctioned Rupees 3,500. The remainder of this amount will be quite sufficient. The work during 1854 was carried out under the superintendence of Mr. Herbert Richardson who most kindly volunteered to direct and look after the coolies which he did in a most efficient manner.

26. No. 15. Rupees 2,925. The new Ghât from Yercaud to Adamancottah via Nagalore. Amount sanctioned Rupees 10,000. Mr. Herbert Richardson, who has one of the largest coffee plantations on the Sherwaroy Hills, most kindly volunteered to carry out the difficult work of making this road and very ably has he executed his task. The road has a very gradual descent as far as Nagalore, from which the fall into the low country is very great, and I almost despaired of being able to make a good bandy line at a moderate expense owing to the large Nul-lahs and very rocky nature of the soil. Since then the direction of the line has been a good deal changed in order to carry it direct to the Railroad at Mullapooram, and Lieutenant Puckle who now has charge of this line writes very hopefully of making a very easy bandy road the whole distance.

27. He calculates two months hence to have a line available for horsemen and bullocks from Adamancottah to Yercaud. A large amount will still be required to make this road available for bandies. I have entered in the Budget for 1854-55 Rupees 10,000 for making a bandy road from Adamancottah to Mullapooram, the site of the Railway station, being at the rate of 1,000 rupees a mile. Rupees 10,000 has also been entered for the bridges from Mullapooram to the foot of the Ghât, and I should think that it would at least take Rs. 10,000 more to finish the Ghât for bandies.

28. No. 16. Rupees 937-13-2. Repairing the Valavanoor Tank bank and clearing out the supplying channel, superintended by the Talook authorities, the estimate Rupees 1,116-11 being ordinary.

29. No. 17. Nos. 67, 69, 46 an emergent estimate for the repair of the Vellaur Annicut. This work has been transferred to the 6th Division.

30. No. 18. Rupees 866-6-10. Reconstructing of an Annicut over the Murdampallam river. Estimate Rs. 876-0-0. This work has been done under the superintendence of the Talook authorities.

31. No. 19. Rupees 3,086. A stone jetty to the bank of the Cauvery at Moganoor. The work was superintended by the Talook authority but was visited while in progress by Captain Ouchterlony. The work was executed for the preservation of the river banks.

32. No. 20. Rs. 1,124-5-0. Repairs to the Punnaputty Rohgammal Annicut. On emergent and ordinary estimate, superintended by the Talook authorities but visited during progress by the Civil Engineer. The Ayacut under this Annicut amounts to Rs. 1,144. In consequence of a breach the revenue in fusly 1263 fell to Rupees 130-1-7. The restoration of this Annicut will increase the Revenue.

33. The total amount which appears to have been expended on public works is Rupees 1,60,489 distributed as follows.

Irrigation.	Roads and Bridges.	Public Buildings.	Revenue Buildings.	Judicial Buildings.	Government House.	Ferry Boats.	Salt Pans.
54,783	1,01,826	2,987	558	212	123	0	0

being an increase of Rupees 94,413 over last years expenditure.

34. See separate paper marked. A.

35. There is great difficulty in making out a report under this head as the Civil Engineer has nothing to do with revenue returns, and directly a work is finished he sees nothing more of it except in the way of repairs.

{ A General Statement of the expenditure for the preceding year including the Civil Engineer and Maramut Establishments.

{ A Statement of the results of the more important works previously executed.

36. The repairs of the Vadumalaputty Tank in the Namcul Talook were carried out in 1852-53 and amounted to Rupees 728-4-11 with the following results.

Cultivation in Fusly 1262. Amounted to Rs. 700 13 1

Do. do. 1263 do. do. 1,875 1 10

Showing an increase of Rupees.....1,174 4 9

37. A new supplying Channel was made in 1852 to the Nadavalore Tank. The result of this improvement has been an annual increase of the revenue in excess of the Beriz for Fusly 1260.

In Fusly 1261 218 13 10

„ 62 594 6 2

„ 63 683 8 0

38. There are I have no doubt many more works which have equally satisfactory results but they have not been brought to my notice by the Collector of the District.

The Principal Employ-
ment of the Civil En-
gineer's Department.

39. See separate paper marked. B.

40. The following changes have taken place in the Civil Engineer's Department.

41. Lieutenant Wilkieson was appointed acting Civil Engineer in place of Captain Ouchterlony proceeding to England on sick certificate.

42. Lieutenant Hessey 2d Assistant Civil Engineer was transferred to the South Arcot Survey Department. I have great satisfaction in bringing to notice the great assistance received from this Officer who I consider to possess great professional attainments.

43. Captain Taylor executive Officer has been removed to the 4th Division.

44. Lieutenant Clay executive Officer was promoted to a 2nd Assistant Civil Engineer but has since been removed to the 6th Division.

45. Lieutenant Moberly 1st Assistant Civil Engineer and Lieutenant Puckle 2d Assistant Civil Engineer have been appointed to this Division.

46. Separate Statement marked C.

{ Statement of the export
and imports of the dis-
trict.

47. This Statement shows the value of the export and imports between this district and foreign ports by sea during the official year from 1st of May 1853 to 30th April 1854.

48. There are also large exports and imports to and from the Ports belonging to this Government, but as no duty is paid on the articles they have not been entered in this list.

A general view of
the present state of the
District in regard to
Irrigation and commu-
nications.

49. During the past year, the Public works have been progressing favorably, but slowly, owing to the great want of a proper establishment of qualified native Maistries.

50. The amount under the head of irrigation appears to have been chiefly expended in repairs for the preservation of the present works. Many new works of irrigation are now sanctioned and will be carried out during the present year amongst which I may mention.

51. The Vieravandy Annicut estimate Rupees 10,000 for the better supply of certain English and French tanks. The French Government pay $\frac{1}{3}$ of the amount as their share.

52. The Tullavassel Annicut Rupees 3,846-11-0.

53. The Ummapoliem Annicut Rupees 2,386-7-0 with several other works of minor importance such as the restoration of old Tanks, Annicut &c.

54. The following roads have been or are about to be opened for cart Traffic.

The Salem and Cuddalore new road.

The Porto Novo and Cheatiatope road.

The Cuddalore and Oolundoorpett road as far as Puttambankum.

Pondicherry to Mylum.

Villapoorum to French territory at Villianore.

Tindevanum to Pondicherry via Killianore.

Do. Markanum.

Do. Thellar.

55. Much valuable assistance has been received from Mr. Gordon Forbes the sub Collector of South Arcot, who in addition to his own laborious duties has found time to lay out and superintend the five last mentioned roads.

56. Several more roads and bridges are sanctioned and will be carried out this season, amongst which I may mention. Road from

Oolundoorpett to Cullacoorchy. Estimate Rupees 14,946-11-0. Road from Tindevanum to Trinomallee Rs. 15,111-2-0. Estimate Rs. 3000-0-0. A wooden lattice bridge of two 90 feet spans has been sanctioned across the Cundaud river at Markanum in connection with the Tindevanum road and salt pans. A large bridge of 30 arches estimate Rupees, 31,850, over the Killinjular between Pondicherry and Cuddalore at the joint expense of the English and French Governments.

57. Many works of irrigation and roads are still required in this district, but are chiefly delayed from the inefficiency of the present maramut Establishment to carry them out, should they be sanctioned.

58. I have however several new projects on hand which I hope ere long to forward to the Board.

59. In my last report I mentioned what valuable use might be made of the waters of the Poneaur. After the present working season I intend, with the sanction of the Board, to employ Mr. Assistant Surveyor Vardon in making a Survey with levels of the river, preparatory to proposing a system of irrigation from its now much neglected waters.

CHARLES W. WILKIESON, Lieut.

Civil Engineer's Office, 5th Division
South Arcot District, Velipoorum
Talook, 17th March 1855.

Ag. Civil Engineer 5th Dn.

General Statement of money expended on Public Works in the 5th Division during the year 1854.

Year.	Irrigation Works.	Roads Bridges &c.	Public Buildings.	Revenue Buildings.	Judicial Buildings.	Flag staff.	Government House.	Ferry Boats.	Salt Pans.	Total.	Disbursement to the Civil Engineer's Department.	Disbursement to the Coll's Maramut Establishment.	Total.	Remarks.
1854	54783 0	1013256 0	2087 0	558 0	212 0	0 0	123 0	0 0	0 0	160480 0	27305 13	7894 8	35261 5	

Civil Engineer's Office, 5th Division, South Arcot
District, Velipoorum Talook, 17th March 1855.

CHARLES W. WILKIESON,

Acting Civil Engineer 5th Division.

A

*Cost of the Civil Engineer's and Collector's Maramut Establishments in the
5th Division for the year 1854.*

RANK.	Amount.	Total.	REMARKS.
<i>Civil Engineer's Department.</i>			
Civil Engineer.....	8962 9 9		
Do. Establishment.....	2924 0 0		
2d Asst. Civil Engineer.....	2837 10 8		
Do. Establishment.....	1057 0 0		
2 Executive Officers.....	4370 0 0		
2 Asst. Surveyors.....	6405 6 0		
4 Asst. Overseers.....	1198 2 8		
2 Apprentices.....	112 0 0	27366 19 1	
<i>Collector's Maramut Establishments.</i>			
Salem.....	4121 8 0		
South Arcot.....	3773 0 0	7874 8 0	
Total Comp's Rupees.....		35261 5 1	

Civil Engr.'s Office, 5th Dn., South
Arcot District, Velipoorum Talook,
17th March 1855.

CHARLES W. WILKIESON,
Act. Civil Engr. 5th Dn.

B

*Statement showing the number of works inspected by the Officers &c., of the Civil Engineer's Department
5th Division during the year 1854.*

No.	NAMES OF OFFICERS.	RANK.	SALEM DISTRICT.												SOUTH ARCOT DISTRICT.												GRAND TOTAL IN BOTH DISTRICTS.			
			January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.		December.	Total.	
1	Captain Ochterlony	Civil Engineer.....	0 29	0	0	0	0	0	0	0	0	0	0	0	128 12	7 34	12	0	0	0	0	0	0	0	0	0	0	85	213	
1	Lieutenant Wilkieson...	Acting Civil Engineer...	0	0	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0	0	0	0	0	0	56	56	
1	Lieutenant Hessey	2nd Asst. Civil Engineer	1 831	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	194	234	
1	Mr. Vardon.....	Asst. Surveyor ..	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	8	7	1	1	1	2	9	2	36	36	36	
1	Mr. Martin.....	Do.	22 14 18	5 14	10	7	11	7	7	15	6	128	0	0	0	1	1	1	8	7	1	1	1	2	9	2	0	0	0	196
1	Mr. Loosemore.....	Asst. Overseer....	1	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	
1	Mr. Kennedy.....	Do.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	1	1	17	17	17	
		Total.....	24 52 49	5 33	48	27	23	11	15	51	24	852	14	9	36	22	16	31	31	24	33	70	44	2	332	2	332	684	684	

Civil Engr.'s Office 5th Dn.,
South Arcot District,
Velipoorum Talook,
17th March 1855.

CHARLES W. WILKIESON,
Ag. Civil Engineer, 5th Dn.

Principal employments and number of works inspected by the

Names of Officers and Rank.	No. of works inspected during the year.	Nature of Employments.
Capt. Ouchterlony Civil Engineer.	214	<i>January.</i> Inspecting works and estimating roads in South Arcot and examining site for an Annicut and bridge across Manemootanuddy river in Virdachellum. <i>February.</i> Inspecting works of irrigation and tracing new lines of road in Salem. <i>March and April.</i> Estimating works of irrigation and inspecting roads in South Arcot. <i>May, June and July.</i> Employed chiefly in estimating works of irrigation and Public Buildings and preparing Plans &c. for Nerinjepett project in Salem. <i>August.</i> Estimating road works in Salem and inspecting road from Salem to Cuddalore. <i>September.</i> Superintending works in Yercaud Ghât and inspecting Darampoory and Nagalore road. <i>October.</i> Inspecting roads and bridges both in Salem and South Arcot and proceeded on sick leave to Europe on the 19th October 1854.
Lieut. Wilkieson Ag. Civil Engr.	56	Joined the Division on the 20th October and marched to Salem during the month and inspected Yercaud Ghât. <i>November.</i> Inspecting and estimating works of irrigation and tracing new lines of roads. <i>December.</i> Estimating works and inspecting roads in Salem.
Lieut. Hussy 2d Asst. Civil Engineer.	234	<i>January.</i> Superintending works in Tapoor Ghât in Salem. <i>February and March.</i> Do. and estimating works of irrigation in Do. <i>April and May.</i> Sick and marched from Salem to South Arcot and estimated works of irrigation in the latter District. <i>August September and October.</i> Marking out roads from Tindevanum to Ginjee and estimating for Bridges on Trinamallay road. <i>November.</i> Estimating works of irrigation and appointed in South Arcot Survey on the 20th of that month.

*Civil Engr.'s Office, South Arcot District, }
Velupooram Talook, 17th March 1855. }*

B

Civil Engineer's Department 5th Division, during the year 1854.

Names of Officers and Rank.	No. of works inspected during the year.	Nature of Employments.
Assistant Surveyor Vardon.	29	<i>January and February.</i> Marking out the line of road from Cuddalore to Salem. <i>March.</i> Tracing the road from Pondicherry via Mykun to Tindevanum. <i>April.</i> Tracing the above roads and taking levels to the channel from an Annicut across Manemootanuddy. <i>May and June.</i> Estimating works of irrigation. <i>July.</i> Inspecting road from Villanoor to Velupooram. <i>August, September and October.</i> Taking levels to the channel from Virdachellum Annicut. <i>November.</i> Laying out the Viceravandy channel from Ginjee river and estimating works of irrigation in its neighbourhood. <i>December.</i> Superintending the excavation of Viceravandy channel and taking levels to the Mullataur Head in South Arcot.
Assistant Surveyor Martin.	121	<i>January, February and March.</i> Estimating and inspecting works of irrigation. <i>April and May.</i> Surveying and levelling certain works of irrigation. <i>June and July.</i> Taking levels from Nirjeeperett Annicut. <i>August and September.</i> Levelling and marking out certain works of irrigation. <i>October.</i> Estimating for the repairs of roads. <i>November and December.</i> Estimating works of irrigation and tracing out roads in Salem District.
Asst. Overseer Loosemore.	2	<i>January and February.</i> Employed on the Nagalore and Salem Ghât. <i>From March to June.</i> Sick at Bangalore and appointed Serjeant Overseer in Superintending Engineers Department Mysore Division.
Asst. Overseer Kenely.	17	<i>From January to November.</i> Employed in Superintending the construction of road from Porto Novo to Shetiatope and also the Vellaur Annicut works.

CHARLES W. WILKIESON,
Ag. Civil Engineer 5th Dn.

C

Statement shewing the Gross value of all articles Exported and Imported to and from Foreign Ports by Sea in South Arcot from 1st May 1853 to 30th April 1854.

Description of Goods.	Export from 1st May 1853 to 30th April 1854.	Import from 1st May 1853 to 30th April 1854.	REMARKS.
Cotton Twist British.....	0 0 0	4,129 10 0	
Piece Goods Dyed.....	81,380 6 11	236 0 0	
Do. Printed.....	18,142 1 3	50 15 9	
Do. Plain.....	35,445 3 0	5,351 13 0	
Ghee.....	2,271 6 9	0 0 0	
Rice.....	86,616 12 0	0 0 0	
Paddy.....	44,984 6 0	0 0 0	
Wheat.....	1,212 0 0	0 0 0	
Indigo.....	1,60,928 0 0	0 0 0	
Gingely Oil.....	19,257 3 10	0 0 0	
Ground Nut.....	30,998 4 10	0 0 0	
Salt Petre.....	4,849 8 0	0 0 0	
Mustard.....	1,237 12 0	0 0 0	
Skins and Hides untanned.....	12,065 12 10	0 0 0	
Do. Tanned.....	3,162 1 8	0 0 0	
Sugar.....	2,53,055 8 4	0 0 0	
Rum.....	3,703 8 0	0 0 0	
Rosewood Pieces.....	1,243 13 0	0 0 0	
Beetlenut, boiled.....	0 0 0	23,729 0 10	
Do. round nut.....	0 0 0	144 15 5	
Cut Nut.....	0 0 0	15,723 8 2	
Molasses or Jagherry Bootties.....	0 0 0	1,383 15 1	
Palmirah Raftera.....	0 0 0	17,232 12 3	
Do. Reapers.....	0 0 0	4,893 11 6	
Cuttamaram.....	0 0 0	714 4 0	
Beams.....	0 0 0	189 12 0	
Sundries.....	8,914 9 4	8,721 14 11	
Total.....	7,99,473 5 9	82,502 4 11	
Coins Company's Rupees.....	0 0 0	1,280 0 0	
Grand Total.....	7,99,473 5 9	83,782 4 11	

Civil Engr.'s Office, 5th Dn.
South Arcot District,
Velipocram Talook,
17th March, 1855.

CHARLES W. WILKIESON,
Ag. Civil Engr. 5th Dn.

Civil Engineer's Office, 6th Division
Cuddalore, 8th May 1855.

No. 391

From

MAJOR E. LAWFORD,

Civil Engineer 6th Division.

To

The Officiating Secretary to the Board of

Revenue in the Department of

Public Works.

SIR,

In forwarding the report on important works executed in 1854, I have the honor to state that the delay of its submission in due time was caused by my not having received the accounts of expenditure from the Collectors as early as wanted.

2. I beg to observe that not having yet received the account from the Tanjore Collector the items of expenditure under different heads are left blank.

I have the honor to be

Sir,

Your most obedient servant

E. LAWFORD,

Civil Engineer.

REPORT ON THE IMPORTANT WORKS EXECUTED IN THE SIXTH DIVISION IN 1854.

TANJORE DISTRICT.

Irrigation Works.

The system on which the works in Tanjore have been carried on for many years past has been followed in the one now under review. Careful attention has been paid to the improvement of existing means of irrigation and drainage, and the gradual extension of cultivation by the prevention of losses either from deficiency or excess of water.

The draught which prevailed at the close of the preceding year, and continued with severity up to the end of July 1854, not only made it necessary to give abundant employment to the labouring population, but by freeing the low lands from the usual inundation rendered practicable many drainage operations which in ordinary seasons could not be executed.

Advantage was taken of both circumstances to the greatest possible extent, and the results of the works so undertaken cannot fail to be most satisfactory and permanent.

TRIVADY TALOOK.

Improving the course of the Conocodingal River.

Estimate.....Rs. 5,797 13 0

Expenditure.....,, 5,498 0 0

This stream carries off the surplus water of 7908 acres of irrigated land.

Its tortuous course and narrow bed had long rendered it a very inefficient drain, and as the revenue affected by it amounts to 60,000 Rs. a complete system of improvement was adopted which has been attended with entire success.

Repairing &c. the Munnyaur Head Sluice and Calingulah.

Estimate.....Rs. 2,560 5 0

Expenditure.....,, 2,553 9 0

This work consisted of additions to the wing walls and apron, and was designed for the security of the Regulating works at the head of a very considerable river. It was correctly and efficiently executed.

Improving the irrigation of the Pillay Voikal.

Estimate.....Rs. 7,870 6 0

Expenditure in 1853 Rs. 6,102 5 0

Do. in 1854 ,, 1,612 1 0 7,714 6 0

The works reported in last year were completed in the present season, and rendered the irrigation under this important channel quite efficient, but the promised increase of cultivation has not taken place owing to the difficulty of adjusting the assessment, as the merassidars object to the rates, which agreeably to the local regulations would be leviable on newly irrigated land.

Repairing and improving the Regulating Dams across the Cauvery and Fennaur at the head of the latter River.

Estimate.....Rs. 13,697 8 0

Expenditure.....,, 10,923 10 0

The important works for regulating the division of water between the two main branches of the Cauvery in Tanjore suffered some injury from the excessive floods of 1853, and were not only thoroughly repaired, but strengthened by additions to the aprons. Part of the work remained for completion till the following season.

TRITERAPOONDY TALOOK.

Reconstructing Annicut with a Bridge over it across the Adapaur in the Paumany limits.

Estimate.....Rs. 5,449 14 0

Expenditure in 1853, Rs. 3,843 4 0

Do. 1854, ,, 1,284 12 0 5,128 0 0

Constructing two Main Channels from the above Annicut and a Head Sluice.

Estimate.....Rs. 8,579 8 0

Expenditure.....,, 6,904 15 0

These works combining a great improvement of the communications and irrigation of the Triterapoondy Talook were nearly completed in the year under review. The bridge was opened for traffic and the new channels on the South side of the river were in full operation, but the Northern channels could not be finished with the season.

Widening Codachittayaur from the Hurrichundranuddy to the Adapaur.

Estimate.....Rs. 3,895 0 0

Expenditure.....,, 3,895 0 0

This work was designed to give a free out fall four miles in length to the Hurrichundranuddy, and was undertaken under the General sanc-

tion to works for employing the destitute poor. It has been attended with very great advantage to a large tract of irrigated land, and has rendered available for cultivation an extensive swamp.

Improving the drainage of Samoodravaily and other Villages.

Aggregate Amount of Estimates.....	Rs. 9,682 15 0
Do. Expenditure.....	„ 9,438 0 0

An estimate for extending the drainage channel of the Village had been sanctioned, but as it seemed extremely desirable to take advantage of the unusually dry season to carry the out fall across the great Southern Swamp, and the necessity of finding work for the poor whose crops had been destroyed by the drought was urgent, it was determined to excavate a new channel 3 miles in length across the Salt swamp to the Sea, a work which has had the most beneficial effect in the discharge of the vast body of water which covers these low lands in heavy rains.

Improving the drainage of Thirty-two Villages under dry cultivation between the Rivers Adapaur and Mooliaur.

Estimate.....	Rs. 36,167 12 0
Expenditure.....	„ 23,762 12 0

This project embraced the drainage of an extensive tract of land including an area of 50 square miles, yielding a revenue of 60,000 Rupees and is thus described.

“The country is an almost level plain of sandy soil with a general but very gentle fall to the South and East. In the Eastern parts are extensive sand drifts covered with low jungle and the Southern border is marked by slight elevations of similar character running parallel to the Coast. The outlet for the drainage water is the Manaucondanaur a shallow irregular stream which flows only after heavy rains from the Western border to the swamp near Vadarniem, where it spreads and is lost. The bed is now generally obstructed by permanent shoals though it appears at some former period to have formed the channel of a considerable river, and to have disembogued, as local tradition asserts, in the Kodicurray backwater. The feeders of this river are small water courses partly of artificial appearance, whose beds are greatly accumulated with sand and over-grown with jungle and grass spreading out at intervals into extensive “Pullums” or ponds of natural formation which overflow the surrounding lands. The drainage, always imperfect, is most ob-

structed in the N. E. Monsoon when nearly the entire tract is actually inundated.”

“It appears that the deficiency of drainage has gradually proceeded from the rise of the swamp choking the outfall of the Manaucondanaur the obstruction extending slowly to every minor drain, and that to restore to the land the means of relief from flood the first point is to re-open the main river, and successively the minor channels which supply it.”

“The excavation of a clear well defined channel for the Manaucondanaur should begin at the termination of the Mooliaur and be carried across the swamp to the sea at Kodicurray. The Mooliaur is one of the branches of the Cauvery which also suffers from its outfall being not into any deep estuary on the open sea, but spreading over the same swamp, and it would be a manifest advantage, and one easily accomplished, to connect this permanent river with what is only a torrent, the bed of which is liable to obstruction by causes which would not affect the other.”

“The excavation of seven minor channels all of which fall into the Manaucondanaur except two (the Mavady and Hera channels which discharge into the Adapaur) is equally necessary with that of the main river.

“Another advantage must not be kept out of sight and that is the improvement of the Port of Kodicurray at Point Calimere. The Merchants of this place have repeatedly petitioned me on this subject, and solicited the restoration of the Manaucondanaur which formerly entered the sea there by a small estuary which still remains, though much choked with mud, and quite separated from the river. They possess 30 Dhonies and carry on some trade with Ceylon, which would be greatly increased by the connection of the Manaucondanaur with the Mooliaur by which stream, boats could bring grain from Triterapondy.

The works recommended in the above report were sanctioned, and all were executed in 1854, except the restoration of the Manaucondanaur which was necessarily deferred until the dry season and is now in progress.

PARELLUM TALOOK.

Extending the head of the Yadagoody irrigating Channel, constructing sluice, and cutting the Veerasholen River.

Estimate.....	Rs. 1,868 12 0
Expenditure.....	„ 1,448 3 0

The object of this work was merely to restore the level of the supply of an important Channel from the Veerasholen, and to separate its course from that of the parent stream. No increase of revenue was expected, and the result is exactly what was anticipated, viz, the perfection of the irrigation.

VELUNGAMAUN TALOOK.

Reconstructing an Annicut across the Mallianaur.

Estimate..... Rs. 1,723 0 0

Expenditure..... „ 1,722 9 0

This was mere work of restoration to preserve existing revenue and was correctly executed.

COMBACONUM TALOOK.

Extending the Lower Coleroon Annicut and constructing a Bridge over it.

Estimate..... Rs. 150,000 0 0

Expenditure..... „ 9,894 5 0

Nothing having been done for the prosecution of these works beyond the preparation of materials, no report is called for.

ROADS AND BRIDGES.

*Trivaloor and Trilerapoondy Talooks constructing 7 Bridges on the Road from Trivaloor to Trilerapoondy.**One Arch-bridge across the Chundranuddy River.*

Estimate..... Rs. 1,660 0 0

Expenditure..... „ 1,572 7 0

Three Arch-bridge across the Vellayaur River.

Estimate..... Rs. 1,395 0 0

Expenditure..... „ 1,235 1 0

Three Arch-bridge across the Paundarayaur River.

Estimate..... Rs. 4,494 0 0

Expenditure..... „ 3,884 0 0

Three Arch-bridge across the Cautaur River.

Estimate..... Rs. 3,365 0 0

Expenditure..... „ 3,130 1 0

Three Arch-bridge across the Vaulayaur River.

Estimate..... Rs. 2,930 0 0

Expenditure..... „ 2,418 13 0

Three Arch-bridge across the Hurnchundranuddy River.

Estimate..... Rs. 3,102 8 0

Expenditure..... „ 2,730 6 0

Three Arch-bridge across the Adapaur River.

Estimate..... Rs. 4,303 13 0

Expenditure..... „ 4,068 15 0

The bridges specified above were built to connect the large towns of Trivaloor and Trilerapoondy and were all completed from the foundations in about four months in a very satisfactory manner, under the general direction of Mr. Morris the special Assistant Collector of Tanjore.

TRILERAPOONDY TALOOK.

Constructing a Bridge of three Segmental Arches of 30 feet span across the Codichittayaur River on the Road from Negapatam to Vadarniem.

Estimate..... Rs. 5,281 0 0

Expenditure..... „ 5,041 6 0

Constructing a Bridge of three small Arches across the Era Channel on the above Road.

Estimate..... Rs. 1,537 8 0

Expenditure..... „ 1,457 10 0

The above bridges on the Southern Coast Road were commenced and finished within the season in a very satisfactory manner.

Constructing a Bridge of three segmental Arches of 20 feet span across the Mooliayaur River on the Road from Mootoopettah to Vadarniem.

Estimate..... Rs. 2,815 15 0

Expenditure..... „ 2,803 10 0

This bridge stands on the Coast Road Westward from Point Calimere and was correctly built in the year under review.

Constructing a Bridge of five Elliptic Arches of 35 feet span across the Panmany River on the Road from Trilerapoondy to Mootoopettah.

Estimate..... Rs. 7,582 10 0

Expenditure in 1853 Rs. 5,405 9 0

Do. in 1854 „ 2,118 8 0 7,524 1 0

The Arches of this bridge were constructed in the year under review in a perfectly efficient manner.

COOTALLUM TALOOK.

Constructing a bridge of five elliptic Arches of 30 feet span across the Palavaur on the Road from Punthenelloor to Vyde Esocrencoil.

Estimate.....Rs. 6,660 0 0

Expenditure.....,, 6,484 0 0

This bridge completed a very important local Communication from the interior to the Port of Trimulvassel and was entirely built within the season in the most satisfactory manner.

COMBACONUM TALOOK.

Reconstructing the bridge across the Trimulrajen river on the Road from Combacorum to Tanjore.

Estimate.....Rs. 2,794 0 0

Expenditure.....,, 2,746 13 0

The bridge across this river having been destroyed by the hurricane of March 1853, a new one was built in the following year consisting of 3 arches of 30 feet and was altogether satisfactory.

Improving the Port of Tranquebar and the Veerasholen River.

Estimate.....Rs. 21,091 4 0

Expenditure in 1853 Rs. 5,879 10 0

Do. in 1854 ,, 11,218 12 0 17,098 6 0

The following report on these works was submitted on the 28th November 1854.

"The better navigation of the Veerasholen was the first object proposed in my plans, and the works for that purpose consisted of the removal of an ancient and sluice which endangered the passage of basket boats. This was accomplished last year and boats can now freely descend the river during moderate freshes but in high floods they are still obstructed by a bridge on the Mayveram and Trivaloor Road at Perenjairy for the alteration of which I am preparing a plan."

"The number of basket boats which arrived at Tranquebar on private account during three years is stated in the accompanying Memorandum but would probably have been much larger in 1853 had not the failure of the crops interfered greatly with trade."

"The opening of the river by the removal of the Dams above noticed involved the alteration of the irrigating and draining channels

connected with them, the former being made to issue from the river itself instead of deriving their supply from surplus water, and the drainage being carried directly to the lowest practicable point without obstruction. These improvements were for the most part executed in 1853, and the results were undoubtedly satisfactory; but owing to the unusual failure of water in the Cauvery, and of rain in the monsoon, the altered system had not a full trial. No complaints however have reached me during the present year, and I have every assurance that the people are satisfied and the revenue rendered more secure by the change."

"The improvement of the Port by deepening the Nundalaur River at its embouchure was proposed to be effected by turning the course of the Umbenaur so as to join the former river, and this part of the project is as yet incomplete. A new channel was partly excavated for the Umbenaur last year, but the bed was almost entirely filled up again by the destruction of the banks in the hurricane of March, and the subsequent drifting of sand, and although it has been re-opened this season to form part of the coast line of navigation, yet I have not thought it advisable to divert the river until the dikes are consolidated, and therefore this work has as yet produced no effect on the Port, nor is it efficient for navigation. The latter deficiency however is of no importance, as the canal cannot be of use until the whole line to Trimulvassel of which I contemplated the construction shall be ready."

From the Umbenaur to Trimulvassel the canal has been under execution this year, and is nearly finished so that the whole extent of improvement proposed in my letter to the Collector of Tanjore dated 17th July 1852 No. 397 will only be brought into operation next year.

Beach Defences at Tranquebar.

Aggregate amount of Est.mate.....Rs. 24,500 0 0

Expenditure in 1853. Rs. 18,449 14 0

Do. in 1854. ,, 5,954 15 0 24,404 13 0

The works executed in 1854, for the protection of the Tranquebar beach consisted merely of repairs and additions to the groynes, previously constructed.

Intermediate groynes of shorter length were thrown out, the effect of which was very beneficial.

Cutting Canal from the Umbenaur to the Port of Trinaculvassel.

Estimate.....Rs. 25,000 0 0

Expenditure.....,, 18,843 10 0

This canal was commenced in continuation of that which had been excavated from Tranquebar to the Northward, but being undertaken at an advanced period of the season it could not be completed within the year, though a great part of it was opened.

The total length of Cutting intended in this season is $9\frac{1}{2}$ miles, of which only about 800 yards remained undone.

*Extending the Jetty and deepening the harbour of Negapatam.*Estimate.....Rs. { 7,200 0 0
3,000 0 0

Expenditure in 1853 Rs. 3,690 6 0

Do. in 1854 ,, 3,201 11 0 6,892 1 0

The construction of the masonry foundation with part of the Jetty was carried on in the year under review, but the works could not be completed, and the effect is not decisive.

The following is a list of the important Public Buildings executed in 1854.

Talook.	Work.	Amount of Estimate.		Amount of Expenditure.	
Trivady.....	Constructing a Cutcherry for the Police Agents at Coelady.....	Rs. 1,211	A. P. 14 0	Rs. 1,211	A. P. 14 0
Keervaloor.....	Do. a Moonsiff's Court house at Negapatam.....	1,318	8 0	1,318	8 0
Triterapoondy.....	Do. a Talook Cutcherry at Triterapoondy.....	3,800	0 0	3,103	14 0
Do.	Do. a Moonsiff's Court house at Triterapoondy.....	1,311	8 0	1,218	8 0
Puttoocottah.....	Do. a Choultry at Trevanum.....	1,604	8 0	1,506	4 0
Sheally.....	Do. a Moonsiff's Court house at Sheally.....	1,318	8 0	1,211	6 0
Manargoody.....	Do. Talook Cutcherry at Manargoody.....	4,332	0 0	4,302	0 0

TRICHINOPOLY DISTRICT.

Irrigation Works.

The works executed in the Trichinopoly District in the year under review were nearly all of an ordinary character, and require individually no remarks. They were designed solely for the improvement of land already cultivated and not for any extension of the irrigation.

MOOSERY TALOOK.

Constructing a Surplus sluice in the limits of Conasalem.

Estimate.....Rs. 2,180 10 0

Expenditure.....,, 1,719 7 0

This work was proposed for the protection of a considerable tract of land from the inundation of the Coleroon which flooded back from the mouth of the Iyaur above the Upper Annicut. It was not quite completed.

ROADS AND BRIDGES.

Constructing the Road No. 5 from Trichinopoly to Madura.

Estimate.....Rs. 23,534 0 0

Expenditure in 1853 Rs. 8,245 15 0

Do. in 1854 ,, 13,857 5 0 22,103 4 0

The works of 1854, on this road comprised the construction of a skew bridge of five arches across the river Corayaur.

Reconstructing the Bridge across the Codamagerty river on the Road from Trichinopoly to Coimbatore.

Estimate.....Rs. 4,763 3 11

Expenditure.....,, 5,146 7 5

This bridge was destroyed by the hurricane in 1853 when the arches were blocked up with stacks of straw carried down by the flood. It was efficiently rebuilt in the following year.

The following is a list of Roads constructed and repaired in 1854.

Talook.	Work.	Amount of Estimate.		Amount of Expenditure.	
Conaud.....	Repairing the Road No. 1 from Trichinopoly to Tanjore via Towagoody.....	Rs. 2,186	A.P. 0 0	Rs. 1,217	A.P. 0 0
Do.	Constructing part of the Road No. 2 from Trichinopoly to Tanjore via Sircarpolliem.....	2,294	4 0	2,148	13 0
Do.	Repairing the Road No. 10 from Trichinopoly to Coimbatore.....	6,896	4 0	6,362	7 0
Do.	Constructing the Road No. 25 from Trichinopoly to Vialoor.....	4,792	9 2	4,564	12 4
Do.	Repairing the Road No. 8 from Trichinopoly to Poodocottah.....	2,151	8 2	1,492	11 4
Laulgoody.....	Do. the Road No. 3 from Trichinopoly to Combacenum.....	5,042	0 0	4,874	8 0
Do. & Moosery.....	Constructing the Road No. 11 from Trichinopoly to Salem from the Coleroon Bridge to Moosery and Constructing a bridge across the Iyaur River.....	18,471	1 0	18,344	12 7
Laulgoody.....	Repairing the Road No. 4 from Trichinopoly to Orrealore and Wodiarpolliem.....	6,492	9 0	986	6 0
Vitticutty.....	Constructing part of the Road No. 24 from Trichinopoly to Dindigul via Coolitullay.....	6,400	0 0	4,670	14 0
	PUBLIC BUILDING.				
	Constructing a Guard Room in the New Jail.....	1,090	0 0	140	9 4

Total Expenditure on Irrigation Works, Rupees...	1,19,911	3	3
Do. Navigation, do.	"	10	10
Do. Roads & Bridges,	"	55,400	5 7
Do. Public Buildings,	"	5,119	0 7

Grand Total Rupees... 1,80,441 3 11

SOUTH ARCOT DISTRICT.

Irrigation Works.

No projects of any importance connected with irrigation were executed in the two Southern Talooks during the year under review; but the usual amount of attention and Improvement was bestowed on existing works.

MANARGOODY TALOOK.

Deepening the old course of the Vuddavaur Channel leading to the Veeranum Tank.

Estimate.....Rs. 4,387 8 0

Expenditure.....,, 4,376 10 0

This work was called for in consequence of the gradual filling up of the lower course of this great channel and a deficiency of supply to the Tank.

The following is a list of the important Roads and Bridges Executed in 1854.

Talook.	Work.	Amount of Estimate.		Amount of Expenditure.	
Manargoody...	Constructing a bridge of three arches across the Vuddavaur on the road from Manargoody to Wodiarpollum.....	Rs. 4,738	A.P. 0 0	Rs. 4,386	A.P. 2 5
Do.	Do. a Road from the Veeranum Tank joining the high road to Chellumbrum Via Pootoor.....	2,470	0 0	2,293	10 0
Do.	Repairing the Road from Shatia tope to Womampelleoor.....	2,800	0 0	2,703	6 0
Chellumbrum.	Do. Road from the Vellaur to Coleroon River.....	1,750	0 0	1,725	0 0
Chellumbrum.	Repairing the Road from Chellumbrum to Laupett.....	2,300	0 0	2,300	0 0
Do.	Constructing a boat for the Coleroon ferry at Vullatoray.....	1,042	14 0	956	4 0
	NAVIGATION WORKS.				
Chellumbrum.	Extending the Lock at Porto Novo.....	1,370	0 0	1,350	0 0
Manargoody...	Cutting Channel from Vellicaul to Veeranattum Aqueduct.....	1,636	4 0	1,603	8 0

Improving the harbour of Cuddalore and Porto Novo and connecting them by a Canal.

Estimate... ..Rs. 53,249 10 6

Expenditure... ..,, 33,400 0 0

The works included in this project were planned estimated and sanctioned in 1853, during which year a small and ineffectual amount was executed. In the following year the Canal was partly dug, but could not be completed.

The nature, extent and scope of the design were explained in the report, which accompanied the estimates and is here inserted; but up to the close of 1854 the works were incomplete and their object had not been attained.

The works at Porto Novo of much less importance than those at Cuddalore were fully completed and their effect as far as can be judged is decidedly satisfactory.

REPORT.

"Four streams of different magnitudes unite their waters and enter the Sea of Cuddalore.

1st. The Paravennaur framed by the surplus of the Wallajah and Permal Tanks to the South, is a considerable River, receiving the drainage of a large tract of country, and in part fed from the Vellaur and Coleroon. At twelve miles from its mouth it is 40 yards broad and 6 feet deep with strong tidal action in low freshes, while in the monsoon it inundates the country and flows with a depth of 12 to 15 feet. For some distance it runs from South to North nearly parallel to the line of coast.

2nd. The Guddelum an inferior River which however has a considerable volume in heavy rains.

3rd. The Bandipollum nullah an insignificant drainage channel.

4th. The Pongair a large River desemboging two miles North Cuddalore, but throwing off a creek which joins the Guddelum just above its mouth."

"During the greater part of the year there is only one outlet to the Sea which is formed by the Paravennaur generally a little to the South of the Custom House, but in the North East Monsoon the bar of the Guddelum is open also."

"The records of the Cuddalore Marine Department and the testimony of every person from whom I have sought information satisfy me that a great deterioration has taken place in the state of the harbour, but from what period this change may be dated I cannot ascertain. As the Collector will report more fully on this point and on the injury to commerce resulting from the present difficulties I need not enter on that part of the subject."

"In investigating the causes of deterioration the first point that attract notice is the confluence of the two principal Rivers in opposite di-

rections. When the freshes of the Guddilum are too weak to force open the northern bar, that river turns towards the southern outlet and thus meets the current of the Paravennaur, from which cause both rivers are checked, their beds loaded with sediment, and the streams spreading over a wide expanse, become feeble and shallow. That this is the origin of the evil is perfectly evident, and it is one of those cases wherein cause and effect are combined, for the decreased action on the northern bar has been necessarily followed by a stronger resistance to the Paravennaur which at low tide presents the appearance of an extensive swamp intersected by channels, while the same cause produces a diminution of the tidal action, and thus the bar has gradually shoaled. In short the main evil to be overcome is the unfavorable confluence of the two rivers, and the question to be decided is whether they shall be entirely separated, or so united as to assist instead of opposing each other, and discharged by one common outlet.

"The northern outlet must certainly at one time have been much deeper and more permanent than now, for at the siege of Fort Saint David a century ago, the French had a battery to prevent the entrance of boats in the month of May, and indeed the position of the Fort seems to indicate a more convenient seaward access originally. I do not however think it would be easy now to prevent the junction of the two rivers, and if their confluence takes place in a manner contrary to any designs to prevent it, the effect will certainly be more unfavorable than if nature and art work together. It therefore seems by far the best plan to lead all the waters into one estuary and then by proper works secure the position of the common mouth.

"The first improvement proposed is that of the Guddilum, which now forms its deep bed in a very serpentine course from some distance above the bar and spreads its flood waters over a great expanse of sand. Cuts made across the low ground on the banks will lead the stream in a channel as direct as circumstances allow to the proposed mouth opposite the outlet of the Bandipollum nullah. To assist the action of this river, it is proposed to enlarge the bridges over the Pongair creek which are much too confined, and widen and embank that stream, so that the current may possess greater force, and by making a deeper channel in a southerly direction, throw up sand across the northern bar which will then be permanently closed. This improvement will be very beneficial

to a large extent of arable land. Immediately opposite the mouth of the Bandipolliam Nullah it is proposed to excavate a new outlet to the sea across the Island which is about 600 yards wide, and through this opening to discharge the Guddilum, which will easily be turned in that direction by the mud bank extending nearly across the backwater from the left bank of the Bandipolliam Nullah. This latter stream will be straightened and embanked so as to reclaim a considerable extent of swampy ground near the Pensioners' Lines.

"The Paravennaur will be embanked to the extent of $2\frac{1}{2}$ miles, an operation which will not only deepen its bed but render culturable a large tract of land now a fetid swamp. Inlets will be left for channels to supply the Salt pans. The effect of thus relieving the Paravennaur from the opposing current of the Guddilum, will be to increase its tendency to stretch northward and destroy part of the island formed by the two rivers, and their connecting back water, ultimately uniting itself with the Guddilum close to their common embouchure.

"From the period when this junction takes place, and the bar of the united rivers begins to be affected by the prevailing tidal current, the Sea works should be commenced, and will consist of a pier of rough stone thrown out from the northern or left bank of the estuary at right angles to the line of coast, and to such extent as to carry the river current into deep water before it is allowed to spread. The depth of water over the bar will very much depend on the length of this pier, but need not exceed that of the River bed, although if not artificially deepened by the land and tidal currents, the bar would be raised by the surf above that level.

"The above are the main works necessary for rendering the harbour as commodious as the nature of the River will allow, and it may be convenient to consider them in two parts, 1st, alterations of the rivers, and 2nd the construction of a pier.

"The rectification of the river courses will in itself produce most important and beneficial effects, and at least restore the capabilities of the Port to that state which record and tradition declare formerly existed, which I consider to be such as to allow the free passage of laden cargo boats at all states of the tide, or a minimum depth of 3 feet. Further benefits will be secured by this improvement, as vessels of 300 Tons will

find shelter and means of repair, though not capable of entering when laden.

"Viewing this part of the project as one of mere restoration, and not of improvement, I have framed a separate estimate for it amounting to Rupees 15,000, and I would strongly recommend the commencement of the works as early as possible. When once begun, their effect will greatly depend on their vigorous prosecution, so that in the ensuing monsoon the rivers may flow freely in their new channels, and the desired result be attained.

"The construction of a pier to fix the northern limit of the estuary is of course an entirely new and very important work. It is not at all doubtful that the effect will be to preserve the full depth of water as far as the pier extends, for the current must be confined to a small space, and the principle is exactly the same as that of a dike of which the uniform result is to deepen a river. For constructing the pier, stone may be easily procured at comparatively moderate cost from the Bandipolliam and Trivandipooram Hills. It will not be desirable to commence the work this year, in order to afford time for the rivers to assume their new conditions, but it would be well to begin the collection of material to be used as rapidly as possible when once the undertaking is in progress. I have allowed in my estimate for a length of 400 yards to the pier, which is to be constructed in a similar manner to the groynes at Tranquebar, and the cost will amount to Rs. 45,000. This will bring the pier head into water 3 fathoms deep, which seems sufficient for present purposes.

"I now proceed to notice the plan for giving the advantage of inland navigation to this important outlet for produce, which is to be done by connecting the Paravennaur with the Vellaur into which river the line from the Cauvery now falls. I examined and measured the ground and found that nothing more is required for this object than a cut within tidal range, seven miles in length and about 4 yards in depth through land almost wholly waste. At 1000 Rupees a mile the expense would amount to 28,000, or with masonry works about 40,000 Rupees. The effect would be to bring a large export trade to Cuddalore as well from the Villages under the great tanks (Wallajah and Pernal) fed by the Vellaur, as from the still richer tracts south of that river. If this undertaking were sanctioned it would be desirable, though by no means essential to improve the course of the Paravennaur by cut-

tings and embankments, at a further cost of about 10,000 Rupees, which would render an extensive tract of swampy land fit for cultivation; but this need not be done till the success of the canal has been established. It certainly affords ground for regret that so fine a stream for navigation should remain entirely useless through the ten miles of its tidal course, when a cut of 7 miles will connect it with a line of 150 miles of water communication."

Memo. on the Plans for the improvement of Porto Novo and Cuddalore Ports by the Chief Engineer Colonel A. T. Cotton.

"I entirely agree with the Civil Engineer of the 6th Division in his views respecting the necessity of improving and mode of dealing with these Ports.

"It is a most manifest mistake to suppose that such Ports will take care of themselves. Like every thing else if totally neglected as these have been, they must be ruined, and we have no right to expect any other result. The ruin of the Ports, and consequently of the trade and the improvement of the Districts adjoining is inevitable, where such neglect is allowed; of course after many years of such a system of proceeding, we must pay for our neglect in restorations, besides all that has been lost from the stoppage of the trade, or its transfer to a foreign Port. The sums now required are quite insignificant compared with the value of the object to be attained. This value must not be estimated from the present trade. If the present trade is used at all in the calculation, we should consider the amount to be expended as bearing an inverse proportion to it, the smaller the trade is, the more liberal should be the expenditure if necessary to restore it. To allow a Port to get into such a ruinous state that the trade is reduced to a trifle, and then to measure the importance of it by the reduced trade, is evidently a mistake. Yet this is constantly the mode of arguing on such questions. The question is not what the trade is, but what it ought to be. In this as in a thousand cases we have no alternative but either to pay for past neglect or to persist in a system as ruinous to the country as it is unworthy of a civilized Government. On the other hand we have the greatest encouragement to proceed upon a new plan. In the present case a Lac of Rupees is required to make those great improvements representing an annual charge of 5000 Rupees a year, certainly not a twentieth part, more likely not a hundredth of the value of the benefits

that will be obtained. I trust that no time will be lost in commencing upon these works for which there are abundant funds available, as I understand, from the sums ordered by the Honorable Court to be set apart for such works. Captain Lawford has now for several years given great attention to the subject of the management of the Ports in this coast, and has had great success with the trifling sums placed at his disposal for that purpose, and I would most earnestly recommend that the sum he has now estimated, and a much larger if it were necessary should be sanctioned to enable him to carry out his plans.

"With respect to the particular Works.

"The improvement of Porto Novo—I think that Captain Lawford is right in his opinion that not much money should be expended upon it, but that the water communication should be extended to Cuddalore and our labour concentrated upon that more important Port. The trifling works he proposes however seem well worthy of execution.

"The Canal from the Vellaur at Porto Novo to the Paravennaur near Cuddalore—This I consider a highly important work in connection with the Canal and river communication from the Vellaur through the Districts Tanjore and Trichinopoly to part of Coimbatore. I am well acquainted with this line and urged the cutting of the canal when in that Division.

"The improvements at Cuddalore within the line of Coast—I consider these planned on correct principles and sure of producing a great change for the better.

"The Pier or Jetty extending seaward from the mouth of the river—This I consider more experimental than the other works. It is an experiment which I have long been anxious to see made, and which I consider this a particularly favorable opportunity of making under the superintendence of an Officer, who has had experience already to some extent. I feel very confident that a great deal may be effected by a work on this principle, but its direction, length, section &c., I think must be decided upon trial. I could meet Captain Lawford and discuss the details of this work with him having had some experience in constructing the Vizagapatam Groynes. In the mean time I should recommend the sanction of the sum he has estimated."

Total Expenditure on Irrigation Works.	Rs. 33,391	3	10
Do. do. Roads and bridges.	„ 15,640	10	10
Do. do. Public buildings...	„ 1,943	12	7
Do. do. Improvements of Harbours of Cuddalore and Porto Novo and excavation of Canal.....	„ 33,400	0	0

Grand Total... Rs. 84,375 11 3

List of the Officers and Subordinates employed in the sixth Division in 1854.

Civil Engineer.....	Major E. Lawford.	
2d Asst. Do.	Lieut. J. G. Ryves.	Trichinopoly.
Assistant Rev. Surveyor.	C. W. Maitland.....	Tanjore.
Do.	W. V. Loftus.....	South Arcot.
Assistant Supervisor.....	Dr. Horgan.....	Trichinopoly and Tanjore.
Overseer.	J. Mills.....	Tanjore.
Assistant Do.	W. F. Bateman.....	Do.

EDWARD LAWFORD MAJOR,

*Civil Engineer's Office, 6th Div.
Cuddalore 8th May 1855.*

Deputy Chief Engineer D. P. W.

REPORT UPON THE MOST IMPORTANT PUBLIC WORKS
EXECUTED IN THE DISTRICT OF COIMBATORE IN
THE YEAR 1854.

CARROOR SUB COLLECTOR'S CUTCHERRY.

Sanctioned 12th January 1852.

Estimate.....	Rs. 694	3	0
Expenditure.....	„ 626	13	5

There are 3 Rooms in this building, one large and 2 small; the former one is appropriated for the Sub Collector's Sheristadar and his Goomastahs, and the latter for the Revenue and Magistrate Jewabnevis and English writers. The front and side Verandahs are used by the Village Curnums who attend the Sub-Collector's Cutcherry during the time of Jummabundy.

Formerly this Office was held in a stone mundappem within the Compound of a Pagoda, which admits of no light nor air, and which is ill-adapted for a Cutcherry. The present building was constructed at the recommendation of Major Cotton and is very convenient in all respects.

CARROOR TRAVELLER'S BUNGALOW.

Sanctioned 26th November 1853.

Estimate.....	Rs. 495	3	0
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This work is in progress, walls have been raised, and the roof work will be completed early in 1855.

CARROOR MOONSIFF'S COURT.

The old building being small and requiring considerable repairs, a new building was recommended and sanctioned in 1851 for Rs. 906-5-3. The Civil Judge suggested certain alterations in the Plan in consequence of which the work was delayed. The work is now going on under contract and will be completed shortly.

BOWANY BUNGALOW.

This was a large rambling building with but little accommodation. It was in former days the Collector's house, the Hoozoor being then curiously situated on the boundary of the District. Rupees 1,912-3-0, was sanctioned on the 18th December 1852 for pulling down a portion that looked dangerous, and more conveniently arranging the accommodation; it will shortly be completed.

HASSANOOR BUNGALOW.

An Estimate for Rupees 1,058-14-0 was sanctioned on the 17th January 1853 for the construction of a 2d class building in this place.

The Estimate provides for glass windows, common doors and a chimney; but the rates allowed are very small. The work was not begun in 1854, nor the materials ready though 2 years have elapsed since it was sanctioned.

The great unhealthiness of this spot and the few workmen to be procured in the district, render it most difficult to get any work done; the Tahsildar having failed, it was left along with the road under charge of Mr. Bake Overseer; but his own severe fever has now put a stop to the work again.

BRIDGE OVER AULUMGOMBOO BUNDY STREAM.

This is constructed near Seroomooogay on the road from Coimbatore to Hassanoor, date of sanction 27th May 1853. Rupees 1,701-0-0.

Expenditure.....Rs. 1,701 0 0

BRIDGE OVER CHINNA CULLAR.

This is constructed near the Perriah Cullar Bridge on the road from Neilgherry to Trichinopoly and is very useful; sanctioned on the 20th October 1853, Rupees 767-0-0.

BRIDGE ON THE 6TH MILE STONE ON THE ROAD FROM COIMBATORE TO TRICHINOPOLY.

Estimate.....Rs. 431 4 0

Expenditure.....„ 431 4 0

TEROOMOOROGGUM POONDY BRIDGE.

This is a most useful bridge constructed over the nullah on the Trichinopoly road from Avanashy to Konghiem, with 5 arches of 20 feet span each, having its foundation on rock.

A dam was first sanctioned here for Rupees 888-9-0 which was afterwards superseded by a bridge and the difference sanctioned by Government.

PULNEY ROAD FROM COIMBATORE VIA PULACHY AND OODAMULCOTTAR

SANCTIONED 27TH MAY 1853.

Repair of Roads.....	Rs. 11,479 10 0
For 18 bridges.....	„ 16,773 10 0
Establishment.....	„ 4,636 0 0

Total Rupees...	32,909 4 0
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Advance &c. up to the end of Novr..	Rs. 15,115 8 0
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This important line of road is under the charge of a separate Officer and is progressing well. It is expected to be completed in 1855. The allowance for the road itself is only about 200 Rs. a mile, and it requires the greatest care to keep the expenditure down to that limit. Of course the gravelling and metalling can only be done to a small width. A liberal annual allowance is required for this road.

SUTTIMUNGALUM BOWANY BRIDGE.

Date of Sanction 30th June 1853.

Estimate.....	Rs. 16,029 4 0
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This work is in charge of Mr. Bake, Overseer. Most of the Materials are ready, and the remainder is under preparation. Two abutments only were finished to the basement by the best exertions of Captain Ludlow in this Year. The completion of this work was expected before the freshes of 1855, but the unprecedented constant freshes in the river during the early months of the year, delayed the work sadly and caused considerable loss of time and extra expense. It will be finished early in 1856 for traffic.

5 BRIDGES IN THE LIMITS OF COIMBATORE ON THE ROAD FROM COIMBATORE TO SUTTIMUNGALUM.

Sanctioned out of Davastanum Fund Rs. 5,003 9 0

The above mentioned 5 Bridges are completed. A sum of nearly Rupees 4,621-10-9 appears to have been laid out. These Bridges are a very great convenience.

CODEVAIRY BRIDGE.

This is of 40 feet span of one arch situated above the Arkanecotta channel and is very useful.

Estimate.....	Rs. 722 8 0
Expenditure.....	„ 640 13 1

Balance Rupees.....	81 10 11
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This too is expended out of Davastanum fund. The remainder may be appropriated for the roads. The work is nearly done.

IRRIGATION WORKS.

ATTOOCOOPLY ANNICUT AND CHANNEL.

For the Construction of a Dam and for excavating a channel off the River near Walliar.

Sanctioned 18th March 1853.

Estimate	Rs. 1,429	5	0
Expenditure	„ 1,427	15	0

The Annicut is placed upon rock, whilst the rock in the rear should serve as an apron for it, but the Maistry has constructed an apron over it with rough Stone. It appears by the Tahsildar's account that the whole of the Estimate amount has been expended, but why is not satisfactorily accounted for, the annicut having been built less high than the plan.

It is necessary that the Rock at the head of the channel should be removed, and sluices built at a cost of about Rupees 300-0-0.

The channel is excavated to the exact length in the Plan, but the level requires in some places to be altered, which may be easily done. This channel leads off a large stream, but left as it is, there will be no more than 20 Cawnies of land cultivated. 10 Cawnies are cultivated this year and the remainder will be so next fusly 1265.

If the channel be lengthened a mile with an aqueduct over the stream, about 300 Cawnies will come under cultivation. Levels have been taken with this view, and the project has been sent up to Government by the Collector.

IMPROVEMENT OF ARCKANCOTTAH CHANNEL.

To Construct irrigation Sluices and excavate 2 branch channels.

Sanctioned on the 16th July 1853.

Estimate	Rs. 9,997	4	0
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Only a branch channel from the middle of Arckancottah channel is begun and advanced one mile. The remaining work is expected to be completed in 1855, and the channel will come into use for the cultivation of Fusly 1265.

IMPROVEMENT OF THUDDAPULLY CHANNEL.

For excavating 2 branch Channels and constructing Sluices and Head Sluice. Sanctioned on the 27th September 1853.

Estimate Rupees.....	Rs. 23,630	15	6
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The channel work is not yet commenced. The head sluice work is half done and will be completed in 1855.

At the head of the channel some works have been performed in widening the channel and blasting rocks, viz. .

Head Sluice	Rs. 2,366	5	7
Blasting Rock.....	„ 212	8	3
Widening Channel	„ 162	13	8
Total Rupees....	2,741	11	6

The Estimated rate for cut stone appears to be very insufficient in this District. The cutters are brought from long distances, and it will be necessary in future to increase the Estimate rates; the new channel work will be commenced as soon as a sufficient number of coolies and wooders are obtained. It is unnecessary here to repeat the general statements concerning the irrigation of the district.

It is essential to preserve a full supply of water for crops in dry seasons, and there appears no better method of doing this than forming substantial reservoirs in convenient spots, and giving out water from them in dry seasons.

The sites for these works have not yet been accurately determined, but it will be made an object of special care as soon as time can be spared by the Civil Engineer's Department.

Considerable improvements are required to the Poogaloor channel off the Cavery, and the Calingarayen channel off the Bowany, and it is expected that estimates for these projects will be entered into the Budget for 1856-57.

The Caniem Polliem Annicut channel has under it 546 Cawnies of land bearing an assessment of Rupees 2476 with a Settlement of Rs. 813, the annual loss being Rupees 1663. This amounts to 69 per cent. on the Cirkar Ayacut. This irrigation is not likely to increase from the locality being infested with wild beasts, having no inhabitants, and those in the neighbourhood being averse to take up ground in so sickly a place. The average assessment per Cawny is Rupees 4½.

Out of the annual Revenue of Rupees 813 derivable from this irrigation a sum of 351 Rupees is expended for Repairs &c. leaving the net profit Rupees 462.

If this water could be brought into the Suttimungalum Talook where the average assessment per Cawny is 12 Rupees, the Government would evidently derive a greatly increased revenue. It will therefore be an object of interest to the Civil Engineer's Department to endeavour to lead a channel off on the Right bank and store the water in tanks for cultivation.

Captain Ludlow's suggestion to form a Reservoir in the Moyar near Gazulhutti is a valuable one, and an Estimate will be entered into the budget of 56-57, for carrying it out.

The lands under the Bowany are dependent on 4 channels, viz., Thuddapully, Arekancottah, Calingarayen and Caniem Palliem. These lands were originally assessed for 2 crops, but only 2 crops are cultivated under Calingarayen; whether one or 2 crops are cultivated, the tax is the same.

The profit is I understand pretty nearly the same to the Ryots who cultivate 2 crops under the Calingarayen and those who cultivate one on the Thuddapully.

The average assessment per Cawny under those channels is 4½ Rs. at Caniem Palliem, 12 at Thuddapully, 12 at Arekancottah and 16 at Calingarayen.

It is most undoubtedly necessary that a Workshop &c. with sufficient artificers and tools for the work, should be opened in a convenient place in the District.

Captain Ludlow remarked upon the great want of artificers in this District in his report of 1852, and the difficulty of getting supplies and appliances. This want is more and more felt, and shows the necessity for a store and a workshop where men can be kept constantly at work. As works extend in other Districts and employment is found for all the workmen and men of intelligence in their own countries, so the Coimbatore District languishes in proportion. It will take some years before a class of men can be educated for Maistries and Overseers, and there have been hitherto no large works properly Superintended to serve as schools for workmen.

One large work, the operations on which extend over a number of years, is invaluable in this respect. The subordinates are kept constantly under the eye of the European Officer. He knows their qualifications; he promotes and stimulates them to action and draws forth their talents. They are then as opportunities occur transferred to separate charges.

In the limited works at Jackatalla, a good many natives of various grades have come to the front and 4 or 5 have given satisfaction as contractors. The contract system answers very well when not the lowest tender is taken, but what the executive Officers know to be a fair remunerating price is given to approved men and to those men only, these contractors who have honestly and promptly performed their works, will prove an advantage to the adjacent country as soon as their services can be made available for general works.

Besides the Civil works carried on in the Division, the cantonment of Jackatalla for European Troops between, the stations of Coonoor and Ootacamund on the Neilgherry Hills, has been so far opened that its roads, water courses, Hospitals, Magazines, racket court and out buildings have been completed, whilst temporary buildings accommodate 5 companies and the Head Quarters of a Regiment until the permanent Barracks are built. The works to October 1854 were carried on under the executive charge of Captain Francis of the Engineers, and are now directed by Captain Campbell, Assistant Executive Engineer, under the general supervision of the former Officer who succeeded Captain Ludlow as Acting Civil Engineer of the Division on the 1st October 1854.

The Government propose now to extend the benefits of the Neilgherry sanitarium by building barracks for a complete Regiment instead of for a wing; and it seems by no means improbable that a dépôt for sick men from all Regiments may in course of time be added, so that the liberal and benevolent purposes of Government may prove a benefit to all services alike.

The expediency also of moving the Orphan Asylums from Madras to the bracing climate of the Hills, has been mooted, and this object will doubtless in time be carried out. An activity and energy may then be imparted to the Young which can never be given at Madras, and without which there is small promise of success for after life.

It is not possible at Jackatalla to make any very rapid progress. Brick earth being only found in few localities, and the drying grounds being of so limited an extent, the bricks are made after the European fashion under the charge of an excellent European Superintendent. They are of good quality and the clay is mixed in pug mills, it is in general of so strong a nature as to require to be united with nearly an equal proportion of sand. Lime stone is now brought up the Coonoor Ghaut.

distance of 20 miles by contract, and is burnt by means of peat in an improved pukka built kiln. The nodulous lime stone found near Matepolliem possesses considerable hydraulic properties, and should therefore be used quite fresh. It was formerly slacked at the kilns below, and brought up on bullocks arriving of course in a perfectly dead state. It was also adulterated to the extent of $\frac{1}{2}$; in every way, therefore great advantage has resulted from the present arrangements, as the lime thus burnt will carry 3 parts of sand instead of $1\frac{1}{2}$ or 2.

European artificers are selected from the regiment and employed as bricklayers, plasterers and sawyers, storekeepers, peat cutters &c. All their work is paid for by contract at Native rates, but in consequence of the superior way in which they are able to work, their gains are sometimes very large. An expert bricklayer can earn about 50 Rs. a month, a sawyer from 25 to 30 Rupees, and an experienced navvy has been known to do more than 5 times as much as a Cooly at earth work and to make 15 annas a day working at the rate of 1 anna per Cubic yard. One of the principal obstacles in the progress of the work at Jackatalla, is the difficulty of procuring wood of sufficient length and scantling for the floors. The small wood required is received at the Anamullay forests at 5 annas a Cubic foot, but Lieutenant Michael charges 2 Rupees a foot for the better class of wood suitable for dockyard work (dockyard planks as they are called) and as no other is to be got long enough for flooring purposes, this rate which with the carriage and working doubles the Estimate rate, is of necessity submitted to, but I am hoping that arrangements may be made for a supply from the Mysore side. The wood which has been cut by the Commissariat Department for the Barracks at Bangalore not being now required for that purpose the difficulty of getting carriage is at present the only obstacle to making use of it.

ROADS.

A great many cross roads have been opened on small sums of money sanctioned by Government and many from Davastanum funds.

ROAD FROM HASSANOOR TO GOODALOOR.

In 1854 Rupees 3278-6-10 were spent upon the road from the foot of the Hassanoor Ghaut to Goodaloor or to within 10 miles of Coimbatore. This opens up a very valuable communication, and is already of great use to the Country it passes through. Some day I hope when the Hassanoor Ghaut is better known and the country becomes more cultivated and less feverish it will come to be a main line.

ROAD FROM TRICHINOPOLY TO MATEPOLLIEM.

Rupees 12,074 were sanctioned for repairing the Main road from Trichinopoly to the Neilgherries, between the limits of Caroor and Matepolliem, and Rupees 4877-14-7 were spent in 1854.

MYSORE AND SEEGOOR ROAD.

Rupees 5,985-4-0 were sanctioned for repairing the road from Mysore to Seegoor between the limits of the frontier, and the latter place being the foot of the Ghaut (distance $12\frac{1}{2}$ miles) the expenditure in 1854 amounted to Rupees 4,871-0-0. The work has since been completed as far as the Money would go, but a considerable sum is still required to put it into anything like the order which has been attained on the Mysore side. The great difficulty we have to contend with is fever which strikes down our workmen and renders it excessively hard to keep a party together. It is only from July to January that we can hope to get on with any success.

This road has been daily increasing in importance. Almost all parties bound for the Sanatorium come by the Transit conveyances which run only on this approach to the Hills, and great efforts have lately been made by the Mysore authorities to facilitate travel within their limits. The necessary grants will no doubt be shortly forthcoming on our side to enable us to show an equally good road. The road is bridged throughout, and it is the slopes and surface which now want improvement. Major Cotton's 70 feet trussed Bridge over the Moyaur River at Teppacadoo remains in excellent condition, and in 1854 Captain Selly brought to a successful termination the lattice Bridge on the Seegoor River, for which Rupees 5,714-15-0 were sanctioned in March 1853.

The Electric telegraph runs along this road, and all Commissariat supplies are now brought up by Seegoor instead of by Matepolliem, greater economy being effected by employing carts although obliged to put on leaders than by using Coolies on the other route.

SEEGOOR GHAUT.

The slopes of the Seegoor Ghaut were laid out 1 in 10 and 1 in 12. Alterations which have occasionally been made by Officers in charge, have steepened the road here and there; however in fair weather, carriages can make the ascent without great difficulty, although slowly, but in wet weather, notwithstanding the care bestowed on the drainage and shape of the roadway, it is most trying to cattle, and the ascent takes

twice as long, weak cattle cannot face it at all. It was the opinion of Captain Ludlow and I believe of Major Cotton also that the time had now arrived at which it would be expedient to remodel the Ghaut which during the 16 years it has been in use must have paid itself over and over in advantage to the country, and lay it out at a slope more consistent with the requirements of quick traffic; but the subject has not been brought to the notice of the local Government, and I have contented myself at present with recommending an outlay for metalling the present road with broken granite, and an increased yearly allowance for keeping it up. The subject of the Neilgherry communications will no doubt be considered as a whole, beginning with the branch Railroad on the South and the new Coonoor Ghaut in continuation of it, together with the road now making to Ootacamund; and the Seegoor Ghaut will doubtless come in for its share of improvement and a more perfect communication be established by it with the Mysore plateau, the source of a large proportion of the timber and grain consumed on the Hills.

COONOOOR GHAUT.

The trace of a new Coonoor Ghaut was ordered by Government in 1854 and begun by Mr. Hamilton of the 27th Regiment appointed for the purpose. He was directed by the late Acting Civil Engineer under orders from the Board, to proceed first of all to try the ground for a system of inclined planes and levels, which Colonel Cotton had proposed to obviate the necessity of a long Ghaut. In this project rails were to be laid on the levels and planes and carriages on the former were to be worked rapidly by horses which being unhooked at the gradients, the ascending carriages were to be worked up by the weight of the descending traffic, communicated through an endless rope over a drum, or in case of no weight being available, using as suggested by Captain Ludlow, water to be let off below, on the Hill side there being no scarcity of small supplying streams: Colonel Cotton proposed to lay the inclines down the spurs which run usually at right angles to the direction of the ravines, choosing out the most convenient spurs and making the length of the inclines depend upon their suitableness, the levels being required to connect the systems of planes. If this could have been carried out, it would have been a cheap and expeditious arrangement, because little cutting would have been wanted, but unfortunately the spurs were all found to be too steep, and after 3 months which Mr. Hamilton bestowed upon an in-

vestigation of the country, the late Acting Civil Engineer decided upon reverting to the original plan of a regularly ascending ghaut or pass. He fixed the gradient at 1 in 20—on a consideration of the length of the road required (the height being 4,700 feet above the present foot of the ghaut and the least possible length therefore being about 18 miles exclusive of the length of road thence to Matepolliem which is 6 miles at present) and also with reference to the fever points and the difficulty of getting sufficiently high in one march on an easier and longer ghaut to avoid risk of sickness. I agreed with Captain Ludlow in his views on those points, and the trace was commenced which has since been marked throughout, and a report on the subject sent in, which is now before the Board. It had appeared to me most important to get a ghaut opened speedily to save money in the carriage up of materials for the Jackatalla barracks, which saving would go far to pay the cost of the New pass, and with this view of speedily working, I had the Ghaut traced so as to avoid those extreme difficulties which however gratifying to an Engineer to overcome, would have taken up so much money, and more especially so much time as to defeat the object; but as the work extends far into 1855 and the determination of the Board is not yet known, further Notice on this interesting subject will be deferred till the next report.

PROVINCE OF MALABAR.

TRAVELLERS BUNGALOW, SOLDIER'S SHED, AND NATIVE CHOUTRY AT GUNNOOTH ON THE PEREMBADDY ROAD (OR TRUNK ROAD No. 4.)

Sanctioned Rs. 3,677 3 5

Expended „ 3,818 7 6

The above accommodations were granted by Government after the road had been opened some years, but in consequence of the thinly inhabited district and sickness of that working season, there was much difficulty in getting the buildings completed. They have however at last been very well done.

Bungalows on this road are built at 4 Stages in the Mysore and Coorg limits and at one stage only (that above mentioned) in the Government territory. To complete the line Bungalows are required at Chavacherry and Codally more particularly at the former, the whole distance from Gunnooth to Cannanore being far too great, 30 miles, for travellers to accomplish in one march.

ROAD FROM CANNANORE BAZAAR TO KAKAUD.

Rupees. 1,476-6-0 were sanctioned for improving this road and the work has been very well performed. Great use is made of it, all the supplies for the Cantonment which are landed at Kakaud to which place they are conveyed on boats by river and blackwater being brought on by it. I have examined this locality with the view to cut a canal with 2 branches, one to bring goods into the north end of the Cantonment and the other to the beach. These works may be executed at a small cost and will be of the greatest benefit. I have desired Estimates to be prepared for them which I hope will be entered into the budget of 1856-57.

MUTTANOOR, COTAPARAMBA AND TELlichERRY ROAD.

Estimate Rupees 13,778-7-0 of which 3,448-1-10 have been spent this year, and altogether Rupees 9,635-4-11.

This road has not made satisfactory progress, which is due to the continual charge of Civil Officers under whose charge the work has been placed. The large bridge over the Meerumboi river has only been built up to the spring of the arches, whereas under more favourable circumstances, there was nothing to prevent the whole having been completed during the last working Season.

PONANY GROINS.

These works have answered admirably in protecting the town of Ponany, and it is now the wish of the shippers that they should be converted into wharves along side which their Coasting boats might lay and take in cargo. An Estimate for this will be submitted to Government for entry into the Budget of 1856 and 1857. The towns people I suppose will have no objection to reimburse the Government from the outlay by a continuance of the cess applied, with their consent, for the purpose of collecting the outlay on the groins.

CUTCHERRY FOR THE CALICUT TALOOK AT CHEYOOR.

Estimate..... Rs. 1,884 4 0

This building has been completed within the year and for the estimated amount. It is in every way creditable to the parties employed. It is situated about 6 miles from Calicut in a fine open and high country. The roads to it require some improvements which may fairly be made from the recently granted ferry funds.

CALOY BRIDGE AT CALICUT.

This is a long bridge having a wooden superstructure on granite piles.

The cost of repairing it this year has been Rupees 2,847-14-2, and the work has been done in a very creditable manner as was to be expected under the eye of the Collector, the workmen of Calicut being also very good.

CHETTOOPALUM BRIDGE AT MALAPOORUM.

This bridge for the convenience of approach to the Military Station has been built at a cost of Rupees 1,381-15-0.

TRUSS BRIDGE OVER THE POODOOR STREAM ON THE ROAD FROM ANGADDYPOORUM TO TIRROANGADY.

Estimate..... Rs. 1,725 1 0
Spent this year..... „ 450 0 0

POORAPARAMBA CUT AND HEAD SLUICE.

Estimate..... Rs. 5,735 1 0
Spent this year..... „ 2,646 10 0

This Cut is to connect the Tannoor Canal with the Venjally Lake and Keeranellore Stream, and as the latter rises in the freshes to a height of 20 feet, the Head Sluice was proposed by Captain Ludlow to keep out the floods which would be dangerous to the canal and to the country. A road way over the Head Sluice renders it of use also to the traffic on the North and South high road. On inspecting this work near the close of the last working season, it was evident that the practical difficulties of working in a quicksand had not been sufficiently allowed for in the Estimate rates, and a Supplemental Estimate was forwarded to Government who have called for a further report. An extended Notice will be given of this work in the report for next year.

CANAL FROM COOTYE ON THE PONANY BACK WATER THROUGH TANOOR AND THE VENJALLY LAKE TO KEERANELLORE.

Estimate..... Rs. 5,020 9 0

This Estimate which is for deepening and straightening, the above portion of the west coast canal, was Sanctioned late in this year, and the work it is expected will be completed in 1855 when a detailed report will be given.

OPENING A CANAL FOR CONNECTING THE PONANY AND CHOWGHAT
BACKWATERS BEING A PART OF THE WEST COAST CANAL.

Estimate..... Rs. 16,381 12 0

Expended in this year 11,273-15-9 and altogether 13,717-6-9.
The work is expected to be completed in 1855, in the report for which year the west coast Canal will be reviewed.

It is not worth while to enter the minor sums expended on repairs of roads and small works or an account of the work which though sanctioned have barely been begun. The following seem to me to be the principal requirements of Malabar.

1. The completion of the west coast canal for the boat traffic of the country.
2. Widening the Southern portion of the canal and improving the back water for navigation, so that light steamers might ply commonly between Cochin and a station upon the rail road a little to the North of the town of Ponany.
3. Improving the inland road so as to admit of their being used for carts.
4. Opening up the Carcoor and Goodaloor Ghauts for carts and making a New Ghaut or pass into Wynaud from Calicut probably in the direction of Tambercherry.
5. Attention to the irrigation of the District so as to obtain two crops from much rich land under the hills which now only produces one crop. The Province of Malabar extends along the sea coast for 145 and its breadth varies from 25 to 70 Miles. It contains 6262 square miles of which perhaps altogether 1-5th is cultivated. It differs from most other districts in the Madras Presidency in receiving the brunt of the South West Monsoon, and by these periodical rains the rice cultivation is carried on. It also exports largely pepper, cocoanuts, oil and other valuable products. The land in Malabar is the acknowledged property of the inhabitants and is lightly assessed.

The western coast being closed to all sea going trade by the violence of the south west monsoon, the canal which runs parallel to the coast is of vital importance to the prosperity of the district. There have been many interruptions to this work, but it will now come into more general

use and I hope in next year's report to be able to get some reliable information as to the extent to which it is used.

The Port of Cochin has been for some years past rapidly increasing in trade and importance; it is the residence of many English firms, and large ships are built there. Having seen the Government consulting Engineer for Railways and the Rail Road Chief Engineer on the subject, I ascertained that they were unwilling to entertain the idea of constructing a branch line, an alternative I first proposed, which should extend southward to Chetwye on the Cochin back water about 50 miles from the Port of Cochin, but they approved my notion of converting the boat canal into one suitable for steamers, and I am now preparing an Estimate for this project which I trust will meet the approval of the Government, and that before long the little steamer which Mr. Oughterson of Cochin has built for the backwater navigation may be able to extend her trips up to the railway.

The Roads generally have received much attention from the Collector and his assistants. Improvements have been every where made in widening, metalling and correcting the slopes. Bridges have also been built in great numbers, but still looking at the communications as a system, there are gaps of unmade road, and unbridged rivers, and difficult hills here and there which render it impossible to say that there are any except the trunk roads 4 and 5, and the coast road which can be called more than makeshift and imperfect cart roads. Of course all that has been done hitherto, whilst it has tended greatly to the advancement of trade, will enable us to complete a system of good cart roads at comparatively small expense.

The trunk road No. 5, itself requires improvement in its slopes and a bridge over the Tritala River. Estimates for these works will be submitted to Captain Johnston for the approval of Government and entry in the ensuing Budget. Captain Ludlow proposed and Estimated a line of road running from Calicut by Condety Malapoorum (a new military station) Angadipoorum and Mannaur to Palghat. It has not yet received Sanction, but as it was entered into the budget for 1855-56, I hope soon to hear of its being passed for execution, for it is a line of first importance both politically and commercially. There is considerable trade between Mysore and Malabar in grain and Salt carried on bullocks by means of the minor Wynaud Ghauts. The Wynaud country elevated some 3000 feet above the sea, is fast growing into prosperity on account

of its coffee estates and European planters, and the choice of that country as an abode by an enterprising race of Moplah Settlers who are spreading themselves rapidly over it. Two improved passes opened on the South would tend much to the advantage and still more rapid developments of the country.

Regarding the Carcoor pass into Wynaud and the Goodaloor Ghaut a continuation of it to the Neilgherries, some preliminary investigations have been made but I must defer this subject till after a fuller investigation.

The irrigation works of the country have principally been confirmed hitherto to dams by which, land has been reclaimed from the backwaters and inland lakes changed from salt to fresh water. Any system which could be introduced enabling the Cultivators to gain a month in the commencement of their sowing, and to grow a 2nd Crop during the dry season would be a great gain to the province. A beginning of the subject has been made in a project for a dam and Channels in the Annamully River, which I hope to mature in time to enter into the Budget of 1856-57.

The Officers and Subordinates employed in the 7th Division in 1854 as follows—Captain Ludlow acting Civil Engineer till end of September.

Captain Francis acting Civil Engineer from 1st October to 31st December.

Captain Selly 1st Assistant Civil Engineer chiefly employed as executive on the Neilgherry and the neighbourhood.

Mr. Hamilton executive Officer employed in tracing the Coonoor Ghaut.

Mr. Holland executive Officer in charge of Polachee road.

Captain Brine who succeeded to the above charge on Mr. Holland's death.

Surveyor Williams and Assistant Surveyor Martin principally employed in levelling, estimate making and drawing, &c.

Assistant Overseer Gilbanks was employed in the execution of works.

Assistant Overseer Bake Do. Captain Babington just joined as 2nd Assistant Civil Engineer

P. M. FRANCIS,

Civil Engineer 7th Division.

Coimbatore, }
5th July 1855. }

REPORT ON THE MORE IMPORTANT WORKS EXECUTED OR IN PROGRESS DURING THE YEAR 1854, IN THE 8th DIVISION.

During the year 1854 the principal works connected with irrigation undertaken in this Division were chiefly of an Ordinary description for the repair and improvement of existing works. Under the head of "Occasional" very little comparatively was done. In Madura the aggregate expenditure on Occasional works amounted only to Rupees 1808-0, and in Tinnevely to Rupees 11,702-8. The more important works included in this latter sum are as follows.

	Amount of Estimate.		Expended in 1854		Remarks.
	Rs.	A.	Rs.	A.	
<i>Tencausey Talook.</i>					
Constructing revetment to Neddoovail Coolasagarapairy Tank.....	2,842	0	1,548	6	Incomplete.
Annicut across Vello day and excavating Channel of supply to Rettacolum Tank.....	1,122	9	908	1	Do.
Constructing revetment to Keelapavoor Pereacolum and building a New sluice in the same.....	5,245	10	2,666	6	Do.
<i>Streevellapoothoor Talook.</i>					
Improvements to Calayacoorchy Annicut Channel and Tank.....	1,361	13	1,160	14	Do.

Under the head of "Ordinary" the more important works

undertaken in the year under review were those mentioned below viz.

	Amount of Estimate.		Expended in 1854		Remarks.
	Rs.	A.	Rs.	A.	
MADURA DISTRICT.					
<i>Mulacolum Talook.</i>					
Repairs to Pareanai on the Vigay River.	1,393	2	1,209	7	Completed.
Nellyoor Tank repairs.....	1,221	15	1,174	15	Do.
Thenkurray Do. Do.....	1,282	15	723	2	Incomplete.
<i>Thiroomungatum Talook.</i>					
Vencatasamoodrum Tank repairs.....	999	6	959	5	Completed.
Soondrapandiam Shencolum Do. Do.....	1,095	11	900	0	Do.
TINNEVELLY DISTRICT.					
<i>Nellumbatum Talook.</i>					
Maunoor Channel from the Chittaur.....	4,846	6	1,850	13	Incomplete.
Areanoyagapoorum Annicut repairs.....	1,075	2	1,006	14	Completed.
<i>Tencausery Talook.</i>					
Calungathyeundy Channel.....	1,553	4	1,310	13	Incomplete.
<i>Sireecigootum Talook.</i>					
Keelacaul Channel from the Murdoor Annicut.....	4,033	1	1,854	7	Do.
Velloor Tank repairs.....	5,752	12	647	11	Do.
Thenkurry Tank Do.....	6,690	3	891	15	Do.
<i>Ootapedarum Talook.</i>					
Thiroomungalacoorehy Tank repairs.....	1,192	5	900	7	Do.
<i>Tullepoor Talook.</i>					
Vizianarianum Pereacolum revetment and earth repairs to bund.....	2,540	8	1,974	1	Do.
<i>Sunkerniarcoil Talook.</i>					
Munnaloor Pereacolum Tank repairs.....	1,012	11	980	8	Completed.

The total expenditure for works of irrigation in the 2 Districts forming this Division was (approximately) as follows.

District.	Ordinary.	Emergent.	Occasional.	Total.
Madura.....	21,721	2,515	1,808 0	26,044 0
Tinnevelly.....	60,942	4,331	11,702 8	76,975 8
Total for No. 8 Division.....	82,663	6,846	13,510 8	1,03,019 8

With respect to the more important works previously executed in this Division, I regret that I am not able to give any further account of

the results obtained from them, than that entered in my report for 1852, not having received from the Collector's Office the returns of Cultivation and revenue derived from the individual works to a later period than fusly 1262. I have, however, been furnished with a return of the aggregate wet Cultivation and revenue for fusly 1263 in both Districts, and as this was an unfavorable season not only in Madura and Tinnevelly, but throughout the Eastern portion of the Presidency, a comparison between it, and former fuslies, will serve in some measure to show the present state and condition of the works in the Division generally; for, if in a confessedly bad season (no rain having fallen in either Dec. or January) the Cultivation returns do not shew any great falling off either in land or revenue, it may, I think, be concluded that the tanks and channels are in a tolerable state of preservation, otherwise, the loss to Government, as well as to the ryots, would have been much greater than it was. Subjoined is the Statement for fusly 1263.

DISTRICTS.	Extent of Cultivation.	Amount of Assessment.	Extent on which remission granted on account of drought.	Amount of remission.	Actual Collection.
	Acres.	Rs.	Acres.	Rs.	Rs.
Madura.....	1,13,249½	5,12,740	3,151½	10,359	5,02,381
Tinnevelly.....	1,84,809½	15,17,769	43,481½	3,44,159	11,73,619
Totals.....	2,98,059½	20,30,509	46,633½	3,54,518	16,75,991

Comparison with previous Fuslies.

DISTRICTS.	Average from Fusly 1257 to 1261.		Fusly 1262.		Fusly 1263.	
	Acres.	Ra.	Acres.	Ra.	Acres.	Ra.
Madura.....	1,05,971½	4,68,516	1,08,327	5,14,129	1,13,249½	5,02,381
Tinnevelly.....	1,76,178½	12,67,719	1,41,832	12,71,999	1,84,809½	11,73,619
Totals.....	2,82,150	17,36,235	2,50,159	17,86,128	2,98,059½	16,75,991

It is thus seen that notwithstanding the very large remission of Rupees 3,44,159 granted in Tinnevelly on account of drought and short

produce, of which Rupees 1,83,616 was on the Tambrapoorney River cultivation alone, the actual collections in that District fell short of those in fusly 1262 by Rupees 98,389 only; and the loss is even less; if the comparison be made between fusly 1263, and the average from fusly 1257 to 1261, while the collections in Madura were only Rupees 11,748 less than those of the previous fusly, and considerably above those of the average from fusly 1257 to 61. Had rain fallen in January, when it was so much required, there is no doubt that the revenue in Tinnevely for fusly 1263 would have exceeded that of any previous fusly (1257 excepted) as the extent of land under Cultivation was considerably greater than the average of previous years.

ROADS AND BRIDGES.

During the year under review, the Bridge of 6 arches, each 30' x 7½', across the Goondaur on Road No. 4 in the Thiroomungalum Talook of Madura, the foundations of which together with the piers and abutments above, were executed in 1853 at a cost of Rupees 1398, was completed with the exception of the plastering and approaches, the expenditure in 1854 being Rupees 3,106-2. It is expected that the work will be fully completed and thrown open to the Public during the current year, and in all probability there will be considerable saving on the Estimate, owing to good management, and careful supervision, on the part of the Maramut Superintendent, Palanyveloo Moodelly. Several small road Bridges and tunnels were constructed on this same road, in the Meyloor Talook, at an aggregate cost of Rupees 1,120-9, being in continuation of work performed in 1853 on an Estimate of Rupees 1,429-8, sanctioned by Government on the 10th January 1853. A further sum of Rs. 1,007-11 was expended under the head of "Ordinary" for repairing portions of the above road in Ramgherry, Meyloor and Thiroomungalum Talooks. The improvements to Road No. 15 between Madura and Dindigul, in the same District, mentioned in previous reports were brought to completion in 1854, the expenditure during that year being Rupees 880-11, making with that of former years Rupees 7,817-7. Considerable benefit to traffic has resulted from this outlay, but to put the road in good order throughout further expenditure is requisite. To the Eastward of Madura further improvements were effected to this road at a cost of Rupees 1,041-9, in continuation of work done in 1852 and 1853, and charged to the account of the Shevagungah Devastanum funds.

There is still a balance of Rupees 1,909 remaining from the sanctioned Estimate for this work, which will be carried into effect during the current year. On Road No. 5 between Meyloor and Thiroopatoor there was an outlay of Rupees 502-4 for sundry repairs and improvements, being in part of the Estimates sanctioned by Government on the 21st October 1852 and 11th January 1853, referred to in my Report for 1853. Very little remained at the end of 1854 to complete this work, and that little is probably accomplished by this time. On Road No. 14, there was considerable outlay both for Road work and Bridges. That for the former is made up of several items, together, amounting to Rupees 2,541-7, of which Rupees 1,864-1 is paid for by Government, and the remainder from the Shevagungah Devastanum funds. The Bridges across the Oopaur and a supply channel immediately adjoining it, near Padamatoor, spoken of in my Report for 1853, were plastered throughout, and considerable progress was made in the formation of the approaches in 1854, but the latter are not yet in a sufficiently advanced state to allow of the Bridges being thrown open to the Public. The expenditure on the Oopaur Bridge in 1854 amounted to Rupees 633-1, making a total of Rupees 5,555-2, while that on the Channel Bridge was Rupees 330-2, or Rupees 1461-15 including previous disbursements. The 5 arches of the Bridge across the Saragunny River on the same road, the piers and Abutments of which were constructed in 1853, were turned in 1854, and the work completed with the exception of the approaches. The outlay in 1854 amounted to Rupees 1,448-15, which, added to that of the previous year, gives a total for the whole work of Rupees 3,600-8, and leaves a balance of Rupees 471-10 to pay for the approaches, the whole of which will not however be required. The superintendence of this work, as well as the Bridges mentioned above, devolved upon the Maramut Superintendent of Shevagungah, Vencatramiah, and the manner in which they have been executed reflects great credit upon him. Their construction, and repairs which are in progress to this Road will materially improve the Communication between Madura, and the Port of Tondi. For the improvement of a portion of Road No. 18, South of Pereacolum, an Estimate of Rupees 1,879-13, was sanctioned by Government on the 20th December 1853. On this Estimate, work to the value of Rupees 1,595-13 was performed in 1854 and the remainder will be completed during the current year. For constructing some additional tunnels and

raising portions of Road No. 2, in the Iyempully Talook, an Estimate of Rupees 501-7 was sanctioned on the date mentioned above, and the expenditure for the same in 1854 amounted to Rupees 481-5. A further sum of Rupees 1,088-14, was expended under the head of "Ordinary" for general repairs to this Road, in the Nellacotta and Iyempully Talooks, under the sanction of Government dated 16th June 1853. The Ghaût leading from Pereacolum to the Pulney Hills, for completing which a further sum of Rupees 3,300 was sanctioned on the 8th October 1853, was recommenced in March 1854 under the Superintendence of Assistant Overseer Bywater, and by the end of the year about $4\frac{1}{2}$ miles of new Road, averaging $2\frac{1}{2}$ yards in width, with a slope of 1 in 12, had been constructed. The expenditure in 1854 was Rupees 2,503-12 leaving a balance of Rupees 796-4, for which sum it is expected the remaining portion will be completed during the current year. The part of the Ghaût made in 1853 has been injured a good deal here and there by the flow of water down it. It is desirable that these injuries, and others which must necessarily occur after every heavy fall of rain, should be repaired without delay, and the best way to effect this will be to have a small Establishment of mile men under a head cooly or Kunganie, kept up for the purpose, on an annual allowance, estimated at Rupees 786-14. The above are the principal works for the improvement of the Roads in the Madura District executed during the year 1854.

In the Tinnevely District, a considerable outlay took place on Road No. 4, partly in continuation of work executed in 1853, and partly on Estimates sanctioned subsequently. To begin with the former. The Virdooputty Bridge was completed at a total cost of Rupees 8,243-8, the expenditure in 1854 being Rupees 4,804-11. Further progress was made in the construction of the Road between Santoor and Odaycaraputty, a distance of about 4 miles, for which an estimate of Rupees 9,956-1 was sanctioned by Government on the 30th August 1853. The sum expended in 1854 was Rupees 5,305-12. This work, and indeed the whole of the Road and Bridge works between Santoor and Gaingoondan, a distance of 37 miles, were under the Superintendence of Assistant Overseer Smither. A small sum of Rupees 51-10 was spent in completion of work performed in 1853 to the Road South of Palamcotta, making a total of Rupees 618-15 on the sanction of Government dated 18th March 1852. The new works on this Road, commenced in

1854 were as follows, 1st A Platform Bridge of 22 Vents, each 6 feet wide, across the Katalumputty Oday, for which an Estimate of Rupees 3,990-4 was sanctioned by Government on the 26th September 1853.

The progress in this work was very satisfactory, the whole of the Piers having been completed to the required height; and the stone platforms to 7 vents laid over them. The expenditure during the year amounted to Rupees 1,845-4. 2nd a Bridge of 9 arches of $30' \times 7\frac{1}{2}'$ across the Veypullaputty River, for which Rs. 10,313-4 were sanctioned by Government on the 1st November 1853. During the year under review, the foundations and piers and abutments above were completed, and the floorings to the arch-ways constructed. The cost of the work thus far was Rupees 3,084-15. 3rd a bridge of 15 arches of 40 feet span across the Santoor River at the Cusbah station sanctioned on the last mentioned date. Here, also, good progress was made during the year under review. With the exception of the floorings to 2 or 3 of the arch-ways on the right bank of the river, for which there was not time before the rains commenced, the whole of the substructure was completed in readiness to commence the arches early in this year. The amount expended on this work was Rupees 7,366-13. On the same road, in the immediate vicinity of Palamcotta, a small sum of Rupees 325 was expended in lengthening 4 Road Bridges, and Tunnels, to afford room for bandies to pass, without injuring the Parapets. For Ordinary repairs to this road between Coilputty and the Arambooly Lines, a total distance of 87 miles, the following sums were expended in 1854.

	Estimate.	In 1853.	In 1854.	Total.
Between Coilputty and Kytaur.....	2,225 14	90 14	1,964 11	2,055 9
Do. Kytaur and Gaingoondan.....	215 4	"	176 "	176 0
Do. Shady Khan Chuttrum and Palamcotta.	160 10	"	141 14	141 14
Do. Vullyoor and Arambooly.....	342 3	63 10	278 9	342 3
Total Rupees...2,561 2				

A further sum of Rupees 7,470-6 for the improvement of this road south of Palamcotta, in the Nangoonairy Talook, was sanctioned by Government on the 15th January 1855, and the work will be put in hand

during the current year. A Bridge of 5 arches of 40 feet span across the Numbeeaur on this part of the road, and also 2 Platform Bridges across jungle streams between Coilputty and Kytaur were sanctioned under date the 15th January 1855 for execution in the Official year 1855-56.

Road No. 10, the improvement of which, between Purpanairy and Punnagoody, was commenced in 1853, had a further outlay of Rupees 631-2 upon it in 1854. This sum was expended chiefly in gravelling those parts which were raised with earth in the previous year. A balance of Rupees 1,052-2 remained at the close of the year to complete the work. On this road, in the Thencausee Talook, an Estimate of Rs. 1,956-9 for a Bridge of 36' x 9' was sanctioned by Government on the 15th March 1854, and during the same year the foundations were laid, and the abutment raised to the spring of the arch at a cost of Rupees 635-10. A small sum of Rupees 277-3 was expended in 1854 for constructing additional tunnels, and gravelling a portion of Road No. 22, leading from Palameotta to Calcaud on an Estimate of Rupees 728, sanctioned by Government on the 20th December 1853. The cross road from Arrekasavanellloor, in the Shairmadevy Talook, to the Tambrapoorney River, spoken of in my report for last year, had a further sum of Rupees 280-4 spent upon it in 1854, chiefly for gravel work. It was still incomplete at the close of the year. Some additional Bridges and tunnels were constructed on Road No. 13, leading from Pullayacoil Salt pans to Streevigoontum on an Estimate of Rupees 929 sanctioned by Government on the 9th August 1853, the cost of which was Rupees 593-3. The remainder will be completed in 1855.

Trunk Cotton Road between Streevellapoothoor and Shevacausee. This portion of the Trunk Road was completed last year under the superintendence of Captain G. Paxton. The expenditure in 1854 was Rupees 7,241-13, making, with previous expenditure, a total outlay of Rupees 17,350-9, for the whole distance of 12 ms. 2 fur. 50 yds. exclusive of superintendence. I inspected this road in the month of January last, and found it in excellent order.

A further portion of the road between Ettiapoorum and Coomara-poorum, commenced in 1853, was carried on under the superintendence of Lieutenant L. Paxton of the 43rd Regiment N. I., who relieved the 2nd Assistant Civil Engineer of the charge, on the 13th May 1854, and

continued in charge for the remainder of the year. In the course of the year side trenches and raising were completed for a distance of 5 ms. 1 fur. 200 yds. of which 4 ms. 3 fur. 132 yds. were laid with broken stone and 4 ms. 3 fur. 146 yds. with gravel, over the broken stone. Several small Bridges and Pavements were likewise constructed, and a commencement was made in laying the foundations of a Bridge of 7 arches across the Cullaur at Yeppothumvanthan, about 10 miles South of Ettiapoorum. The expenditure, exclusive of Superintendence, amounted to Rupees 10,030-12.

On the completion of the Streevellapoothoor portion of the Trunk road, I applied for and obtained the Board's permission to place Captain G. Paxton in charge of the last, and Southernmost Section of the line included between Coomara-poorum and Tuticorin, a distance of 11 ms. 5 fur. 70 yds. This Officer accordingly took charge on the 23rd September, and commenced operations on the 29th idem. From that date to the end of the year, side trenches and raising, were carried forward for a distance of 3 ms. 5 fur. 90 yds. The work was executed partly by a body of hired Coolies, or Pioneers enlisted towards the latter end of October, under the sanction of Government No. 404, dated 21st September 1854. These men are paid at rates varying from 2 to 3 annas per diem, and are superintended by head coolies, or Kunganies, one to every 50 Coolies, on a salary of Rupees 6 per mensem. Four privates of the Corps of Sappers and Miners are also employed with the Coolies as instructors. It remains to be seen, whether this experiment will answer. The quantity of work performed during the above interval was not in proportion to the number of men employed, or to the amount expended; but allowance must be made for the state of the weather, which during the months of October and November, was most unfavorable for road work, and also for inexperience on the part of the Coolies, many of whom are new to this kind of work. The total expenditure during the year, exclusive of superintendence; was Rupees 1,138-4, of which Rupees 638-4-8 was for work done by village Coolies, and the remainder for the Pioneers.

On the Cross Cotton Road between Coilputty, and Ettiapoorum, there was no work executed in 1854, the repairs and additions mentioned in my last report under this head, having been postponed till 1855.

Branch Cotton Road. The portion of this road lying within the Ramnad limits, in the Madura District, had a small outlay of Rupees 87-6 upon it during the year 1854, for constructing a pavement and cutting a channel to it for the better drainage of the road. In the Tahpathy limits, the work was fully completed at a total cost of Rupees 8,135-8, the distance being 2 ms. 1 fur. 35 yds. This has proved a very expensive portion of the road. The whole of the broken stone, and gravel, had to be carried on Carts from a distance of 2½ miles, and cost is nearly double the amount allowed in the Original Estimate. The total length of road completed in the above mentioned 2 limits, and paid for from the funds of Government is 12 ms. 2 fur. 175 yds., and the total expenditure for the same Rupees 27,299-15. In the Tinnevely limits, a further distance of 1 ms. 7 fur. 156 yds. was completed, and 3 ms. 4 fur. 109 yds., commenced in 1854. The Bridge of 3 arches of 24 span across the Thotagoundenputty stream, commenced in 1853, was fully completed, and another Bridge of the same dimensions across the Mailakaranthy stream nearly so in 1854. The expenditure for the year amounted to Rs. 14,259-13, making with previous expenditure a total of Rs. 26,175-12, exclusive of Superintendence. This road was under the superintendence of the 2d Assistant Civil Engineer up to the 3d April, and subsequently under that of Mr. W. Harrington appointed on the 27th January 1854.

PUBLIC BUILDINGS.

The principal items of expenditure in 1854 on account of public buildings in Madura and Tinnevely, were as follows.—

DISTRICT.	Amount of Estimate.	Expended in 1854.	In previous years.	TOTAL.
<i>Madura.</i>	R. A.	R. A.	R. A.	
Additional Record room and up stair room to Hoozoor Cutcherry at Madura.....	2,398 8	1,800 15	496 8	Incomplete. 2,297 7
Talook Cutcherry at Manaparay in the Ramgherry Talook...	3,007 4	1,488 15	1,279 7	Incomplete. 2,768 6
Traveller's Bungalow at Culputty on Road No. 1.....	437 13	211 3	173 9	Incomplete. 384 12
Constructing 2 additional wards adjacent to the Civil Hospital at Madura.....	449 11	449 11	0	Complete. 449 11
Repairing sub Collector's Cutcherry at Dindigul, and adding tiled communication...	1,016 9	948 9	0	Incomplete. 948 9

DISTRICT.	Amount of Estimate.	Expended in 1854.	In previous years.	TOTAL.
<i>Tinnevely.</i>	R. A.	R. A.	R. A.	
Police Cutcherry at Wattrap in Streevellapoothoor Talook.	1,586 11	258 7	156 4	Incomplete. 414 12
Frontier chowkey at Ellenjee in the Thencasey Talook...	659 11	306 12	349 15	Complete. 656 11
Talook Cutcherry at Sautoor...	3,099 9	2,910 2	0	Incomplete. 2,910 2
Do. at Streevellapoothoor...	1,164 4	300 6	0	Incomplete. 300 6
New Court House at Tinnevely, and repairing old one...	3,886 6	1,154 7	0	Incomplete. 1,154 7

In addition to the above, the undermentioned Chuttrams in the Tinnevely District were, in part constructed during the year 1854 at the expence of the Surplus Chuttram fund of the District, viz.

NAME OF WORK.	Amount of Estimate.	Expended in 1854.	In previous years.	TOTAL.
Culputty Chuttrams on Road No. 1.....	R. A. 1,979 0	R. A. 1,632 13	R. A. 392 7	Incomplete. 1,425 4
Sethaparanelloor Chuttrams on Road No. 9.....	4,979 0	2,661 5	2,134 3	Incomplete. 4,795 8
Allaghayapandeapooram Chuttrams on Road No. 2.....	4,979 0	746 0	0	Incomplete. 746 0

The filling up of the Minah Teppacolum at Madura, commenced in 1853, was continued in the following year, but not fully completed. The expenditure in 1854 was Rupees 1,100, making with the previous expenditure, Rupees 2,440-12 paid for, from the Surplus Devasthanam funds.

During the year under review the Civil Engineer Department in this Division, consisted of the following Officers, Surveyors, &c.

- One Civil Engineer,
- One 2nd Assistant Civil Engineer,
- Two Assistant Revenue Surveyors,
- Two Assistant Overseers.

With the exception of about 6 weeks at the beginning of the year during which I made my usual annual tour through Madura, my own time was occupied in Tinnevely. The 2d Asst. Civil Engineer, Lieutenant G. M. Payne, was employed until the 13th May in superintending the Trunk Cotton Road, after which he proceeded to Madura, and was engaged in that District for the remainder of the year, in examining works under execution, and in surveying, and estimating, for the repair and improvement of Roads Nos. 1, 18 and 15.

The two Assistant surveyors were employed one in Madura, and the other in Tinnevely, in examining works in progress, and in estimating for others requiring repair in 1855.

Assistant Overseer Bywater, was employed for the greater part of the year, in superintending the work on the ghatt leading from Peralacolum to the Pulney Hills. During the month of April he was on leave at Panmben, and for 28 days, partly in October and partly in November, he was under medical treatment at Madura.

Assistant Overseer Sraithier was engaged throughout the year in superintending the repairs, and improvements to Road No. 4, between Madura and Palameotta, and the construction of the several large Bridges, on the same road, mentioned in a former part of this report.

As respects the present state of the Division in an Engineering point of view, I do not see that I can add any thing to what has been already said in previous Reports, and in this also, as far as regards irrigation. A new system is shortly to be introduced, and the whole of the Executive transferred to the Engineer Department. Advantage should be taken of the opportunity to lay down some general rules for the due preservation of public works, particularly those connected with irrigation, many of which are wantonly injured by the ryots, or their servants. And if such is the case now with the Department in the hands of the Collector and his subordinates, what will it be when this check is removed? If the District Engineer is to have the general charge over all the works in the District to which he is attached, he must have the means of punishing those who wilfully injure those works. Rules and regulations also are very much wanted in regard to the distribution of water. It does not seem to be clearly understood at present, to whom the water belongs, and whether the Collector, or the Civil Engineer can in-

terfere in the distribution of it; that is, supposing any particular tank, supplied by a river channel, has sufficient and more than sufficient water for its own cultivation, whether water may be taken by the same channel to another tank which is in danger of losing its crop for want of a sufficient supply. This is always resisted by the Meerassadars, though in general the authority of the Collector overcomes the difficulty. But how will it be when the works are handed over to the Engineer Department? Unless there is some legislation, and well defined rules are laid down, the probability is the District Engineer, if he attempts to interfere in such matters, will find himself involved in endless Civil Suits in the local Courts.

As respects new works for the improvement of the districts forming this Division, having but very lately given my opinion on this subject at considerable length in a letter to the Chief Secretary to Government, in reference to the memo, dated 5th July 1854, drawn up by the Chief Engineer and other Officers, I need not do more here, than give an outline of the several projects therein suggested. They are as follows.

ROADS.

Madura.

1. To construct a Bridge across the River Vigay at Madura on Road No. 4, and connect it with Road No. 15 by a new line of Road along the right bank of this river.
2. To improve Road No. 1 leading from Dindigul to Trichinopoly, for which an Estimate of Rupees 14,171-9 has been forwarded for Sanction.
3. To perfect those portions of Road Nos. 2, 4, 13, 14, 15, 16 and 18, which have not been made, and to keep in repair those which are made by means of annual grants or mile men.
4. To connect Madura with the Branch Cotton Road at Arcopocotta, for which a survey and Estimate will shortly be prepared.
5. To repair and improve Roads Nos. 17, 19 and 23, for which surveys and Estimates are under preparation, and generally to improve the communications between the Cusbah stations.

TINNEVELLY.

1. To complete the construction of Road No. 4 between Madura and Palameottah.
2. To construct Road No. 1 so as to connect Streevellapoothoor in Tinnevely, with Thiroomungalum in Madura.

3. To improve a further portion of Road No. 1 between Streevellapoothoor and Thencausee, and also Nos. 2 and 9 connecting the Cusbah Towns of Sunkerninaccoil, Thencausee, and Tinnevelly respectively.

4. To construct a good metalled Road between Palamcottah and Tuticorin, for which an Estimate of Rupees 67,363-10 has been prepared, and will be submitted shortly for sanction.

5. To construct a similar road from Palamcotta to the Port of Colasagaraputnam, on an Estimate of Rupees 69,460-2.

6. To keep in repair those Roads which have been made by means of annual grants or mile men.

CANALS.

1. The extension of the Eastern Coast canal to the Port of Tuticorin, and eventually perhaps to Travancore.

2. To connect the Tambrapoorney irrigation Channels, so as to form a navigable canal from Culladacoorchy to Tuticorin, a distance of 80 miles—and a Canal from Streevigoontum to Colasagaraputnam, 27 miles

IRRIGATION WORKS.

1. Reservoirs at the foot of the Pulney Hills in Madura.
2. Reservoirs in the valley of the Tambrapoorney above, and below the falls of Paupanassum.

3. The construction of an Anicut across the Tambrapoorney River at Streevigoontum, with channels from it to Tuticorin on the North and Colasagaraputnam on the South—an Estimate of Rupees 3,59,172-5 for this work has been prepared, and will shortly be submitted for sanction.

4. Turning some of the streams on the Eastern Ghâts, which now run waste into Travancore, for the improvement of the North western portion of Tinnevelly.

5. The restoration of old and breached tanks in the Sautoor and Ootapedarum Talooks, in particular one near Sevellapairy, which was formerly supplied by an Anicut across the Chittaur below Gaingoon-dan.

As respects the Ports of these 2 Districts, I have nothing to add to the account given of them in my Report for 1853.

W. H. HORSLEY, Captain.

Civil Engineer 8th Division.

Civil Engineer's Office, 8th Division,
Tinnevelly District, Veerapandiempulnam,
11th May 1855.

Statement shewing the number of Officers &c., employed in No. 8, Division during the year 1854, the number of works examined or superintended, and the amount of salary drawn by each individual.

NAME OF OFFICERS. &c.	Designation.	Number of days employed in the Division.	WORKS EXAMINED.		WORKS ESTIMATED.				Amount of salary.	Percentage on the works ex- amined or su- perintended by each Officer or Supervisor.			
			No.	Amount.	No.	Amount.							
						Rs.	A.P.						
Captain W. H. Horsley	Civil Engineer	365	207	1,15,888	111	73	1,52,194	11	00,860	0	0	8	81 9 1/2
Lieut. G. M. Payne.	2nd Asst. Civil Engineer	232	88	20,902	4	25	31,714	10	01,454	1	1	7	15 10 1/2
Mr. F. Mason.	Assistant Surveyor	365	63	37,229	5	199	43,451	1	02,047	9	5	5	50 2 1/2
Mr. D. McNair.	Do.	365	150	39,080	4	135	1,06,252	14	01,695	0	0	4	54 1/2
2nd Corporal W. H. Bywater.	Assistant Overseer.	365	2	2,450	15	1	0	0	0	527	5	0	21 80 4 1/2
Do. T. Smither.	Do.	365	6	20,249	3	0	0	0	0	718	4	6	88 3 1/2
Lieut. G. M. Payne.	Supt. Trunk Cotton Road between Ettimparum and Conmarapoorum	733	1	3,591	8	0	0	0	0	840	14	11	23 67 4 1/2
Lieut. L. Paxton.	Do.	232	1	6,429	3	0	0	0	0	01,454	1	1	22 93 1 1/2
Captain G. Paxton.	Supt. of do. between Coom- marapoorum & Tuticorin	100	1	1,138	4	0	0	0	0	626	10	8	55 16 3 1/2
Do.	Do. of do. between Stree- vellapoothoor and Sheva- cauee.	232	1	7,241	13	0	0	0	0	01,466	0	0	20 310 9 1/2
Lieut. G. M. Payne.	Superintendent Branch Cotton Road	93	1	3,756	8	0	0	0	0	840	0	0	8 40 3 1/2
W. Harrington, Esq.		272	1	10,503	5	0	0	0	0	02,225	0	0	21 211 6 1/2

W. H. HORSLEY, Captain,
Civil Engineer 8th Division.

Civil Engineer's Office, 8th Division Tinnevelly
District, Veerapandiempulnam 11th May, 1855.

Statement shewing the amount expended on Public Works in No. 8 Division during the year 1854.

Description of Work.	Madura.		Tinnevely.		Total.		REMARKS.
	Rs.	A.	Rs.	A.	Rs.	A.	
<i>Works of Irrigation.</i>							
Ordinary.....	21,721	0	60,942	0	82,663	0	These amounts are only approximate, as the bills have not yet been prepared in the Collector's Office.
Extraordinary.....	2,515	0	4,331	0	6,846	0	
Occasional.....	1,808	0	11,702	8	13,510	8	
<i>Works not of Irrigation.</i>							
Roads and Bridges.....	20,297	12	46,258	5	66,466	1	
Civil Buildings.....	3,811	12	5,912	7	9,723	3	
Chuttrams.....	241	13	4,581	8	4,822	5	
Military Buildings.....	0	0	0	0	0	0	
Grand Total Rs. 1,84,033							1

Civil Engineer's Office 8th Division
Tinnevely District Veerapandi-
putnam, 11th May 1855.

W. H. HORSLEY, Captain,
Civil Engineer 8th Division.

REPORT OF IMPORTANT WORKS EXECUTED IN THE 9TH DIVISION DURING THE YEAR 1854.

THE PRINCIPAL WORKS EXECUTED DURING THE PAST YEAR IN THE
9TH DIVISION WERE AS FOLLOWS.

Irrigation.

Completion of the extension of the Irrigation Channel, and Masonry works connected with it in the Hoondah of Paltalagam in the District of Ganjam.

Head Sluice to the Polaki Channel in the Wadadah Talook in the Do. of Do.

Do. Do. to the Jullmoor Do. in the Do. Do. in the Do. of Do.

Repairs to the Duggadah Annicut, and Sluices in the Golgondah Talook in the District of Vizagapatam. New Tank in the Town of Vizagapatam.

TRUNK ROAD DEPARTMENT.

Completion of a Bridge of 10 Arches of 30 feet span over the Shadda Nuddie, near the Town of Vizagapatam. Commencement of a Bridge of 10 Arches of 30 feet span over the Toonee River, near the Town of the same name.

The completion of Trunk Road including several small Masonry works between the Towns of Toonee, and Yellamanchilly.

Commencement of the Trunk Road between Soobarum, and Chittivulsah.

Commencement of Trunk Road from Chicacole towards Itchapore.

Do. of a Bridge of 25 Arches of 12 yards span each, over the Nau-goolea River near the Town of Chicacole.

Repairing Trunk Road from Itchapore to Hooma.

BRANCH ROADS.

VIZAGAPATAM DISTRICT.

Completion of Road from Vizagapatam to Vamoolavulsah,
Construction of 3 Bridges on the Road from Do. to Do.

Construction of Road from Vizagapatam to Ankapilly.
 Do. of Do. from the Ferry at Vizagapatam via Puchadarlah to Poolapurtee on Trunk Road No. 6.
 Do. of Do. from Nursipatam to join the Trunk Road No. 6. at Thalapollem.
 Do. of Do. from Do. towards Gulgondah.
 Do. of Do. from Do. via Urutlah to Polarum.
 Do. of Do. from Tautipurty at the foot of Ghaüt near Madgole to join Trunk Road No. 6. between Ankapilly and Cassimetta.
 Do. of Do. from Palcondah to Chapurpilly.
 Do. of Do. from Do. to Parvatipore.
 Do. of Do. from Parvatipore to Boundary of Bobbily Zemindary.
 Pass into the Jeypore country from Parvatipore.
 Pass into the Do. Do. from Tautipurty.

BRANCH ROADS.

GANJAM DISTRICT.

Execution of repairs and Masonry works to Road from the Town of Chicacole to Port of Calingapatam. Repairs to Road from Berhampore to Gopaulpore.

Construction of Road from Do. to Russelecondah.

Do. of Do. from Russelecondah to Koinjoro.

Commencement of Road from Kinedy to Poody within the Kinedy Zemindary.

Do. of Road from Kinedy to Nursipetta within the Do. Do.

Do. of Do. from Palcondah to the town of Chicacole, with branch from Chintadah to Gaura on the Road to Calingapatam.

GANJAM DISTRICT.

PATTALAGAM HOONDAH.

Irrigation Channel, Caligulah, and Sluices.

Estimate Rupees..... 3,551 *

Expenditure in 1854 Rs..... 1,504

Expenditure up to 1854 Rs. about..... 3,300

Superintended at the commencement by Lieutenant I. S. Ross, Assistant Civil Engineer, salary Rs. 193, and latterly by Sub Assistant Revenue Surveyor A Colquhoun salary Rs. 103-8-8.

Very important work, completed in August last, and has perfectly answered the object in view viz. that of supplying the Paltalagarm Hoondah.

GANJAM DISTRICT.

WADADAH TALOOK.

HEAD SLUICE ACROSS THE POLAKI CHANNEL.

Ordinary Estimate, Rupees..... 4,124 15 0

Expenditure, Rupees..... 3,002 11 8

Superintended by Sub Assistant Revenue Surveyor A. Colquhoun. Salary, Rs. 103-8-8.

Completed in July last, but the very high freshes in the river carried away the wing walls, which are being rebuilt this year.

HEAD SLUICE ACROSS THE JULLMOOR CHANNEL.

Ordinary Estimate, Rupees..... 3,461 12 0

Expenditure, Rupees..... 2,128 10 7

Superintended by Sub Assistant Revenue Surveyor A. Colquhoun. Salary, Rs. 103 8 8.

Completed in July last. Both these works in consequence of the country being subject to floods annually, were built in compliance with Captain Rundall's request. The estimates for the same inserted in the Ordinary list for the year.

VIZAGAPATAM DISTRICT.

GOLGONDAR TALOOK.

REPAIRS TO DUGGADAH ANNICUT AND SLUICES.

Ordinary estimate, Rupees..... 2,082

Expenditure about, „ 1,800

Superintended by Assistant Surveyor J. Georges. Salary Rs. 141-4-0.

A very important work, and was executed as "Ordinary" agreeably to the orders of the Board. Revenue dependent thereon Rs. 11,422.

Work completed with the exception of a portion of the Wall adjoining the Annicut. By new arrangement of Sluices, the Head of Channel has been kept in good order, and breaches prevented as formerly. The Tanks dependent on this channel were all filled the last season. The work progressed but slowly at first, on account of sickness amongst the neighbouring Villages, and on the work itself. The remaining work is being completed this year.

VIZAGAPATAM.

NEW TANK IN TOWN.

No Estimate.

ExpenditureRs. 2,793 0 6.

Work was executed agreeably to the sanction of Government without an Estimate. In the heavy Rains in July, the Bund was breached—the Earthwork not having had time to settle, and the stone facing not having been placed at a proper slope. It has been since repaired and has proved of much use to the townspeople. This work gave employment to a large number of the poorest inhabitants in the place during the season of scarcity.

TRUNK ROAD DEPARTMENT.

VIZAGAPATAM.

BRIDGE OF 10 ARCHES OF 30 FEET SPAN OVER THE ANKAPILLY RIVER.

Estimate.....Rs. 10,567 8 0

Expenditure in 1854....., 4,356 8 7

Expenditure up to completion ,, 9,878 15 7

In 1853, this work was superintended by Assistant Supervisor Robertson salary Rs. 75, afterwards by Lieutenant B. W. Magrath Asst. Superintendent of Roads salary Rs. 150.

The particulars of this work have been already detailed in the Report for 1853, has been satisfactorily executed, and sustained no injury during the very heavy Freshes of last year, although the water rose 2 feet above the crown of the Arches, and spread in both sides of the Bridge for a mile, covering the Road from 5 to 6 feet in depth. By a return taken in April 1854, 1,230 Loaded Bandies, 1,500 Loaded animals, and about 7,500 foot passengers crossed this River daily. The Bridge was completed early in April 1854, and was of very great service during the last Monsoon.

COMMENCEMENT OF BRIDGE OF 10 ARCHES OF 30 FEET SPAN EACH OVER THE TOONEE RIVER.

Estimate.....Rs. 10,567 8 0

Expenditure....., 6,467 6 8

Superintended partly by Lieutenant B. W. Magrath and partly by Captain H. J. Anderson Assistant Superintendents, salary each Rs. 150, and Road Maistry T. Raurniah salary Rs. 55.

Of the same dimensions as the above. The Piers, abutments and flooring were all finished last year. Captain Anderson having resigned at the commencement of the Monsoon in September, and no Officer having been since appointed, nor any experienced Overseer available for superintending the work, the turning of the arches could not be commenced during the present working season.

EXTENSIVE REPAIRS TO TRUNK ROAD FROM TOONEE TO YELLAMUNCHILLY.

Estimate.....Rs. 26,771 0 5

Supplemental Estimate. ,, 11,707 2 6

Expenditure in 1854....., 12,580 13 0

Total... Do., 24,362 13 0

Superintended by Lieutenant B. W. Magrath, and Captain H. J. Anderson Assistant Superintendents, salary each Rs. 150, and by Road Maistry T. Raurniah salary Rs. 55. A portion of about 12 miles was nearly finished in 1853, as also 5 Bridges, 10 Tunnels and 202 yards in length of Road Dams, as enumerated in the last report. The Road was completed about the end of the year. The total number of Cubic Yards of Earthwork amounting to 76,286 at a cost of Rs. 2,873-2-0 including levelling &c., 13,009 Cubic yards of gravel, and 16,323 Cubic yards of Metalling have been spread on the line, at a cost of Rs. 7,733-12-6. Cost for Masonry Works, Rs. 6,476-2-6. Most of them constructed in 1853, but those built in 1854, are as follow—

- 1 Bridge of 3 Arches of 4 Yards Span.
- 2 Do. of 2 Do. of 3 Do.
- 1 Do. of 1 Do. of 4 Do.
- 2 Do. of 2 Do. of 2 Do.
- 1 Do. of 1 Do. of 3 Do.
- 8 Tunnels of 1 Vent of 1 Yard Span.
- 5 Do. of 1 Do. of 2 Do.

Portions of this Road from Yellamunchilly to Soobarum were completed in the years 1851 and 1852. A part of this Road from Toonee to Soobarum sustained considerable damage during the Freshes last year, having been breached in several places, a great portion of the gravelling washed off, and the metalling left bare. Several small Irrigation Tunnels having been required, a supplemental Estimate was submitted and sanctioned. The Estimate amounted to Rs. 11,707-2-6 from which after

deducting the balance of the original Estimate, the unexpended balances of the Annual Repairs for the years 1853-54 and 1854-55, the sum sanctioned by Government amounted to only Rs. 5,292-10-11. The work as per Supplemental Estimate, and a Bridge of 3 Arches over the Poolee Calamah Nullah between Anakapilly and Soobarum is now in progress under the superintendence of Maistry T. Raumiah. An Estimate is being prepared for submission for compensation to be paid for Houses that it will be necessary to remove on the line passing through the Town of Anakapilly.

The Traffic along this line has greatly increased since last year.

TRUNK ROAD FROM SOOBARUM TO CHITTIVULSAH.

Estimate Rupees.....	15,709 9 6
Expenditure Rupees.....	2,042 2 8

Superintended by Road Maistry T. Raumiah. Salary, Rs. 35.

Eight miles of this Road have been trenched, and 8,915 Cubic yards of gravel carted to Road side was commenced in August last, but little work is done last year. The estimate at present provides for earthwork to Road only. An estimate is under preparation for Masonry works.

At Chittivulsa the small Bridge of 3 arches of 10 yards span built near the large Bridge was entirely washed away during the freshes of last season; the large bridge however sustained no damage. An estimate for the reconstruction of another Bridge of 5 arches of the same span with a masonry flooring, amounting to Rs. 5,165 8 4 has received the sanction of Government, but has not yet been commenced from the want of an officer to superintend the construction of the same.

TRUNK ROAD FROM CHICACOLE TOWARDS ITCHAPORE.

Estimate at 500 Rs.....	per mile.
Expenditure Rs.....	12,963 6 2

Superintended by Lieutenant W. C. Palmer Asst. Superintendent of Road. Salary Rs. 150.

A new street has been formed through the Town of Chicacole 8 yards broad, compensation paid for the houses, and 5 Road Tunnels of 1 yard span each built Earthwork has been thrown up from Chicacole to Teekaly Ragoonathpooram a distance of 30 miles. Metalling and materials for Bridges have been collected. Not much work carried on last year as the officer appointed for this line joined in June only. An estimate

for masonry works from Chicacole to Suntheshapoorum a distance of 40 miles, has been forwarded amounting to Rs. 1,14,404 15 6, but not yet sanctioned. One for the remaining portion of this line from Suntheshapooram to Itchapore will be prepared shortly.

TRUNK ROAD DEPARTMENT.

BRIDGE OF 25 ARCHES OF 12 YARDS SPAN OVER THE NAUGOOLEA RIVER AT CHICACOLE.

Estimate Rs.....	29,285 2 10
Supplemental Do. Rs.....	10,048 8 3
Expenditure Rs.....	11,614 6 2

Superintended by Lieut. W. C. Palmer Asst. Superintendent of Roads. Salary, Rs. 150, and at the commencement by Asst. Supervisor T. Robertson. Salary Rs. 75.

The work performed up to 31st December last was as follows—

- 4 Wing Walls.
- 2 Abutments.
- 3 Piers to height of 2 yards each, and the approaches to the Bridge formed.

These were built under the superintendence of Asst. Supervisor T. Robertson, Lieut. Palmer having arrived in June only, from which time till the beginning of December, no work was carried on, on account of the constant freshes of the River. The work was commenced again on 4th December, and has made rapid progress. The original estimate not having provided for the facing to Piers with cutstone, and it having been found necessary to raise them 2 feet 3 inches more, as also the item for baling and superintendence insufficient, a supplemental estimate was prepared and sanctioned. This work together with the Trunk Road from Chicacole towards Itchapore afforded employment to hundreds of Coolies daily, during the season of scarcity.

TRUNK ROAD FROM ITCHAPORE TO HOOMMA.

Estimate Rs.....	39,567 0 8
Supplemental, Do. Rs.....	11,741 7 5
Expenditure Rs.....	15,264 5 5

Superintended by Asst. Overseer Hopkins, monthly salary Rupees 93-15-1, and Native Superintendent M. Caumarange, Salary Rs. 28.

3½ miles completed. Earthwork executed to 7 miles more, and a Bridge of 2 Arches of 10 yards Span built over the Denda Gedda. The foundations and walls of 20 Bridges and Tunnels have been built. By returns taken at the Denda Gedda Bridge, from 300 to 400 Bandies passed daily. This Bridge was much injured during the very heavy rains of October 1854; a supplemental estimate for its repair, providing for 3 Arches in the stead of two, sufficient water way not having been allowed, and additional Masonry works to complete the line, has been submitted.

BRANCH ROADS.

VIZAGAPATAM DISTRICT.

COMPLETION OF ROAD FROM VIZAGAPATAM TO VAMOO LAVULSAH.

Estimate Rs.	7,065	14	4
Supplemental Do. Rs.	1,500	0	0
Expenditure in 1854 Rs.	1,500	0	0

Total Do. Rs. 8,565 0 0

Supervised by the Principal Assistant Collector.

This line is completed with the exception of 3 Bridges, hereafter mentioned, now under execution. It connects Vizagapatam with the Northern Trunk Road.

THREE BRIDGES VIZ. HANOMUNTEWAKAH, MARREWULSAH AND GUMBEERUM.

Estimate.....Rs.	8,565	10	6
Expenditure.....	3,383	12	0

Superintended by Assistant Surveyor J. Georges. Salary Rs. 141-4-0.

The first of 5 Arches of 10 yards span—finished with exception of 2 Arches.

The second of 4 Arches of 10 yards span foundation of one abutment laid.

The third of 3 Arches of 10 yards span—abutments and Wing Walls completed.

These Bridges will be completed during the working season of 1855. The Hill streams which they will span have hitherto much impeded traffic.

THE CONSTRUCTION OF ROAD FROM VIZAGAPATAM TO THE TRUNK ROAD AT ANAKAPILLY.

Estimate.....	Rs.	8,722	8	5
Expenditure in 1854....	„	1,831	7	8
Total Expenditure.....	„	9,917	11	3

Superintended partly by Asst. Supervisor Robertson. Salary Rs. 75, and partly by Assistant Rev. Surveyor Georges. Salary Rs. 141-4-0, and in 1854, by Lieutenant B. W. Magrath Assistant Superintendent of Roads. Salary 150 Rs.

This line connects Vizagapatam with the Trunk Road at Anakapilly, a place of much importance. By this branch line, the rich talook of Survasiddy is connected with Vizagapatam. During the last Monsoon it was much damaged. Additional masonry works are also required, and a supplemental Estimate has been submitted for its thorough completion.

CONSTRUCTION OF ROAD FROM THE FERRY AT VIZAGAPATAM VIA PUNCHADARLAH TO POOLAPURTEE ON TRUNK ROAD NO. 6.

Estimate at 500 Rs. per mile.

Expenditure.....Rs. 10,496 13 4

This line connecting Vizagapatam with a rich tract of country lying between the Trunk Road and the Sea, required an outlet for its produce. Large quantities of rice, grain &c. are daily brought by it to Vizagapatam. The construction of this line at a season of great scarcity was the means of preserving the lives of thousands who must otherwise have perished from want. It is open to traffic for a distance of about 12 miles, and its completion for a further distance of 7 miles via Punchadarlah to Poolaparty on Trunk Road is very desirable. Estimates for extending the same, and completing it throughout with Masonry Works, are being prepared. The Ferry at Vizagapatam is crossed by Bandies without difficulty by means of a large Ferry Boat.

CONSTRUCTION OF ROAD FROM NURSIPATAM TO JOIN TRUNK ROAD NO. 6 AT THALAPOLLEM.

Estimate at 500 Rs. per mile.

Expenditure.....Rs. 10,057 4 0

Superintended by Lieut. W. Syme. Salary Rs. 191-4-0. Gravelled, metalled, and all nullahs made passable for 7 miles, and 3 miles trenched

for which gravel and metal were being collected. The Jungle cleared to Thalapollem with the exception of 2 miles.

CONSTRUCTION OF ROAD FROM NURSAPATAM TO GOLGONDAH.

Estimate.....Rs. 500 per mile.

Expenditure.....Rs. 1,181 7 0

Superintended by Lieut. W. Syme. Salary Rs. 191 4 0

Earthwork has been finished for 2½ miles, metalling collected for most of the low parts, and gravelled for about ½ mile. From Golgondah to Makkaram distance 10 miles, a Road is very desirable. An Estimate for the same is in course of preparation.

CONSTRUCTION OF ROAD FROM NURSAPATAM VIA URTILAH TO COAST OF POLABUM.

Estimate at 500 Rupees per mile.

Expenditure.....Rs. 3,633 1 0

Superintended by Lieut. W. Syme salary Rs. 191 4 0

The first 6 miles from Nursapatam has been metalled. The construction of the roads connecting Nursapatam with the Northern Trunk Road, and the Coast, has given employment to many during the late season, and a direct communication will be shortly established with the hitherto little known hill tracts of Nursapatam and Golgondah. Estimates for completing these roads with Masonry works are being prepared.

CONSTRUCTION OF ROAD FROM TAUTIPURTY AT THE FOOT OF THE HILLS NEAR MUDGALE, TO JOIN TRUNK ROAD NO. 6 BETWEEN ANAKAPILLY AND CASSIMCOTTAH.

Estimate at 500 Rupees per mile.

Expenditure.....Rs. 4,484 7 4

Superintended by Lieut. J. Flint Asst. to the Civil Engineer. Salary, Rs. 193.

Earthwork for a distance of 8½ miles completed. 7,132 Cubic yards gravel and 6,966 Cubic yards metalling collected. Much work was not performed on this line last year, as Lieut. Flint was ordered to his Regiment in July, and joined the Division on the 15th December only, during which time, but very little work was executed.

ROAD FROM PALCONDAH TO CHEEPERPILLY.

Estimate at 500 Rs. per mile.

Expenditure.....Rs. 13,940 14 4

Superintended at the first instance by Capt. J. Biggs, afterwards by Captain J. H. Wright, salary Rs. 191-4-0.

Earth work and Masonry works completed for 9 miles of the Line. From Cheerpilly to Vizianagram a Road has already been made by His Highness the Rajah of Vizianagram.

ROAD FROM PALACONDAH *via* VEERAGHOTTAM TO PARVATTIPORE.

Estimate at 500 Rs. per mile.

Expenditure.....Rs. 2,131 13 4

Superintended partly by Captain J. Biggs and Captain J. H. Wright, salary each Rs. 191-4-0.

Earth work from Palcondah towards Veeraghottam completed for 7 miles, and some masonry works built.

ROAD FROM PARVATTIPORE TO BOUNDARY OF BOBBILY ZEMINDARY.

Estimate at 500 Rs. per mile.

Expenditure.....Rs. 1064 6 2

Earth work to Boundary of the Bobbily estate a distance of 5 miles completed; the line thence to Vizianagram will be constructed by Zemindary Proprietors.

PASS INTO THE JEYPORE COUNTRY FROM PARVATTIPORE.

No Estimate.

Expenditure.....Rs. 2,098 13 8

Superintended by Asst. Overseer J. Gammon, salary Rs. 40.

Jungle cleared for about 15 miles, and the Road made passable for 9 miles from Parvattipore to a Village called Vikrampooram; work executed only from January to April 1854, as the Overseer and Writer, were sick, and resigned.

PASS INTO THE JEYPORE COUNTRY FROM TAUTIPURTY.

No Estimate.

Expenditure.....Rs. 6,744

This together with the above Pass, were executed agreeably to an advance of Rs. 10,000 granted by Government—Jungle cleared for a distance of 9 miles or about three fourths of the length of Ghaut. Much work could not be executed as Lieut Flint was with his Regiment from July till December, during which time very little or no work was carried on.

GANJAM DISTRICT.

BRANCH ROADS.

THE EXECUTION OF REPAIRS AND MASONRY WORKS TO ROAD FROM THE
TOWN OF CHICACOLE TO PORT OF CALINGAPATAM.

Estimate.....Rs. 10,946 9 0

Expenditure in 1854 ... „ 4,633 0 0

Total Expenditure.....Rs. 12,433 0 0

Superintended partly by Lieut. J. S. Ross, Salary Rs. 193, and by
S. A. Rev. Surveyor A. Colquhoun. Salary Rs. 103-8-8.

The remaining Masonry Works and portions of Road were finished last year. A Supplemental Estimate has been submitted, for completing the line into Calingapatam, the original Estimate being insufficient and not providing for several Irrigation, and Drainage Tunnels, &c.

REPAIRS TO ROAD FROM BERHAMPORE TO GOPALPORE.

Estimate.....Rs. 5,302 5 8

Expenditure in 1854..... „ 2,699 12 8

Total. Do.Rs. 4,302 5 8

Superintended by Native Superintendent M. Caumarauje, Salary Rs. 28.

Line completed and now in very good order.

ROAD FROM BERHAMPORE TO RUSSELCONDAN.

Estimate.....Rs. 1,42,246 0 0

Expenditure in 1854.. „ 32,946 5 5

Total. Do.Rs. 36,718 14 0

Superintended by Lieut. R. K. Macquord Salary Rs. 190.

Considerable progress has been made in the construction of this Line, which, with the exception of the Bridges over the Rooshkoolea River at Aska, and the Godhall Nullah at Injilly will be completed this next June. The Piers and abutments to the Tryilly and Rooshkoolea Bridges will also be raised their full height, and I trust also all the Earthwork between Aska and Russelcondan.

COMMENCEMENT OF ROAD FROM RUSSELCONDAN TO KOINJORE,

Estimate on average...Rs. 28,700 0 0

Expenditure..... „ 11,383 7 0

Superintended by Lieut. H. Thurburn, Salary Rs. 200.

But a small portion of the Road has been laid out, Lieut. Thurburn having resigned, shortly after the work was commenced. The Line should be regularly surveyed and Estimated for, before any further money is laid out on it.

COMMENCEMENT OF ROAD FROM KIMEDY TO POODY WITHIN THE KEMEDY
ZEMINDARY.

Estimate.....Rs. 23,352 11 7

Expenditure..... „ 3,441 6 0

Superintended by Lieut. C. G. Philipps, Salary Rs. 191-4-0.

Work on this line was commenced in August last only—the expenditure is now about Rs. 3,000 monthly, and defrayed from the Funds of the Zemindary.

COMMENCEMENT OF ROAD FROM KIMEDY TO NURSIPETTA WITHIN THE
KIMEDY ZEMINDARY.

Estimate.....Rs. 26,152 15 2

Expenditure..... „ 493 1 0

Superintended by Lieut. C. G. Philipps salary Rs. 191-4-0

The valley from Kimedy to Bomeka being subject to constant inundations, the former route to Byree was abandoned, and the one to Nursipetta substituted. Also on Trunk Road No. 6. Very little work was executed on this line also, last year.

ROAD FROM PALCONDAN TO CHICACOLE WITH A BRANCH FROM CHINTADA TO
GAURA ON THE ROAD TO CALINGAPATAM.

Estimate.....Rs. 41,452 4 7

Commenced under the superintendence of Lieut. E. H. Harington 1st Asst. Civil Engineer, no officer having been appointed for that duty.

The total amount of work executed under the special superintendence of the Engineer Department during the year 1854, was of.

Occasional Works.....Rs. 1,22,442

Ordinary Works..... „ 23,000

Expenditure in the Road Department..... „ 65,088

Total Rs. 2,10,530

R
D1.211/M53
M56.

THE STRENGTH OF THE ESTABLISHMENT WAS AS FOLLOWS.

1	1st Assistant Civil Engineer for 5 months, and Civil Engineer for 7 months.....	Rs. 7,136	2	0
1	2d Assistant Civil Engineer for 7½ months.....	„ 1,538	0	0
1	Assistant Rev. Surveyor for 12 months.....	„ 1,695	0	0
1	Do. Do. for 1 month, and Sub Assistant Do. for 7 months.....	„ 866	0	0
1	Assistant Supervisor for 12 months.....	„ 1,250	0	0
	Office Establishments.....	„ 2,247	0	0
Total Rupees		14,732	2	0

Captain Rundall's time was fully occupied in visiting frequently the Roads, Bridges under construction, and Irrigation Works under execution in the Vizagapatam, and Ganjam Districts.

Lieutenant Harrington accompanied Captain Rundall for a short time, and then proceeded to superintend the repairs &c. of Irrigation Works in the Sub Collectorate of Ganjam.

Assistant Surveyor J. Georges was employed in framing ordinary Estimates for the Survasiddy and Golgondah Talooks, the repairs to the Croostumrauze Channel embankment, the Duggadah Annicut, and the construction of the Bridges on the Road from Vizagapatam to Vamoolavulsah.

Number of Works inspected about 250, and the amount of money spent under his superintendence about Rs. 6,500.

Sub Assistant Surveyor A. Colquhoun was employed in superintending the execution of the Head sluices across the Polaki and Jallinoor Channels, the Paltalagam Works, repairs to Calingapatam Road, in framing Estimates, and superintending repairs to Irrigation Works in the Sub Collectorate of Ganjam.

Number of Works inspected about 200, and the amount of money spent under his superintendence, about Rs. 21,000.

Assistant Supervisor T. Robertson was employed in superintending the repairs to the Military Pay Office at Vizagapatam, completion of the Travellers' Bungalows at Waltair and Chittivulsah, afterwards at the Chicacole and Aska River Bridges, and on the Berhampore and Russelcondah Road. The amount spent under his superintendence was about Rs. 11,000.

The present state of the Division, as regards the Irrigation works is improving, especially the Sub Collectorate of Ganjam. Amount expended for Ordinary repairs during 1854, Rs. 20,000-0-0, and considerable progress is being made in the opening of communications from the interior to the Coast.

The exports from the Ports in both Districts have considerably increased. The value of exports in Sugar, Oil-seeds, Hides &c. at the Port of Bimlipatam, in 1853-54, amounted to about 12 Lacs of Rupees. The Chief Ports in the Ganjam District are Ganjam and Calingapatam. The value of exports from the former was Rs. 1,15,109 in 1852-53, and double that in 1853-54 viz. Rs. 2,29,603—at the latter the exports in 1852-53, was Rs. 5,93,136 and in 1853-54, Rs. 4,52,492.

A Sea Custom House with a Flag Staff will this year be built at Bimlipatam. Those proposed for other Ports in both Districts are not yet sanctioned.

The total amount of money spent in the Division during 1854, has much exceeded that in former years; and Estimates are under preparation for Irrigation works required, of which the principal ones are annicuts across the Rooshkoolea or Aska River, a mile below the junction of the two Rivers, viz. the Aska, and the Lohara Kundu, and across the Godhall Nullah, for the better supplying a Channel now running east towards Ganjam, and opening a new one towards the South East for supplying the Tanks in that direction, eventually emptying itself in the Munsooreotta Backwater. The Channel from the Rooshkoolea annicut to the Godhall Nullah will, there is every reason to expect, irrigate a very large extent of land lying between it, and the right bank of the Rooshkoolea River.

Levels will be taken, and Estimates prepared for embanking the Rivers, viz., the Rooshkoolea, the Lohara Kundee, and the Mahanuddee in the Gumsur Talook, the country along their Banks suffering very considerably from inundations during the Freshes.

Civil Engineer's Office, 9th Divn.
Ganjam District Camp at
Berhampore, May 1855.

W. BIRDWOOD, Major,
Civil Engineer 9th Division.

To

MAJOR J. H. BELL,

Offg. Secy. to the Board of Revenue D. P. W.

Fort Saint George.

56928

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