

E A S T I N D I A.
(PUBLIC WORKS, INDIA.)

RETURN to an Order of the Honourable The House of Commons,
dated 4 March 1850;—for,

A RETURN "of all PUBLIC WORKS which have been completed in *India*
by the EAST INDIA COMPANY within the last Ten Years; including
EMBANKMENTS, CANALS and WORKS of IRRIGATION, ROADS and BRIDGES,
BUILDINGS, FACTORIES, DOCKS, and all other Public Works :"

"Also, a similar RETURN of all PUBLIC WORKS now in Progress in *India* (with
the Addition of any proposed RAILWAYS); showing in each Case the Object of
the Work, the Date of its Commencement, and (where terminated) its
Termination, the Amount of Expense incurred, the Amount Estimated
for Completion, and the probable Time of Completion of all unfinished
Works; with such Statements or Documents as may be deemed necessary
to explain or illustrate the above Returns."

East India House, }
26 July 1851. }

JAMES C. MELVILL.

(Mr. Ewart.)

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Ordered, by The House of Commons, to be Printed,
1 August 1851.

N.B.—The Return to this Order, so far as it relates to the Presidency of Bengal, comprises Public Works of all descriptions constructed under the sanction of the Government. The amount expended in the improvement of Roads, &c. under the control of local Committees, out of funds derived from Ferries, and other sources placed at their disposal for that purpose, is not included, nor the value of convict labour employed on Public Works.

The Return for the Presidencies of Madras and Bombay contains only the amounts expended on Works of Irrigation, Roads and Bridges, no general statement having been furnished by those Governments of the expenditure on Public Works of other descriptions; but such Statement has been called for.

LIST OF CONTENTS.

	Page
Return for the Presidency of Bengal - - - - -	4
Copy of a Despatch of the Honourable the Court of Directors to the Government of India in the Public Department; dated 30 January (No. 2) 1850 - - -	146
Statement of Expenditure in the Civil Department of Public Works, from Season 1839-40, to Season 1848-49, inclusive - - - - -	154
Return for the Presidency of Fort St. George - - - - -	154
Statement of Expenditure on Public Works for the Years 1838 to 1847, inclusive - - - - -	166
Return for the Presidency of Bombay - - - - -	166
Reports of the Proceedings of the Road and Tank Department for the Official Years 1845-46 and 1846-47 - - - - -	166
Statement of Expenditure on Public Works from Season 1836-37 to Season 1845-46 - - - - -	206
Summary of Expenditure incurred in the several Presidencies for periods of Ten Years - - - - -	208
Railways in India - - - - -	209

APPENDIX.

Letter from the Honourable Court of Directors to the Government of India in the Revenue Department; dated 7 July (No. 9) 1847 - - - - -	210
Letter from the Governor-general to the Honourable the Court of Directors in the Foreign Department; dated 30 July (No. 35) 1849 - - - - -	211
Letter from the Honourable Court of Directors to the Government of India in the Revenue Department; dated 5 December (No. 11) 1849 - - - - -	211
Letter from the Governor-general to the Honourable the Court of Directors in the Foreign Department; dated 10 June (No. 15) 1850 - - - - -	212
Letter from the Honourable the Court of Directors to the Government of India in the Revenue Department; dated 25 April (No. 5) 1851 - - - - -	212
Letter from the Honourable the Court of Directors to the Government of Madras in the Revenue Department; dated 18 July (No. 6) 1849 - - - - -	213
Letter from the Honourable the Court of Directors to the Government of Madras in the Revenue Department; dated 8 January (No. 1) 1851 - - - - -	214
Letter from the Honourable the Court of Directors to the Government of Bombay in the Public Department; dated 13 February (No. 6) 1850 - - - - -	216
Letter from the Government of Bombay to the Honourable Court of Directors in the Public Department; dated 31 August (No. 74) 1850 - - - - -	217
Letter from the Honourable Court of Directors to the Government of Bombay in the Public Department; dated 5 March (No. 4) 1851 - - - - -	217
Letter from the Honourable Court of Directors to the Government of Bombay in the Public Department; dated 21 August (No. 27) 1850 - - - - -	218
Extract Political Letter from Bombay; dated 15 February (No. 17) 1851 - - - - -	219
Letter from the Honourable Court of Directors to the Government of Bombay in the Public Department; dated 12 January (No. 1) 1848 - - - - -	219
Letter from the Government of Bombay to the Honourable the Court of Directors in the Public Department; dated 12 May (No. 48) 1849 - - - - -	220
Letter from the Government of Bombay to the Honourable the Court of Directors in the Public Department; dated 15 November (No. 98) 1850 - - - - -	221

East India House,
26 July 1851.

T. L. Peacock,
Examiner of India Correspondence.

RETURN FOR THE PRESIDENCY OF BENGAL. - - -

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces :			
Roads from the Town of Aeng, in Arracan, to Nagatongu and Thorowah, and for the construction of Bridges.	- - - - -	sanctioned, 1840-41	- - - - -
Akyab: Construction of two Wooden Bridges over the Peek Tock Kyng Nullah.	-- to replace old Bridges which were originally constructed of indifferent materials by the Mughls of the province.	sanctioned, 12 January 1841	Akyab - - -
Construction of five Masonry Bridges over Nullahs.	-- for maintaining an uninterrupted communication at the station.	sanctioned, 16 February 1841	- - - - -
Construction of Pucka Drain Bridges in the town.	-- the necessity for this work was brought to the notice of Government by the Local Civil Officers.	sanctioned, 18 May 1841	- - - - -
Construction of two Pucka Bridges.	- ditto - - - - -	sanctioned, 27 April 1841	-- one on the road towards Nagarparr, and the other in the town, on the bank of the Pick Sik Kyong.
Restoration of the Bund and Sluice at Akyab, and Clearance of Jungle.	-- for the purpose of drainage, and as essentially necessary to the salubrity of the station.	sanctioned, 3 April 1843	Akyab - - -
Construction of two Bridges at, in the Arracan Division.	-- required to keep open the communication between the Station and the Point Bungalows, belonging to the residents.	sanctioned, 18 August 1840	- - - - -
Construction of two Pucka Drain Bridges in the town of Akyab.	- - - - -	sanctioned, 28 November 1842	- - - - -
Aeng Road and Pass, Construction of a Bridge, and Repair of seven others, and of Travellers' Houses.	-- these works are intimately connected with the interests of the trading community.	sanctioned, 9 September 1844	- - - - -
Agrachour to Baildah, Construction of a Foot-road connecting the Contar with the Cuttack Road.	-- to facilitate the transmission of the Dawks between Contar and Midnapore.	sanctioned, 16 April 1845	Baildah - - -
Roads and Bridges, Lower Provinces :			
ASSAM ROADS :			
Lower Assam :			
From Rahe to Gobba	- - - - -	length, 27 miles	Assam - - -
" Talia Mhookutta to Lowkhoa.	- - - - -	" 10 "	" - - -
" Nowgong Division Roads.	- - - - -	" 9 "	" - - -
" Borallygong to Soonnaree.	- - - - -	" 3 "	" - - -
" Nowgong to Demoo-roogooree.	- - - - -	" 2 "	" - - -
		sanctioned, 9 January 1838.	

- RETURN FOR THE PRESIDENCY OF BENGAL.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
- 17,523 7 4	- - - - -	season 1840-41	-- seven of the bridges to be restored were destroyed by the Burmese in their flight from Arracan to Ava in the year 1824.
- 5,869 11 1	5,470 11 3	- - completed, 1842-43.	- - the breadth of these bridges, as first sanctioned, was 18 feet for both, but subsequently the Government authorized the width of one to be increased to 22, and the other to 24 feet. This has consequently increased the expense by Rs. 608. 2. 7.
- 8,078 10 7	5,272 - 2	-- completed, sea- son, 1842-43.	
- 875 - 1 -	- - - - -	- - constructed, season 1842-43.	
- 1,445 12 2	- - - - -	- ditto.	
- 3,482 6 10	7,203 9 2	-- completed, sea- son 1843-44.	-- this work, which was sanctioned in 1841-42, at an estimated cost of Rs. 6,637. 14. 6. was completed for Rs. 7,527. 10. 4., but it was destroyed by an irruption of the sea during a violent storm on the 15th May 1842, through a want of sufficient height. It was raised five feet above the highest spring tides, nevertheless the sea, on this occasion, overtopped the bund by five feet. The saving has accrued chiefly by a reduction of the rates, and also by the employment of convicts on a portion of the work.
- 4,375 10 2	5,523 3 9	-- completed, sea- son 1842-43.	
- 351 7 2	- - - - -	- ditto.	
- - - - -	1,161 11 1		
- 1,878 6 8½	1,886 8 7		
- - - - -	981 7 5		
- - - - -	9,917 7 11		
- - - - -	972 9 -	-- completed, sea- son 1842-43.	- - these are unmetalled roads, and their width is 16 feet; they have been raised where necessary.
- - - - -	297 10 7		
- - - - -	533 8 -		

6 • RETURN OF PUBLIC WORKS COMPLETED IN INDIA, IN THE

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, Lower Provinces—continued.			
<i>Assam Roads—continued.</i>			
<i>Lower Assam :</i>			
Repair of the Road from Kulling River to Koliabur.	-	length 72 miles } sanctioned, 22 August 1842.	-
From Koliabur to the Dunsary.	-	" 60 " }	-
Repair of Road between Nowgong and Tazpore.	-	" 17 " } sanctioned, 26 April 1843.	-
Repair of Road from Rah to Daboka.	-	" 23½ " }	-
Roads and Bridges, Central Provinces :			
Ajmere and Nusseerabad Road, metalling of.	- - metalling of such portions, as from the nature of the soil may require the construction of a hard artificial surface.	- - length of the road, 13 miles 4 furlongs ; aggregate length requiring to be metalled, 6 miles 4 furlongs and 6 yards. Sanctioned, 12 January 1848.	-
Roads and Bridges, North Western Provinces :			
Agra Strand, Bridging of Drains on the.	-	sanctioned, 1848-49	Agra
Agra, Bridge over the Dookar Ravine.	- - on account of the inconvenience experienced by the public, who have occasion to pass by the bridge and bazar near the Tripolish, and Cauzeepara, owing to there being but one narrow confined road at this entrance of the town.	sanctioned, 7 December 1840	-
Agra to Mynpooree : Construction of Bridges over the Jhara River and Guddakhur Ravine, and over the Peelakar Rivulet.	- - this road is of much importance, being a direct communication between Agra and Futtyghur.	sanctioned, 1840-41	Mynpooree
Construction of a Bridge over the Urind Nuddee.	-	- - of three arches of 40 feet span ; sanctioned 3 January 1845.	- - crossing the Agra and Mynpooree road, 15 miles from Mynpooree, at the village of Kulhore.
Construction of a Bridge over the Singur Nullah.	-	- - to consist of five elliptic arches, the centre one of 45 feet, and the two arches on each side of 40 feet respectively ; sanctioned 3 January 1845.	- - crossing the Agra and Mynpooree road, 23 miles from Mynpooree, at the village of Nrown.

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

7

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	2,474 1 -	-- completed, sea- son 1842-43.	-- this road will be made 12 feet wide, with 108 wooden bridges and drains.
- - - - -	- - - - -	- - - - -	proposed width 15 feet.
- - 4,924 8 -	4,924 - 4	- - - - -	width 12 feet, with 22 bridges and drains.
- - 5,152 15 3	5,528 3 4	-- completed, 1846-47.	-- width 12 feet, with wooden bridges and drains. The saving of Rs. 1,875. 14. 8, on the estimate has been effected by the reduction of rates.
- - - - -	6,472 15 -	- - - - -	
- - 7,910 15 -	9,620 7 1	-- completed, sea- son 1842-43.	
- - 910 8 2	1,118 2 4	-- completed, sea- son 1841-42.	
-- bridge over the Jhera - - - - - Ditto over the Peelakar Rivulet	Rs. a. p. 7,083 8 6 5,161 10 -	13,017 12 5	-- completed, sea- son 1842-43.
	<u>Rs. 12,215 2 6</u>		
- - 17,071 - 1 -	23,874 3 7		
- - 22,951 5 7	33,533 5 3	completed, sea- son 1846-47.	-- the savings on the sanctioned esti- mates, viz. of Rs. 6,808. 8. 6, and Rs. 10,681. 15. 8, respectively, are owing to much of the masonry work having been dispensed with, in consequence of the soil being more favourable than was originally expected, and to other judicious deviations from the plan. A reduction of rates has also contributed in effecting these savings.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, North Western Provinces—continued.			
Agra and Bombay Road: To the Nerbudda River -	- - a fair-weather road adapted for hackeries or wheel conveyances being much required between Agra and Bombay, it was determined in 1840 to improve, with occasional diversion, the existing road; the improvement was to comprise the removal of the principal obstructions in the ghauts, jungles, and in the passage of rivers and nullahs, or mountain streams.	Length, 1st portion: <i>M. f. yds.</i> Agra to Indore - 370 3 102 Length, 2d portion: Indore to Akberpore on the Nerbudda - 51 0 167 Length, 3d portion: Akberpore to Sindwa - 43 1 0 Length, 4th portion: Sindwa to Bombay - 270 1 179 TOTAL - 734 7 8 commenced in 1840.	Bombay - -
Construction of a Wall at the top of the Kilner (Gara) Ghaut.	- - on a representation from the resident at Indore of the very serious inconvenience experienced by troops and travellers, from the want of water at that spot.	sanctioned, season 1845-46 -	- - between Deodas and Akbarpore.
Agra: Proposed construction of a Suspension Bridge over the river Jumna.	- - - - -	- - - - -	Agra - -
Civil Buildings, South Eastern Provinces; Judicial:			
Akyab:	Construction of a Cutcherry. - - to replace the existingutcherry, not worth repairing.	sanctioned, 1 August 1839 -	Akyab - -
Construction of a new Gaol.	- - to replace old buildings, which are unserviceable and unworthy of repair.	sanctioned, 23 March 1841 -	Akyab - -
Construction of a Sanitarium Bungalow, with Bathing - rooms and Out-offices.	- - it is not stated for whose use the building is designed.	sanctioned, 9 January 1838 -	- - situated at the end of the Faqueer's Rooks, two miles from the station of Akyab.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<p>-- the expenditure within the Bengal Division to November 1847, is stated as follows; viz.</p> <p style="text-align: right;">Rs.</p> <p>New work of road - 1,94,810 Superintendence - 1,13,109 Repairs, &c. - 47,542</p> <p style="text-align: right;">3,54,958</p> <p>The sum expended on two Divisions of the road within the Bombay Presidency, to 30th April 1848, exclusive of repairs, was - - - - 9,74,811</p> <p>There has also been a further sum sanctioned for various useful purposes of about - - 7,000</p> <p style="text-align: right;">Making a TOTAL of Rs. 13,30,769</p>	<p style="text-align: center;">Rs. a. p.</p> <p>11,00,000 - - - (Eleven lacs) without metalling.</p> <p>improvement of the existing roads, and in a great degree to give up the new lines which had been proposed. The Government, on the 30th June 1840, sanctioned an estimate of 1,20,000 rupees, exclusive of engineer's salary and establishment, for improving the worst parts of the road between the Chambul River and Suppre, 115½ miles, and between Indore and the Nerbudda River, 78½ miles, so as to be practicable for wheeled carriages, including a branch road from Suppre to Gwalior. An increase in the width of the Ghauts, from 10 to 14 feet, was authorised on 3d January 1843. Returns were called for in 1846, with a view to undertaking the improvement of such detached parts along this great line of road as urgently required either construction or repair, when the following estimates were submitted and recommended for immediate sanction; viz.</p> <p style="text-align: right;">Rs.</p> <p>For the repair of about 20 miles of the road in Candeish - - - - 1,00,000 For completing part of the road under charge of the civil engineer, a distance of 93 miles, with bridges and drains - - - - 2,48,514 For bridging a portion of the road between Soonghur and Dhoolia - - - - 65,000 For completing the unmetalled portion of the line in Kandeish - - - - 3,00,000</p> <p style="text-align: right;">TOTAL - - - - Rs. 7,11,514</p> <p>These works, however desirable, were considered too costly to be undertaken at present. A sum of 4,224 rupees was sanctioned in June 1849, for converting into a fair-weather road the line of 49 miles in length between Scindwa and the Nerbudda, his Highness Holkar having contributed a moiety. The Court, in January 1850, sanctioned the annual expenditure of 29,700 rupees for the maintenance of this road within the Bengal Presidency.</p>	<p style="text-align: center;">Rs. a. p.</p> <p>694 14 8 - - -</p> <p>760 14 5</p> <p>-- completed, season 1846-47.</p>	<p>-- Major Drummond has brought his survey of the portion of the line between Agra and Nerbudda to a close; and with reference to the enormous expense which must be incurred for such a road as would be available throughout the rainy season, the Government has come to the resolution to limit the work to an</p>
<p>5,33,378 - - -</p> <p>4,51,740 - - -</p>	<p>5,33,378 - - -</p> <p>4,51,740 - - -</p>	<p>-- the first estimate is for a bridge of two spans of 500 feet each, with two half-spans of 225 feet each, and a roadway 28 feet broad, supported by three chains the other, with the same openings, supported by two chains. These estimates, together with others on the taper chain or Dredgian principle, were held over, awaiting a report of a special committee on the causes of the failure of the Balli Khall Bridge on the Dredgian principle. Subsequent to these proceedings, the construction of bridges on the taper chain or Dredgian principle was generally prohibited by the home authorities. An estimate for a masonry bridge was then submitted, but the Lieutenant-governor being doubtful whether the same site would suit a railway bridge as would be selected for the ordinary traffic of the country, has suspended any ulterior proceedings. The proper site for a railroad bridge, it is supposed, would approach Agra by Ferozabad, two marches short of Agra.</p>	<p>-- completed, season 1841-42.</p> <p>-- completed, season 1843-44.</p> <p>-- the new gaol is equal to the accommodation of 320 prisoners.</p> <p>-- constructed in 1840-41.</p>
<p>4,869 8 5 - - -</p> <p>12,159 9 4 - - -</p> <p>4,813 9 10 - - -</p>	<p>4,742 8 3</p> <p>14,362 7 1</p> <p>- - - - -</p>	<p>4,869 8 5</p> <p>12,159 9 4</p> <p>4,813 9 10</p>	<p>-- completed, season 1841-42.</p> <p>-- completed, season 1843-44.</p> <p>-- the new gaol is equal to the accommodation of 320 prisoners.</p> <p>-- constructed in 1840-41.</p>

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Civil Buildings, South-Eastern Provinces; Judicial—continued.			
Akyab, Construction of a Treasury Record-room, Malkana and Cash-room at the Civil Station.	- - - - -	sanctioned, 19 October 1841	Akyab
Amherst, Construction of a new Gaol at.	-- in consequence of the insufficient accommodation afforded by the existing gaol.	sanctioned, 11 January 1842	Amherst
Allipore Gaol, Construction of a Barrack and a Picket-shed.	-- for the gaol guard. The old guard-rooms were partly blown down by the storm of the 3d June 1842.	sanctioned, 9 January 1843	Allipore
Akyab: Construction of a Gaol Wall, with Sentry-boxes.	-- in consequence of a suggestion by the Commissioners of Arracan, that all men sentenced to more than one year's imprisonment should be located at Akyab.	sanctioned, 17 May 1838	Akyab
Construction of Wards within the above Gaol Wall.	-- the existing gaol buildings having become old, and unworthy of further repair.	sanctioned, season 1840-41	- ditto
Construction of a Sudder Hospital at.	-- rendered necessary by the existence of a military police, the flotilla establishment, crews of vessels, &c., all requiring medical aid, in consequence of the insalubrity of the climate, as well as the ruinous condition of the old hospital.	sanctioned, 6 February 1848	- ditto
Allipore Gaol, Alterations and improvement to.	-- to improve the gaol, as regards cleanliness, salubrity and discipline.	sanctioned, 22 June 1841	Allipore
Akyab: Construction of six Drain Bridges.	-- necessary to the cleanliness and salubrity of the town.	-- of one arch of six feet, sanctioned 20 August 1845.	-- on the Chowreggya road.
Construction of a Bridge at Talee Bazar.	-- required to replace bridges of wood, reported to be unsafe for wheel carriages; and as the line of road on which they are situated is considered the most important at Akyab, it is considered that they should be of the most durable description	one arch, of 20 feet span	Akyab
Construction of a Bridge at Nazirpah.		24 feet span	- ditto
Allipore Gaol, Putting up a Pump.	-- for raising water from the large tank in the gaol to the reservoir above it, to supply the different wards with drinking water.	sanctioned, 20 August 1845	Allipore
Akyab, Construction of the Budder Mokam Stone Sluice.	-- this sluice, together with the bund at Akyab, was destroyed by a storm on the 15th May 1842.	sanctioned, 28 May 1845	Akyab
Allipore Gaol: Alterations and improvements.	-- to improve the gaol as regards cleanliness, salubrity and discipline.	sanctioned, 22 June 1841	Allipore
Construction of a Balagustee Guard-room to the.	-- this building will be of more durable materials than the last, which has been entirely destroyed by white ants.	sanctioned, 22 June 1845	- ditto
Akyab, Additions and alterations to the Cutchery at.	-- for the better accommodation of the different civil officers.	sanctioned, 3 June 1844	Akyab

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

11

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
6,741 15 6	6,414 15 9	-- completed, season 1843-44.	
3,445 4 4	5,106 14 3	-- completed, season 1843-44.	-- the gaol is intended for the accommodation of 280 convicts. The difference is owing to the employment of convicts, and to a reduction of the accommodation, with the concurrence of the Commissioner. The dimensions sanctioned were 240 x 50, while those of the new gaol are 157 x 48.
5,494 12 1	5,776 13 1	-- completed, season 1843-44.	-- these buildings are required for the accommodation of 211 men. The walls will be of masonry, and the roofs of tiles.
9,100 14 2		season 1838-39.	
14,362 7 1	14,362 7 1	-- completed, season 1840-41.	-- the new wards will accommodate 120 prisoners.
1,703 1 - -	1,397 11 9	-- completed, season 1844-45.	-- the new hospital will be 60 x 24, with a 10-feet verandah all round, the corners of which are to be partitioned off into separate rooms, for the native doctor, dispensary and operating rooms.
20,734 13 10	22,377 15 8	-- completed, season 1843-44.	
1,942 5 8	2,292 - -	-- completed, season 1846-47.	
	6,318 - -		
	4,998 - -		
402 8 - -	402 8 - -	-- completed, season 1846-47.	
1,783 15 8	1,783 15 8	-- completed, season 1846-47.	-- the roadway over the sluice has been made sufficiently large to be safe and practicable for wheel conveyances. The reconstruction of the bund was reported in 1844.
20,734 13 10	22,377 15 8	-- completed, season 1843-44.	-- the works sanctioned are as follows:— The construction of aqueducts to carry water to the reservoirs in the several court-yards, for drinking and other purposes; the construction of privies; the filling up of wells; the construction of partition walls, with a view to the separation of the convicts into squads of about 100 men; the removal of the existing solitary cells to a more airy site, and the construction of an additional ward and working shed.
606 - - -	606 - - -	-- completed, season 1845-46.	
	2,306 9 3	- - -	-- this building has been lengthened about 40 feet.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces ; Judicial :			
Arrah, Sudder Ameen's Cutcherry.	- - - - -	G. O., 23 January 1839	Arrah
Akyab, Construction of a Cutcherry at.	- - - - -	sanctioned, 1 August 1839	Akyab
Arrah, Construction of a Dewauny or Civil Gaol.	-- no separate provision had been made for the confinement of civil prisoners, and, in consequence, persons of this class were mixed up with the common felons of the gaol.	sanctioned, 1 November 1842	Arrah
Arrah Gaol, Construction of 60 Ventilators, and lowering the Compound Walls.	-- for the better ventilation of the criminal wards.	sanctioned, 17 February 1848	Arrah
Civil Buildings, Central Provinces ; Judicial :			
Allahabad, Sudder Ameen's Cutcherry.	- - - - -	sanctioned, 28 August 1839	Allahabad
Ajmere Gaol, Alterations to the.	- - - - -	sanctioned, 24 December 1840	Ajmere
Azimghur, Construction of a Record-room.	-- for the use of the Collector and Magistrate.	sanctioned, 23 March 1844	
Civil Buildings, North Western Provinces ; Judicial :			
Allyghur Gaol, Construction of an additional Ward.	-- in consequence of the insufficiency of space in the gaol.	sanctioned, 30 August 1841	
Agra: House for the Magistrate and Collector, and his Deputy.	-- the house which had been rented was no longer in a fit state for a public office.	sanctioned, 11 September 1842	Agra
Erection of Offices for the Court of Sudder Dewanny.	- - - - -	sanctioned, April 1843	
Erection of Offices for the Board of Revenue.	- - - - -	ditto	
Construction of a Hospital Ward at the Foujdarry Gaol.	for the use of females	sanctioned, 4 November 1843	Agra
Allyghur, Construction of a Gaol in the Fort.	-- to relieve the district gaol by the withdrawal of life prisoners, and to lessen the expense for increased guards for the custody of convicts.	sanctioned, 2 March 1844	Allyghur
Agra, Construction of a Court House.	for the Sessions Judge	sanctioned, 3 June 1845	Agra
Allyghur, Construction of Cutcheries for the Sudder Ameen and Omlahs.	-- during the last rains the old buildings became too dilapidated for use.	sanctioned, 25 March 1846	Allyghur
Civil Buildings, South Eastern Provinces ; Revenue :			
Akyab, Additions and Alterations to the Treasury and Record-room.	- - - - -	sanctioned, 9 September 1844	Akyab
Civil Buildings, Central Provinces ; Revenue :			
Allahabad, Pilgrim Hospital, Additions to.	- - - - -	20 December 1839	Allahabad

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

13

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
1,559		season 1849-40.	
4,742			
3,437 12 7	4,649 10 6	-- completed, season 1844-45.	-- in the new gaol, and at the suggestion of the Judge, separate accommodation is provided for prisoners of rank and caste.
492 2 10	412 4 6	season 1848-49.	
1,278 6 8	1,579 8	-- completed, season 1841-42.	
1,700	1,700	season 1840-41.	
2,225 7 9	2,238 6 9	-- completed, season 1846-47.	
1,484 4 10		-- constructed, season 1842-43.	
	11,956 13 9	season 1842-43.	
20,392 9 3	17,501	-- completed, season 1844-45.	-- these new offices will be built near the Secretariat Buildings, and the whole of the public buildings will be enclosed by a low wall.
	11,067		-- the excess of expenditure is owing to a rise in the price of timber in the bazar.
849 6 7	969 12 9	-- constructed, season 1843-44.	-- the necessity for this work was reported direct by the civil authorities to the Government.
-- these works suspended in season 1844-45.	66,989 1		-- This gaol is intended to accommodate 1,200 male and 200 female convicts. The whole of the buildings are to be surrounded by a ditch 14 feet broad and 12 feet deep, with a pucca wall 14 feet high in the centre. The slopes are to be secured with masonry revetments, and the bottom of the ditch and a few feet of the bottom of the slope to be substantially faced with masonry, and the ditch to be made considerably wider at top.
6,436 10	8,558 12 9	-- completed, season 1846-47.	
3,355 13 10	3,008	-- completed, season 1846-47.	
1,625	1,625	-- completed, season 1845-46.	-- the works executed consisted of an arched pucca verandah in lieu of a thatched one, additional alterations to doors and windows, and renewing the terrace roof.
1,475 1	1,475 1	-- completed, season 1840-41.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Central Provinces; Revenue—continued.			
Allahabad: Office of the Sudder Board of Revenue.	-- repair of injury done by storms on the 2d and 3d May 1838.	18 October 1838 - - -	Allahabad - - -
Construction of four Tehsil- dary Cutcheries.	- - - - -	sanctioned, 27 August 1840	- - these cutcheries are situated at Menjab, Chail, Kur- chunna and Manjun- pore.
Azimghur, Construction of a Tehsildary Cutcherry.	- - - - -	sanctioned, 31 March 1838	at Cheerkote - - -
Allahabad, Construction of a Treasury-room to the late Judges' Cutcherry.	-- this cutcherry has been transferred to the Collector of Allahabad.	sanctioned, 27 March 1847	Allahabad - - -
Civil Buildings, North Western Provinces; Revenue:			
Agra: Construction of a Cut- cherry for the Commis- sioner of the Division.	- - - - -	sanctioned, 11 August 1846	Agra - - -
Addition of Out-buildings to the Cutcherry of the Commissioner.	-- consisting of a guard-house, godown and shed,	-- the necessity for these works was brought to the notice of the Lieutenant-Governor, who at once directed the Executive Officer to commence on the buildings.	ditto - - -
Allyghur, Construction of a Tehsildary Cutcherry at Eglass.	-- the tchsil duties have been carried on with much inconvenience at the Sudder station, which is a distance of 15 miles.	sanctioned, 7 July 1843 - - -	Eglass - - -
Civil Buildings, South Eastern Provinces; General:			
Akyab, Enclosure of the Burial-ground.	- - - - -	sanctioned, 16 May 1842	- - - - -
Allipore: Removing and setting up a Steam-engine in the Iron Bridge Yard.	-- this engine, which has been trans- ferred from Chaund Paul Ghaut, is of 10-horse power.	sanctioned, 23 October 1843	Allipore - - -
Construction of New Buildings.	-- for the establishment attached to the Mathematical Instrument De- partment.	sanctioned, 16 January 1844	ditto - - -
Akyab: Protection of the Beach and formation of a Landing-place.	-- the necessity for this work was brought to notice by the Marine Board, and the Commissioner of Arracan.	sanctioned, 19 June 1843	Akyab - - -
Construction of a large Shed with Verandah, to serve as an Exchange.	-- a place of this description is much wanted at Akyab, where merchants, agents, captains, &c. may assemble under shelter from sun or rain.	sanctioned, 17 November 1845	- - - - -
Construction of three Ma- rine Wells.	- - - - -	sanctioned, 20 March 1844	- - - - -
Allipore: Additions, &c., to the Iron Bridge Yard.	-- for increasing the accommodation to afford shelter to the carpenters, who at present work in the open air; for English smithy coal, to prevent its wastage from wind and rain; and also to provide sufficient space to meet heavy demands.	sanctioned, 27 May 1846	Allipore - - -
Construction and setting up of an additional Boiler to the Steam-engine at the Iron Bridge Yard.	-- necessary to secure the efficiency of the establishment and prevent delays, which would prove detri- mental to the public service.	sanctioned, 17 May 1845	ditto - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

15

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. - 8,540 - - -	Rs. a. p. 8,540 - -	-- completed, sea- son 1839-40.	
- 19,812 4 5 - -	20,423 2 4	-- completed, sea- son 1842-43.	
- 5,780 - 4 3/4 - -	- - - -	-- completed, sea- son 1841-42.	
- - - - -	3,869 - -		
- 9,561 6 - - -	10,573 - -	-- completed, sea- son 1846-47.	
- 1,206 5 7 - -	1,533 - 3	-- completed, sea- son 1847-48.	
- - - - -	4,092 12 6		
- - - - -	4,985 12 3		
- 7,249 - - - -	7,020 - -	-- completed, sea- son 1844-45.	
- 3,794 12 8 - -	3,794 12 8	season 1843-44.	
- 10,120 - 7 - -	13,868 11 2	-- completed, sea- son 1845-46.	-- this outlay is to be defrayed from the port dues. The saving on the work is 3,748 rupees, in consequence of 7 1/2 groins having been constructed instead of 10. The pier provided in the sanc- tioned estimate, has not been executed. The above amount has been placed at the disposal of the Commissioner of Arracan, for completing the pier or breakwater.
- - - - -	1,500 - -	season 1845-46	-- the shed is to be 66, x 20 with a verandah 12 feet on four sides.
- 767 3 3 - - -	- - - -	-- completed, sea- son 1845-46.	
- 4,260 2 6 - -	4,199 - -	season 1846-49.	
- 3,289 15 9 - -	3,289 15 9	-- constructed, season 1846-47.	

RETURN FOR THE PRESIDENCY OF BENGAL—*continued.*

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; General— <i>continued.</i>			
Amherst, Provision of a Pilot Station on the Island off Amherst.	- - - - -	sanctioned, October 1848	Amherst - - -
Civil Buildings, Lower Provinces; General:			
Akra, Additions to the Sema-phoric Tower.	- - - - -	sanctioned, 12 August 1846	Akra - - -
Civil Buildings, Central Provinces; General:			
Allahabad, Ghaut on the Jumna at.	- - - - -	sanctioned, 1839-40	- - - - -
Agra, Provision of Accommodation for the Establishment with the Governor-general.	- - - - -	sanctioned, season 1843-44	Agra - - -
Allahabad, Enlargement of the Burial-ground.	-- the ground in the existing outcherry was completely occupied with graves, and the burial-place required extension.	sanctioned, 14 February 1848	Allahabad - - -
Civil Buildings, North Western Provinces; General:			
Agra: Enclosure of the new Burial-ground.	- - - - -	sanctioned, 17 October 1842	Agra - - -
Construction of a Record-room.	-- for the Accountant, North-Western Provinces.	sanctioned, 6 October 1845	Agra - - -
Erection of a new Staging Bungalow.	-- in lieu of the present building, which is not suited for the accommodation of travellers.	sanctioned, 14 August 1845	Agra - - -
Civil Buildings, Lower Provinces; Political:			
Assam, Upper, Construction of various Buildings at.	-- at Subsaugor:—Treasury, Record-room, Magazine, with Guard-room. At Detroghur:—Record rooms, Treasury, Powder Magazine, Store-Room.	sanctioned, 3 August 1840	Upper Assam - -
Civil Buildings, Central Provinces; Political:			
Ajmere, Construction of Residency Buildings.	- - - - -	sanctioned, 31 August 1840	- - - - -
Civil Buildings, North Western Provinces; Political:			
Agra, Construction of additional Buildings.	-- for the accommodation of the records of the office of the Secretary to Government.	sanctioned, 13 February 1846	Agra - - -
Marine Buildings, Lower Provinces:			
Akyab, Construction of a Lighthouse on the Great Savage Rock.	- - - - -	sanctioned, 9 November 1842	- - - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

17

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
487 11 11	500 - -	-- reported, sea- son 1846-47.	
575 10 1½	- - - -	season 1847-48.	
5,799 12 - -	3,500 - -	completed, 1840- 41.	-- the excess over the estimated amount is owing to the execution of the work on a more complete plan than was intended, in accordance with the advice of the magis- trate, who had promised aid to the extent of 2,000 rupees towards the undertaking.
2,611 15 11	- - - -	season 1843-44.	
529 2 11	564 5 3	-- completed, sea- son 1848-49.	
386 1 4	- - - -	-- completed, sea- son 1842-43.	
2,181 10 10	2,168 - -	-- completed, sea- son 1846-47.	
1,756 5 9	2,102 - -	-- completed, sea- son 1846-47.	
- - - -	11,013 9 9	season 1840-41.	
1,024 3 5	1,160 15 11	-- completed, sea- son 1841-42.	
2,789 9 10	- - - -	-- constructed, season 1846-47.	-- the new Record-room measures 30 x 18 feet, with two side and one end verandah 10 feet in the clear.
Cost of Light- house	Rs. a. p. 33,425 8 7	-- completed, sea- son 1843-44.	-- 35 feet of the rock downwards has been removed, and a base thus obtained for the superstructure. The rock is now 40½ feet above high-water mark, and the light- house will be raised to the height of 50½ feet, so that it will be 100 feet above the highest spring tides. The lantern was lighted on the 7th March 1844.
Buildings at- tached	1,501 9 6	The cost will be defrayed from the funds of the port, which are be- lieved to amount to 20,000 or 30,000 rupees. The lantern to be used, which is valued at about 21,000 rupees, will be supplied from the marine stores in Calcutta.	
Lantern	15,000 - -		
	Rs. 50,089 3 10		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Embankments, South Western Provinces :			
Burdwan Division : Restoration of the Kannes Khal Bunds.	- - - - -	sanctioned, 15 July 1841	Burdwan - -
New Bund on the Adjye River.	- - to prevent injuries to lands by the overflows of the river.	sanctioned, 1841-42	- - - - -
Embankments, South Eastern Provinces :			
Bogree, Construction of a new Bund on the Selia River.	- - to replace the old bunds which were pronounced to be quite insus- ceptible of efficient repair.	- - length 10,480 feet; sanc- tioned, season 1843-44.	Bogree Pergunnah
Burdwan, Construction of a new line of Bund from Salaspore to the Cannu Nuddes, and repairs and renewals to the Burdwan Bunds generally.	- - the new bund is proposed for construction at a point where the old one has frequently failed, caus- ing great damage to the country.	- - length of new bund, 4 miles; sanctioned, 1847-48.	Burdwan - -
Balasore Division, Con- struction of new Bunds, and restoration of others which had been aban- doned.	- - required for the protection of the Estate Mouzah Sindeeah, Pergunnah Soonhut.	sanctioned, January 1844	- - - - -
Embankments, Lower Provinces :			
Berhampore Division, Bunds at Moorshedabad.	- - - - -	length, about 74 miles	- - - - -
Bauleah Bunds, New Bund from Huntanabad to Bau- leah Ghaut.	for the protection of the town - -	- - length, 2 miles, 1 furlong and 180 yards; sanctioned, 6 Feb. 1840; 3,100 feet additional, sanctioned December 1840.	- - - - -
Embankments, Central Provinces :			
Behar, Sacri Bund, recon- struction of.	- - to protect the country on the Western Channel from inundations.	sanctioned, season 1838-39	Behar - -
Canals, North Western Provinces :			
Beejapore : Watercourse in the Deyrah Dhoon.	- - for the irrigation of land lying between the Tonse, the Arson, and Bogul Rivers.	sanctioned, 1838-39	Deyrah Dhoon -
Construction of Masonry falls.	to lessen the rapidity of the stream	sanctioned, 1838-39	- - - - -
Brotana Branch Canal, Con- struction of 50 Masonry outlets.	for irrigation - - - - -	sanctioned, 7 March 1837	- - - - -
Beejapore Watercourse, Con- struction of a Masonry Tunnel.	in lieu of a wooden tunnel - -	sanctioned, 26 September 1843	- - near the village of Dakra.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
- - - - -	1,075 12 -	season 1841-42 -	- - the length of embankments in the Burdwan Division is represented in 1839-40 to be 285 miles, and the estimated cost of annual repairs, 4,819 rupees.
- 1,884 11 - - -	- - - - -	-- completed, season 1841-42.	
- 2,437 14 1 - - -	- - - - -	-- completed, season 1843-44.	- - it is expected that about 844 beegahs of land will be fertilized.
- - - - -	72,176 12 9		
- - - - -	230 - - -	season 1843-44 -	- - the average length of embankments in 1839-40 in the Balasore Division was estimated at 185 miles, and the cost of annual repairs, 1,655 rupees. In 1847-48, the estimate for annual repairs was Rs. 7,097. 13. 9.
- - - - -	- - - - -	- - - - -	- - the cost of annual repairs is about 3,000 rupees.
- - - - -	4,111 - - -	- - this work is in progress.	
- 64 8 1½ - - -	1,337 - - -	completed 1841-42	- - Rs. 1,272. 14. 1½ less than the original estimate, owing to the employment of convicts on the work.
- 16,218 - - - Estimate for ordinary repairs 1,500 rupees.	9,155 2 7	completed 1840-41	- - the great excess of expenditure beyond the estimate was occasioned by Lieutenant Ommansy not making a sufficient allowance for the great distance from which the earth had to be brought. The bund has fully answered the purposes for which it has been reconstructed, and the Collector anticipates no difficulty in realizing from the zemindars the amount expended.
- 15,928 14 7 - - -	- - - - -	completed 1840-41	
- 6,364 2 4 - - -	- - - - -	completed 1841-42	
- 4,501 1 4 - - -	- - - - -	-- completed, season 1842-43.	
- 2,996 14 - - -	2,996 14 -	-- completed, season 1843-44.	- - the wooden tunnel was a source of much trouble and expense, owing to the repairs which it required constantly.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Canals, South Western Provinces :			
Canal from the Banka Nullah to the New Pertaub-khallee Canal in Tamlook.	-- the Banka Nullah Canal forms a navigable communication between the Huldee and Roopnerain River, and is chiefly used for the transport of Salt. By the New Cut the dangerous route taken by the salt-boats of Tangrakhally and Roopnerain Rivers will be avoided.	-- length of the new cut, 8 miles and 146 feet; sanctioned 24 November 1841.	- - - -
Baliaghatta Canal	- - - - -	sanctioned, 13 December 1839	- - - -
Roads and Bridges, South Eastern Provinces :			
Construction of a Bridge on the Burdwan and Hooghly Road at Shaikpore.	-- this bridge is required on a part of the road which is liable to be cut through whenever the floods of the Damooda Nullah are brought down the Banka Nullah, from the neighbourhood of Burdwan.	sanctioned, 22 December 1840	- - - -
Bancoora and Burdwan Road	-- a portion of the old line of road bordering on the southern bank of the Damoodah Rivers by the floods of which it is constantly breached, is to be abandoned, and a more direct one adopted.	-- length 14½ miles; sanctioned 16 February 1841 and 9 May 1842.	- - - -
Bissenpore Road : Construction of a New Masonry Bridge on the.	-- indispensable for the safety of the Bissenpore Road, of which, owing to insufficiency of drainage, 2,000 feet were carried away by a flood.	-- sanctioned, 28 August 1843; to consist of two arches of 16 feet span each.	-- near Gobroo Bazar.
Construction of a Masonry Bridge over the Doodiah Khall.	-- to supply the place of an old bridge which was destroyed by inundation.	-- of 4 arches 20 feet span each, sanctioned 26 March 1845.	-- between Midnapore and Bissenpore.
Boringham, Construction of two additional Arches to the Masonry Bridge at.	-- this Bridge was severely injured by the overflowing of the river in September 1843. It is hoped that these arches will reduce the elevation of the waters in some degree, and thus lessen the evil to be feared by the error in construction of not having raised the pier to a sufficient height.	sanctioned, 29 June 1844	-- on the Rae-pore Mail Road in the Nagpore territory.
Ballee Khal Iron Tension Bridge : Construction of	-- a bridge at the spot selected, will be a great public convenience.	-- one span of 250 feet, with a 16 feet roadway; sanctioned 3 June 1844.	-- situated on the right bank of the Hooghly River near Howrah, opposite Calcutta.
Restitution of the	- - - - -	sanctioned, 29 October 1845	- - - -
Making the Approaches to the.	- - - - -	sanctioned, 16 March 1846	- - - -
Bissenpore Road, Strengthening of the Tamaul Nullah and Sautancoorah Masonry Bridges.	-- in consequence of injuries sustained by the floods of season 1844.	sanctioned, 27 August 1845	-- situated in the Midnapore Division.

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

21

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
-- this project was abandoned under orders of Government, 17 August 1842.	-- estimated for the New Cut Rs. a. p. 17,619 2 -	- - - -	-- further inquiry established the fact that there are no sufficient grounds for entertaining the expectation that it will be possible to locate 300 or 400 khalines along the sides or in the vicinity of the proposed Canal, and that the risk attending the transport of the Ourung Salt to Ghat Narampore as now conducted, ought, with proper precautions, to be quite inconsiderable.
Rs. a. p. - - 1,611 4 - - sanctioned for strengthening the south bank by piling.	- - - -	-- completed, season 1843-44.	
- - 1,588 9 5 - -	1,681 1 10	-- completed, season 1842-43.	this is to be a bridge of three (3) arches.
cost of the bridges, Rs. 7,890 -	12,000 - - and 8,880 14 3	-- completed, season 1846-47.	-- the number of bridges and drains to be constructed amounts to 34. The road is under charge of the Burdwan Local Committee.
- - 2,120 1 - 1 - -	2,438 2 10	-- completed, season 1844-45.	-- this is an important line of communication, as it connects the Grand Trunk Road with Midnapore and the Province of Orissa.
- - 7,449 - - - -	8,646 4 -	-- completed, season 1847-48.	
- - 4,945 13 - - -	4,945 13 -	-- completed, season 1846-47.	the bridge consisted of three arches.
- - 56,680 4 2 - -	48,447 9 -	completed in 1845	-- the inhabitants subscribed 17,800 rupees towards its erection; the requisite disbursement for completing the structure was to be made from the Ferry Funds of the district. This bridge fell down in June 1845, immediately after its completion, which was attributed to a want of sufficient strength in the central connexion of the chains. The Bridge was again put up greatly strengthened in the central connexion. The Court, in a despatch dated 3d December (No. 9) 1845, disapproved the tension principle, and directed that it should not be further adopted in the construction of suspension bridges.
- - 12,927 9 8 - -	7,431 - -	-- reconstructed, season 1846-47.	
- - - - - - - -	2,445 9 7		
- - 2,172 1 - - - -	3,572 - -	-- completed, season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South-Eastern Provinces—continued.			
Bankipore to Jehanah, Re-construction of a Bridge and two small Drains.	-- these works were carried away by a high flood on the 22d August 1844.	sanctioned, 7 May 1845	- - -
Behar District, Construction of Drain Bridges on the Line of the Grand Trunk Road.	for the drainage of the road - -	sanctioned, 30 April 1845	- - -
Budga-Budge Road, Construction of four Drain Bridges, and Repairs thereon.	-- with a view to render the road more practicable for mail carts.	sanctioned, 24 December 1845	- - -
Bissenpore Road, Repair of the Masonry Bridge over the Tama Nullah.	- - - - -	sanctioned, 9 May 1847	- - -
Roads and Bridges, Lower Provinces :			
Beyalal to Diamond Harbour, Repairs to the Puoka Road and Bridges on.	- - - - -	-- length, 24 miles; width, 14 feet; sanctioned 28 July 1845.	Diamond Harbour
Barripore to Calpee, Construction of a Cutch Road.	- - - - -	-- length, 32 miles; sanctioned in 1844.	Calpee - -
Burgatchy to Dinagopore, Raising of the Road.	-- this line was adopted in lieu of the old road <i>vid</i> Malda, when the settlement at Darjeeling was first formed.	-- length, 91 miles and 71 yards; sanctioned 20 October 1847.	Dinagopore -
Roads and Bridges, North Western Provinces :			
Bridge over the Baigool River on the Peelibheet Road, in the District of Rohilkund.	sanctioned in season 1839-40	- - - - -	- - -
Civil Buildings, Lower Provinces; Judicial:			
Baraset Gaol, Rebuilding of the Compound Wall.	-- the former wall was pulled down when the alterations to the gaol, for the reception of the followers of the Ameers of Scinde, were undertaken.	sanctioned, 18 July 1844	- - -
Civil Buildings, South Western Provinces; Judicial:			
Balasure Gaol; Construction of additional Wards.	-- owing to the insufficiency of accommodation.	sanctioned, season 1839-40	Balasure - -
Improvements to the Drainage of.	- - - - -	sanctioned, season 1841-42	- - -
Civil Buildings, Lower Provinces, Judicial:			
Bauleah Gaol, Additions to, and Drainage.	to provide for better ventilation, &c.	length of drain, 361 feet -	Bauleah - -
Behar, Construction of an additional Record-room.	-- for the records of the office of the Judge.	sanctioned, 11 September 1843	Behar - -
Burnagore, Construction of a small Gaol, with Out-offices.	-- for the prisoners employed at Burnagore.	sanctioned, 12 December 1845	Burnagore -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

23

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time for Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	1,601 10 1 and 10,000 - - for drainage.		
- - 8,177.13 4 - -	8,177 13 4	-- constructed, season 1846-47.	
- - 2,440 - 9 - -	2,440 - 9	season 1845-46.	
- - - - -	1,219 16 1		
- - 35,000 - - - -	35,000 - -	-- completed, sea- son 1845-46.	-- the estimate for annual repairs to the pucca centre of this road amounts to 8,991 rupees.
- - 19,948 6 6 - -	- - - - -	-- completed, sea- son 1847-48.	
- - - - -	18,010 2 9		
- - 11,298 3 8½ - -	9,158 8 -	-- completed, sea- son 1841-42.	-- the excess, Rs. 2,139. 11. 8. of expen- diture beyond the estimate, is owing to the difficulties encountered in the execution of the work, and to convict aid to the extent contemplated not having been afforded.
- - 1,057 9 2½ - -	- - - - -	-- completed, sea- son 1844-45.	-- Government subsequently decided on sending the ex-Ameers to Hazareebaugh.
- - 4,740 - - - -	4,605 - -	-- completed, sea- son 1841-42.	
- - 1,095 2 1 - -	- - - - -	-- completed, sea- son 1841-42.	
- - 8,027 8 9 - -	7,726 - - for additions.	-- completed, sea- son 1840-41.	
- - 1,239 3 - - - -	1,239 3 -	season 1813-44	-- the necessity for this additional accom- modation was brought to notice by the Sudder Dewanny Adawlut.
- - 1,396 - - - -	1,396 - -	season 1846-47.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; Judicial—continued.			
Baraset Gaol, Additions and Alterations to.	-- to render it secure as a place of confinement.	sanctioned, 20 April 1846	Baraset
Bauleah, Addition of a Verandah to the Principal and two Sudder Ameens' Cutcheries.	-- in consequence of the crowded state of these cutcherries, and also with a view to make the buildings more comfortable.	sanctioned, 9 September 1846	Bauleah
Civil Buildings, North Western Provinces; Judicial:			
Bareilly Gaol: Construction of two Experimental Wards.	- - - - -	sanctioned, 7 October 1842	Bareilly
Construction of additional Public Buildings.	-- for a mill-house, guard-room and cook-room.	sanctioned, 17 February 1843	ditto
Budaon Gaol - - - -	- - - - -	sanctioned, 1838-39	Budaon
Bareilly, Construction of a Howalat at.	-- for the accommodation of prisoners under trial.	sanctioned, 15 November 1841	- - -
Boolundshuher Gaol, Alterations to.	-- for the improvement of the prison discipline, and for two separate rooms for juvenile offenders.	sanctioned, 16 December 1842	- - -
Bowannah, Construction of a Tuhildarry Cutcherry at.	-- the old cutcherry was in ruins, and inconveniently situated.	sanctioned, 22 November 1842	- - -
Bhandaree, Construction of Police Guards and Gaols.	for prisoners under trial - -	sanctioned, 27 April 1844	-- in the districts of Kuchwagur and Bhandaree.
Boolundshuher Gaol, Construction of Outbuildings and Cook-rooms.	- - - - -	sanctioned, 20 August 1844	Boolundshuher
Civil Buildings, Central Provinces; Judicial:			
Benares, Additions and Alterations to the Insane Hospital.	-- for the better classification and custody of the insanes, two of whom lost their lives from the want of means of separating the harmless from the violent.	sanctioned, 26 February 1845	Benares
Bedur Gaol, Alterations, &c.	-- for security of the prisoners, and for the ventilation of the gaol.	sanctioned, 9 May 1843	Bedur
Bandah Gaol, Construction of a Pucca Well.	-- required to replace an old one, which has failed.	sanctioned, 18 August 1846	Bandah
Bandah, Construction of a new Cutcherry for the Collector.	-- the cutcherry is at present held in a hired building in cantonment, but it is required to be given up to the military.	sanctioned, 3 April 1847	ditto
Benares, Construction of a Well outside the Gaol Compound.	-- the only well outside the gaol which supplied water to the establishment of Burkundaues, had fallen in.	sanctioned, 17 June 1847	Benares

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

25

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
7,184 14 4½	6,945 - -	-- completed, season 1847-48.	-- the contemplated works are the substitution of iron for the wood-work of the windows, &c., and raising the surrounding wall from 9 to 13 feet.
1,817 1 - -	1,959 2 8	-- completed, season 1847-48.	-- the lowness of the wall, only 12. 6. below the beams, rendered them exceedingly close and hot.
11,170 9 1½ Rs. 10,000 have been paid for the site of the building.	12,436 5 8	-- completed, season 1842-43.	
2,143 4 10	2,355 10 -	-- completed, season 1844-45.	
13,981 - - - and Rs. 469. 8. 4. for draining.	- - - -	-- completed, season 1844-45.	-- this gaol consists merely of an enclosure wall, a hospital, guard-room, sentry-boxes and wells. The convicts to build their own huts.
- - - -	2,634 5 -		
602 10 8	1,433 4 4	-- completed, season 1843-44.	-- two rooms for juvenile offenders have been constructed; the rest of the improvements estimated for were not considered absolutely necessary.
5,641 3 1	5,641 3 1	-- completed, season 1842-43.	
2,200 - - -	2,200 - -	season 1844-45.	
1,601 1 1	1,600 5 1	-- completed, season 1844-45.	
5,459 6 6	6,173 7 4	season 1848-49	-- in the contemplated alterations, part of the compound-wall will be taken down, and 29 suitable and commodious cells will be built. Provision has also been made for improving the drainage.
714 14 2	714 14 2	season 1843-44.	
- - - -	1,804 1 -		
14,709 11 6	7,164 - -	-- completed, season 1848-49.	-- this outcherry has been made of permanent materials, on a revised plan.
830 4 9	571 5 9	-- completed, season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces ; Judicial :			
Burrisaul: Cutcherry for the Magistrate and Registrar.	-- to replace the cutcherry destroyed by fire in February 1838.	sanctioned, 15 January 1839	Burrisaul - - -
New Cutcherry for the Principal Sudder Ameen.	-- this was rendered necessary, in consequence of the existing cutcherry being far removed from that of the Judge, and thus occasioning much inconvenience to suitors and pleaders.	sanctioned, 16 November 1841	ditto - - -
Piling of the bank of the River.	-- in consequence of an encroachment of the Burrisaul River on the town.	sanctioned, 12 March 1842	ditto - - -
Bograh, Construction of a new Circuit Bungalow, with Out-offices.	- - - - -	sanctioned, 20 November 1844	- - - - -
Burrisaul, Construction of a new Circuit House and Out-offices.	-- on the requisition of the Commissioner of Daeca, who represented that there was no circuit house for his accommodation, as well as that of his office ; and that the transfer of a large section of the Soonderbands to the Collector's jurisdiction, demanded that a great portion of his time should be devoted to the affairs of this collectorate.	sanctioned, 16 December 1846	Burrisaul - - -
Burrisaul Gaol, Construction of four Solitary Cells, and Drainage of.	-- The necessity for these works was originally brought to the notice of Government by the local civil authorities.	sanctioned, 28 December 1846	ditto - - -
Burdwan Gaol, Hospital, Construction of an additional Ward.	- - - - -	sanctioned, 24 November 1847	Burdwan - - -
Civil Buildings, Lower Provinces ; Revenue :			
Bhangulpore, Additions to the Collector's Cutcherry.	-- on a representation from the Collector to the Commissioner, of the great inconvenience felt from the small size of the cutcherry.	sanctioned, 11 August 1847	Bhangulpore - - -
Civil Buildings, South Eastern Provinces ; Revenue :			
Burrisaul, Additions to the Collector's Cutcherry.	-- required on account of the crowded state of the record-room, and also for the accommodation of two deputy collectors, recently added to the collectorate of Backergunge.	sanctioned, 26 November 1845	Burrisaul - - -
Civil Buildings, Central Provinces ; Revenue :			
Bundelcund, Enclosure of the Tulsildarry Cutcherry at Koench.	-- in consequence of an attempt made to plunder the treasury.	sanctioned, 29 March 1842	Koench - - -
Benares, Construction of a Verandah to the Collector's Cutcherry.	-- the necessity of this work was brought to the notice of Government by the local civil authorities. These verandahs will make the cutcherries cooler, and afford greater facilities for putting up tatties during the hot season in the upper rooms.	sanctioned, 26 April 1846	Benares - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
7,052 4 7		-- completed, 1840-41.	
2,695 13 11	2,894 15 3	-- completed, sea- son 1843-44.	-- the old cutcherry has been made over to the Local Committee of Public Instruction at Burrisaul, to be used as a school-house.
2,330 9 10	2,664 6	-- completed, sea- son 1843-44.	-- the labour will be performed by convicts. These measures proved a failure. The Ex- ecutive Officer submitted a project for the purpose of turning the current of the river, which in execution would cost about 1,00,000 rupees; the Government declined to sanc- tion the work, deeming it inexpedient to incur further expense.
4,682 14 7	4,999 5	-- completed, sea- son 1846-47.	
	5,490 15 10		
	1,843 15 11		
	1,000		-- to be constructed by the convicts, under the immediate superintendence of the Ma- gistrate, assisted in respect of plans by the Executive Officer of the division.
	3,269 4 04		
5,848 14 10	6,533	-- completed, sea- son 1847-48.	
1,173 4 4	1,441 3 11	-- completed, sea- son 1842-43.	
1,683 2 11	1,683 2 11	-- completed, sea- son 1846-47.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings; Lower Provinces, General:			
Buloah, New Salt Cut-cherry.	for the use of the Salt Agent	sanctioned, 1839-40.	at Noacolly
Barrackpore Government-house, Construction of new Out-houses.	- - - - -	sanctioned, 4 November 1840	- - - - -
Bagundee, Construction of a new Guard-house.	for the Sepoy guard	sanctioned, 3 January 1841	- - - - -
Barrackpore:			
Enlargement of the Burial-ground.	the extension is urgently required	sanctioned 6 September 1844	Barrackpore
Conversion of a Building in the Park into an Aviary.	- - - - -	sanctioned, season 1845-46	- - - - -
Bauleah, Construction of a Post-office.	this is a pucca building	sanctioned, 10 February 1847	Bauleah
Civil Buildings; Central Provinces, General:			
Buxar Chapel, Repair of the, and Construction of a Verandah.	- - - - -	sanctioned, season 1846-47	- - - - - situated midway between the fort and the buildings occupied by invalids.
Benares, Construction of an additional Godown.	- - to extend the accommodation of the opium factory premises.	sanctioned, 17 February 1847	Benares
Civil Buildings, Lower Provinces; Ecclesiastical:			
Barrackpore Church, Construction of a Wall.	to enclose the church	sanctioned, 28th October 1839	Barrackpore
Embankments, South Western Provinces:			
Culmeejole Division	- - - - -	- - length, 426 miles; estimated cost of annual repairs, 1839-40, Rs. 18,323. 9.	- - - - -
Cuttack	- - - - -	length, 560 miles	- - - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

29

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
2,646 - - -		-- completed, 1839-40.	-- the former building was altogether unfit for the purpose, for want of sufficient accommodation, and from the dampness of the floors.
4,646 - 4 8½		-- constructed, 1840-41.	
502 11 1	543 2 8	-- completed, 1841-42.	-- great sickness and mortality occurred in the Sepoy guard, which, in the general opinion of the officers, as well as of the civil surgeon, was owing to the proximity of the old guard-room to the salt godowns.
1,044 10 5	1,025 7 8	-- completed, sea- son 1845-46.	-- the additional space to be included, measures 880 × 100 feet.
7,558 13 4	7,558 13 4	-- completed, sea- son 1845-46.	
1,189 7 11½	1,226 11 1	-- completed, sea- son 1847-48.	
1,714 8 11	1,874 11 2	-- completed, sea- son 1847-48.	-- this chapel was assigned over to Government by the Missionary Society; it measures 40 × 20 feet (interior dimen- sions).
4,817 - - -	3,917 - - - -- A further sum of 400 rupees sanctioned for alterations to the boundary wall of the factory.	season 1847-48.	
	1,100 10 7	season 1839-40.	
			-- the average cost of annual repairs in the Culmejole division, was in 1847-48, Government Bonds - Rs. 15,826 13 10 Zemindary - - - 9,116 2 4 Rs. 24,943 - 2
			-- the cost of repairs to the embank- ments in the Cuttack Division in 1847-48 was Rs. 22,322. 14. 7. In report 1840-41, para. 19, it is stated that in central Cuttack alone, during the last 10 years, 11,09,427 rupees have been remitted on account of loss from drought and inundations.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces:			
Construction of Wooden Bridges on the road between Chittagong and the Fenny River, in Arracan.	- - - - -	- - - - -	- - - - -
Culna Road: Repair of - - - -	- - - - -	-- Length 35½ miles; sanctioned, 1841-42.	-- from Burdwan to the Hooghly River.
Metalling of the - - - -	- - - - -	sanctioned, 6 June 1844 - -	- ditto - -
Chittagong: Construction of a Drain Bridge.	-- in the place of a bridge destroyed in the rains of 1843.	sanctioned, 15 January 1845 -	- - - - -
Construction of Ramps in the Nullahs on the Chittagong Road.	-- these ramps are intended for the passage of cattle, with a view to the preservation of the wooden bridges.	sanctioned, 23 January 1846 -	-- between Chittagong and the Big Fenny River.
Calcutta to Barrackpore, repair of the Road.	- - - - -	sanctioned, 2 September 1845 -	- - from Shambazur Bridge to Pettah Ghaut.
Chittagong City, Construction of a Bridge.	-- in lieu of a bridge destroyed by inundation during the rains of 1841.	sanctioned, 31 March 1847 -	Chittagong -
Chittagong, Road to the Big Fenny River.	-- additional flooring to six masonry bridges, to prevent their destruction by undermining.	sanctioned, 11 January 1848 -	Big Fenny River
Roads and Bridges, Lower Provinces:			
Chupprah to Mootaree -	-- as a means of communication with the new Civil Station, established in Chumparun in 1837.	-- length, 61 miles; estimated for in August 1839.	-- Mootaree in Chumparun.
Chupprah to Rewah Ghaut.	- - - - -	-- length, 92½ miles; estimate dated 4 June 1839.	- - - - -
Colmere Ghaut to Buxar, Construction of Bridges and Drains.	-- for keeping open the communication between Ghazeepore and Dinapore.	- - - - -	Buxar - -
Cachar to Munnipore -	-- to make the communication between the Eastern Frontier and the Burmese country comparatively easy.	- - length, about 93 miles; commenced in 1837.	-- Paiksandy in Cachar.
Chota Nagpore, Bridge over the Nullah at Dorundah.	-- for keeping up the communication in the rainy season between the Military and Civil Stations at Dorundah.	sanctioned, 2 May 1842 -	Dorundah -
Comillah Road, Construction of 16 new Jungle-wood Bridges.	- - - - -	sanctioned, 8 July 1844 -	- - situated between Comillah and the Big Fenny.
Cossyah Hills to Assam: Repair of the Road and Bridges over the.	- - - - -	-- length, 85 miles; sanctioned 13 November 1844.	-- from Purreeya Ghaut to Pansegong in Assam.
Construction of Iron Suspension Bridges over the Boga and Burpanee Torrents.	- - - - -	-- East Bridge, 6 feet in width; sanctioned 10 July 1839.	Cossya Hills -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

31

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	3,625 6 8	- - - - -	-- the Executive Engineer will consider the future maintenance of this road as part of his ordinary duty.
3,292 12 10 and Rs. 1,282. 1. 10, for Drain Bridges.	- - - - -	-- completed, 1841-42.	-- the expenses will be paid by the Rajah of Burdwan.
- - - - - 12,419 - - - - -	11,937 6 3	-- completed, sea- son 1846-47.	
- - - - - 333 11 10 - - - - -	- - - - -	-- constructed, season 1845-46.	
- - - - - 1,165 4 - - - - -	1,521 - - -	-- constructed, season 1846-47.	-- a large trade in cattle is carried on between Arracan and the Bengal districts to the north; and it has been ascertained that so many as 3,000 have passed down the road in one month.
- - - - -	57,713 15 11½	- - - - -	-- the road is to be repaired with three- inch gouting.
- - - - -	1,551 - - -	- - - - -	-- the new bridge will be of two seg- mental arches of 10 feet span, each versed 1½ of span.
- - - - - 1,212 9 10 - - - - -	1,260 8 7	- - - - -	
- - - - -	47,286 7 4	-- its completion not reported.	
- - - - - 7,445 1 9 - - - - -	8,602 5 7	season 1841-42.	
- - - - -	67,783 8 8	not reported	-- this road, though it forms part of the communication by land between the Military Station of Ghazespore and Dinapore, is no great military thoroughfare, the communication between them being always open by water; it is, however, of importance to the traffic of one of the richest and most populous districts in India, and should be kept up, if possible, from local resources.
- about 39,947 10 4 - - - - -	- - - - -	-- completed, sea- son 1842-43.	
- - - - - 1,406 18 11 - - - - -	1,406 18 11	season 1842-43.	
- - - - -	886 3 6	season 1844-45.	
- - - - - 4,569 - - - - -	4,845 11 6	-- completed, sea- son 1846-47.	
- - - - - 14,057 11 1½ - - - - -	14,327 14 4	- - - - -	-- although the bridges are defective in some points of construction, they are believed to be, in all essential respects, substantial and suitable. The Bogapanee Bridge has one span of 94 feet between the points of suspension, with sus- pended approaches, one of which is 28 and the other 30 feet long, and the Burpanee consists of two spans, one of 88 feet and the other 65 feet between the points of suspension.

RETURN FOR THE PRESIDENCY OF BENGAL--continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, Central Provinces :			
Chunar to Sookroot, in the Mirzapore district.	to supersede the old road	-- length, about 19 miles; estimated in September 1930.	Sookroot
Civil Buildings, North Western Provinces; Judicial :			
Chunderee, Construction of a small Gaol and Cutcherry Bungalow.	- - - - -	sanctioned, 4 January 1845	Chunderee
Civil Buildings, South Western Provinces; Judicial :			
Calcutta House of Correction, Construction of Solitary Cells at the.	-- twenty-four cells have been constructed with improved accommodation for prisoners.	- - - - -	Calcutta
Civil Buildings, South Eastern Provinces; Judicial :			
Cuttack Gaol Hospital, Construction of Three Wards.	for insane patients	sanctioned, 23 July 1840	Cuttack
Commillah, New Court-room for the Magistrate.	- - - - -	sanctioned, 5 November 1840	Commillah
Calcutta Penitentiary : Construction of Six Wards	- - - - -	season 1841-42	- - - - -
Alterations and Additions to.	-- in consequence of defects having been discovered, whereby the security of the prisoners was compromised.	sanctioned, 10 May 1843	- - - - -
Calcutta Aqueducts, Setting up a Steam-engine, and Alterations and Enlargement of the Aqueducts, from the Reservoir at Chundpaul Ghaut, to the South-west corner of Esplanade-row East.	-- to raise water for filling the aqueducts; the enlargement of the aqueducts was rendered necessary, consequent on the enlarged supply of water to be expected from the substitution of a 20 for a 10 horse power engine.	sanctioned, 6 January 1841	Calcutta
Calcutta Police Hospital : Construction of Two Additional Wards.	-- for the sick poor of the town, and as a place for the resort of the poor from the neighbouring district for surgical operations.	sanctioned, 1841-43	ditto
Construction of a Tiled Shed at the Sudder Dewanny.	-- for the convenience of vakeels and others who attend the court.	sanctioned, 19 September 1842	ditto
Calcutta Penitentiary : Construction of Six Wards	-- for civil and criminal Supreme Court prisoners.	sanctioned, 16 June 1841	ditto
Construction of a New Steam-engine house.	-- for a 20-horse power engine, transferred from the Arsenal of Fort William to the town of Calcutta.	sanctioned, 7 September 1841	-- situated at the Chaund Paul Ghat
Construction of other Works connected therewith.	- - - - -	sanctioned, March 1844	ditto
Chittagong Gaol, Additions and Improvements to.	-- in consequence of the offensive state of the gaol, the want of proper ventilation, and the dampness of the floor of the gaol hospital.	sanctioned, 17 October 1842	Chittagong
Calcutta : Construction of Machinery in the House of Correction, and erection of a Building.	-- to employ the power of cast iron tread-mill, received from England.	sanctioned, 16 September 1844	Calcutta

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
6,998 7 9	6,325 - -	-- completed, sea- son 1841-42.	
600 - - - -	600 - -	-- constructed, season 1844-45.	
9,586 3 10	- - - -	completed 1839-40	-- the cost has been defrayed from funds realized by the prisoners' labour. The Chief Magistrate considers the cells to have answered their intended object so well, that the construction of 24 additional ones is contemplated.
646 12 2	495 2 -	-- completed, sea- son 1840-41.	
2,426 1 7	3,307 2 8	completed 1841-42	-- this work was completed for a sum of Rs. 661. 1. 1. less than the estimated cost, owing to the labour having been done by convicts.
30,800 - 7 - -	32,000 8 9	-- completed, sea- son 1842-43.	
2,296 15 8	2,296 15 8	-- completed, sea- son 1844-45.	
Cost of setting up the Engine } 11,074 12 7	{-- For setting {up the Engine } 11,074 12 7	{-- completed, sea- {son 1842-43.	-- the engine, which is of 20-horse power, is valued at Rs. 11,008. 12. 11½, and was sent to India in 1828-29, with the saw-mill machinery; it is now transferred from the Arsenal of Fort William.
Cost of New Aqueduct } 8,194 8 6	{-- For enlarging {the Aqueduct } 9,863 11 3	{-- completed, sea- {son 1845-46.	
1,317 2 - - -	1,317 2 - -	season 1841-42.	
1,340 4 9 - -	1,358 5 8	-- completed, sea- son 1843-44.	
30,800 - 7 - -	32,000 8 9	-- completed, sea- son 1842-43.	
11,074 12 7 - -	11,074 12 7	-- completed, sea- son 1842-43.	
16,252 1 7 - -	16,252 1 7	-- completed, sea- son 1843-44.	
1,288 11 9 - -	1,288 11 9	-- completed, sea- son 1842-43.	
12,202 12 7 - -	9,674 12 10	-- completed, sea- son 1846-47.	-- the power is intended to be applied in turning a soorkee mill, and grinding corn, but neither objects have as yet been efficiently attained.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; Judicial—continued.			
Calcutta, General Hospital. Excavation of two Tanks.	-- for watering the roads in the vicinity of the General Hospital.	season 1846-47	Calcutta
Chittagong Gaol, Construction of 22 Ventilators.	-- a more thorough ventilation of the gaol being considered necessary by the local and medical authorities, for the improvement of its salubrity.	sanctioned, 20 May 1846	Chittagong
Calcutta House of Correction, Construction of a Pucca Tiled Shed.	-- to replace a very old shed which has fallen into ruin.	sanctioned, 19 May 1847	Calcutta
Calcutta, Construction of Quarters for four Sergeants.	-- in compliance with a recommendation from the Chief Magistrate.	sanctioned, 19 May 1847	-- situated in the north-west corner of the Police Compound at Calcutta.
Comillah, Additions and improvements to the Judge's Cutcherry.	-- the necessity of these additions was brought to notice by the Civil and Sessions Judge.	sanctioned, 22 December 1848	
Civil Buildings, South Eastern Provinces; Revenue :			
Calcutta : Alterations of a portion of the Audit Office.	to provide for a stamp-office	sanctioned, 19 May 1841	Calcutta
Construction of a Portico to the office of the Sudder Board of Revenue.		sanctioned, 28 November 1842	ditto
Erection of Sheds at the Iron Bridge Yard, for 20 additional Forges.	-- in consequence of the heavy demand for iron suspension bridges from all quarters, particularly for the Grand Trunk Road.	sanctioned, 8 May 1843	ditto
Civil Buildings, South Western Provinces; Revenue :			
Cuttack, Revenue Survey Office and Record-rooms.	-- for the Revenue Surveyors and establishment.	sanctioned, 16 January 1838	Cuttack
Cachar, Construction of a Treasury and Record-room.	-- for the reception of the treasure and records.	sanctioned, 16 January 1843	Cachar
Civil Buildings, North Western Provinces; Revenue :			
Chunpore, Construction of a Tuhildarry Cutcherry.	-- rendered necessary with reference to the new settlement of land revenue in the North Western Provinces.	sanctioned, season 1838-39	in Zillah Bijnore
Civil Buildings, Central Provinces; Revenue :			
Coilsa, Repair of the Tuhildarry Cutcheries at.		sanctioned, 27 May 1840	

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

35

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	- - an estimate has been called for, in the meantime an annual outlay of 2,248 rupees has been authorized for the payment of bheesties, for watering the roads.	- - - - -	- - the excavation of the proposed two tanks will reduce the labour, and conse- quently the outlay for the bheesties to 1,864 rupees per annum.
- - 731 11 8 - -	- - 758 - - -	- - constructed, season 1846-47.	
- - 1,174 - - - -	- - 1,174 6 10 -	- - completed, sea- son 1847-48.	
- - - - -	- - 5,714 7 -		
- - - - -	- - 5,261 6 6 -	- - - - -	- - the works to be executed are two ad- ditional upper rooms, one of 41½ x 15½, and one 53 x 14½, the raising of the walls of the three old upper rooms, to make them convenient as Record-rooms, and the supplying of record racks.
- - 4,050 9 5 - -	- - 4,220 5 9 -	- - completed, sea- son 1841-42.	
- - 819 7 6 - -	- - - - -	- - completed, sea- son 1843-44.	
- - 5,046 1 10 -	- - - - -	- - constructed, season 1843-44.	
- - 2,071 9 4 - -	- - 2,071 9 4 -	- - completed, sea- son 1839-40.	
- - 195 6 4 - -	- - 195 6 4 -	- ditto - -	- - the smallness of the outlay was caused by the employment of convict labour.
- - 3,264 - 6 - -	- - - - -	- - completed, sea- son 1840-41.	
- - 4,804 15 2 -	- - - - -	- - repaired, sea- son 1842-43.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South-Eastern Provinces; General:			
Calcutta Mint, Construction of a Guard-house and Stabling.	-- to replace buildings destroyed by a storm on the 29th of April 1839.	sanctioned, season 1839-40	Calcutta
Calcutta Treasury, Improvements at the.	-- to remedy the inconvenience felt for want of office accommodation.	sanctioned, 4 March 1840	-
Chittagong, Repairs to the Breakwater in front of the Salt Golahs.	-- for the safety of the salt in store during the rains.	sanctioned, 1 April 1842	Chittagong
Calcutta Custom-house, Construction of additional Buildings.	-- to accommodate the increasing trade of the port.	sanctioned, 31 March 1841	Calcutta
Calcutta General Treasury, Additions to.	to afford additional accommodation	sanctioned, season 1838-39	-
Calcutta:			
Construction of a House in the Botanical Garden.	for an assistant overseer	sanctioned, 22 September 1841	-
Construction of a Record-room.	-- for the General and Financial Departments.	sanctioned, 26 March 1842	-
Raising the Floors of two Godowns.	-- they were subject to inundation in heavy rains.	sanctioned, 14 September 1842	-
New Roofing of the Circular Cutting-out Room at the Mint.	-- in consequence of some of the beams having failed.	sanctioned, 8 March 1843	-
Quadrennial Repairs to the Government House and Out-offices.	-	sanctioned, season 1842-43	-
Construction of Lecture-rooms and School-rooms at the Hindoo College.	-- for the General Committee of Public Instruction.	sanctioned, March 1843	-
Repairs to the General Treasury Premises.	-	sanctioned, 8 March 1843	-
Calcutta Medical College:			
Construction of Quarters for the House Surgeon and Staff Serjeant.	-- in consequence of insufficient accommodation.	sanctioned, 18 September 1843	Calcutta
Construction of a Verandah to the Male Hospital.	-- under a representation of its necessity from the Council of Education.	sanctioned, 14 July 1843	ditto

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

37

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
18,850 8 10	20,626 9 1	-- completed, season 1840-41.	-- the proposed dimensions and architectural decorations were considered superior to what are usual or necessary for similar works in the place. The work is stated to have been satisfactorily done.
	23,138 4 6		-- the house used for the Savings Bank is altogether removed, and a new building erected on the entire frontage, between the Treasury and the Accountant-general's offices. The new building will be carried up to the full height of the Treasury, and will provide accommodation for the General Treasury, the Accountant-general's offices and the Savings Bank.
12,478 6 7	14,633 1 -	-- completed, season 1843-44.	-- a saving of Rs. 2,154. 10. 5. occurred on the amount authorized, in consequence of a reduction in the quantity, as well as in the rates of the work.
20,954	19,710 1 10	-- completed, season 1842-43.	
20,021 15 6		-- completed, season 1841-42.	
1,913 11 4	1,803 2 9	-- completed, season, 1842-43.	
4,289 15 4	4,289 15 4	- ditto.	
1,325 10 6	1,412 4 8	- ditto.	
	2,224 11 5½	-- completion not reported.	-- the estimate framed is for a new roof supported on iron beams.
26,983 14	26,983 14	season 1842-43.	
18,152 4 5	19,634 3 -	-- constructed, season 1844-45.	-- the expense will be borne in nearly equal shares by Government and the College.
435 11			
0,091 6 5	6,319 6 11	-- completed, season 1844-45.	
	Rs. 2,000 also granted for the purchase of ground required to be added to the Medical College premises.		
967 14 1	1,019 3 10	- ditto -	-- this work was necessary to the comfort, efficiency, and internal economy of the establishment.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
	Eastern Provinces; General— <i>continued.</i>		
Calcutta Medical College, Construction of a new Dissecting-room.	-- it was considered necessary to remove the dissecting operations to a distinct building; they had been carried on in a room in close proximity to the Female Hospital and quarters of the Secondary School.	sanctioned, 2 October 1843	Calcutta
Calcutta, Additions to St. James' Church.	-- the works consist of a new wooden gallery, laying a marble floor, &c.	sanctioned, 15 March 1843	ditto
Calcutta Government House: Construction of an Entrance Gate.	-- to the gardens south of the building.	sanctioned, 14 February 1843	ditto
New Supreme Court-house and Insolvent Court.	-- In consequence of the existing buildings and arrangements not affording the necessary accommodation for the distribution of business.	-- estimates called for, 7 June 1842.	"
Construction of New Salt Golahs on the banks of the Creek between the Islands and of Kankra and Kissenpore.	- - - - -	- - - - -	- - - - -
Chittagong, Construction of a new Tiled Roof Custom-house, and purchase of a site.	-- required to replace a thatched shed, which is out of repair and inconveniently situated, being separated by a large nullah from the pier at Chittagong.	sanctioned, 8 March 1843	Chittagong
Calcutta General Post-office, Additions to.	-- represented by the Postmaster-general to be indispensable, with reference to the increased business transacted in the Post-office.	sanctioned, 2 July 1845	Calcutta
Calcutta Medical College: Construction of additional Rooms.	-- for cook-rooms to the Female Hospital.	sanctioned, 28 January 1846	"
Construction of a new Coach-house.	-- required in lieu of the former one, which had settled and cracked.	sanctioned, 7 November 1845	"
Calcutta Mint, Building and fitting up an Electrotype refinery.	- - - - -	sanctioned, 13 December 1844	"
Calcutta Stamp Office, Construction of a Drying-room over the Stables attached to the Stamp-office.	-- the necessity for this work was brought to the notice of Government by the Board of Customs, Salt and Opium.	sanctioned, 20 October 1847	Calcutta
Cuttack, Repairs to the School-house.	-- damage was occasioned to the school-house by a fire, which occurred on the 7th of May 1846.	sanctioned, 9 September 1846	Cuttack

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. - - 5,119 5 7 - -	Rs. a. p. 5,119 5 7	season 1843-44.	
- - 4,007 3 10 - -	- - - - -	-- constructed, season 1843-44.	-- of the amount expended, R.2,344. 2. 9. have been recovered from the vestry of the church, such being the engagement under which the work was executed.
- - 851 15 3 - -	871 10 1	-- completed, sea- son 1844-46.	ordered by the Governor-general.
-- the proposal was referred to the Home Authorities, to whom the necessity for the contemplated arrangements was not apparent.	3,94,530 - -	- - - - -	-- the present Court-house is a public building, valued at 80,000 rupees, and the Insolvent Court is held in an adjoining building, rented at 500 rupees per mensem.
- - - - -	16,236 2 6	- - - - -	-- the estimate is for 10 golahs each, calculated to hold 75,000 maunds of salt, and for a maund raised 7½ feet, 717 × 284 feet for the golahs to be built on. The excavation of the work intrusted to the officers in the Salt Department, there being no officer of the Department of Public Works available for the duty.
- - 5,150 1 - - - -	5,448 - 9 Cost of site, Rs. 5,000	-- completed, sea- son 1846-47.	-- the bridging of the nullah would have been more expensive than the building the new Custom-house.
-- this work was suspended, the erection of an entirely new Post-office being contemplated by Government.	9,485 - -	- - - - -	-- the additions will comprise an upper room 50 × 85, a room 16 × 16.
- - 551 9 1 - - - -	505 - -	-- completed, sea- son 1847-48.	
- - 1,143 - - - - -	1,143 - -	season, 1845-46.	
- - 3,510 - - - - -	- - - - -	-- constructed, season 1846-47.	
- - - - -	2,176 18 3	- - - - -	
- - 865 1 4 - - - -	- - - - -	season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; General—continued.			
Calcutta Post-office, Construction of Sheds in the Compound of the General Post-office.	-- to provide residences for the distributing peons on the spot, so that their services may be available at all hours.	sanctioned, 19 May 1847	Calcutta
Calcutta General Post-office, Construction of a Stable, Cart, and overland Van Sheds in the Compound of the Post-office.	-- the Postmaster-general considered the proposed works absolutely necessary for conducting the greatly increased business of the office, and more particularly of the steam branch.	sanctioned, 19 July 1847	Calcutta
Civil Buildings, Lower Provinces; General:			
Chinsurah Church, Repairs to.	-- the roof, owing to the decayed state of the beams, was reported to be in a dangerous state.	sanctioned, 23 February 1842	
Cheera Coal Mines, Construction of a Roadway.	-- for facilitating the means for the conveyance of coals from the Cheera Hills to the plains.	sanctioned, 5 October 1842	Cheera
Chinsurah, Enlargement of the Burial-ground.	- - - - -	sanctioned, 15 February 1847	Chinsurah
Civil Buildings, South Western Provinces; Ecclesiastical:			
Circular Road, Purchase of Land.	for a burial-ground	sanctioned, 28 August 1839	
Civil Buildings, South Eastern Provinces; Ecclesiastical:			
Chittagong Church, Construction of.	- - - - -	sanctioned, 9 October 1840	
Marine Buildings, South Western Provinces:			
Calcutta, Construction of a House and Offices for the Master Attendant.	-- residence for the Master Attendant and offices and godowns for naval stores.	- - - - -	
Marine Buildings, Lower Provinces:			
Chittagong Pier: Construction of	- - - - -	- - - - -	
Repairs to the	-- in consequence of injuries done to it by marine worms.	sanctioned, season 1842-43	
Chittagong, Construction of a tiled roof Custom-House.	-- to replace a thatched shed, which is out of repair and inconveniently situated.	sanctioned, 8 March 1843	

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

41

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
2,194 11 - -	2,199 - -	-- completed, season 1848-49.	
2,505 9 11 - -	3,107 8 9	-- completed, season 1848-49.	
2,674 7 1½ - -	2,674 7 1½	-- completed, season 1842-43.	-- this is an old Dutch building, and is supposed to have been built in the year 1685.
- - - - -	66,584 11 -		
- - - - -	- - the payment of Rs. 2,788. 11. was sanctioned, as well as the remission of Rs. 25. 4., or Company's Rs. 28. 15., on account of annual revenue.	season 1846-47 -	- - an estimate amounting to 452 rupees was sanctioned on the 28th July 1846, for the enclosure of the newly purchased ground.
1,088 1 10 - -	19,700 - - for ground, and Rs. 2,385. 9. 5. to adapt it for the object intended.	-- completed, season 1840-41.	- - the saving of Rs. 307. 7. 7. within the estimated amount, is owing to the material for the pathways having been obtained from certain buildings which it was found necessary to clear off the ground purchased.)
10,335 - - - -	9,947 3 8	-- completed, season 1843-44.	- - of the amount, 3,518 rupees has been paid by Government, and the remainder (6,817 rupees) by the community and the Church Building Fund.
- - - - -	46,000 - -		
6,504 14 10 - -	6,504 14 10	- - completed, 1830-40.	
1,213 14 10 - -	- - - - -	-- completed, season 1842-43.	
- - - - -	5,448 - 9		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces ; Judicial :			
Chupprah, Construction of a Hazut Tuzwees Ward.	for the Magistrate of Sarum - -	sanctioned, 24 May 1848 - -	Chupprah - -
Chitpore, Construction of a Thannah House near the Suspension Bridge.	- - to replace the former thatched building, which was destroyed by fire.	sanctioned, 7 July 1847 - -	Chitpore - -
Canals, North Western Provinces :			
Doab Canal :			
Construction of five additional Falls and Locks .	for irrigation and navigation - -	estimates sanctioned in 1839 - -	- - Doab ; the falls are to be at Lerkurrie, Hullallpore, Meg, Chupper, Ruree, and Balpore.
Introduction of Rajbuhas, in the tract between the Canal and the River Hindun.	- - these rajbuhas are water-channels, which, diverging from the main stream of the canal, flow to a considerable distance from its line, and serve to extend the irrigation to numerous villages, which could not without much inconvenience and many disputes, obtain water direct from the canal itself; they are very useful works, and likely to afford a good return for the outlay expended on them.	estimates sanctioned, May 1839 - -	- - - -
Plantations of trees on the banks of the.	- - - - -	from 1830 to 1840-41 - -	- - - -
Connexion of the, with the Dumola River.	- - - - -	14 September 1839 - -	Doab Canal - -
Delhi Canal - - -	- - - - -	- - - - -	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
4,782 - 6½ - -	5,400 1 8	--completed, season 1846-47.	
1,160 15 7 - -	1,160 15 7	--completed, season 1847-48.	-- as the thannah at this locality has been burnt down three times during twelve years, the present estimate provides for the erection of a pucca building.
52,856 8 1 - - the conversion of the 11 falls as locks from Belkes to Balpore in Pergunnah Behut and Saharunpore has been also effected at a cost of Rs. 21,040. 11. 7.	69,171 - - sanctioned for additional falls and locks.	-- completed, season 1840-41.	-- the raising of the banks of the Doab Canal was sanctioned in 1838-39, the cost was Rs. 70,844. 8. 6., and the entire length of the work done 885,132 feet; the additional bunding up of the main stream of the Jumna, in order to convey the water to the canal, puts an entire stop to the timber trade from the hills, but when the canal has been made navigable, this inconvenience will cease. The total amount expended on account of the Doab Canal in 1840-41, amounted to Rs. 1,15,156. 12. 1., and the direct return to 1,66,936 rupees.
20,000 - - - -	20,000 - - - -	season 1839-40-	-- this sum of 20,000 rupees, was placed at the disposal of Captain Cautley, for the introduction of rajbuhars or watercourses on a tract of land lying between the Doab Canal and the river Hindun, a great part of which had fallen to the British Government by the death of her Highness the Begum Sumroo.
14,891 12 7 - - amount realized from cuttings 10,435 rupees.	- - - -	- - - -	-- the number of trees on the banks of the Doab Canal to 30th April 1848, was 2,85,827, and their value was estimated at 30,000 rupees; a sum of Rs. 9,872. 4. 4. had been realized by the sale of timbers.
- - - -	18,800 - - sanctioned for the construction of aqueducts.	- - - -	- - - -
- - - -	-- the amount of expenditure incurred on account of plantations on the banks of the Delhi Canal to the 30th April 1847 was Rs. 27,363. 5. 7., the amount realized Rs. 52,025. 12. 6., and the estimated value of the trees on the banks of the canal, Rs. 5,66,998. 5. 4. Orders were reported in season 1848-49, for the removal of 6,746 trees; the number remaining amounted to 369,646 of different ages, and their value was estimated at Rs. 5,57,828. 2. 8.	- - - -	- - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
<i>Canals, North Western Provinces—continued.</i>			
Deyra Dhoon:			
Construction of a Masonry Tunnel in lieu of a wooden one on the Beejapore Canal.	-- the wooden tunnel was a source of much trouble and expense, owing to the repairs which it constantly required.	sanctioned, 26 September 1843	-- situated near the village of Dakra.
Rajpore Watercourse	-- to supply pure and wholesome water to the town of Deyra, for domestic purposes.	-- length, 7½ miles; sanctioned, 8 March 1841.	-- from the hills at Rajpore to the town of Deyra.
Setting up of a Saw Mill	-- the watercourses in Deyra are stated to be peculiarly applicable to machinery of all kinds.	sanctioned, 11 September 1843.	--
Construction of 12 small Reservoirs on the Rajpore Watercourse.	-- intended for watering the village cattle, and they will relieve the main stream intended for drinking purposes from impurities, of which it could not be kept free so long as cattle resorted to it generally.	sanctioned, 14 June 1844	-- in the Deyra Dhoon.
Construction of four Corn Mills on the Beejapore Watercourse.	-- the construction of these mills will be advantageous to the Government, as well as to the inhabitants, who now carry their corn to other mills, distant between four and five miles.	sanctioned, 15 June 1844	-- ditto
Delhi Canal:			
Masonry Bridge over the Bowanee Outlet Nullah, on the Delhi Canal.	-- in lieu of an old bridge, two arches of which had fallen.	sanctioned, 4 October 1839	-- situated near the village of Shappore.
New Cut for protecting the Channel, and for the security of the Dadoopore Dam.	-- to protect the Delhi Canal from injury, by incursions of the Soanee River.	-- length, 11,200 feet, width, 75 feet, average depth 9 feet.	Delhi
Bridge over the Delhi Canal at Rhudour.	-- to promote the traffic of the town of Rhudour.	sanctioned, 15 August 1837	--
Construction of an Iron Suspension Bridge at Indore over the.	-- with a view to the maintenance of the communication of the country.	sanctioned, 24 August 1838	--
New Channel under the Indore Bridge.	--	sanctioned, 24 August 1838	--
Construction of a Dam Bridge across a Ravine at Dadoopore.	-- in lieu of an over-fall drain bridge, which was carried away during heavy rains in 1841.	sanctioned, 15 April 1843	--
Construction of two Inlet Bridges over Ravines, entering the Canal near the Pucca Tank, west of Hissar.	-- these inlet bridges are necessary to preserve the continuity of the embankments, and to check the influx of silt, at a point between the pucca tank of Hissar and the village of Solumo Shekspore, where both banks of the canal are interrupted by ravines, which enter the canals at opposite points.	sanctioned, 19 June 1847	--

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i> 3,358 1 6 Rs. 6,244 sanctioned for the construction of falls, or masonry descents, for the passage of the waters.	<i>Rs. a. p.</i> 2,996 14 -	-- completed, season 1844-45.	
42,984 11 9	41,207 2 4	-- constructed, season 1844-45.	-- the object for which this watercourse was constructed has been fully obtained, the water running in a clear and pure stream.
Rs. 2,000 advanced	- - - -	-- constructed, season 1844-45.	
1,608	1,608 - -	-- constructed, season 1844-45.	
2,500	2,500 - -	-- constructed, season 1844-45.	
2,315 3 10	3,330 9 9	-- completed, season 1840-41.	-- the savings are ascribed to the substitution of gratings at the depth of six feet, instead of cylinders, under the wing walls.
1,779 13 2	1,779 13 2	-- completed, season 1843-44.	-- the cut has since been widened, by the action of the current, to twice its original dimensions.
9,577 5 2	- - - -	-- completed, season 1841-42.	-- the roadway is of timber, and is supported on masonry piers.
13,267 7 5	- - - -	-- completed, season 1840-41.	
15,717 14 2	18,122 15 5	-- completed, season 1842-43.	-- the soil through which the new cut was to be excavated, proved to be so saturated with water as to prevent a greater depth of excavation than four feet being attained. The action of the current has however cleared out the channel to the depth of eight or nine feet.
- - - -	548 15 10		
- - - -	1,141 - 10		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
<i>Canals, North Western Provinces—continued.</i>			
Deyrah Doon : Construction of Corn Mills.	-	-- sanctioned, 6 July 1844, and 30 August 1844.	-- under the town of Rajpore.
Compensation to Individ- uals for Loss of Prop- erty and Profit.	-- in consequence of the water from the old Rajpore watercourse having been turned into the masonry channel.	-- sanctioned, 18 May 1845 ; sanctioned, 24 July 1845.	-
Re-construction of the Dakra Aqueduct.	-- this aqueduct was severely da- maged by heavy rain, on the 27th July 1844.	sanctioned, 2 December 1844 -	-
Repair of 13 Tanks	-- to making them serviceable as reservoirs for irrigation.	sanctioned, 10 July 1845	-
Doab Canal	-	-	-
Restitution of the Now- gong Dam, and Con- struction of a Retaining Dam.	-- greatly injured by a flood, on the 21st June 1841.	sanctioned, 24 March 1843	-
Constructing the Outlets of the Head of the Pu- thine Rajbuha, in the North Division of the.	-- with the intention of protecting the head supply, as well as giving the power of delivering water into the rajbuha, or irrigation channel, with greater facility.	sanctioned, 20 September 1844	-
Clearance of the Khorra Head of the Canal.	-- in consequence of a change which took place in the main channel of the Jumna, towards the close of last rains.	sanctioned, season 1844-45	-
Dadoopore Dam : Protection of the East flank of the.	-- by securing the right bank of the Jumna against further encroachments of that river.	sanctioned, 26 July 1845	-
Measures for the Security of the Canal Works.	-- the floods of July 1845, from their long duration and extreme violence, did considerable injury to the crib spurs intended for the protection of the right bank of the Jumna, to the earthen bund on the Sombe.	sanctioned, 19 March 1846	-
Delhi Canal : Improvement of the Em- bankments of the.	-- with a view to confine the canal within certain limits.	sanctioned, 9 September 1845	near Hissar
Construction of 20 Second- class Chowkies, and furnishing Chowkies.	-- necessary to enable the Superin- tendent and his establishment to pass with convenience and rapidity along the line.	sanctioned, 1 December 1845	-

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

47

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. 4,988 2 - -	-- for 8 miles, Rs. 5,414 " 6 " 3,960	-- constructed, season 1845-46.	
	Rs. 9,374		
2,732 13 - - 4,205 - -			-- ten miles already constructed by Govern- ment on the watercourse, have been rented for upwards of 4,000 rupees per annum.
1,542 10 1 - -	Rs. a. p. 1,480 - -	-- completed, sea- son 1845-46.	
5,004 10 7½ - -	5,004 10 7½	season 1845-46.	
			-- total amount ex- pended on account of canal works, including current expenses, to 1 May 1847 - - - - - Rs. a. p. 23,20,868 11 7 Deduct, value of Dead Stock - 8,01,983 12 2 15,18,884 15 5 Amount realized by revenue - 14,63,196 4 11 Deficit - Co's. Rs. - 55,688 - -
			The amount expended on account of plantations on the banks of the Denab Canal, to 30 April 1847, was Rs. 21,162. 12. 2. The amount realized, Rs. 8,505. 8. 9.; and the value of the trees on the canal banks, 1,46,793 rupees.
36,694 4 5 - -	30,745 - -		
656 9 - - - -	661 8 8	-- completed, sea- son 1846-47.	
	1,871 4 6	season 1844-45.	
6,717 6 9 - -	6,073 - -	-- completed, sea- son 1846-47.	
15,211 - - - -	14,647 - -	-- completed, sea- son 1846-47.	
9,290 - - - -	9,290 - -		-- in consequence of too great an economy in the original construction, the canal con- stantly floods the land in the vicinity of Hisar.
	6,714 - -	season 1845-46.	

RETURN FOR THE PRESIDENCY OF BENGAL—*continued.*

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
<i>Canals, North Western Provinces—continued.</i>			
Delhi Canal, Construction of five First-class and six Second-class Chowkies.	-- sanctioned, after personal inquiry as to their necessity.	sanctioned, 7 May 1845	-
Dooab Canal: Construction of three Bridges on the.	-- to facilitate the communication of the country. At present the villagers, with difficulty and inconvenience, ford the canals at their respective ghats.	sanctioned, 8 April 1846	-- at Admerpore, Kyampore, and Behlap, in the South Division.
Alterations to 15 Bridges on the.	-- with a view to give an increased and less impeded waterway.	sanctioned, 28 March 1846	-- in the Centre Division.
Digging of the Manti Rajbeeha on the.	-- to give a supply of drinking water to 33 villages in the district of Seharunpore, and for irrigation.	sanctioned, 22 November 1841	-
Construction of a Dam with Bridge for.	-- for securing all the Dooab Canal escape water for the Delhi Canal.	sanctioned, 23 October 1841	at Fysabad
Construction of Drains for Irrigation.	-	sanctioned, 31 May 1831	-
Construction of a third Chamber at the Ghinen and Megla Falls.	-- to facilitate repairs, and to avoid the necessity of forming cuts around the falls for the passage of water, and thereby admitting silt at the same time into the canal.	sanctioned, season 1838-39	-
Construction of a third Chamber at the Rundole and Bobyla Falls.	-	sanctioned, season 1838-39	-
Construction of a Fall at Behut, between the Muskarra Dam and Bekla Falls.	-- to lessen the velocity of the water in that part of the Dooab Canal, and its injurious effects on its bed and sides.	sanctioned, 14 March 1837	-
Construction of an additional Tail to the Nowgong Dam.	necessary for the safety of the dam	sanctioned, 19 April 1842	-
Dadoopore Dam	-- repair of breaches made by floods in July 1845.	sanctioned, 18 August 1846	-
Delhi Canal: Construction of a Pucca Revetment.	-- this work will conduce to the appearance of the canal, and to the comfort, and perhaps even the health of the inhabitants of Delhi.	sanctioned, 3 September 1846	-
Construction of 114 Masonry Outlets on the Banks of the Canal.	-	sanctioned, season 1846-47	-
Dooab Canal: Improvement to the Romalla and Kandraoli Bridges.	-- to remedy the inconvenience experienced in the free transit of boats between Selimpore and Shamli.	sanctioned, 8 June 1846	Dooab Canal
Construction of 60 Cross Drains attached to the ramps of 30 Bridges.	-- the ramps are high and massive, and as they intersect the natural drainage of the country at right angles, the rain-water, without these drains, would have accumulated on the upper side of the ramps, and noxious swamps have been formed.	sanctioned, 5 March 1847	-

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
- - - - -	9,133 4 10	-- completed, season 1845-46.	
4,004 - 9 - -	4,394 - - -	-- completed, season 1847-48.	
7,270 3 9 - -	8,528 - - -	-- completed, season 1847-48.	
- - - - -	-- an advance of 19,120 rupees, sanctioned on the 22d Nov. 1841.	- - - - -	-- the return to the state will be about 5,500 rupees per annum.
13,881 3 1 - -	13,304 - - - for a bridge Rs. 3,021.3	-- completed, season 1843-44.	-- this outlay will soon be repaid by the return derived from the employment in irrigation of the quantity of water now lost, and by the annual saving of the expense of temporary bunds.
16,321 8 2 - -	16,378 8 2 -	-- completed, season 1841-42.	
20,761 11 - - -	13,518 5 3 -	-- completed, season 1841-42.	-- the estimate is exceeded by the amount of Rs. 7,243. 5. 9., owing to the difficulties which had to be overcome.
7,996 3 1 - - -	10,178 - 2 -	-- completed, season 1841-42.	-- there not having been any natural difficulties to overcome in this work, the charge is by Rs. 2,181. 13. 1. less than the sanctioned estimate.
22,885 15 6 - -	14,743 - 9 -	-- completed, season 1841-42.	-- owing to the difficulties met with in the execution of the work, the bill has exceeded the estimate by Rs. 8,142. 14. 0., but no blame attaches to the Executive officer.
16,486 11 9 - -	18,000 - - -	-- completed, season 1842-43.	-- this dam was almost entirely destroyed by a severe flood on the 21st June 1841.
1,756 6 1 - - -	- - - - -	-- completed, season, 1846-47.	
- - - - -	9,277 - - -		
16,059 12 2 - -	- - - - -	-- completed, season 1846-47.	-- these are fitted with lever frames, lever sluice, and shutters.
2,347 13 5 - - -	2,338 - - -	-- completed, season 1847-48.	-- the superstructure of these bridges has been raised.
- - - - -	5,174 6 -		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Canals, North Western Provinces—continued.			
Dooab Canal:			
Protection of the Gundawar Bridge by a masonry Tail.	-- considered indispensable to the safety of the bridge, which has been considered for some time past in a precarious state.	sanctioned, 17 December 1846 -	- - -
Construction of a First-class Chokee at the Kharra, or upper head of the Canal.	-- it was considered desirable to have a depôt for tools and stores at the head work, instead of having to depend on that at Nyaskur, the nearest first-class chokee, which is at a distance of 6½ miles from the Kharra head.	sanctioned, 10 December 1846 -	- - -
Delhi Canal, repair of the Madhilpore Bridge over the	to increase the waterway	sanctioned, 23 June 1847	Madhilpore
Delhi, Reconstruction of Water Mills' Range.	Nos. 17 and 18	sanctioned, 18 March 1847	Delhi
Delhi Canal:			
Formation of Road Embankments.	-- these artificial banks constructed on low ground, confine the waters of the canal within their limits, and prevent the formation of swamps.	sanctioned, 19 September 1846	- - -
Construction of Buildings	-- for a dispensary and quarters for the sub-assistant surgeon appointed to the medical charge of the canals at Dadoopore.	sanctioned, 17 February 1846	Dadoopore
Dooab Canal:			
Construction of Masonry Heads to nine Rajbuhas.	for the protection of the banks	sanctioned, 5 June 1847	Dooab Canal
Construction of two Flour Mills on the Cardbunna and Madhoopore Rajbuhas.	-- in order that advantage might be taken of water-power available in these rajbuhas.	sanctioned, 5 August 1847	- - -
Construction of a second Head to the Scharunpore Mill Cut.	-- to prevent the stoppage of the mills when the supply is cut off from the first head, to enable the workmen to clear away the silt, which is freely deposited in this channel.	sanctioned, 28 August 1847	- - -
Construction of the Amith Mhow Cut, with two Masonry Bridges.	-- this cut was made to enable the natural drainage of a large tract of ground to pass freely through the canal embankments.	sanctioned, 30 May 1846	-- in Pergunnah Gungo, Zillah Seharunpore.
Deyrah Doon, Repairs to the Rajpore Watercourse.	-- the Ruspinnah River has been turned back to its old channel.	sanctioned, 12 May 1847	- - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs. a. p.		
- - - - -	- - - - -	3,021 2 -		
- - - - -	- - - - -	1,193 7 4		
- - - - -	- - - - -	2,400 - -	- - - - -	-- the eastern abutment of the bridge was turned by the floods of August 1846, and as the canal is about 20 feet wider than the length of the bridge, it is proposed to reconstruct the abutment as a pier, and to add an arch of 22 feet to the bridge.
- - 681 - - - - -	- - - - -	681 - -	-- reconstructed, season 1847-48.	
- - 13,974 6 8 - - -	- - - - -	- - - - -	-- completed, season 1847-48.	-- the swamps originated in too great an economy in the construction of a canal, which was led through low and broken ground without any measures being adopted to confine its water.
- - 960 15 9 - - -	- - - - -	1,029 - -	-- completed, season 1848-49.	
- - - - -	- - - - -	3,631 11 -		
- - - - -	- - - - -	2,378 2 8	- - - - -	-- there is every reason to believe that the outlay will be turned to good account.
- - - - -	- - - - -	2,198 - -		
- - 1,436 3 3 - - -	- - - - -	- - - - -	-- constructed, season 1847-48.	-- the land thus relieved from standing water is now available for cultivation.
- - 1,573 - - - - -	- - - - -	1,573 - -	-- completed, season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Western Provinces :			
Diamond Harbour and Barri-poor Roads, Repair of the portion between Gurriahaut and Barri-pore.	-- both these lines are much out of repair, and are much wanted to enable the cultivators to bring the produce of their lands to Calcutta.	sanctioned, 6 April 1841	-- in the 24 Pergunnahs.
Roads and Bridges, Lower Provinces :			
Daudpore to Sheerpore, Construction of a new Road.	-- in lieu of a road which had been carried away by encroachments of the River Ganges.	-- length, 13 miles; sanctioned 4 June 1839.	Sheerpore - - -
Doudecondy to Mungdo, Construction of Forty Wooden Bridges.	- - - - -	sanctioned, 27 May 1841	-- Chittagong to the Ferry near Company kattath.
Darjeeling and Calcutta Road.	-- to perfect the communication between Calcutta and Darjeeling, which new station is becoming a place of general resort for invalids.	-- length, about 363 miles; sanctioned, season 1840-41. Berhampore to Baraset, 120 miles; Baraset to Kishnagur, 50 miles.	Calcutta - - -
Darjeeling, Road from, to the foot of the Hills.	-- this work, when finished, will be eminently useful.	-- length, 33 miles and 181 yards; sanctioned 30 November 1840 and 1841.	-- Hills above Darjeeling.
Darjeeling Road : First Division ; Construction of Three Bridges and Six Drains.	- - - - -	sanctioned, 28 December 1841	Berhampore - -
Second Division ; Construction of Wells.	for the convenience of travellers	- - - - -	-- between Bur-gatchee and Dinagepore.
Construction of Roads in the Neighbourhood of, including the "Auckland Road."	-- for facilitating the means of communication.	-- length, about 4½ miles; sanctioned, season 1844-45.	Darjeeling - -
Dinapore to Bankipore; Re-construction of the Pucka portion of this Road.	-- this road connects the city of Patna with the cantonment of Dinapore.	-- length, about 7½ miles, from the main guard bridge at Dinapore, to the parade at Bankipore.	Bankipore - -
Repair of the Road between Dum Dum and Coaspore.	- - - - -	-- length, 3 miles; sanctioned 3 December 1839.	Coaspore - - -
Dinagepore Bridge, over the Guggrah Nullah at	-- required in the place of the Creighton's pucka bridge, which was destroyed by an inundation in July 1841.	-- the water-way of this bridge is 191 feet in length; sanctioned, 9 January 1843.	Dinagepore - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
10,190 12 2	10,190 12 2	season 1841-42	-- an attempt was made to obtain the assistance of the landholders; but nearly all the estates along the line were under the management of the Government officers, and accordingly the State was, in fact, the zemindar.
1,592 4	1,592 4	season 1839-40	this new line is taken well inland.
3,625 6 8	3,625 6 8	-- completed, season 1841-42.	-- all the masonry bridges on this line are being repaired, great damage having been done by an unusually severe flood.
-- the work has been performed under divisional superintendence. No general return of the amount of advances has been prepared; but so far as can be ascertained, the amount expended for road works, bridges and bungalows, to the period of its completion, has been about 95,957 rupees.		-- completed, season 1843-44.	-- the old line of road between Berhampore and Dinagore <i>via</i> Malda, has been abandoned, and a new line, 30 miles shorter, adopted. This road was reported to have been put in a perfect state of repair as a dry-weather communication, and it would only require ordinary repairs after the rains of each year. It had been intended, when the road was first projected, to employ convicts extensively on it, but owing to great sickness, the convicts were entirely withdrawn.
-- the aggregate cost of this line was 68,829 rupees, including that of bungalows, &c.	28,396 11 2	-- completed, season 1840-41.	-- this road has been opened for foot passengers by Lieutenant Napier, of the Engineers, and is quite practicable to travellers and laden Coolies. Of this line, 28½ miles are opened to the full width of 11 feet; 3 miles to 9 feet, and 6½ to 6 feet. The execution of the work has been attended with great labour; the excess of expenditure is owing to the employment of hired labour in lieu of the Sebundy sappers, a sufficient number of whom could not be spared.
7,087 10 2½	7,087 10 2½	-- completed, season 1844-45.	
436 6 6	436 6 6	-- constructed, season 1842-43.	
4,499 8		-- completed, season 1844-45.	
	1,276 7 9		the width of the metal is 26 and 20 feet.
6,776	6,776	-- completed, season 1839-40.	this is a pukka road.
6,801 11 6½	8,260 11 2	-- completed, season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, North Western Provinces :			
Delhi to Shamlie <i>via</i> Kur- naul, Estimates for Bridg- ing and Metalling the Road.	- - - - -	-- estimate submitted, July and August 1840.	Shamlie - -
Delhi : Projects for a permanent Communication across the Jumna at.	-- a permanent communication at the point proposed is important in a military point of view, as it would provide the ready means of access to the city of Delhi, and the arsenal it contains, from the neighbouring can- tonment of Meerut, in the Doab. In a commercial point of view, it is important to connect Delhi with the grand trunk road, and so form a good means of transit for the valu- able merchandize which passes through Delhi in either direction from the east or west.	-- submitted to the Lieutenant- governor on the 8d April 1846.	Delhi - -
Construction of a Cause- way on both banks of the River Jumna, hav- ing two openings, each duly provided with Pucca Bridge Heads, for the passage of the waters of the river.	- - - - -	sanctioned, 22 July 1846	-- from the ter- minus of the grand trunk road at Selemore to the Negumbode gate of the city.
Roads and Bridges, Central Provinces :			
Deekullee Bridge over the Gungee Nullah, on the Road from Benares to Ghazeeepore.	-- this bridge was required in the place of one built in 1820, which, owing to an insufficiency of water- way, fell in the year 1830.	- - - - -	- - - - -
Deeodee River, Construction of a Causeway across the.	-- to supersede the construction of a bridge, which would have cost, by a rough calculation, about 40,000 rupees.	sanctioned, 7 October 1846	- - - - -
Roads and Bridges, South Eastern Provinces :			
Dum Dum to Baraset, Re- pairs of the Pucka Road.	-- forms a part of the road to Dar- jeeling.	-- length, seven miles; sanc- tioned 15 April and 31 May 1844.	Baraset - -
Darjeeling Road, Construc- tion of 13 Houses.	-- for the accommodation of dawk- bearers, and to prevent their resorting in bad weather to the villages at some distance from the road for protection, and thus occasioning much delay and inconvenience to travellers.	sanctioned, 23 May 1843	-- between Bar- gatchee and Tit- talya <i>via</i> Dinage- pore.
Civil Buildings, Central Provinces ; Judicial :			
Dumoh, Construction of a fortified Gaol at.	- - - - -	sanctioned, 16 April 1845	Dumoh - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	2,95,056 - -	- - - - -	-- the work has been placed in the hands of the local Civil Officer; the expense to be defrayed from local funds.
1st Scheme:			
By a Causeway and Bridge of Boats: - - - - -			
Causeway - - - - -	Rs. 1,50,000	- - - - -	-- the Governor-general admitted the importance of the work, but was nevertheless of opinion, that in the present state of the finances, other public works of still greater utility must have the preference.
Bridge of boats - - - - -	1,00,000	- - - - -	
Total - - - - -	Rs. 2,50,000	- - - - -	
2d Scheme:			
By a Suspension Bridge and Causeway: - - - - -			
Suspension bridge - - - - -	Rs. 7,00,000	- - - - -	
Causeway - - - - -	1,50,000	- - - - -	
Total - - - - -	Rs. 8,50,000	- - - - -	
3d Scheme:			
By a Masonry Bridge, with Causeway: - - - - -			
Masonry bridge - - - - -	Rs. 4,50,000	- - - - -	
Causeway - - - - -	1,50,000	- - - - -	
Total - - - - -	Rs. 6,00,000	- - - - -	
- - - - -	1,37,481 - -	- - - - -	-- the less expensive project of a causeway with two openings was sanctioned by the Governor-general in July 1846. The main opening having a span of 2,800 feet, the other, immediately below the Negumabad gate, of 200 feet, making a total of 3,000 feet, or allowing for the floating of 80 boats 24 feet wide, drawing 1.6. 0. water (assuming the main depth of the river at 6 feet), an uninterrupted waterway of 2,670 feet.
- 14,087 - 3 - -	-- the immediate space will be filled by a bridge of boats, which will be formed and maintained by the Ferry Fund Committee.	-- completed in season 1841-42.	-- this bridge is of three arches, of 85 feet span each.
- - 7,866 8 5 - -	7,909 - -	-- completed, season 1846-47.	-- the length of the pucca pavement is 201 feet clear roadway, of which 156 feet are level, and raised 1 foot above the highest dry-weather stream.
- - 7,153 9 3 - -	7,153 9 3	-- completed, season 1844-45.	
- - 685 6 6 - -	- - - - -	-- completed, season 1845-46.	
- - 22,735 9 2 - -	20,460 7 2	-- completed, season 1848-49.	-- Government expressed a desire that the building should be calculated for defence by a small body of men, and that provision should be made within the gaol for the occasional close confinement of all the prisoners. The new gaol has been accordingly made to consist of a centre barrack of two wards, empty bastions, with tower curtains, solitary cell, airing yard, reservoirs, drains, aqueducts, cesspools, &c. &c.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces ; Judicial :			
Delhi Gaol: Construction of Gaol Wards, with Cook- rooms and Guard-rooms.	-	season 1841-42	Delhi
Delhi Hospital	for insanes	sanctioned, 9 March 1841	-
Deyrah Gaol	-	sanctioned, 1838-39	-
Delhi Gaol Hospital, Con- struction of a new Roof.	-	sanctioned, 16 August 1841	-
Delhi, Construction of a new Kotewallee for the City, and a Lock-up House.	-- the old kotewallee is in a dan- gerous dilapidated state, part having already fallen.	sanctioned, 4 April 1845	Delhi
Delhi Penitentiary, Addi- tions to the.	-- in compliance with the orders of the Lieutenant-governor for the in- troduction of a capstan mill, to be worked by the prisoners.	sanctioned, 29 May 1845	ditto
Civil Buildings, Lower Provinces ; Judicial :			
Dinapore Gaol: Drainage and Ventila- tion of the.	to improve the salubrity	-- sanctioned, January 1840 and April 1841.	Dinapore
Addition of 13 Skylights	- ditto	sanctioned, 28 February 1842	ditto
Dacca Insane Hospital: Construction of additional Cells.	-- in consequence of the insufficiency of the accommodation.	sanctioned, 24 July 1843	Dacca
Construction of quarters for the Native Doctor and Darogah.	- ditto	sanctioned, 26 December 1843	ditto
Durrung, Construction of New Buildings.	-- in lieu of the existing cutcherry gaol and thannah, which are in a totally decayed state.	sanctioned, 3 November 1841	Durrung
Debrooghur: Construction of a Gaol at	-- for the accommodation of 136 prisoners, males and females.	sanctioned, 3 April 1843	-
Construction of a Circuit Bungalow.	-- in consequence of the incon- venience experienced by the Deputy Commissioner in holding his court, from the want of proper buildings.	sanctioned, 14 August 1843	Debrooghur
Dumoh, Construction of a new defensive Gaol.	-	sanctioned, 27 January 1844	Dumoh

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. - 9,542 5 11 - -	Rs. a. p. 9,999 - 3	-- completed, sea- son 1842-43.	
- 25,723 - 10 - - (exclusive of Rs. 899. 5. for clearing and levelling a portion of the site for the asylum.)	26,663 4 1	-- completed, sea- son 1846-47.	-- the plan provides for a main building, a separate place for convalescents, and for a garden.
- 18,558 11 6 - -	15,908 2 7	-- completed, sea- son 1840-41.	-- the excess of Rs. 2,744. 8. 11. over the estimated cost, is owing to a failure in the Executive Officer's kilns, and the ne- cessity he was under of purchasing bricks from the bazaar, and also to the execution of additional work.
- 2,586 6 1 - -	2,757 15 -	-- completed, sea- son 1842-43.	
for the lock-up house : 2,869 10 10	-- for the Kote- } 5,929 1 4 walle - } Lock-up house 2,446 5 - Rs. - 8,375 6 4	-- completed, sea- son 1846-47.	-- the execution of these works devolved on the Magistrate.
- 934 4 4 - -	1,358 10 6	-- completed, sea- son 1846-47.	
- 3,227 10 8 - -	3,780 - -	-- completed, sea- son 1842-43.	
- 8,149 13 - -	8,149 13 -	season 1842-43.	
- 1,228 5 4 - -	1,228 5 4	-- constructed, sea- son 1843-44.	
- - - - -	- - - - -	-- completed, sea- son 1843-44.	
- 1,217 11 7 - -	1,158 11 -	-- completed, sea- son 1844-45.	
- 6,495 1 10 - -	6,506 5 7	-- completed, sea- son 1844-45.	
- 1,160 2 11 - -	1,746 2 6	-- completed, sea- son 1845-46.	
- - - - -	16,662 14 -	- - - - -	-- Government expressed a desire that the buildings should be calculated for defence by a small body of men, and that provision should be made for the occasional close confinement of all the prisoners, so as to enable a small body of troops to retain the prisoners.

RETURN FOR THE PRESIDENCY OF BENGAL--continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Civil Buildings, Lower Provinces; Judicial--continued.			
Deebrooghur, Construction of a new Cutcherry.	-- in lieu of a similar one condemned by the Annual Survey Committee.	sanctioned, 8 February 1846 --	Deebrooghur --
Dinagopore, Improvements to the Magistrate's Cutcherry, by the construction of a Room with Verandahs.	-- the insufficiency of the existing building was brought to notice by the Civil Authorities, who preferred the present arrangement for improving the buildings to assigning the upper apartments of the Judge's old outcherry to the Magistrate, which would have been difficult of access to the poor.	sanctioned, 7 July 1847 - -	Dinagopore - -
Deebrooghur, Construction of a new Gaol Hospital.	-- the new hospital will be built on a better site; the present buildings, owing to the want of ventilation, are very damp and unhealthy.	sanctioned, 12 May 1847 - -	Deebrooghur - -
Civil Buildings, North Western Provinces; Revenue :			
Datagunge, in the district of Budaon, Construction of a Tehsildarry Cutcherry at.	- - - - -	sanctioned, 13 December 1838	Datagunge - -
Civil Buildings, North Western Provinces; General :			
Delhi: Improvements to the Staging Bungalow.	-- the alterations consist in the addition of new dressing and bath-rooms, the construction of a verandah, and throwing a thatch roof over the flat one.	sanctioned, 9 April 1845 - -	Delhi - - - -
New College at - -	-- altering the Residency buildings, to adapt them for a college.	sanctioned, 26 November 1846	- - - -
Dongurtal, on the road between Nagpore and Seonee, Construction of a Staging Bungalow.	for the convenience of travellers -	sanctioned, 3 August 1840 - -	- - - -
Dumow, Construction of a Dawk Bungalow and Out-offices.	- - - - -	sanctioned, 21 June 1842 - -	Dumow - -
Dearee, Enclosure of the Burial-ground.	- - - - -	sanctioned, 26 September 1844	-- on the Burdwan and Benares Road.
Civil Buildings, Lower Provinces; General :			
Dacca College - - -	- - - - -	-- sanctioned, season 1842-43; estimate revised, 16 October 1844.	Dacca - -
Construction of a surrounding Wall and Out-offices.	- - - - -	sanctioned, 30 September 1846	- - - -
Deebrooghur Road to Jaipore, Construction of two Seraias on the.	- - - - -	sanctioned, 30 April 1845 - -	- - - -
Darjeeling, Construction of Staging Bungalows at Carrogolah Ghaut, Purneah and Kishengunge.	-- for the use of Europeans and their families proceeding from the Western Stations, and from Calcutta to Darjeeling.	sanctioned, season 1846-47 - -	Darjeeling - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. 900 - - -	Rs. a. p. 5,822 1 7	season 1847-48 -	-- the purchase of Captain Fagan's bungalow for 900 rupees, for a outcherry, was authorized on the 9th June 1847, as the site was better than any other that could be obtained.
- - - - -	3,927 - -	- - - - -	-- the room is to be 40x24 feet, with a 10-foot verandah on the east, west and south sides.
- - - - -	631 1 4	- - - - -	- - - - -
4,360 12 - - -	4,360 12 - -	- - constructed, season 1838-39.	- - - - -
1,849 10 - - -	1,849 10 - -	-- completed, season 1845-46.	- - - - -
5,699 1 3 - - -	6,242 8 6	-- completed, season 1847-48.	- - - - -
1,068 5 6 - - -	1,075 8 1	-- completed, season 1841-42.	-- this route is much frequented by persons on their way to or from Bombay.
1,478 14 7 - - -	1,478 14 7	-- completed, season 1843-44.	- - - - -
552 10 6 - - -	612 4 - -	-- completed, season 1846-47.	- - - - -
33,707 14 - - -	20,568 5 10 the Government contribution not to exceed 17,900 rupees. An additional outlay of 11,874 rupees, sanctioned 16 April 1844.	-- completed, season 1848-49.	-- the additional outlay of 11,874 rupees was found necessary for the construction of a building in every respect suited to the purpose intended.
3,187 - - - - -	3,187 - - 500 - -	- - constructed, season 1846-47.	- - - - -
7,500 - - - - -	7,500 - -	- - - - -	-- the Superintendent of Darjeeling represented the very great inconvenience experienced from the want of such accommodation.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME OF WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; General—continued.			
Dacca, Rebuilding the Enclosure of the Old Burial-ground.	-- the old wall fell during the rains of 1845.	sanctioned, 23 September 1846.	Dacca
Civil Buildings, Lower Provinces; Political:			
Debroo Mookh, Grant for Temporary Buildings at the New Station of.	-- this station promises to become a place of considerable trade, being particularly convenient for many of the tea localities, and for the export of grain and cotton from Mattock.	sanctioned, 5 February 1840	-- the site is on the bank of the Debroo River, near its junction with a branch of the Berhampooter River, called the Meehla Gooter, three miles up from the main stream of the Berhampooter.
Darjeeling, Construction of Public Buildings at the Civil Station of.	-- these consisted of a magistrates' cutcherry, a hospital, thanah, bazaar shops, out-offices, tanks.	-- Resolution of Government, Political Department, 23 May 1838.	-
Civil Buildings, Central Provinces; Political:			
Dumoh, Construction of Buildings.	-- as quarters for the Adjutant and non-commissioned officers of the 2d Police Battalion.	sanctioned, 11 March 1844	Dumoh
Civil Buildings, North Western Provinces; Political:			
Delhi, Excavation of a New Tank.	-- required in front of the Delhi Palace.	sanctioned, 3 February 1845	-- on the site commonly called the Goolabase Bagh.
Delhi Palace, Repairs to	-	-- estimate submitted, 27 Feb. 1846.	Delhi
Canals, South Eastern Provinces:			
Entalle Canal, Excavation of Mud from the Bed of the.	-	sanctioned, 9 January 1843	-
Eastern Canals, Clearance of the Embankments.	-- to complete the tracking communication along them.	sanctioned, 25 September 1843	-
Entalle Canal, Excavation of Deposit from the Bed of the.	-	sanctioned, 16 April 1846	-
Roads and Bridges, Lower Provinces:			
Bridge at Ektearpore, on the Road from Jounpore to Buzar.	-	-- of five arches of 20 feet span each, sanctioned 6 February 1838.	-
Civil Buildings, North Western Provinces; Judicial:			
Etawah New Gaol, New Gaol Buildings.	-- offices for the Magistrate and Collector.	sanctioned, May 1840	-
Civil Buildings, North Western Provinces; General:			
Etawah, Construction of Staging Bungalows.	for the accommodation of travellers -	sanctioned, 7 January 1846	Etawah
Civil Buildings, Eastern Settlements; General:			
EASTERN SETTLEMENTS:			
Singapore	Hospital for Convicts	sanctioned, June 1837	-
	Market at Company Glam	sanctioned, January 1838	-
	Enclosure to Gaol	sanctioned, July 1838	-

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

61

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred:	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
680 8 -	- - -	season 1847-48.	
2,700 - - -	- - -	season 1839-40.	
15,087 5 7	- - -	-- completion reported, season 1843-44.	
4,605 - 5 -	4,652 15 5	-- completed, season 1846-47.	
25,117 7 -	22,345 3 -	-- completed, season 1846-47.	
- - -	50,573 - -		
3,248 15 8	3,679 15 5	-- completed, season 1844-45.	
3,726 11 8	4,368 4 6	-- completed, season 1844-45.	
4,470 8 -	5,172 - -	-- completed, season 1846-47.	-- the deposits which had silted up the bed of the canal have been removed, and the bed has been deepened.
4,197 11 6	4,197 11 6	-- completed, season 1840-41.	-- the cost of this bridge will be defrayed from the funds under the management of the local Agent at Shahabad.
26,761 14 4	13,357 5 7	-- completed, season 1841-42.	
4,497 - - -	4,647 - -	-- completed, season 1846-47.	
2,870 7 9			
5,703 2 4			
10,290 5 10			
<u>Rs. 18,863 15 11</u>			

63 RETURN OF PUBLIC WORKS COMPLETED IN INDIA, IN THE

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Eastern Settlements; General—continued.			
Eastern Settlements—continued.			
Singapore	- - new market at the China Town at Singapore.	sanctioned, September 1834	- - - -
Construction of a new Fish-Market.	- - in consequence of the present market being liable to inundation,	sanctioned, season 1840-41	- - - -
Roads and Bridges, North Western Provinces:			
Road from Ferrah to Horal on the route from Agra to Delhi, Estimate for Drains and Bridges.	- - - - -	length, 102½ miles	Horal
Road from Ferozepore to Shikarpore.	for a military road	- - sanctioned, season 1841-42; length 415 miles.	Shikarpore
Civil Buildings, North Western Provinces; Judicial:			
Ferozepore, Construction of a Gaol at.	- - undertaken in consequence of the necessity of retaining a gang of convicts to supply the place of hired labourers, of whom a sufficient number for carrying on the numerous works in progress could not be obtained.	sanctioned, season 1846-47	Ferozepore
Civil Buildings, Lower; Provinces Judicial:			
Furzedpore, Additions and Alterations to the Gaol.	- - to improve the salubrity of the building.	sanctioned, 9 April 1845	Furzedpore
Civil Buildings, Central Provinces; Judicial:			
Futtehpore, Construction of a Judge's Court-house and Out-offices.	- - a new court-house was much required; the records were kept in almost irreparable bungalows, and were exposed to much risk of destruction.	sanctioned, 22 April 1847	Futtehpore
Civil Buildings, North Western Provinces; Revenue:			
Furruckabad, Construction of Tehsildarry Cutcheries.	- - - - -	sanctioned, 11 April 1843	- - at Teriva and Ayrwah.
Futtehpore, Enlargement of the Circuit-house to accommodate the Collector and Magistrate and their Records, and construction of a Cutcherry for the Huzoor Tahseel, and a Guard-room for 70 men.	- - this concentration of offices has been sanctioned, to put an end to the existing inconvenient arrangement of these functionaries holding their offices in separate buildings, and being separated a distance of one mile from their records.	sanctioned, 17 August 1843	Futtehpore
Civil Buildings, South Eastern Provinces; General:			
False-point Lighthouse	- - - - -	sanctioned, season 1839-40	- - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

63

RETURN FOR THE PRESIDENCY OF BENGAL--continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
28,980 2 7		-- completed, 1839-40.	-- this market covers an area of twice the size of the old one, in order to meet the daily increasing necessities of the settlement.
2,216 2 4		-- completed, 1841-42.	
	14,884 7 7		-- this work has been placed in the hands of the local Civil Officer at Agra, and the expense will be provided for from the local funds.
11,145 9 6		season 1841-42 -	-- the bill for this work was submitted by Captain Hatton, attached to Shah Soojah's force.
1,402 3 5		-- completed, sea- son 1846-47.	
4,104 10 10	3,623 11 10	season 1848-49 -	-- the floors will be built on piles four feet from the ground; some division walls, which obstruct the free circulation of air, will be removed.
	14,962		-- the building will be constructed of pucca materials, with flat roof, and con- sist of nine rooms, with a surrounding verandah.
at Ayrwah 3,955 3 5	8,970 4 6	-- completed, sea- son 1846-47.	
15,807 1 9½	17,482 5 4	-- completed, sea- son 1844-45.	
-- the breakwater has been com- pleted at a cost of Rs. 2,204. 6., or 298 rupees less than the amount sanctioned.	731 14 5 sanctioned for plais- tering the building, and 2,500 rupees for a breakwater of rough stone at the Eastern bund.	-- completed, sea- son 1841-42.	-- the building is of a red colour, having a large white stone on the sea-front, and is easily distinguished by passing vessels. The interior of the lighthouse has been rendered completely habitable. The breakwater was visited by the Superintend- ing Engineer of the South Eastern Pro- vinces, on the 13th March 1843, and was found quite effective in preventing an en- croachment of the sea.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.																																
Civil Buildings, South Eastern Provinces; General—continued.																																			
Fakeer Point, Construction of a Lighthouse.	- - - - -	sanctioned, 9 November 1842	- - - - -																																
Civil Buildings, Central Provinces; General:																																			
Futtehabad, Repairs to the Staging Bungalow.	-- considered indispensable for the Superintendent of the Bhuttan territory and the residents at Susa.	sanctioned, 28 March 1842	-- situated between Susa and Hissar.																																
Civil Buildings, North Western Provinces; General:																																			
Ferozepore Burial-ground, Enlargement of the.	- - - - -	sanctioned, 25 March 1846	Ferozepore																																
Canals, North Western Provinces; General:																																			
Ganges Canal - - -	-- for making the waters of the Ganges available for irrigation on the eastern side of the Doab.	-- suggested by Captain Cauley, in the year 1836.	-- to leave the Ganges at Kunkul, and pass near Meerut and Coel, and finally join the River Esau, near Mynpooree.																																
Ganges Canal, Construction of a Hospital.	-- for the Native establishment and workmen of the canal.	sanctioned, 31 December 1845	at Roorkie																																
Roads and Bridges, South Eastern Provinces:																																			
Grand Trunk Road between Allahabad and Delhi.	-- of this road only a small portion is in the south eastern provinces. This road may be considered as the main artery of land communication through Bengal and Hindostan.	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>1st Division. Pullagbant to Barrakur River</td> <td style="text-align: right;">M. f.</td> </tr> <tr> <td>2d " Barrakur River to Burkes</td> <td style="text-align: right;">128 0</td> </tr> <tr> <td>3d " Burkes to Caramnessa River</td> <td style="text-align: right;">97 1</td> </tr> <tr> <td>4th " Caramnessa River to Allahabad</td> <td style="text-align: right;">123 0</td> </tr> <tr> <td>5th " Allahabad to Bewar</td> <td style="text-align: right;">106 0</td> </tr> <tr> <td>6th " Bewar via Allyghur to Gaseedugger</td> <td style="text-align: right;">198 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">800 5</td> </tr> <tr> <td>7th " Meerut to Delhi Branch</td> <td style="text-align: right;">40 0</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">840 5</td> </tr> <tr> <td colspan="2">The Branch Roads are,—</td> <td style="text-align: right;">M. f.</td> </tr> <tr> <td>Agra to Allyghur</td> <td style="text-align: right;">47 0</td> </tr> <tr> <td>Keorja to Meerut</td> <td style="text-align: right;">50 4</td> </tr> <tr> <td>5th Division</td> <td style="text-align: right;">78 0</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">175 4</td> </tr> <tr> <td colspan="2" style="text-align: right;">TOTAL</td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;">1,015 1</td> </tr> </table>	1st Division. Pullagbant to Barrakur River	M. f.	2d " Barrakur River to Burkes	128 0	3d " Burkes to Caramnessa River	97 1	4th " Caramnessa River to Allahabad	123 0	5th " Allahabad to Bewar	106 0	6th " Bewar via Allyghur to Gaseedugger	198 4		800 5	7th " Meerut to Delhi Branch	40 0		840 5	The Branch Roads are,—		M. f.	Agra to Allyghur	47 0	Keorja to Meerut	50 4	5th Division	78 0		175 4	TOTAL		1,015 1	
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	175 4																																		
TOTAL		1,015 1																																	
Restoration of the Iron Suspension Bridge at Muggra.	-- blown down during a storm on the 3d June 1842.	-- length of the bridge 110 feet, and breadth 12 feet; built in the year 1830, by subscription. Its restoration sanctioned 1 August 1842.	-- situated seven miles to the westward of Hooghly.																																
Metalling of the portion of the, within the Benares Division.	- - - - -	-- length, 4 miles 7 furlongs; sanctioned, 6 October 1846.	- - - - -																																
Repairs to the portion from Goopeegunge to Futtehpore.	- - - - -	-- length, 114½ miles; sanctioned, season 1846-47.	- - - - -																																

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
7,082 9 10	5,000 - -	-- completed, season 1845-46.	-- the excess is owing to the necessity of providing red stained glass and reflectors for the lantern, and other necessary items overlooked in the first estimate.
552 15 1	- - - -	-- completed, season 1843-44.	-- this building was erected by Major Thoresby, at a cost of 2,000 rupees, and made over by him to the Government.
	3,804 2 -		
<p>-- Estimates submitted in season 1841-42:</p> <p>length of main line - 458 Miles.</p> <p>length of Futtchghur branch - 160</p> <p> " Boolundshuhur - 70</p> <p> " Etawah - 172</p> <p> " Cawnpore - 42½</p> <p> 898½</p>	<p>-- Rs. 66,65,226, or Rs. 66,88,018. 10, exclusive of the sum which would be required for an aqueduct over the Solani River, which work may be avoided by taking a more circuitous route, and by crossing the Solani Valley at a higher level.</p>		<p>-- it will be necessary, first of all, to convey the water from the Ganges at Kunkul, to Roorkee, a distance of 20 miles, by an expensive series of works, estimated at Rs. 19,64,376. 13, of which sum about 8,63,668 rupees, is for the aqueduct over the Solani River. The estimate further provides for carrying the main branch from Roorkee to Chitorea, mean width of canal 150 feet; and thence to Cawnpore, 230 miles, mean width 90 feet; at a cost of Rs. 28,86,281. 0. 6.; and for four branch canals; viz. the Futtchghur branch, 160 miles, mean breadth, 404 feet, cost, 6,53,667 rupees. The Tappal branch, 70 miles, mean breadth, 28 feet, cost, 1,93,746 rupees. The Shekoabad branch, 180 miles, mean breadth, 384 feet, cost, 7,10,997 rupees. The Allahabad branch, 100 miles, mean breadth, 30 feet, cost, 3,06,139 rupees. A sudden stop was put to the progress of the work in 1842; the Governor-general being desirous of applying a further test to the scientific and financial calculations on which the scheme is based. This absolute prohibition was, however, partially withdrawn on the 29th June; Government being apprehensive, that if a total stop were put to the work, the money already laid out, about 1,06,000 rupees, would be to a great degree lost; and Captain Cauley was required to confine his operations from the head to the village of Noorpoor, on a line of about 100 miles. On the 7th October 1842, Government was pleased to limit the expenditure on the canal, until further orders, to two lacs (2,00,000) per annum. In July 1844, the assignment was increased to the amount of three lacs (3,00,000) per annum, to which the Court's sanction was given, in their Revenue despatch to the Government of India, dated 20 May (No. 12) 1844. The Military Board, in their Annual Report for season 1845-49, stated the amount expended up to the 30th April 1848, at Rs. 20,34,463. 2. 5½.</p>
1,286 1 7	873 - -	-- completed, season 1847-48.	
<p>expenditure to 30 April 1848, 48,91,000</p>	<p>The estimated amount for completion in December 1848, was—</p> <p>Rs.</p> <p>for road works - 33,02,507</p> <p>for bridge over the Soane - 60,00,000</p> <p>for bridge over the Jumna - 10,00,000</p> <p>Rs. 1,03,02,507</p>		<p>-- the Court, in a despatch, dated 30 Jan. (No. 2) 1850, observe, "We attach great importance to the completion of the Great Trunk Road; we desire to see it completed with substantial bridges: those over the Soane and Jumna should be for the present suspended; but you will carefully consider whether the prospect of a railway through the North Western Provinces is sufficiently near to justify the suspension of any other portion of this great work."</p>
	1,189 1 7		
	11,774 - -		
	14,482 - -		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces—continued.			
Grand Trunk Road: Construction of a new Masonry Bridge on the	-- required to replace an old one with reference to the injury done to it, by a breach near it during the heavy rains of the last season.	sanctioned, 8 July 1846 - -	- - - - -
Construction of Wells on the.	-- these wells are much required, as travellers halting at the bungalows have felt much inconvenience for the want of water.	sanctioned, 28 December 1846 -	-- at Mirzapore and Futtehpore.
Raising of the Wing Walls and Parapets of Bridges and Drains be- tween Futtehpore and Goorshaigunge.	- - - - -	sanctioned, season 1846-47 -	Goorshaigunge -
Renewal of a Bridge on the.	-- to replace a bridge injured by a breach which occurred on the road near it, during the heavy rains of 1848.	sanctioned, 8 July 1846 - -	-- Grand Trunk Road.
Iron Suspension Bridge over the Tomlah Torrent.	- - - - -	sanctioned in 1843 - - -	-- situated three miles east of Uadall.
Re-construction of the	- - - - -	sanctioned, 15 September 1847 -	ditto - - -
Construction of an Iron Tension Bridge over the Noonia Nuddee.	- - - - -	sanctioned, 21 July 1847 - -	-- in the district of Beerbhoom.
Construction of an Iron Tension Bridge over Singharra River.	- - - - -	sanctioned, 21 July 1847 - -	ditto - - -
Laying down Iron Tract Roads over the Noonia, Singharra and Tomlah Bridges.	- - - - -	sanctioned, 21 May 1847 - -	- - - - -
Construction of a Bridge over the Gowarao Nuddee.	- - - - -	sanctioned, 25 September 1843 -	-- in the district of Behar.
Construction of a Bridge over the Danwah Nullah.	- - - - -	sanctioned, 21 August 1843 -	-- in the district of Behar.

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

67 ..

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS
Rs. a. p.	Rs. a. p.		
- - - - -	2,057 9 10		
- - - - -	1,201 6 6		
- - 9,089 7 6 - -	- - - - -	-- completed, sea- son 1846-47.	
- - 1,791 11 11 - -	1,791 11 11	-- completed, sea- son 1846-47.	-- this is a bridge of two arches of ten feet span.
- - 9,168 - 10 - -	9,168 - 10	-- completed, sea- son 1844-45.	-- this bridge is to consist of two spans of 30 feet, and one of 20 feet, with a 16- feet road-way; *and is to be constructed on the Dredgian or tension principle.
- - 9,198 12 10 - -	9,198 12 10	-- completed, sea- son 1847-48.	-- the bridge first constructed fell down, owing to a deficiency of water-way, and to a want of depth of foundation to the abutment piers.
- - 28,223 13 - -	28,223 13 -	-- completed, sea- son 1847-48.	-- this bridge has had some standards of stone masonry. The centre span is 150 feet, the side spans 63-7½ feet; embanked approaches neatly sloped off and turfed, lead to the bridge, 1,610 feet long, and having an average height above the country of 10 feet. The embankment is supplied with two drain bridges of stone masonry of 5 feet span each.
- - 29,733 3 6 - -	29,733 3 6	- - - - -	-- this is a similar bridge of the same size as the former, but with masonry, part stone, part brick, with three subsidiary drains, each of 10 feet span, of masonry, with embankments 2,500 feet long, and averaging 20 feet high.
- - - - -	2,062 4 3	- - - - -	-- the tracts for each will be 16 inches wide, consisting of four plates three inches bread, with intermediate spaces of 1½ inches. Four tracts will be laid for the entire length of each bridge, to admit of two wheeled vehicles passing over the bridge at the same time.
- - 19,601 12 5½ - -	19,601 12 5½	-- completed, sea- son 1847-48.	-- this is a stone masonry bridge of 5 arches, each of 26 feet span.
- - 16,956 12 1 - -	16,956 12 1	- - completed, 1847-48.	-- this is a stone masonry bridge of 4 arches, each 26 feet span.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces—continued.			
Grand Trunk Road : Construction of a Drain Bridge.		sanctioned, 12 April 1845	--situated between Barah and Mud-denpore.
Construction of a Dak Staging Bungalow.	to replace the old bungalow	sanctioned, 24 March 1848	at Jehanabad.
Metalling of the Road between the Raj Ghaut at Allahabad and the Raj Ghaut at Benares.		-- length, 75 miles; sanctioned, 30 January 1848.	
Gokoolpore, Construction of a new Bridge on the Tension Principle over the Kallee Nuddee at.	--the old bridge was severely injured by floods on the 20th June 1842.	sanctioned, season 1844-45	
Googree, Construction of a Staging Bungalow at.		sanctioned, 27 June 1846	
Roads and Bridges, Lower Provinces :			
Gowahatty to the Kulling River in Lower Assam, Reconstruction of the Road.	-- this is represented to be one of the most frequented roads in Assam, and a highly important military communication, being a continuation of the road from Bengal, by Gowalparrah and the Cosayah Hills, to this province.	-- length, 83½ miles; sanctioned, 15 August 1842.	Kulling River
Gya Roads, Annual Repairs, 1842-43.		From Gya to Jehanabad } Miles on the Patna Road } 30 " to Shergatty, on } 22 the Trunk Road } " to Surwah, on } 20 the Trunk Road } Miles - - - 72	
Golar Ghaut to Bor Pathor through Nagara.	-- The opening of this road will, it is considered, afford the most effectual means of opening an intercourse with, and controlling the Nagas.	-- length, about 30 miles; sanctioned, 24 August 1844.	Bor Pathor
Gyah Roads, Construction of a new Line from Doobeen to Gyah.	-- It is contemplated to abandon the two existing lines of road which branch off from the Grand Trunk Road towards Gyah, the one from Sherghotty, and the other from Surwah. The new line is not intersected by rivers, whereas to make the old lines practicable for wheel carriage traffic throughout the year, it would be necessary to bridge four large rivers and four small ones, at a very considerable cost.	-- length, about 21 miles; sanctioned, 20 August 1845.	Doobeen
Roads and Bridges, Central Provinces :			
Great Deccan Road, Metalling of the.	-- in consequence of the great wear and tear on the.	-- length, 245 miles; sanctioned, 28 September 1840.	-- from Telwarra Ghaut, between Jubbulpore on the Nerbudda, and Mirzapore on the Ganges.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
5,864 7 8½	5,864 7 8½	-- completed, 1847-48.	this is a drain bridge of stone masonry.
1,848 3 8	1,848 3 8	-- completed, sea- son 1847-48.	
	80,958 9 4		-- the metal is to be spread of the average depth of 4-75 feet.
	16,517		-- the expanse of water in the valley of the Kallee Nuddee, during the flood in June 1842, extended over a breadth of 2,830 feet, and the water-way of the bridge proved insufficient for the passage of this large vo- lume of water. The entire bed of the Nullah under the arches was swept away, and the piers of the bridge, being under- mined, subsided.
2,403 7 9	2,403 7 9	-- completed, sea- son 1846-47.	
6,535 2 3	9,962 1	-- completed, sea- son 1844-45.	-- in this estimate provision is made for 32 bridges of masonry, and 118 of wood. The saving on the estimate is owing to a reduc- tion in the rate, and also in the quantity of work contemplated.
2,132 5 7½	1,911 6 7		-- of this extent of road, 15 miles are kept in repair by the Gya convicts, and accord- ingly provision is not made in the estimate for repairing the same.
800	800	season 1844-45.	
	83,895	-- completion not reported.	-- the old line of communication from Gyah to Jehanabad (29 miles), and from Jenaha- bad to Patna (about 80 miles), will not be changed.
89,924 10 5	86,826 15 4	-- completed, sea- son 1843-44.	-- this road was originally constructed by Major Drummond. A sum of 2,180 rupees was expended on repairs to this road during 1847-48, and an estimate of Rs. 6,048. 11. 8. was sanctioned for the following year.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; Judicial:			
Gyah, Construction of two Record-rooms.	-- for the records of the officers of the Judge, and of the Collector.	sanctioned, 2 April 1837 - -	- - - -
Gowhatty:			
Construction of Buildings	-- for a cutcherry for the Collector and Magistrate.	sanctioned, 4 January 1842 -	- - - -
Construction of Temporary Gaol Buildings.	-- to replace buildings burnt down on the 4th April 1840.	sanctioned, 12 February 1841 -	- - - -
Construction of a Record-room.	-- for the records of the Commissioner's office.	-- length 50 feet by 20; sanctioned, 16 January 1838.	- - - -
Construction of a Treasury Room.	-- for the use of the Commissioner's office.	sanctioned, 4 January 1841 -	- - - -
Gowalparrah, Lower Assam:			
Construction of a Cutcherry for the Magistrate.	-- to replace an old cutcherry of temporary materials, which was in a dilapidated state.	sanctioned, 5 December 1837 -	- - - -
Reconstruction of the Gaol Buildings.	-- in consequence of the decayed state of the present temporary gaol buildings.	sanctioned, 29 December 1842	- - - -
Gowahatty, Erection of a Wall around the Gaol.	-- proposed by the Commissioners to save the expense of keeping the bamboo fences in good order.	sanctioned, 20 May 1844 -	Gowahatty -
Gyah, Construction of an additional room to the Judge's Record Office.	- - - - -	sanctioned, 11 September 1844	Gyah - -
Gowalparrah Gaol, Construction of Cook-rooms of Masonry.	-- for the convicts and their guards, in lieu of similar buildings of inflammable materials.	sanctioned, 6 August 1845 -	Gowalparrah -
Gowahatty:			
Addition to the Commissioner's Cutcherry.	-- to afford shelter to the people attending court.	sanctioned, 5 November 1845 -	Gowahatty -
Construction of a new Record-room for the Collector and Magistrate.	-- the necessity for this work was brought to notice by the civil authorities, who suggested that a room be built over the existing treasury and record-room.	sanctioned, 19 May 1847 -	Gowahatty -
Gowahatty Gaol, Construction of a Criminal Ward.	-- to replace an existing ward reported by the Commissioners of Assam to be dilapidated beyond repair.	sanctioned, 12 May 1847 -	Gowahatty -
Gyah, Construction of a Cutcherry.	-- for the Principal Sudder Ameen, and additional Moonsiff of Behar.	sanctioned, 22 March 1848 -	Gyah - -
Civil Buildings, North-Western Provinces; Judicial:			
Goorgaon, Construction of a Cutcherry with Out-offices.	-- for the Collector and Magistrate; the construction of this cutcherry will do away with the renting of buildings stated by the local officer to be inconvenient and ill adapted.	sanctioned, 27 November 1847	Goorgaon -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
5,750 12 3		completed, 1840-41.	
6,705 3 6	6,036 5 10	-- completed, sea- son 1843-44.	
1,150 8 5	1,361 10 10	-- completed, sea- son 1841-42.	
	2,528 5 7		
902 6 6		-- completed, sea- son 1841-42.	
3,598 9		-- completed, sea- son 1841-42.	
3,015 3 4	3,425 3 6	-- completed, sea- son 1844-45.	
2,166 6 9	2,210 10 -	-- completed, sea- son 1845-46.	
1,141 8	1,141 8	-- completed, sea- son 1845-46.	
2,812 14 3	2,812 14 3	-- completed, sea- son 1845-46.	
602 4 4	602 4 4	-- constructed, season 1846-47.	
	3,454 7 3		-- the estimate provides for a new build- ing, as the house would not have borne the weight of an upper story.
	1,768 7 6		
	1,818 - -		
	11,465 5 8		

RETURN FOR THE PRESIDENCY OF BERGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces ; Revenue :			
Genour, Construction of a Tuhildary Cutcherry.		sanctioned, season 1838-39	in Zillah Budaon
Civil Buildings, Central Provinces ; Revenue :			
Ghazepore, Construction of a Guard-room to the Collector's Cutcherry.	-- in consequence of the insufficiency of accommodation for the guard.	sanctioned, 25 May 1844	Ghazepore
Civil Buildings, Central Provinces ; General :			
Ghazepore : Extension of the Godown accommodation in the Opium Factory, and Bungalow for the use of the First Assistant.		sanctioned, 1 May 1839	Ghazepore
Construction of an Opium Godown at.	-- required in lieu of one built in 1835-36, which was reported to be in ruins.	sanctioned, 10 September 1845	ditto
Construction of a Bungalow and Out-offices at the Opium Factory.	-- for the Second Assistant to the Superintendent at the Factory.	sanctioned, 17 September 1845	ditto
Civil Buildings, South Eastern Provinces ; General :			
Great Savage Rock, Construction of a Lighthouse on the.	-- this lighthouse will enable vessels of a certain draft of water to cross the bar of the river during the night.	sanctioned, 9 November 1842	
Civil Buildings, Lower Provinces ; General :			
Ghazepore, Enlargement of the Burial-ground.	-- the necessity of its enlargement was brought to the notice of Government by the local authorities at Ghazepore, through the Archdeacon.	sanctioned; August 1843	Ghazepore
Goolzarbahng, Construction of a Boundary Wall to the Opium Godown.	-- considered necessary for the security of much valuable property from fires and plunderers.	sanctioned, 3 December 1845	Goolzarbahng
Gyah Road, Additions and Alterations to the Staging Bungalows on the.	-- with a view to assimilate them to the bungalows on the Grand Trunk Road.	sanctioned, 8 September 1845	Gyah Road
Gowahatty : Rebuilding the top of the Spire of Christ's Church.	-- fractured by a shock of earthquake on the 18th June 1846.	sanctioned, 12 February 1847	Gowahatty
Rebuilding of the Gaol Hospital.	-- ditto	ditto	ditto
Gyah, Construction of an additional Opium Godown.	-- in compliance with the opinion of the Board of Custom, Salt and Opium, in regard to the necessity of the proposed outlay.	sanctioned, 13 March 1848	Gyah
Civil Buildings, North Western Provinces ; Political :			
Gwalior Hospital	-- for the sick of the escort of the Resident.	sanctioned, 6 April 1840	Gwalior

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.										
Rs. a. p.	Rs. a. p.												
4,581 15 3		-- completed, season 1841-42.											
575 4 2	575 4 2	-- completed, season 1844-45.											
11,884		-- completed, season 1841-42.											
2,357 8 3	2,314 14 11½	-- completed, season 1846-47.											
	1,275 --	season 1845-46.											
33,587 10 4	33,425 8 7	-- completed, season 1843-44.	-- the lantern was first lighted on the night of the 7th March 1844 : <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: right;">Rs. a. p.</td> </tr> <tr> <td>Cost of Lighthouse</td> <td style="text-align: right;">- 33,587 10 4</td> </tr> <tr> <td>Buildings attached</td> <td style="text-align: right;">- 1,501 9 6</td> </tr> <tr> <td>Lantern</td> <td style="text-align: right;">- 15,000 --</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">Rs. 50,089 3 10</td> </tr> </table> <p>The total cost of the structure, including a building for establishment and stores, has been Rs. 60,089. 3. 10.</p>		Rs. a. p.	Cost of Lighthouse	- 33,587 10 4	Buildings attached	- 1,501 9 6	Lantern	- 15,000 --		Rs. 50,089 3 10
	Rs. a. p.												
Cost of Lighthouse	- 33,587 10 4												
Buildings attached	- 1,501 9 6												
Lantern	- 15,000 --												
	Rs. 50,089 3 10												
1,527 3 4	1,527 3 4	season 1843-44	a space of 300 x 330 has been added.										
4,882 14 3	5,170 --	-- completed, season 1846-47.											
611	611 --	-- completed, season 1845-46.											
187 7 10	200 --	-- completed, season 1847-48.											
151 1 3		-- completed, season 1847-48.											
	2,776 10 3												
2,128 2 8½	2,038 15 7	-- completed, season 1843-44.											

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Embankments, South Eastern Provinces :			
Hidgellee : Embankments in the Rusa- sulpore River frontage.	-- for the protection of large tracts of resumed lands in Hidgellee.	Length, 56 miles ; sanctioned, 6 November 1841.	-
Construction of a new line of Bunds in Pergunnah Khadar.	-- for the protection of the Govern- ment estate of Bolakeepore.	-- length, 2½ miles ; sanctioned, 26 April 1842.	-
Excavation of the Koonj- pore and Mirzapore Khalls.	-	-- length, 8 miles ; sanctioned, season 1843-44.	-
Excavation of Patgoda Canal.	-	sanctioned - ditto	-
Drainage of the Jella- mootah Pergunnah.	-- this work is stated to be in- dispensable to the prosperity of the cultivation of the pergunnah.	sanctioned, 6 June 1844.	-
Construction of a new Bund.	-- to prevent the ingress of salt water to the Kusbah, which now finds its way into the cultivated lands at high spring-tides, through certain low channels.	-- the new bund measures 2 miles and 495 feet, and its average height is 9 feet ; sanc- tioned, 26 September 1844.	at Kusbah
Construction of new Bunds	-- for the protection of the resumed meahls of Ustiacool and Bunder- booriah.	-- length, 4 miles and 6 fur- longs ; sanctioned, 15 January 1845.	-- situated at Pergunnah Pahar- pore.
Construction and repair of Bunds on resumed Estates.	-- for the protection of resumed estates, and with a view to increased cultivation.	-- length, 3 miles and 1 fur- long ; sanctioned, 13 January 1845.	-- in Pergunnah Nurroomootah.
Canals, South Western Provinces :			
Hidgellee Canals, Deepen- ing of a Khall leading from Tanropukeriah to Kallynuggur on the Hul- dee, and Russoolpore.	-- to facilitate the concentration of the salt of the Hidgellee Agency in one set of golahs. For this object the canal is of great importance, when the strong winds make the coast navigation dangerous.	sanctioned, 15 May 1839	-
Canals, North Western Provinces :			
Hallalpole and Meg Chup- per, Repairs of the Falls and Bridges.	-- with a view to the Doab Canal being hereafter used both for irriga- tion and navigation.	sanctioned, season 1838-39	-- on the Doab Canal.
Roads and Bridges, Lower Provinces :			
Hajeeppore to Kurrinjah on the Mozufferpore Road.	-- to supersede the old road to Mo- zufferpore <i>vid</i> Persa Ghaut.	estimated, January 1840	Kurrinjah

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - - - -	11,648 - 11	- - - - -	-- the length of the embankments in the Hidgallee Division in 1839-40 was 1,046 miles, and the estimated cost of annual repairs 23,500 rupees. In this division 12 sluices have been sanctioned in the Soojamote Pergunnah, which is under the management of the Court of Wards.
- - 3,314 5 8 - -	3,163 7 6	-- completed, season 1843-44.	
- - 3,645 5 9 - -	3,680 6 2½	-- completed, season 1847-48.	-- the width of these khalla varies from 72 to 80 feet throughout.
- - - - -	4,030 10 -		
- - - - -	3,800 9 2½	-- its completion not reported.	
- - 1,003 2 5½ - -	1,003 2 5½	-- completed, season 1845-46.	
- - 1,352 12 - - - -	1,388 6 -	-- completed, season 1846-47.	
- - - - -	23,138 - -		
- - 20,725 - - - -	17,479 - -	completed 1840-41	-- an excess of Rs.3,247. 15. 11. has been incurred in their execution, owing to the renewal of the old bridges entirely, and a greater depth and solidity having been given to the foundations, with reference to the unfavourable nature of the soil.
- - - - -	40,686 12 1	- - - - -	-- this work does not appear to have been carried out.

RETURN FOR THE PRESIDENCY OF BENGAL—*continued.*

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Roads and Bridges, Lower Provinces—<i>continued.</i>			
Hazareebaugh, Construction of Drains, &c. on the road from, to the Grand Trunk Road.	-- this road connects the military station of Hazareebaugh with the Grand Trunk Road at Barria.	sanctioned, 2 April 1841	Grand Trunk Road.
Roads and Bridges, South Eastern Provinces:			
Hazareebaugh, Construction of a Stone Bridge over the Aarah Nuddee.	- - - - -	sanctioned, 16 October 1849	- - - - -
Roads and Bridges, North Western Provinces:			
Hindun Bridge: Proposal for converting it into a Suspension Bridge.	- - - - -	- - - - -	- - - - -
Filling up Deep Pools in front and at the tail of the Bridge.	-- the pools were filled up with blocks of kunkur, to prevent damage to the bridge.	sanctioned, 28 May 1847	- - - - -
Hydramal Bridge over the Kallee Nuddee, metalling the Causeway of.	-- the metalling had worn out, and the road-way surface had sunk generally so much as 9 inches below the mouth of the drain.	sanctioned, 14 May 1844	- - - - -
Hindun Causeway, Construction of a Drain Bridge under the.	-- required to pass off the waters which collect in the nook or angle formed by the junction of the Meerut road and causeway.	sanctioned, season 1844-45	- - - - -
Hurreepore, Construction of an Iron Suspension Bridge over the Gumbleer River.	-- to replace a Shakespearian bridge, reported unworthy of further repair.	sanctioned, 26 July 1844	-- to be one span of 120 feet, with breadth of road-way 7 feet. Situated about 6½ miles from Subathoo.
Hurdwar <i>vid</i> Roorkie to Saharanpore, Construction of a Road.	-- for the good of the trading community, and for the benefit of the Ganges Canal. By the proposed road, lime, timber and bricks may be conveyed to the works on the canal.	length, 42 miles	Saharanpore
Hindun Bridge, Completion of the Causeway leading to the.	- - - - -	sanctioned, 16 March 1847	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. 3,707 14 8	Rs. a. p. 3,753 15 5	-- completed, sea- son 1841-42.	
5,029 7	5,029 7	-- completed, sea- son 1846-47.	-- this bridge has three arches of 20 feet span.
	1,45,577 10 2 including the expense of metalling the portion of the Grand Trunk Road between the bridge and Sehinpore, near Delhi.	-- completed, sea- son 1846-46.	-- this bridge was thrown open to the public on the 23th August 1845.
	546 8 2	-- completed, sea- son 1847-48.	-- the pooling appears to have arisen from the set of the current having turned against the eastern abutment of the bridge, and the outlay was necessary to prevent further damage.
3,620 15		-- completed, sea- son 1844-45.	-- the expenditure was incurred for carting kunkur. The labour was performed by convicts.
	702 9 11		
21,712 13 3	10,721 10 6	-- completed, sea- son 1847-48.	-- this sum exceeds the authorized estimate by about 10,000 rupees, in consequence of the necessity of restoring certain parts of the abutments and revetments, which were injured by the floods; also, in part, by carrying the foundations of the abutments to a greater depth than was originally intended, and by the construction of an additional wing-wall up stream.
	14,700		-- the Saharunpore local committee have assented to bear the whole cost; the money will be advanced by Government, the committee returning it by instalment of 2,000 rupees per annum. This work was projected by Lieutenant Strachey, an executive officer of the Ganges Canal, and its execution will be entrusted to him.
5,862 6 11	5,862 6 11	-- completed, sea- son 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; Judicial:			
Hyderabad, Conversion of an Enclosure into a temporary Civil Gaol.	-- at the recommendation of the Governor of Scinde.	sanctioned, 8 August 1844	Hyderabad
Civil Buildings, Lower Provinces; Judicial:			
Hazareebaugh: Purchase of an Estate, the property of Major Bird, for a Cutcherry, for the Principal Assistant Commissioner.	-- the existing outcherry was represented to be quite inadequate for the accumulated records, and to be too confined for the large number of persons constantly in attendance.	sanctioned, 25 January 1841	Hazareebaugh
Construction of a Gaol at	for civil and criminal prisoners.	sanctioned, 8 May 1838	ditto
Purchase and alteration of a Bungalow as a Cutcherry for the Principal Agent, Governor-general.	-- rendered necessary in consequence of the Government Cutcherry Bungalow having been appropriated to the use of the Ex-Ameers of Scinde.	sanctioned, 24 January 1845	ditto
Hooghly Gaol: Supply of water to the	for the use of the prisoners	sanctioned, 25 February 1846	Hooghly
Construction of two Cooking Sheds and Ventilators.	-- the removal of the present cooking sheds was necessary to prevent the escape of the prisoners, and the other sanitary works were considered essential.	sanctioned, 21 July 1847	ditto
Hazareebaugh, transfer of the European Hospital to the Judicial Department.	for the confinement of prisoners	sanctioned, 1 December 1847	Hazareebaugh
Civil Buildings, Central Provinces; Judicial:			
Hoshungabad Gaol, Construction of additional Wards.	-- The existing buildings, for want of space, admit of no classification, or internal gaol discipline.	sanctioned, 9 March 1846	Hoshungabad
Hoshungabad: Restoration of the Peshkarree Cutcherry.	-- this outcherry was destroyed by fire on the 27th May 1846.	sanctioned, 2 February 1847	ditto
Civil Buildings, Central Provinces; Revenue:			
Hoshungabad: Construction of a Peeskar's Cutcherry.	- - - - -	sanctioned, 26 December 1838	ditto
Civil Buildings, South Eastern Provinces; General:			
Howrah, Extension of the Burial-ground.	- - - - -	sanctioned, 14 March 1842	Howrah

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
	1,698 12 4	not reported	-- the gaol will consist of three flat-roofed wards, with guard-rooms and out-offices.
3,500		season 1841-42	-- the estate is beyond the limits of cantonments.
4,699 7 1/2	4,699 7 1/2	-- completed, season 1842-43.	-- the buildings of this gaol are of a temporary nature. A hospital and wards for females are included amongst the buildings which have been constructed.
3,772 8 9	3,772 8 9	season 1845-46.	
2,082 9 4	2,184 -- --	-- completed, season 1846-47.	
1,725 5 8	1,692 10 8		
	1,889 2 11 1/2		-- this arrangement will obviate the necessity there would otherwise have been to enlarge the Kishenpore gaol.
6,411 3 2	6,694 -- --		
580		season 1847-48.	
1,074 8 6		-- completed, season 1841-42.	
855 -- 6		-- completed, season 1842-43.	-- a space of about 175 x 170 has been taken in and enclosed.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; General:			
Hooghley River, Construction of two Obelisks on the.	-- the actual necessity of these beacons was pointed out by the marine authorities.	sanctioned, 20 May 1844	-- one at Canterbury Point, the other at the mouth of the Hog River Creek.
Civil Buildings, Central Provinces; General:			
Hatrass, Repairs and Improvements to Hardingunge.	- - - - -	sanctioned, 26 July 1841	Hatrass
Civil Buildings, Lower Provinces; Political:			
Hazareebaugh, Repair of Buildings.	-- purchased for the accommodation of the ex-Ameers of Soinds.	sanctioned, 17 January 1845	- - - - -
Canals, North Western Provinces:			
Intally Canal, Excavation and Clearance of.	- - - - -	sanctioned, 14 April 1840	- - - - -
Jumna River - - -	-- improvements to the navigation of the.	- - - - -	- - - - -
Plantations on the Banks of the Canals west of the Jumna River.	- - - - -	from 1830 to 1 January 1841	- - - - -
Jumna Bund, Repair and Extension of the.	-- for the purpose of relieving the Jumna New Cut and Bund from a portion of the flood-water, and clearing out the mouth of Biene's Cut.	sanctioned, 8 April 1837	- - - - -
Roads and Bridges, South Eastern Provinces:			
Juggernaith Road - - -	- - - - -	-- length, 261 miles, extends from the old Benares Road at Jellalabad <i>vid</i> Midnapore, to Pooree.	- - - - -
Repairs to the Ghoree Khall Suspension Bridge on the.	- - - - -	-- built by Lieutenant Schaleh many years ago; repairs sanctioned, 20 July 1841.	-- in the Balasore division.
Repairs to the Foolnaekra Bridge, in the Cuttack Division of this Road.	-- damaged by a flood on the 2d October 1842.	sanctioned, 5 June 1843	- - - - -
Construction of a Drain Bridge in the Balasore Division at Ummerrah.	-- to supply the place of a 4-foot drain, which was carried away by a flood in September 1841.	the new drain is of 8 feet span	- - - - -
Renewal of the Woodwork of the Iron Suspension Bridge at Kud-dum Khandee.	- - - - -	sanctioned, 3 October 1842	- - - - -
Construction of a new Drain Bridge on the.	-- this drain is much required at the spot, which is cut every year by the ryots to let off the water from their fields.	-- sanctioned, 23 October 1843. This bridge is to be of 8 feet span.	at Dysurrah

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
1,237 4 10	2,008 12 5	-- completed, season 1845-46.	-- the obelisk at Canterbury Point is to be 50 feet, and that at Hog River Creek 40 feet in height.
3,339 15 7	4,006 1 7	-- completed, season 1843-44.	
529 5 8	529 5 8	-- completed, season 1845-46.	
3,466 9 5	An estimate for its clearance, amounting to Rs. 4,528. 10. 6.	-- completed, season 1840-41.	
10,626	Since 1830 an average yearly outlay of 2,000 rupees has been incurred in rearing plantations. The amount realized by the sale of cuttings from these trees has been 19,968 rupees, and the amount expended 22,426 rupees.		-- they consist chiefly of babool, teak, saul and sissoo, which, when they arrive at maturity, will yield a very profitable return.
not reported	10,363 11 1		
3,088 14 6	2,773	-- completed, season 1844-45.	-- the standards have given way, and the failure is ascribed either to the masonry on which the ground links are built having sunk and allowed the chain to come forward, or to the ground links not having been firmly built into the masonry at first.
1,309 11 9	1,309 11 9	-- completed, season 1843-44.	
579 10 7		-- completed, season 1842-43.	
886 11 5	902 2 1	-- completed, season 1843-44.	
313 3 3	313 3 3	-- completed, season 1843-44.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces—continued.			
Juggernaut Road : Construction of a new Bridge near the present Noonajoori Bridge.	-- with a view to the preservation of the Juggernaut Road, which at the site fixed on for the new bridge was constantly liable to be cut through by the floods of the country.	sanctioned, 27 August 1844	
Repairs to, in the Balasore Division.	-- in consequence of heavy damage sustained by floods.	-- length about 8½ miles; sanctioned 27 February 1845.	-- between Goreekhaul and Rajghaut.
Construction of a Drain Bridge on the.	-- the road was every year cut through by the ryots, to let the water off their fields; this practice, it is hoped, will be put a stop to.	-- of 8 feet span; sanctioned 23 October 1843.	at Dysurrah
Construction of a Drain Bridge on the.	-- with a view of bringing the water into the villages, instead of allowing it to be carried off to a different direction.	sanctioned, 26 April 1844	at Khurruckpore
Construction of two Bridges.	for drainage	sanctioned, 6 September 1847	at Rajghaut
Roads and Bridges, North Western Provinces :			
Joah Bridge, under the City of Bareilly, on the road to Moradabad.			
Jyaree, Construction of an Iron Suspension Bridge, on the Taper Chain principle, over the Kosillah River at.	-- in lieu of a bridge which was carried away in September 1840 by a sudden rise of the river.	sanctioned, 5 April 1842	Jyaree
Roads and Bridges, Lower Provinces :			
Jamalpore, Construction of Drain Bridges at.		sanctioned, 10 May 1844	Jamalpore
Jaipore to Ningroo, Opening of a Road.	-- military posts having been established at these places, it has been found necessary to open a temporary communication between them.	-- length, 27 miles; sanctioned, season 1844-45.	Ningroo
Roads and Bridges, Central Provinces :			
Jubbulpore to Mirzapore, or the Great Deccan Road : Metalling of the	-- in consequence of the great wear and tear on this road.	-- length, 245 miles; sanctioned, 28 September 1840.	-- from Tilwarra Ghaut between Jubbulpore on the Nerbudda, and Mirzapore on the Ganges.
Annual Repair to the metalled portion of.	also for making wooden bridges, &c.	sanctioned, 30 November 1842	Mirzapore

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- 11,094 2 4 -	16,856 4 9	-- completed, season 1846-47.	-- this is a bridge of five arches, viz. two of 22 feet, two of 24 feet, and one of 26 feet span. A saving of Rs. 5,762. 2. 5. has been effected by a reduction in the quantity of masonry, as well as in the rates assumed in the estimate.
- 1,404 9 11 -	1,404 9 11	season 1845-46.	
- 302 8 5 -	302 8 5	-- constructed, season 1843-44.	
- 243 5 11 -	243 5 11	season 1844-45.	
- - - - -	not stated	- - - - -	each of two arches of 10 feet span:
- - - - -	15,702 - -	- - - - -	-- a wealthy native gentleman, Dewan Behadour Sing, offered to defray the cost of this bridge, which had been taken out of the hands of the Executive Engineer.
- 10,543 - - - -	8,681 8 8	-- completed, season 1846-47.	-- this bridge is to consist of five arches of 20 feet span each, with piers 20 feet high.
- 950 9 9 -	- - - - -	-- completed, season 1844-45.	
- 1,075 8 5 -	989 - -	-- constructed, season 1845.	-- the road has been merely cleared of the jungle, so as to admit the passage of troops.
- 88,924 10 5 -	86,826 15 4	-- completed, season 1846-47.	-- this road was originally constructed by Major Drummond.
for Bridges - - Rs. 2,448 " Repairs - - - 2,708 <u>Rs. 5,156</u>	5,168 8 8	-- completed, season 1846-47.	-- this estimate also provides for the construction of 15 wooden bridges on the road connecting Jokehia and Dumoh, and clearing the Nuddee Ghauts.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, Central Provinces—continued.			
Jubbulpore, <i>via</i> Seonee to Hamptee, Proposed Metalling and partial Bridging of the Road.	- - to continue the great road from Mirzapore to Jubbulpore (or Great Deccan Road).	Length: <i>M. f. yds.</i> Jubbulpore to Seonee 83 7 32 Seonee to Kamptee 63 7 96 <hr/> Miles - - 148 0 0	Kamptee - - -
With reference to the magnitude of the outlay contemplated, its commencement has been deferred until the estimates have been reported on by the Superintending Engineer, after personal inspection.			
Civil Buildings, South Eastern Provinces; Judicial :			
Intally, Purchase of Ground	- - for the sheds of the conservancy department.	- - sanctioned, 2 April 1839 and 23 June 1840.	Intally - - -
Civil Buildings, Lower Provinces; Judicial :			
Jessore, Construction of a flat-roofed Cutcherry.	- - for the two Principal Sudder Ameens, to enable them to give up the rooms in which they at present hold their cutcherries, for the custody of the records of the Judge and Magistrate.	sanctioned, 2 May 1842	Jessore - - -
Jessore Gaol, Construction of 12 necessaries.	- - - - -	sanctioned, 25 January 1843	Jessore - - -
Jessore: Cutcherry for the Sudder Ameen.	- - - - -	sanctioned, 27 February 1843	Jessore - - -
Construction of a Selakhana.	- - for the reception of property recovered in cases of dacoity, burglary, &c., and in lieu of an old building inconveniently situated.	sanctioned, 28 February 1844	- - the new building will be erected close to the Magistrate's cutcherry.
Jessore Gaol, Construction of a Dead-house and Dispensary.	- - - - -	sanctioned 27 May 1846	Jessore - - -
Civil Buildings, Central Provinces; Judicial :			
Jubbulpore: Construction of a new Gaol.	- - for the accommodation of 300 prisoners.	sanctioned, 10 March 1841	Jubbulpore - - -
Construction of Public Buildings.	- - for the 1st battalion of military police.	- - sanctioned, 14 August and 13 October 1843.	- - - - -
Construction of a New Gaol Hospital.	- - under a representation that the gaol hospital was not a fit receptacle for the united Thug and zillah sick prisoners.	sanctioned, season 1844-45	- - - - -
Civil Buildings, South Eastern Provinces; General :			
James Prinsep Ghaut, Contributions towards the Erection of.	- - to be erected with the aid, of Government, by the inhabitants of Calcutta, to the memory of the late James Prinsep, Esq.	sanctioned, 1840-41	- - to be erected in a situation highly useful for the embarkation or disembarkation of European troops.

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
	1,76,246		
	61,600		
	<u>Rs. 2,37,746</u>		
	exclusive of the item of bridges.		
			Rs. 20,010. 5. 6½. were expended in season 1847-48 in cutting jungle, making proper inclined ghauts, and clearing and smoothing the surface of the ghauts; and advance of 16,000 Company's rupees was sanctioned for the earth-work of the por- tion of the road in the Nagpore territory, and Rs. 24,180. 8. 10. for earth-work be- tween Jubbulpore and Seemee.
7,000		season 1840-41.	
2,696 5 3½	2,860 14 5	-- completed, sea- son 1844-45.	-- the cutcherry is to be flat roofed with tiled verandahs.
1,234 8 1	1,113 12 6	-- completed, sea- son 1844-45.	
2,696 5 3½	3,657 10 9	-- completed, sea- son 1844-45.	
764 8 5	823 11 10	-- completed, sea- son 1844-45.	
588 4 3½		-- completed, sea- son 1847-48.	
18,044 11 9	15,541 11 1	-- completed, sea- son 1842-43.	
2,411 7 1	2,805 8 7	-- completed, sea- son 1844-45.	
8,765 5 3	8,876 7 5	-- completed, sea- son 1846-47.	
donation, season 1840-41	Rs. 10,000		
23 November 1842: Flag-stones contributed towards its erection, to the value of	600		
3 July 1843: A further grant authorized, of	2,756		
	<u>Rs. 13,356</u>		-- on the 3d July 1843, the completion of the work devolved on the Garrison Engineer of Fort William, who it was understood had been provided with funds sufficient for that purpose.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; General:			
James' and Mary's Anchorage Creek, Construction of an Obelisk at the.	-- the spot is most dangerous for navigation; the Obelisk is intended as a day beacon.	sanctioned, 25 March 1843	-- situated below Fultah, on the Hooghly River.
Civil Buildings, Central Provinces; General:			
Inashowna, Construction of a Staging Bungalow at.	-	sanctioned, 7 May 1843	-- situated between Sultanpore and Benares.
Jugadaree, Erection of a Staging Bungalow and Out-offices.	-	sanctioned, 9 September 1843	-- situated between Umballah and Kheree.
Civil Buildings, Jullundhur Division; General:			
Jullundur, Construction of a Cutcherry and Guard-room.	-- for the Deputy Commissioner of the station.	sanctioned, 31 August 1847	Jullundhur
Canals, South Western Provinces:			
Kamapookreeh Khal, Repair of the Dam across the Mouth of the.	-	sanctioned, 1840-41	-
Canals, South Eastern Provinces:			
Kotakhally Nullah in Chitragong, Excavation of the.	-	sanctioned, 29 May 1838	-
Khattee Canal, Repair and Improvement of.	-- in consequence of the abandonment of the Oolabarreeh Canal.	sanctioned, 12 February 1845	-- this canal is a communication between the Damoodahand Hooghly Rivers.
Khattee Bund, raising of the, two feet.	-- to bring it above the level of the inundations which occurred in August 1844.	sanctioned, 27 May 1845	-
Canals, North Western Provinces:			
Kunjnoon, Escape Nullah	-- construction of a masonry bridge across the.	sanctioned, 4 April 1836	-- near the village of Nakroan.
Kutta Puther Canal	-- for the purpose of irrigating a tract of country bounded by the Jumna on the west, by the Asum on the south, by the hills on the north, and on the east by a stream called the Sutwala Rao.	sanctioned, 4 February 1848	-

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

87

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
2,642 10 4 $\frac{1}{2}$	1,861 - 10	-- completed, sea- son 1843-44.	its height will be 80 feet.
	1,881 4 8	season 1843-44 -	-- this bungalow will be constructed from the funds originally granted for the bungal- ow at Benares, a bungalow at the latter place being under construction from funds collected by private subscription.
3,244 10 6	2,243 10 9	-- completed, sea- son 1846-47.	
	25,450 4 10	- - - - -	-- the old fort at Jullundur, formerly used as a outcherry, has been sold for 40,000 Company's rupees.
818 15 6	825 - -	-- repairs com- pleted 1841-42.	-- the total sum expended for this work since its commencement is 2,945 rupees.
1,224 9 11		-- completed, sea- son 1841-42.	
2,000	2,000	-- completed, sea- son 1846-46.	
	2,568 3 6	- - - - -	-- the greatest part of the earth for this work will be dug out from the Khattee Canal, the improvement of which will thus be effected at little or no expense.
2,142	2,142	- - constructed, season 1846-47.	-- this bridge has timber road-way, on ma- sonry piers and abutments.
	88,902 11 1	- - - - -	-- this tract of land to be irrigated, contains 20,254 acres (31 square miles), more than four-fifths of which is good land for culti- vation.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, North Western Provinces :			
Kallee Nuddee, Iron Suspension Bridge at Khodagunge, between Cawnpore and Furrackabad.	-	-	-
Kumson, Construction of a Bridge on the Taper Chain principle, over the Kosillah River.	-- the old bridge was injured by a sudden and unusual high rise of the river in September 1840.	sanctioned, 5 April 1842	at Jyarea
Kathar Nuddee Bridge, near Subathoo.	-- to replace an old bridge which was represented to be unsafe for travellers.	-- sanctioned, season 1841-42; a revised estimate sanctioned 19 July 1844.	-- on the road from Subathoo and Simla.
Roads and Bridges, Lower Provinces :			
Kubbadduck River, Suspension Bridge over the, on the Tension principle.	-	sanctioned, 28 February 1841	near Jessore
Kamroop, Construction of Bridges on the Mofussil Roads in the District of Kamroop, and the Town of Gowahatty.	-	sanctioned, 13 September 1842	-
Koliabar to the Dunsurry River.	-- the construction of this road will complete the direct communication between Upper and Lower Assam.	-- length, 67 miles, 1 furlong; sanctioned 4 December 1844.	Dunsurry River
Kalling River to Koliabar, Repair of the Road.	-- this road follows the course of the river, and forms a bund to keep out inundation.	length, 72 miles	Koliabar
Roads and Bridges, South Eastern Provinces :			
Khoorda Road : Repairs to, and clearance of Jungle on.	-	-- length of road, 69 miles, 5 furlongs, and, 115 feet; repairs sanctioned 24 November 1840.	-- extends from the Madras frontier to Cuttack.
Construction of 129 Bridges and Drains on the.	-- to facilitate the means of communication.	sanctioned, season 1839-40	-
Kyouk Phoo, Construction of five First-class Masonry Bridges.	-	sanctioned, 18 September 1841	Kyouk Phoo
Khoorda Road, Construction of large Bridges on the.	-- required over rivers that intersect the road.	-- the length of the Khoorda Road is 69 miles, 5 furlongs and 115 feet; sanctioned, 25 September 1844.	-- one over the Coosmy River ; One over the Sahal River ; One over the Coosie River.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
- - 5,600 4 6 - -	9,170 13 1	-- completed, sea- son 1842-43. *	-- was built by the late Nuwab Mebindie Allee Khan Bahadour, but having been made over to Government by his nephew, Ahmed Allee Khan Bahadour, orders have been given to provide for its future repair.
- - 940 11 6 - -	420 5 7	-- completed, sea- son 1844-45.	-- this bridge was totally destroyed by the storms which occurred between the 17th and 20th July 1844. It will not be restored.
- - 21,056 - 3 - -	22,818 13 4	-- completed in 1846.	-- a wealthy native gentleman, by name Kallee Podar, has made an offer to Govern- ment to defray half the cost of this bridge. This bridge had been but recently con- structed and reported upon (on the 26th August 1846) by a special committee, and while their report was under consideration, accounts were received of its failure on the 30th September 1846, with a loss of 150 lives, in consequence of the whole structure having been thronged with natives witnessing the pas- sage of the Doorgah under the bridge. The estimate for the restoration of the bridge amounts to 5,428 rupees. The Court, in their despatch to the Government of India dated the 29th Sep- tember (No. 25) 1847, reiterated their orders of 1846, forbidding the further adoption of the tension principle in the construction of suspen- sion bridges. See Ballee Khal Bridge.
- - 1,839 14 5 - -	- - - - -	-- completed, sea- son 1842-43.	-- the amount will be charged partly to the Town Improvement Committee funds, and partly to the Mofussil Road funds.
- - not reported - -	24,500 2 2	- - - - -	-- the construction of 240 drain bridges on the line is provided for in the estimate.
- - 6,212 - - - -	6,212 - - -	-- completed, sea- son 1844-45.	
- - - - -	11,450 10 - 1/2	- - - - -	
- - 49,702 6 5 - -	60,872 3 6	-- completed, sea- son 1845-46.	-- the saving of Rs. 10,970. 11. 1. is owing to a reduction of rates, and also to the quantity of masonry.
- - 10,518 14 10 - -	11,256 7 1	-- completed, sea- son 1842-43.	
- - - - -	6,970 14 1	- - - - -	-- for a bridge of seven arches and 20 feet span over the Coosan River.
- - - - -	9,668 9 2	- - - - -	-- for an iron suspension bridge of 8 feet span over the Sahah River.
- - - - -	30,382 - - -	- - - - -	-- for a bridge on the tension principle over the Consais River.
No report of the final completion of these bridges has been received			

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces—continued.			
Kyook Phyoo:			
Construction of two Sluices with self-acting Gates to Bunds.	-- for keeping out the salt water from the station.	sanctioned, 15 April 1846	Khyook Phyoo
Construction of twelve Pucea Drain Bridges.	-- these works were undertaken at the requisition of the Commissioner of Arracan.	ditto	at Mugh Bazar
Construction of four Drain Bridges.		ditto	at Khyook Phyoo
Kedgeres Dāk Road, renewal of Wooden Bridges over the Kolah Khallee, and Tangooah Khalls.	-- to replace the present structures, which are in a decayed and dangerous condition.	sanctioned, 17 March 1847	-- Kedgeres Dāk Road.
Roads and Bridges, Umballa Division:			
Kalka to Dugshye	-- with reference to the formation of a new cantonment on the hills at Dugshye, the road from Kalka at the foot of the hills will be extended to Dugshye.	-- length, 18½ miles; sanctioned 28 April 1847.	Dugshye
Civil Buildings, Lower Provinces; Judicial:			
Kyook Phyoo, Construction of a Cutcherry Bungalow at.	-- to be used either by the Assistant at Aeng, or by the Commissioner.	G. O.; 26 September 1839,	Khyook Phyoo
Koosbaugh near Moorshedabad, Repairs to Buildings at the Mausoleum of Mohabut Jung.		-- sanctioned, seasons 1840-41, and 1841-42.	Koosbaugh
Kishenagur Gaol, Erection of a Dead-house.		sanctioned, 23 November 1846	Kishenagur
Khoolna, Construction of a Cutcherry and Dwelling-house for the Joint Magistrate.	-- the construction of the building was rendered unavoidable, in consequence of a tendency to outrage and disturbance existing in that quarter, which called for the constant presence of a Joint Magistrate.	sanctioned, 3 June 1844	Khoolna
Kissenpore Gaol, New Tile roofing to the.	-- the gaol had heretofore been thatched, but a thatched roof, from its liability to take fire, was considered particularly objectionable for a gaol.	sanctioned, 16 September 1844	Kissenpore
Civil Buildings, South Eastern Provinces; Judicial:			
Kyook Phyoo:			
Addition of Out-offices to the new Circuit-house.		sanctioned, 5 October 1841	
Construction of new Gaol Buildings.	-- the old gaol wards were quite unworthy of further repairs.	sanctioned, 31 July 1843	Kyook Phyoo
Construction of a Suddur Hospital.	-- indispensably necessary for the accommodation of the sick of the police, the flotilla, and other civil establishments.	sanctioned, 24 June 1844	
Construction of two new Wells for the Gaol.		sanctioned, 31 July 1843	

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. . - - 1,828 4 - - -	Rs. a. p. 1,451 - -	-- completed, sea- son 1845-46.	
- - 1,217 15 7, for nine bridges in 1847-48.	1,361 - -		
- - - - -	1,348 - -		
- - 4,009 7 10 - - -	Rs. 2,230 1 1 1,770 6 9 <hr/> Rs. 4,009 7 10	-- completed, sea- son 1847-48.	- - the bridge over the Kolah Khallee, is to be of 70 feet span; that on the Tangouah Khall, of 60 feet span.
- - - - -	1,20,250 - -	- - - - -	- - up to the 1st April 1848, a sum of Rs. 45,068. 1. 3., had been expended on the work, the progress of which has also been assisted by three or four companies of the corps of sappers and miners.
- - 7,428 5 8 - - -	5,335 9 8	-- completed, sea- son 1842-43.	- - the whole, or nearly so, of this excess, has been expended on works not included in the original estimate.
- - 2,308 10 6 - - -	2,308 10 6	season 1841-42,	
- - 417 11 4 - - -	- - - - -	- - - constructed, season 1847-48.	
- - 6,796 11 10 - - -	7,150 8 9	-- completed, sea- son 1845-46.	
- - 2,066 5 11 - - -	2,616 4 3	-- completed, sea- son 1846-47.	
- - 1,082 3 3 - - -	1,082 - 3	-- completed, sea- son 1842-43.	
- - - - -	20,867 5 2		
- - 1,753 10 6 - - -	1,760 5 -	-- completed, sea- son 1845-46.	
- - 517 5 9 - - -	517 5 9	- - - constructed, season 1845-46.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; Judicial:			
Kumaon, Construction of a Cutcherry.	- - for the accommodation of the junior Assistant Commissioner and Suddur Ameen.	sanctioned, 7 July 1841 -	- - - -
Kuchwagur, Construction of Police Guards.	for prisoners under trial - - -	sanctioned, 27 April 1844 -	Kuchwagur -
Civil Buildings, South Eastern Provinces; Revenue:			
Kyook Phyoo: Construction of Masonry Sluices with self-acting Gates.	- - in compliance with the recommendation of the Commissioner of Arracan.	- - sanctioned, 4 March and 20 May 1846.	- - in Freeman's Bund at Kyook Phyoo.
Construction of a Masonry Sluice with self-acting Gate.	- ditto - - - - -	sanctioned, 15 April 1846	- - in Hopkinson's Bund at Kyook Phyoo.
Construction of a Masonry Sluice with self-acting Gate.	- ditto - - - - -	sanctioned, 4 March 1846	- - in the Fish Village Bund.
Civil Buildings, South Eastern Provinces; General:			
Kedgerree Tripod	- - for the security of the establishments at Kedgerree, as well as of the inhabitants, in the event of a gale occurring similar to that in 1833.	- - the fabric will be 50 feet high, and of four stories; sanctioned, 27 January 1840.	Kedgerree -
Kidderpore, New fitting Shop in the Steam Dock-Yard.	- - - - -	sanctioned, season 1838-39	- - - -
Kedgerree, Enclosure of the Burial-ground.	- - the place was represented to be a perfect jungle, without any surrounding wall, hedge or fence of any kind whatever.	sanctioned, 26 April 1842	- - - -
Kyook Phyoo: Construction of Godowns	for marine stores - - - -	- - by order of the Commissioner of Arracan, dated 17 February 1840.	Kyook Phyoo. -
Construction of a new Marine Magazine.	- - the old building has been in a state of dilapidation since 1838.	sanctioned, season 1842-43	Kyook Phyoo. -
Kootubdea Island, Construction of a Lighthouse, &c.	- - - - -	sanctioned, 11 January 1843	Kootubdea Island
Kidderpore: Additional accommodation in the Steam Department.	- - for a new store-room, offices and model-room.	sanctioned, 20 July 1842	Kidderpore -
Construction of Pucka Dry Dock.	in lieu of the existing cutcha dook -	- - sanctioned, 19 October 1842, and 5 February 1844.	- - - -
Completion of the River Wall, Piling and filling up the old Mud Dock and Tank.	- - - - -	- - - - -	- - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs. a. p.		
685	1 3	779 15	-- completed, season 1841-42.	
2,200		2,200	-- constructed, season 1844-45.	
2,577	2 11	2,577 2 11	-- completed, season 1847-48.	
982	1 11	982 1 11	-- completed, season 1847-48.	
598	14 9	598 14 9	-- completed, season 1847-48.	
4,189	11	4,214 9 9	-- completed, season 1841-42.	-- three of the stories will be for places of refuge in times of inundation, and the fourth may be used by the Semaphore establishment, and also for the purpose of exhibiting a light, if necessary, for the use of the shipping.
12,945	1		-- completed, season 1841-42.	the work has been satisfactorily executed.
754	12 11½	796 5	-- completed, season 1843-44.	
2,550	3 10		-- completed, season 1841-42.	-- these buildings replaced two others which had been pulled down.
1,798	9 2		-- completed, season 1842-43.	
35,511		29,235 6 5	-- completed, 21 February 1846.	-- the light will be exhibited 100 feet above high-water spring tides, and the lantern is to be 12 feet in diameter.
40,036	12 6	45,376 4 6	-- completed, season 1844-45.	-- the saving of Rs. 5,330. 0. 6., is ascribed to modifications from the original design.
92,048	7 9½	87,788 7 1	-- completed, season 1844-45	-- in consequence of the difficult nature of the undertaking, the floor of the dock resting on a mass of springs, it became necessary to change the mode of laying the foundation.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; General—continued.			
Kidderpore: Renewing a Store-room, constructing a Coal-tar Tank, &c., in the Naval Storekeeper's Depart- ment.	-- at the request of the Superinten- dent of the Marine.	sanctioned, 9 April 1844 -	Kidderpore -
Construction of Buildings	-- for the reception of the pump and punching machine.	sanctioned, 17 June 1844 -	- - - -
Construction of a Shed -	as a receptacle for coals - - -	sanctioned, 28 February 1844 -	- - - -
Dock-yard, Renewal of a portion of the Retain- ing Wall.	-- the old retaining wall is in a dangerous state, and the foundations are supposed to be defective.	sanctioned, 22 July 1846 -	- - - -
Kyook Phyoo, Construc- tion of three Jetties or Piers.	-- for the convenience of the salt traders frequenting the port.	sanctioned, 16 September 1844 -	Kyook Phyoo -
Kidderpore Dockyard, Con- struction of a Masonry Platform.	-- for setting up an iron crane, shipped by the Court of Directors.	- - - - -	- - - -
Kootubdeá, Lighthouse Buildings.	-- for a lighthouse tower and lan- tern, with buildings for the establish- ment of Overseer and Lascars, on the Island of Kootubdeá.	sanctioned, 8 October 1845 -	Kootubdeá Island
Kidderpore: Proposed construction of a Basin or Wet Deck.	for inland steamers - - - -	-- submitted for sanction, 19 June 1846.	Kidderpore -
Dockyard, Construction of Boat and Coal-sheds, and fitting up a Tank.	-- the necessity for these works was brought to notice by the Acting Superintendent of Marine.	sanctioned, 21 June 1847 -	- ditto - -
Dockyard, Construction of Dwelling-houses.	-- for the Naval Storekeeper and Marine Surveyor and Builder.	sanctioned, 29 April 1848 -	- ditto - -
Civil Buildings, Lower Provinces; General:			
Kurseong, Construction of a Staging Bungalow.	-- this bungalow is to be in the place of the staging bungalow at Mahalderam, built by the Darjeeling Committee, but now in a dilapidated state.	sanctioned, 5 August 1844 -	Kurseong - -
Kishenagur, Construction of a Post-office at.	-- the accommodation heretofore af- forded to the records of the Post- office in the Collector's office, is no longer available.	sanctioned, 6 March 1846 -	Kishenagur - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - 6,507 6 9 - -	6,564 4 1	-- completed, sea- son 1844-45.	
- - 8,429 8 9 - -	7,005 3 6	-- completed, sea- son 1845-46.	
- - 477 - - - -	477 - -	-- constructed, season 1844-45.	
- - this work was suspended in 1845-46, as the entrance to a projected wet dock for steamers will be made on part of the in- tended site.	83,557 1 10	- - - -	-- the section of the new wall will be similar to that of the wharf wall at Sheer- ness, where the soil somewhat resembles that at Kidderpore.
- - - - -	3,748 8 -		
- - 20,240 - - - -	17,375 - -		
- - 35,289 - 5 - -	29,235 - -	-- completed, Fe- bruary 1846.	-- the excess* over the original estimate was occasioned by the rates assumed by the Executive Engineer being purely con- jectural, in consequence of the isolated spot at which the work was to be car- ried on.
- - - - -	1,27,211 6 9	- - - -	-- it is proposed to make the entrance into the wet dock through the dry dock, whereby the expense of constructing a new entrance, with locks, &c., will be in great part avoided, while the dry dock will still remain available for the purposes of its original construction, whenever required.
- - - - -	16,057 7 6		
- - - - -	19,608 11 8	- - - -	-- this arrangement will make the present house occupied by the Naval Storekeeper available for the Assistant Surveyor and Builder. The quarters of the latter, which are unfit for a dwelling-house, the rooms being confined and low, will be converted into godowns, as proposed by the Marine Superintendent.
- - 3,190 11 6 - -	3,107 15 4	-- constructed, season 1846-47.	-- at the suggestion of the Superinten- dent of Darjeeling, the site of the bunga- low has been removed to Kurseong, which station is five miles nearer the plains than Mahalderam, at which latter place there has hitherto been, and still is, an hotel for the accommodation of travellers.
- - 733 9 5 - -	722 - -	-- completed, sea- son 1847-48.	-- this building is to be of pucca, on account of the great destruction of wood- work at the station.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; General:			
Kurnaul, new Roof to the Roman Catholic Chapel.	- - - - -	sanctioned, 6 April 1842 -	Kurnaul - -
Kussowlee: Construction of a Protestant Church at.	- - - - -	sanctioned, 17 January 1845 -	Kussowlee -
Construction of a Staging Bungalow.	-- the necessity for this bungalow appears to have been brought to notice by the Post-master, North Western Provinces.	sanctioned, 23 November 1844	- - - -
Kurrachee, Erection of a Post-office.	-- sanctioned by Government in the Foreign Department.	sanctioned, 13 July 1844	- - - -
Civil Buildings, Central Provinces; General:			
Kheree, Construction of a Staging Bungalow.	-- the existing buildings, owing to the inefficiency of accommodation, did not meet the public wants.	sanctioned, 9 September 1843 -	Kheree - -
Civil Buildings, South Western Provinces; Marine:			
Kidderpore, Construction of a Workshop for the Comptroller of Steam Machinery.	sanctioned, 22 May 1839 - -	- - - - -	- - - -
Roads and Bridges, Central Provinces:			
Lucknow Canal, Bridge over the, on the road from the city to Constantia, and bridging of the water-courses on that road.	-- these bridges are to be on a new line of road, half a mile less in length than the old road, which is through the King of Oude's private park, at Delkoosah, and although his Majesty permits all European gentlemen to use this road, it is apprehended that this privilege would not be extended to all classes of persons proceeding to and from Constantia, after it shall have become a public College.	-- Estimate submitted, 26 Feb. 1842.	- - - -
Roads and Bridges, North Western Provinces:			
Loharee Bridge, over the Uriil River.	-- increase to the water-way in consequence of the approaches to it being flooded in the rains.	sanctioned, 3 June 1842 -	Loharee - -
Lucknow Bridge, and repair of the Causeway.	-- two lengths of the causeway, measuring 551 and 307 feet respectively, were entirely destroyed by a violent flood on the 20th June 1842.	- - - - -	near Sheharunpore

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

97

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i> 577 15 11		-- completed, season 1842-43.	
-- this work was suspended in season 1845-46.	25,734 12 6		
3,806 12 8	3,913 12 5	-- completed, season 1845-46.	
849 8		-- constructed, season 1844-45.	
1,947 1 2	2,037 10 2 and Rs. 136. 7. 3. for the requisite furniture.	-- completed, season 1844-45.	
6,601 12	6,893 4 8	-- completed in season 1839-40.	
not reported	12,565 3 6 and Rs. 632. 7. 10. for bridges.	not reported	-- the bridge over the Lucknow Canal is to be of three arches; the cost will, it is believed, be defrayed from the Maritime Fund.
11,322 3 5½	11,333 15 1	-- completed, season 1842-43.	
			-- the causeway of the Lucknow Bridge is constructed on land arches traversing a plain of deep sand, and extends to a length of 2,224 feet. The bridges and causeway were constructed in the year 1827, at a cost of 36,000 rupees. The piers of the main arches of the bridge are carried down 20 feet below the bed of the river to solid soil. Two of the arches having been choked up, and shown symptoms of settlement in 1847-48, a sum of Co.'s Rs. 536. 6. 6. was expended in flooring the spaces between the piers with rough wooden caissons.

RETURN FOR THE PRESIDENCY OF BENGAL—*continued.*

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, North Western Provinces—<i>continued.</i>			
Landour Roads: Reconstruction of several portions of the Embankment Walls.	-- these roads were greatly injured by heavy rains in August 1842.	sanctioned, 6 January 1843	- - -
Repair of, and Enclosure of parts of the Road leading from the Barracks to the Hospital with a rough Railing.	-- these roads were again injured by the heavy rains of August and September 1843.	sanctioned, 1 December 1843	- - -
Lohoo Ghaut, Construction of an Iron Suspension Bridge over the Lohoo River at.	-- this bridge is intended to replace an old wooden bridge, which is considered by the local authorities to be no longer safe.	sanctioned, 26 September 1846	Lohoo Ghaut
Civil Buildings, North Western Provinces; General:			
Landour, Enclosure of the Burial-ground at.	- - - - -	sanctioned, 1 October 1842	- - -
Lohoo Ghaut, Construction of a wall around the Burial-ground.	- - - - -	sanctioned, 21 July 1843	- - -
Loodianah Church, Addition to.	-- in consequence of the accommodation being insufficient for the increased number of European troops.	sanctioned, 8 April 1844	- - -
Civil Buildings, Central Provinces; Ecclesiastical:			
Lucknow Church	- - - - -	sanctioned in August 1838	- - -
Civil Buildings, North Western Provinces; Ecclesiastical:			
Landour Church, Construction of.	- - - - -	sanctioned in 1838	- - -
Landour Burial-ground, Construction of a Wooden Railing.	to inclose the burial-ground	sanctioned, 29 November 1839	- - -
Civil Buildings, Central Provinces; Political:			
Lucknow, Completion and Repairs of the Constantia House Buildings.	- - - - -	-- estimates submitted, 13 July 1843.	- - -
Civil Buildings, North Western Provinces; Political:			
Lahore, Conversion of the Anarkuller House into a Residency.	for the Political Resident	sanctioned, 6 October 1847	Lahore

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred:	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. - - 5,548 3 8 - -	Rs. a. p. 5,832 7 11	-- completed, sea- son 1843-44.	
- - 2,131 5 3 - -	3,444 5 3	-- completed, sea- son 1844-45.	a railing has been erected along the road.
- - - - -	2,455 9 7		
- - 781 12 9 - -	781 12 9	-- completed, sea- son 1844-45.	
- - 261 1 2 - -	261 1 2	-- completed, sea- son 1844-45.	
- - 4,043 11 2 - -	- - - - -	-- completed, sea- son 1845-46.	-- an addition of 40 feet has been made to the length of the church.
- - 5,400 - - - - of which 1,900 rupees were by private subscription.	- - - - -	-- completed, sea- son 1840-41.	-- the future repairs of the church will be repaid by the State.
- - 6,493 7 6 - -	5,000 - -	-- completed, sea- son 1840-41.	
- - - - -	937 11 7		
- - - - -	1,96,650 4 4	- - - - -	-- the estimates were returned with an opinion, that the design appeared good and the rates moderate.
- - - - -	24,900 - -	- - - - -	-- the Resident is to be permitted to occupy the building rent-free, on the con- dition that he shall keep it in tenatable repair at his own cost, after the addi- tions and repairs provided for have been completed.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Embankments, South Eastern Provinces :			
Midnapore Division - - - - -	- - - - -	- - length, 657 miles; estimated amount for annual repairs, Rs.29,729. 11. 7.	
Construction of a new Line in lieu, of the old Zemindarry Khattee Bund, in Pergunnah Mingleghant.	- - for the protection of the Oolabareah mail road.	- - length, 3 miles 1 furlong; sanctioned, 14 February 1842.	
Construction of two Irrigation Channels, with Sluices.	- - these works were proposed by the local authorities for the improvement of the Government estate; viz. the pergunnah of Khider Koond.	- - one of the sluices 16,000 feet in length, the other 765 feet in length, from the Cossye River, with two sluice-gates; sanctioned, 8 October 1845.	Midnapore - -
Middleton Point, Saugor Island; Construction of a new Bund.	- - in consequence of the old bund having been nearly washed away during the gale of September 1846.	sanctioned, 17 February 1847 - -	
Canals, South Eastern Provinces :			
Mofussil Canals, Improvements of the.	- - by cutting down jungle, repairing and making tow-paths, &c.	sanctioned, 28 September 1843	
Canals, North Western Provinces :			
Muskurra River :			
Construction of Retaining Dam, south of the Masonry Dam.	- - for the protection of the dam which, during the flood of the 21st and 22d June 1842, appears to have been in great danger.	sanctioned, 2 March 1842 - -	
Prolongation of the Box-work tail of this Dam.	- - considered indispensable for the safety of the dam.	sanctioned, 29 January 1844 - -	
Muskurra Dam, Repair of Damage occasioned by Floods.	- - the Muskurra River, by the breaking of the bunds at the Kolawalla Pass, and at the Dawalooka, received all the mountain supply which usually passes off down the Hindun.	sanctioned, 20 March 1845 - -	
Roads and Bridges, South Eastern Provinces :			
Midnapore, Construction of a new Masonry Bridge.	in lieu of an unserviceable bridge - -	sanctioned, 28 February 1842 - -	
Muggra to Chotekund, on the Grand Trunk Road, metalling of.	- - - - -	sanctioned, 22 April 1847 - -	Chotekund - -
Maumbhoom, Construction of a Bridge over the Jailgarrah Nuddee.	- - - - -	sanctioned, 16 October 1843 - -	Maumbhoom - -
Midnapore to Bissenpore, Construction of 12 Masonry Bridges.	to replace the old dilapidated works	sanctioned, 8 September 1847 - -	Bissenpore - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a.	Rs. a. p.		
7,717 5 9	7,717 5 9	-- completed, season 1843-44.	-- large plains, heretofore totally unproductive, have been brought under cultivation.
2,078	2,078	season 1845-46.	
1,625	1,625		
	4,368 4 6		-- these works will materially facilitate the inland communication.
10,490 5	13,530	-- completed, season 1843-44.	-- this work has fully answered the expectations entertained of it.
5,398 13 10	6,102 8 5	-- completed, season 1844-45.	
	6,222		
781 8 10		-- constructed, season 1843-44.	
	76,186 10 6		-- the distance to be metalled is about 20 miles. The high rate for metalling (amounting to nearly 4,000 rupees per mile) is occasioned by the great distances at which the quarries are situated.
5,929 9 3	8,861 7 1	-- completed, season 1846-47.	-- this bridge is of three arches of 25 feet span each. The saving of Rs. 2,931. 13. 10. was in consequence of a saving on the quantity of masonry in the foundations, and of a great reduction of rates.
	1,480		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, Lower Provinces :			
Manipore Road	-- to make the communication between the Eastern Frontier and the Burmese country comparatively easy.	length, about 93 miles	-- Panksandy, in Cachar.
Roads and Bridges, Central Provinces :			
Mogul Serai to Allahabad	-- the project is highly advocated, as forming a direct communication between the Grand Trunk Road east of Benares and Mirzapore, without crossing the Ganges at Benares and recrossing it at Mirzapore, as at present.	-- length, about 93 miles; estimates submitted 28 February 1840.	Allahabad
Mirzapore to Jubbulpore	-- for opening a communication with the Saugor and Nerbudda Territories, and with a view to its ultimate continuation to Nagpore and Oomraotee.	commenced in 1824	-- Jubbulpore (This is a portion of the Great Deccan Road).
Mirzapore to Jubbulpore, Construction of three Bridges on this Road between Myhna and Sewagunge.	-- in lieu of bridges carried away by floods in 1839.	sanctioned, season 1839-40	
Roads and Bridges, North Western Provinces :			
Meerut to Ghazeeoodennuggur :			
Improvement of the Road		-- sanctioned, season 1848-49; length, 28 miles 7 furlongs.	-- Ghazeeoodennuggur.
Construction of a Bridge over a Nullah.	for drainage	sanctioned, 27 October 1842	
Meerut to Kurnaul	-- represented to be useful both for commercial and military purposes.		
Mohana, Construction of a Paved Causeway across the River Parbattee.	-- this work is considered absolutely necessary on account of the roughness of the present crossing, at which vehicles frequently break down, or are so much shaken as to render them almost useless.	sanctioned, 16 January 1847	-- on the road between Gwalior and Seepree.
Moozuffernuggur, Restoration of the Bridge over the Kallee Nuddee.	-- carried away by a flood on the 20th June 1842.	sanctioned, 17 November 1842	at Mulleerah

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. 92,427 9 1	Rs. a. p. 1,28,340 4 4	-- completed, sea- son 1842-43.	-- the line of road was considered by the Committee appointed in 1843 to have been judiciously selected, and the construction of it generally to reflect the greatest credit on the engineer officer. The road is quite practicable for the passage of guns except at one point, where, however, the difficulty may be obviated by the use of ropes.
	-- estimate for the portion of the road from Mogul Serai to Mirzapore, 113½ miles, 1,08,040 rupees.		-- in 1840 the Government stated that the large amount contemplated was more than could be assigned to the object from the general resources of the State; it was not intended to abandon the plan altogether, and the surveys and estimates are therefore made over to the Commissioner of the Benares Division, with instructions to apply all available resources for the advancement of the project.
7,60,302	60,000 -- -- also Rs. 3,573. 7. 2. for the re-construction of bridges carried away by hill floods in 1839	-- completion re- ported; season 1839-40.	
3,506 14	3,573 7 2½	-- completed, sea- son 1842-43.	
-- for bridges - 7,745 - 5 for metalling - 68,881 14 11 for a pukka drain 7,745 - 5	77,407 -- -- sanctioned for metalling this road.	-- completed, sea- son 1842-43.	-- the construction of this road was first undertaken by the Meerut Road Fund Committee, by whom it was abandoned after eight miles had been completed, owing to insufficient means; the Committee pledges itself to execute the earth-work, leaving the metalling and bridges to Government. This line of road has been transferred from the Meerut to the 7th Division of the Grand Trunk Road; the annual repairs are estimated at 6,825 rupees.
620 4 4	620 4 4	-- constructed, season 1843-44.	
	9,490 8 6		-- the causeway is of rough stone, dressed with chisel.
14,404 12 9	11,205 8 2	-- completed, sea- son 1844-45.	-- this bridge was constructed in 1826 by Captain M. Mullin at a cost of 52,000 rupees. The five principal arches which withstood the flood were founded on wells, those which failed rested only on caissons. To the defect and to the contracted span of the arches, the failure is in a great measure to be ascribed. The piers are to be raised to 14½ instead of 9 feet.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
<i>Roads and Bridges, North Western Provinces—continued.</i>			
Meerut to Koorja, Construction of a Road.	- - - - -	- - length, 50 miles; sanctioned 24 January 1843.	Koorja - -
Mulluck Chund Serais, to the boundary of the Cantonnments at Agra; Construction of a raised Metal Road.	- - - - -	- - length, 1½ miles; sanctioned 20 April 1846.	- - Agra Cantonnments.
Malwa, Construction of a Bridge over the Nullah at Chitrokerce.	- - the nullah is bunded for irrigation below the road, and after a favourable rainy season there is sometimes a depth of five feet of water on the ford crossed by the road. The nullah bed being black soil, and the ford impassable for travellers or carts until the season of irrigation has passed over, the necessity for the construction of the bridge is sufficiently obvious.	sanctioned, 5 December 1846 -	- - - - -
<i>Civil Buildings, South Eastern Provinces; Judicial:</i>			
Moulmein, Alterations to the Gaol, and construction of Buildings.	- - - - -	sanctioned, 9 May 1837 -	Moulmein - -
Midnapore, Construction of an additional Room to the Magistrate's Cutcherry.	- - owing to the small size of the room in which the Magistrate's Court is held, it has been found necessary to exclude all persons except those whose cases were actually being heard.	sanctioned, 18 July 1844 - -	- - - - -
Maumbhoom, Construction of a Cutcherry for the Native Judge.	- - - - -	sanctioned, 20 June 1842 -	Maumbhoom - -
Moulmein Gaol, Alterations to.	- - - - -	sanctioned, 22 June 1844 -	- - - - -
Moulmein Court House:			
Alterations to - -	- - with a view to improve the interior arrangements.	sanctioned, 5 August 1844 -	- - - - -
Construction of Night Privies to the Gaol.	- - - - -	sanctioned, 23 April 1845 -	- - - - -
Construction of seven Police Watch-houses.	- - constructed on the emergent requisition of the Commissioner of the Tenasserim Provinces.	sanctioned, 23 May 1845 -	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.		Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs.	a. p.		
1,48,919	3 8	93,645	3 8	-- completed, season 1846-47.	-- twenty bridges will be constructed on the line, and four dāk bungalows, viz; Kurkhonda, Hauppera, Gallowtee, and opposite to Boolundshur. The three former bungalows it was subsequently found would not be required. The formation and metalling of the portion of this road between Gallowtee and Khoorja (22 miles), which had been left to the Boolundshur Road Fund Committee, was so imperfectly done in the first instance by that committee, that a supplementary estimate of Rs. 55,274. 10. was sanctioned on the 27th August 1846, for repairing ruts and restoring the metalling.
5,235	4	5,235	4	-- completed, season 1846-47.	
		3,870			-- the bridge is to be of three arches, with raised approaches.
		9,398	6	completed 1841-42.	
2,348	5 ½	2,340	5 6 ½	-- completed, season 1847-48.	-- the existing buildings were inadequate for the proper custody of the numerous valuable papers connected with the survey, resumptions, and settlement proceedings, recently brought to a close.
1,264	11			-- completed, season 1844-45.	
2,084	2 9			-- completed, season 1844-45.	-- the gaol wall, which varied from 9 to 12 feet in height, has been raised to an uniform height of 15 feet all round.
1,611	10 2			-- completed, season 1844-45.	
426	3 9	426	3 9	-- constructed, season 1845-46.	
621		621		-- constructed, season 1845-46.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
<i>Civil Buildings, South Eastern Provinces; Judicial—continued.</i>			
Moulmein, Construction of Offices and Sessions Court.	-- for the Commissioner of the Tenasserim Provinces, and his Principal Assistant.	sanctioned, 17 October 1845 -	Moulmein -
Mergui, Purchase and Repair of a Building.	for a Circuit House - - -	sanctioned, 2 June 1847 -	Mergui - -
Midnapore Gaol, Construction of improved Ventilators, and additional accommodation.	-- fifty-seven ventilators were constructed in 1841-43, which only partially succeeded, in consequence of their inadequate size, being only 1½ feet square, in improving the salubrity of the gaol.	sanctioned, season 1846-47 -	Midnapore -
Midnapore, Additions to the Collector's and Magistrate's Cutcherries.	-- the construction of seven additional rooms of pucca masonry, with flat roofs, is required.	sanctioned, 16 June 1847	- - - -
<i>Civil Buildings, Lower Provinces; Judicial :</i>			
Moorshedabad, Construction of four experimental Penitentiary Wards.	- - - - -	sanctioned, 8 February 1842 -	Moorshedabad -
Moozufferpore, House of Correction.	- - - - -	sanctioned, 7 December 1841 -	Moozufferpore -
Moorshedabad, Imambarrah	-- to replace an old imambarrah in a state of great decay, and which was considered too close to the palace.	sanctioned, 7 December 1840 -	Moorshedabad -
Monghyr Gaol, Construction of additional Wards.	-- for the accommodation of the prisoners, the existing space being insufficient.	sanctioned, 17 November 1840	Monghyr - -
Monghyr: Construction of a Cutcherry for the Magistrate.	-- called for with reference to the appointment of a separate officer to the magistracy.	sanctioned, 29 July 1844 -	ditto - -
Construction of a Circuit House.	- - - - -	sanctioned, 20 November 1844	- - - -
Mootsearee, Construction of a Circuit House and Out-offices.	- - - - -	sanctioned, 20 November 1844	Mootsearee -
Maldah, Purchase of a House, and its adaptation for the purposes of a Circuit House.	- - - - -	sanctioned, 20 November 1844	Maldah - -
Moozufferpore, Purchase of a Private Building at.	-- for a cutcherry for the Sessions Judge.	sanctioned, 29 December 1838 -	- - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

107

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
13,877 3 7	10,569 - -	-- completed, season 1847-48.	-- the excess over the estimate is owing to difference of rates, and the execution of much work which was not provided for.
1,868 14 0	- - - -	season 1847-48.	
4,010 6 - -	4,010 6 -	-- constructed, season 1846-47.	-- the new ventilators are of a larger description, being 8x2 in the clear.
- - - -	9,111 3 -		
23,962 - - - -	23,962 - -	- - - -	these four wards are for 120 men.
14,947 4 1 $\frac{1}{2}$	13,000 - -	-- completed, season 1842-43.	-- the gaol of this place, in consequence of the encroachments of the river, must ere long be entirely given up. The prisoners of this district sentenced to longer periods of confinement than one year, will be sent to the Patna Penitentiary.
not reported	90,000 - -	not reported	-- this work will be paid for from the Nizamut Deposit Fund.
885 6 4 $\frac{1}{2}$	695 8 9	-- completed, season 1841-42.	
4,931 - 6 - -	5,190 13 10	-- completed, season 1846-47.	
4,572 9 3 $\frac{1}{2}$	4,999 5 -	season 1847-48.	-- a private house was purchased and converted into a circuit house, in accordance with an estimate sanctioned on the 7th October 1845.
5,072 10 5 -	4,999 5 -	-- completed, season 1847-48.	
5,761 13 11 -	5,761 13 11	season 1844-45.	
1,700 - - - -	- - - -	season 1841-42.	-- this building, which was the property of Meer Abdoollah, and had been hired ever since the year 1803, at a monthly rent of 80 rupees, has been purchased for less than two years' rent.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Civil Buildings, Lower Provinces ; Judicial—continued.			
Monghyr, Additions to the Magistrate's and Collector's Cutcherry.	to afford more accommodation	sanctioned, 2 November 1841.	
Mymensing : Addition of a Pucca Tiled Verandah to the Judicial Cutcherry.	-- for the accommodation and convenience of suitors.	sanctioned, 6 July 1841	
Construction of Cutcheries for the Principal Sudder Ameen.	-- the present building is a cutcha building with a thatched roof, and is considered by Government an unfit place (in consequence of its liability to be destroyed by fire) for the reception of documents of great importance, which are now lodged in it.	sanctioned, 30 July 1845	Mymensing.
Mymensing Gaol, Construction of seven Night Privies.	- - - - -	sanctioned, season 1844-45.	ditto
Monghyr, Construction of a suitable Court-house for the Sudder Ameen and Moonsiff.	-- this building is required in lieu of a private building, the property of the former Native Judge, which is inconveniently situated, being in the heart of the town, and at a considerable distance from other public offices, which are all within the fort.	sanctioned, 16 April 1846	Monghyr
Moozufferpore : Raising the pillars of the Verandah of the Judge's Cutcherry.	-- to raise the verandah two feet, and to give it a sloping terraced roof.	sanctioned, 30 April 1845	Moozufferpore
Construction of a House of Correction.	-- for 562 prisoners, including patients in hospital at Moozufferpore.	sanctioned, 17 November 1847	
Civil Buildings, North Western Provinces ; Judicial :			
Nutra Gaol, Improvements to the.	to increase the accommodation	sanctioned, 29 April 1840	
Malhout, in the Bhutte Territory ; Construction of a Well.	- - - - -	sanctioned, season 1839-40	
Meerut, Construction of Houses.	-- for the Non-commissioned Officers of the Police Battalion.	sanctioned, 31 March 1845	
Mooradabad, Construction of a Record-room for the Collector and Magistrate's Cutcherry.	-- the Lieutenant-governor satisfied himself, on a visit to the station, of the necessity for this accommodation.	sanctioned, 22 August 1845	Mooradabad
Civil Buildings, Central Provinces ; Judicial :			
Mirzapore : Construction of a new Gaol Hospital.	-- on account of the confined and unhealthy site of the existing hospital.	sanctioned, 10 August 1841	
Construction of a Bridge near Wellesley's Thanah.	- - - - -	sanctioned, 23 March 1841	
Construction of a Cutcherry for the Collector and Magistrate.	-- in consequence of the sale of the Custom-house.	sanctioned, season 1839-40	
Mundlaiser Gaol, Additions to.	- - - - -	sanctioned, 27 November 1841	

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

109

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.		Probable Time of Completion.	REMARKS.
<i>Rs.</i>	<i>a. p.</i>	<i>Rs.</i>	<i>a. p.</i>		
883	4 10			-- constructed, season 1842-43.	
		5,088			
667	13 9½			-- completed, sea- son 1845-46.	
998	13 1½	1,097		-- completed, sea- son 1847-48.	
1,541	13 6	1,541	13 6	-- completed, sea- son 1846-47.	
		20,601	9 8		
3,238	15 9	4,041		-- completed, sea- son 1841-42.	
1,408	6 4	1,000		-- completed, sea- son 1840-41.	-- the excess of 408 rupees was owing to the necessity for making the well 188 feet deep, instead of 90 feet, as contemplated by the estimate.
3,677		3,658	2 10	-- completed, sea- son 1845-46.	
5,238	11 4	5,235		-- completed, sea- son 1847-48.	
12,405	6 2	12,638	8 2	-- completed, sea- son 1843-44.	
610	6			-- completed, sea- son 1841-42.	-- this work was represented to be very much required.
15,022	4 5½			-- completed, sea- son 1841-42.	
3,771	3	2,941	5 ½	-- completed, sea- son 1842-43.	-- the new building is capable of holding 60 or 70 convicts.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces ; Revenue :			
Midnapore, Additional Accommodation to the Collector's Cutchery.	- - - - -	sanctioned, 6 April 1841 -	- - - - -
Civil Buildings, Lower Provinces ; Revenue :			
Moozufferpore, Construction of two Dams in the River Little Gunduck.	for the protection of the station -	sanctioned, 25 April 1842 -	- - - - -
Moorshedabad, Record-room for the Collector's Cutchery.	- - - - -	sanctioned, 16 June 1840 -	- - - - -
Mymensing, Construction of Tiled Cutchery for the Deputy Collector and Law Officer, and Rooms for Records of the Magistrate and Collector.	-- rendered necessary in consequence of the crowded state of the Collector's cutchery.	sanctioned, 21 September 1846	Mymensing -
Moozufferpore, Construction of two Pucca Verandahs.	- - - - -	sanctioned, 1 July 1846 -	-- to the east and west sides of the Collector's cutchery.
Civil Buildings, South Western Provinces ; Revenue :			
Midnapore : Enlargement of the Collector's Cutchery.	-- to provide accommodation for the Joint Magistrate and the Assistant.	sanctioned, 13 September 1836	- - - - -
House for the Revenue Surveyors and Establishment.	- - - - -	sanctioned, 16 January 1838 -	- - - - -
Civil Buildings, North Western Provinces ; Revenue :			
Mynpooree : Construction of a Tehsil-darry Cutchery,	for the Collector and Magistrate -	sanctioned, 8 March 1842 -	at Ghirole -
Alterations and Additions to the Sirpoorah Cutchery.	-- to adapt it for the Tehsil establishment of the Lukat Eytah Division.	sanctioned, 7 October 1842 -	Sirpoorah -
Mahur, Construction of a Bungalow.	for the Deputy Collector	sanctioned, 18 June 1846 -	Scinde Division -
Civil Buildings, Lower Provinces ; General :			
Moorshedabad College, Construction of.	- - - - -	sanctioned, 6 April 1840 -	Moorshedabad -
Civil Buildings, North Western Provinces ; General :			
Mohun Chowkes, new Staging Bungalow at.	-- in substitution of one previously existing at Rajpore.	sanctioned, 14 November 1840	- - - - -
Mussooree Church, Construction of a new Roof, and Repairs of.	- - - - -	sanctioned, 21 September 1841	- - - - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

111

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs. a. p.		
- -	2,643 8 5	2,762 6 -	-- completed, season 1842-43.	
- -	682 7 11	- - - -	-- constructed, season 1842-43.	-- this work was proposed by the Civil Officer and the Durbungah Rajah.
- -	1,685 2 9½	- - - -	-- completed, season 1841-42.	
- -	4,948 1 5	5,375 1 2	- - - -	-- as very indifferent roofs are made from tiles at the station, a revised estimate was passed, providing for the substitution of flat roof and pucca superstructure walls, in lieu of tiled roofs and kutcha pucca walls.
- -	408 4 3	408 4 3	-- constructed, season 1847-48.	
- -	7,054 10 2	- - - -	- - - -	-- the additions made were four rooms, and verandahs on three sides of the outcherry.
- -	2,918 11 4	- - - -	- - - -	
- -	4,009 11 6	4,174 7 2	-- completed, season 1843-44.	
- -	1,728 2 6½	- - - -	-- completed, season 1843-44.	
- -	1,964 5 2	1,964 5 2	-- completed, season 1845-47.	
- -	76,500 5 4	73,000 - -	-- completed, season 1843-44.	-- in the amount expended is included Rs. 2,400. 5. 4., for the purchase of lands, &c. for a site, which was not included in the estimate.
- -	1,477 7 3	1,189 13 5	-- completed, season 1840-41.	-- it is expected that the convenience of travellers will be much increased by this arrangement.
- -	1,359 5 -	- - - -	-- completed, season 1843-44.	-- the cost of furniture is included in the expenditure.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; General—continued.			
Mozuffernuggur, Construction of Staging Bungalows at Seharunpoor.	-- the Executive Engineer was directed to commence upon the buildings without delay, as they were urgently required for the accommodation of travellers.	sanctioned, 18 November 1844	- - -
Civil Buildings, South Eastern Provinces; General:			
Midnapore:			
Construction of a Staging Bungalow.	as a resting-place for travellers	sanctioned, 14 July 1841	Midnapore
Construction of a new School-house.	-- to replace a building which is stated to have been accidentally burnt down.	sanctioned, 1 December 1841	- ditto -
Addition to the Collector's Cutcherry.	for a Post-office	- - - - -	- - - - -
Moulmein, Construction of a new Wharf.	for the principal bazaar	sanctioned, 17 July 1843	Moulmein
Middleton Point, Renewal of the Stockade, with Saal Posts.	-- this stockade must be maintained, for the protection of the Government establishment from tigers.	sanctioned, 20 November 1844	Middleton Point
Moulmein, Substitution of Tiled for Thatched Roofs to certain Marine Buildings.	for the protection of naval stores	sanctioned, 11 March 1846	Moulmein
Civil Buildings, Central Provinces; General:			
Mirzapore, Construction of a Staging Bungalow.	-- for connecting the line of bungalows on the Decean Road towards Nagpore, with those on the Grand Trunk Road from Calcutta to Delhi.	sanctioned, 25 September 1843	Mirzapore
Civil Buildings, South Eastern Provinces; Marine:			
Moulmein:			
Construction of a Hospital Ward within the Compound of the European Infantry Hospital.	-- for the reception of the sick men of Her Majesty's ships on the river.	sanctioned, 24 January 1842	Moulmein
Construction of a Post-office and five Sheds.	for marine stores	sanctioned, 27 April	- - -
Political Buildings, Lower Provinces:			
Moorshedabad, Repairs to the Mausoleum of Mohabat Jung.	- - - - -	sanctioned, season 1840-41	at Kooshbaug

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.		Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs.	a. p.		
4,122	- - -	4,390	3 2	-- completed, sea- son 1845-46.	
1,442	6 9½	1,468	- 4	-- completed, sea- son 1842-43.	
3,217	6 7	3,409	- 7	-- completed, sea- son 1843-44.	
		1,042	2 1½		
		2,672	1 9		-- the suspension of the works was or- dered on the 23d September 1843, as some changes were stated to be in contem- plation which might render the construc- tion of the wharf unsuitable at the place originally intended.
2,576	2 3	2,665	13 -	-- completed, sea- son 1845-46.	
719	9 9	736	- 9	-- completed, sea- son 1847-48.	
2,340	9 2	2,340	9 2	-- completed, sea- son 1844-45.	
758	8 10	758	8 10	season 1842-43 -	-- the seamen have hitherto been received into the Regimental Hospital, but owing to the increase in the strength of the corps, the hospital is now barely sufficient for the men of the regiment.
4,004	6 3	3,221	5 7	-- completed, sea- son 1842-43.	
1,914	1 -			-- completed, sea- son 1842-43.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Canals, North Western Provinces :			
Nyashur Watercourse	for irrigation	sanctioned, 21 November 1834	this watercourse leaves the main channel just under the village of Tanda, and passes to the east of Nyashur.
Nuggeenah Canal, at Moradabad.	for irrigation	length, 23 miles; sanctioned in 1839-40.	
Raising of the banks of the.	in order to admit a sufficient quantity of water.	sanctioned, 16 March 1841	
Nujufghur Jheel Canal, Formation of a Channel for the draining the.	to enable the people to cultivate such land which in past seasons has been submerged.	sanctioned, 1846-47	
Nuggeenah Canal: Construction of a First-class Chowkee.		sanctioned, 3 March 1843	situated near the regulating dam on the Kuroola Nuddee.
Construction of a Second-class Chowkee.		sanctioned, 3 March 1842	situated near Jogespara.
Nyashur Dam, Increase to the Waterway of the.	in consequence of the excessive body of water thrown on the dam during the rains.	sanctioned, 31 March 1845.	
Nujufghur Jheel Drain, Annual Clearance of the.		sanctioned, 3 February 1848	
Canals and Rivers, Lower Provinces :			
Nuddea Rivers, Toll Collections.			
Roads and Bridges, South Eastern Provinces :			
Nuddea, Construction of an Iron Suspension Bridge over the Ishamuttee River.		sanctioned, 24 February 1847	at the village of Bungong.
Roads and Bridges, Central Provinces :			
Nusseerabad and Ajmere: Improvement of the Road between.	to remove the difficulties attending the passage of wheel carriages between these two places, the one, a chief military station, the other, a depôt for military stores.	length, 13½ miles; estimate sanctioned, 13 November 1840.	
Further Improvements to	by constructing pukka revetments over watercourses which intersect this line.	length, 13½ miles; sanctioned, 5 November 1842.	
Roads and Bridges, North Western Provinces :			
Newabgunge, Construction of an Iron Suspension Bridge over the Pangyle.	in consideration of the great traffic on the line of road, and of the importance of the bridge to the good of the country.	sanctioned, season 1844-45	on the road between Bareilly and Perlibheet.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. 4,080 11 3	Rs. a. p. - - -	-- completed, sea- son 1841-42.	
83,369 5 7	- - -	-- completed, sea- son 1841-42.	-- it is expected that 5,000 rupees will be ultimately realised by water-rent.
1,049 11 -	- - -	season 1842-43.	
- - -	58,077 2 -	- - -	-- the complete drainage of the Jheel has this year brought a large quantity of land into cultivation.
932 7 3	932 7 3	-- completed, sea- son 1843-44.	
131 6 3	131 6 3	-- completed, sea- son 1843-44.	
- - -	2,040 - -	- - -	
711 14 4	- - -	- - -	
- - -	- - -	- - -	-- the toll collections on these rivers, viz., the Bloigerutty, Muttabhaugah and Jel- linghy, during the year 1847-48, amount to Rs. 2,88,729. 2. 9. The total expendi- ture on account of establishment, and for the execution of the works undertaken to facilitate the navigation, amounts to Rs. 47,262. 15. 6.; surplus, Rs. 1,91,466. 8. 8.
- - -	48,000 8 - of which 20,000 rupees will be subscribed by Baboo Kallepersaud Podlar.	- - -	-- the project for this bridge contemplates two spans of 180 feet each; with a road- way 16 feet wide, including the thickness of the half drop bars on each side. The angle of suspension will be 15°.
5,773 14 10	7,979 2 9	-- completed, sea- son 1842-43.	-- this road has been made practicable for wheeled carriages.
2,259 4 3	2,204 3 10	-- completed, sea- son 1843-44.	
25,943 - - -	27,471 11 2½	-- completed, sea- son 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; Judicial:			
Noacolly, Construction of a Wall around the Gaol Hospital, and one separating the Female Wards.	- - - - -	sanctioned, 15 January 1839	Noacolly - - -
Noakallee Gaol, Construction of two additional Wards.	- - for the Hazut and Dewanny prisoners; to effect a better classification of the prisoners.	sanctioned, 4 November 1846	Noakallee - - -
Civil Buildings, Lower Provinces; Judicial:			
Nowgong: Temporary Buildings, Roads, &c.	- - the civil station of Bungarah has been removed to Nowgong.	- - - - -	- - - - -
Construction of additional Buildings.	as a treasury and record-rooms	sanctioned, 22 June 1841	- - - - -
Construction of an additional Gaol Ward, and other Works.	- - - - -	sanctioned, 30 March 1841	- - - - -
Construction of 20 Drain Bridges.	for drainage purposes	sanctioned, 12 September 1842	- - - - -
Construction of a Cutcherry.	- - to replace an old cutcherry, built originally of inferior materials, and now in a decayed state.	sanctioned, 23 October 1844	- - - - -
Construction of a new Circuit Bungalow.	- - in lieu of the present circuit bungalow, which is in an unsafe state.	sanctioned, December 1845	Nowgong - - -
Erection of a Wall round the Gaol Buildings.	- - in accordance with the views of the civil officers.	sanctioned, 28 October 1846	- - - - -
Nattore, New Roofing the south end of the Judge and Magistrate's Cutcherry.	- - - - -	sanctioned, 20 May 1846	Nattore - - -
Civil Buildings, Central Provinces; Judicial:			
Nursingpore, Construction of a Malkana, and additions to the Cutcherry at.	- - - - -	sanctioned, 1 April 1844	- - - - -
Newabgunge, Addition of a Record-room to the Collector's Cutcherry.	- - great inconvenience was experienced from the distance between the cutcherries of the Magistrate and Collector; the new record-room was to be connected by a covered passage.	sanctioned, 14 January 1846	- - - - -
Neemuck, Construction of a Gaol at.	- - the outlay is chargeable to the revenues of the district of Jawud Neemuck, transferred by Scindia to the British Government.	sanctioned, 10 October 1846	Neemuck - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
1,021 7 11			-- the works were executed a considerable time back, but there has been delay in the submission of the bill.
1,746 2	1,904	-- completed, season 1847-48.	
2,948 6 6			
6,417	4,950 8 6	-- constructed, season 1846-47.	-- the buildings are to be of pucca materials, with a terraced roof. There has been an excess of Rs. 1,406. 2. 6. over the sanctioned amount; and as the executive officer has been able to account satisfactorily for this to the extent of Rs. 752. 10. 1. only, he has been held responsible for the balance.
908 10 7		-- completed, season 1841-42.	
1,722 13 10	1,722 13 10		
7,033 5 11	4,354 9 5	-- completed, season 1848-49.	-- the amount includes the cost of an additional wing not provided for in the estimate, but commenced on, in compliance with a requisition by the Commissioner in Assam.
	2,753		-- an estimate amounting to Rs. 8,188. 10. 2. for the construction of a new gaol in 1846, to consist of a criminal ward, 160 x 80, a civil ward, 72 x 86, hospital, 72 x 86, guard-room and malakane, 70 x 20 feet, with six ranges of cooking sheds; the buildings to be thatched over, supported on sawl posts and walls of whole bamboo. The new buildings are to be constructed within the wall erected agreeably to the estimate sanctioned in 1847.
3,302 1 10½	3,302 1 10½		
1,732 5 ½		-- completed, season 1847-48.	
4,094 10 5	4,739 9	-- completed, season 1846-47.	-- the necessity for these works was brought to notice by the Commissioner of the Saugor Division.
7,407 3 2	7,164	-- completed, season 1847-48.	
14,109 10 10	17,860 3 8	-- completed, season 1848-49.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Civil Buildings, Central Provinces; Revenue:			
Nuraol, Construction of a New Tehsildarry Cutcherry at.	-- to supersede the old outcherry at Sorh, which will be sold.	sanctioned, in 1843	-- situated in the Cawnpore district at Soosulanepore.
Civil Buildings, South Eastern Provinces; Revenue:			
Noakhally, Construction of a Record-room over the Collector's Cutcherry.	-- the necessity for this work was brought to notice by Mr. Commissioner Ricketts, who stated that all useless papers among the Bulloah records had been destroyed, and that the remaining papers had been arranged with all practicable economy of space, but that there was no accommodation for them.	sanctioned, 29 December 1847	Noakhally
Civil Buildings, South Eastern Provinces; General:			
Noakhally, Enlargement of the Burial-ground.	- - - - -	sanctioned, 26 September 1842	Noakhally
Nurrungabad, Construction of a Dak Bungalow at.	-- in lieu of the existing bungalow, which is in a ruinous state, and not worthy of repairing.	sanctioned, 16 September 1846	- - - - -
Canals, South Eastern Provinces:			
Oolabareah Canal	- - - - -	- - - - -	- - - - -
Ooltadanga: Iron Suspension Bridge	- - - - -	-- estimates submitted, 19 May 1840.	- - - - -
Construction of Roads to the East and West of the Bridge.	- - - - -	sanctioned, 25 July 1844	- - - - -
Roads and Bridges, South Eastern Provinces:			
Oolabareah Road: Construction of a Bridge at Surrerampore.	- - - - -	sanctioned in March 1841	Oolabareah
Renewal of a portion of the.	-- this road, owing to the mistake in its first formation, of placing the canal to the south or lowest side, instead of the north of the road, is liable to constant injuries during the rains. Owing to this defect it was found necessary to abandon about 1½ miles, and a new and more retired line was adopted.	-- length, 18½ miles; sanctioned in March 1841.	- ditto -
Bridge at Jorehutte, on the.	-- required for purpose of general drainage.	-- of one arch of six feet span, sanctioned 23 November 1842.	- ditto -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
5,687 4 1½	5,674 - 7	-- completed, season 1844-45.	
	3,252 - -		
307 14 3	307 14 3	-- completed, season 1843-44.	the space enclosed measures 92 x 63.
3,021 - -	3,021 - -	season 1846-47.	
			-- the abandonment of this canal was determined on, on the 12th February 1845, owing to its encroachment on the road along its side, and the Khuttee Canal, which is also a communication between the Damoorda and Hooghly Rivers, was repaired and improved.
12,658 6 5½	12,040 2 9	-- constructed, season 1843-44.	-- under instruction from the Court of Directors.
1,598 5 7		-- completed, season 1845-46.	
1,619 12 3	2,000 - -	-- completed, season 1841-42.	-- through this road the communication is at present maintained with Bombay <i>vid</i> the Kaeports Road.
6,504 8 3	6,343 12 3	-- completed season 1842-43.	-- this new line is at a safe distance from the canal.
390 10 6	390 10 6	season 1842-43.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.																								
Civil Buildings, Central Provinces; Judicial:																											
Oorai Gaol, Construction of	-- a statement was received from the local officers showing the necessity of the work.	sanctioned, 9 May 1846	-- in the Gwalior Ceded District of Kuchmarghur, or Bhindaree.																								
Canals and Rivers, North Western Provinces:																											
Phoulock Bridge, Repairs to the.	-- the renewal of the east abutment, which failed during the rains of 1844.	sanctioned, 22 August 1846	- - - -																								
Roads and Bridges, Lower Provinces:																											
Patna to Gyah, Raising of the Road.	- - - - -	sanctioned, season 1838-39	Gyah - - -																								
Patna City Road, Reconstruction of the.	- - - - -	length, 7½ miles	- - - -																								
Purneah, Construction of four Pucca arched Drains across the Station Roads.	-- these drains are required to prevent in future the cutting of the station roads, which are raised from three to four feet in height, for the purpose of letting off the rain-water which collects within the station lands.	sanctioned, 5 June 1843	Purneah - - -																								
Roads and Bridges, Central Provinces:																											
Putteereah and Dumow, Construction of Drains on the Roads between.	-- this road is crossed by many nullahs liable to temporary flood.	-- length of road, 16 miles 6 furlongs.	Dumow - - -																								
Roads and Bridges, North Western Provinces:																											
Pangyle Nuddee, Construction of an Iron Suspension Bridge over the, at Newabgunge, on the road between Barally and Peshibheet.	- - - - -	sanctioned, 1 February 1842	Newabgunge - -																								
Pinjore <i>via</i> Khalka and Kusowlee to Subathoo, Construction of a Road.	- - - - -	-- length, 21 miles 6 furlongs; sanctioned 22 March 1845.	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="2">Length.</th> <th>Width.</th> </tr> <tr> <th></th> <th>m.</th> <th>f.</th> <th>ft.</th> </tr> </thead> <tbody> <tr> <td>1st portion, from Pinjore to Khalka</td> <td>3</td> <td>5½</td> <td>48</td> </tr> <tr> <td>2d portion, from Khalka to Kusowlee</td> <td>8</td> <td>5</td> <td> <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>from</td><td>16</td></tr> <tr><td>to</td><td>12</td></tr> </table> </td> </tr> <tr> <td>3d portion, from Kusowlee to Subathoo</td> <td>9</td> <td>4</td> <td>12 ft.</td> </tr> </tbody> </table>		Length.		Width.		m.	f.	ft.	1st portion, from Pinjore to Khalka	3	5½	48	2d portion, from Khalka to Kusowlee	8	5	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>from</td><td>16</td></tr> <tr><td>to</td><td>12</td></tr> </table>	from	16	to	12	3d portion, from Kusowlee to Subathoo	9	4	12 ft.
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to	12																										
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Civil Buildings, South Eastern Provinces; Judicial:																											
Penitentiary, Plan for a Central one.	to contain 2,004 prisoners	- - - - -	- - - - -																								
Pooree, Construction of a Circuit-house.	-- for the use of the Commissioner; the temporary building was destroyed by a gale on the 30th April 1840.	sanctioned, 29 September 1840	Pooree - - -																								
Pooree Gaol, Additional Hospital.	for sick and insane prisoners	-- the gaol was constructed in the year 1838; the addition of a hospital, sanctioned in season 1840-1.	- - - - -																								

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
10,813 10 7½		-- completed, sea- son 1847-48.	
644		-- completed, sea- son 1846-47.	
51,292 18 7	70,222 10 7½	-- completed, sea- son 1841-42.	
15,765 11 8		-- completed, sea- son 1845-46.	
983 11		-- constructed, season 1843-44.	
1,484 1 8½		completed 1840-41.	
-- this work was suspended in season 1842-43.	22,000		
60,787 15 6	67,307 6 11	-- completed, sea- son 1845-46.	
	4,41,564 8 5		
7,596 8 8½	5,751 8 5	-- completed, sea- son 1842-43.	
1,332 13 7	1,190 11 3	-- completed, sea- son 1841-42.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, South Eastern Provinces; Judicial—continued.			
Pooree: Reconstruction of the Dispensary.	-- in lieu of a building which was blown down by a gale on 30th April 1840.	sanctioned, 21 February 1843	Pooree
Buildings for the use of the Treasury Guard.	- - - - -	sanctioned, 27 March 1843	- ditto -
Civil Buildings, Lower Provinces; Judicial:			
Patna Penitentiary, Construction of four Wards.	-- to supersede the present places of confinement situated in different parts of the station and its vicinity, each at an inconvenient distance from the Magistrate's office.	sanctioned, 27 October 1845	Patna
Purellia temporary Gaol, Chota Nagpore.	- - - - -	sanctioned, 11 October 1836	- - - - -
Purneah Gaol, Estimate for Fluing the Floors.	-- owing to the dampness in the existing floors.	sanctioned, 17 November 1840	- - - - -
Purneah Gaol Hospital, Additions to.	-- additional wards for medicine-rooms, &c.	sanctioned, 12 October 1841	Purneah
Pubna, Construction of a Circuit-house.	- - - - -	sanctioned, 20 November 1844	Pubnah
Purneah: Reconstruction of 13 Night Privies.	- - - - -	sanctioned, 17 December 1845	Purneah
Construction of a Guard-room for the Burkundauzes attached to the Judge's Cutcherry.	- - - - -	sanctioned, 28 December 1846	- ditto -
Civil Buildings, South Eastern Provinces; General:			
Pooree: Construction of a Wall around the Burial-ground.	- - - - -	sanctioned, 28 August 1843	Pooree
Reconstruction of the Pooka Treasury and Collector's Cutcherry.	-- these buildings were injured by a storm.	sanctioned, 17 April 1843	- ditto -
Puchim Bamney Khall, Construction of an Iron Suspension Bridge over the.	- - - - -	sanctioned, 20 January 1847	- - on the road from Calcutta to Nulloah and Calpea.
Civil Buildings, Lower Provinces; General:			
Purneah, Construction of a Cutcherry.	for the Sub-deputy Opium Agent	sanctioned, 18 July 1838	- - - - -
Patna, Donation towards the construction of a new Church	- - - - -	sanctioned, 15 December 1840	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
5,256 15 5	5,437 9 1	-- completed, season 1846-47.	
2,080 8 4	2,080 8 4	season 1843-44.	
36,251 15 8½	23,677 - -	-- completed, season 1846-47.	-- the plan approved is for the accommodation of 240 prisoners.
	2,924 7 6		
1,151 13 1	1,220 10 -½	-- completed, season 1841-42.	
4,925 7 2	5,098 4 5½	-- completed, season 1845-46.	
4,414 - - -	4,999 5 -	-- completed, season 1845-46.	
	2,970 14 6		
384 13 8½	- - -	-- constructed, season 1847-48.	
945 2 7	1,108 4 -	-- completed, season 1843-44.	-- the necessity for this work was brought to notice by the Magistrate of the Southern District of Cuttack.
2,720 5 8½	- - -	-- completed, season 1844-45.	
	15,715 4 5	- - -	-- the span of the suspended roadway is 100 feet between the centres of the standards, with 16 feet width of roadway, or 14 feet clear traffic way. The soil of the Khall is good, the piers will therefore be built merely of gratings of saul wood, without piles below them.
	2,048 12 5½	-- completed, season 1840-41.	-- the foundation and plinth of the building are of pukka masonry, the superstructure of cutcha pukka, and the roof of tiles.
Government donation of rupees.	16,072 - -	- - -	-- for this edifice the Protestant residents at Patna have subscribed 5,500 rupees. It is the intention of the Lord Bishop to make up the deficiency from the Church Building Fund.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces ; General—continued.			
Patna, Construction of Tiled Verandah to the Cutcherry of the Sub-deputy Opium Agent.	-- in lieu of an old verandah, which no longer affords the required protection.	sanctioned, 17 March 1843	Patna
Punkabarree, Construction of a new Staging Bungalow and Out-offices.	-- to replace a similar building constructed by the Darjeeling Committee, which was condemned, as totally unserviceable.	sanctioned, 18 June 1845	Punkabarree
Civil Buildings, South Western Provinces ; Revenue :			
Pooree Pilgrim Hospital, Rebuilt.	-	sanctioned, 1838-39	Pooree
Patna, Provision of a Circuit Bungalow.	-- the Special Commissioner's outcherry has been converted for the reception of the office of the Commissioner of Revenue, in order that that officer's outcherry may be given over for a circuit bungalow.	sanctioned, 25 May 1845	Patna
Civil Buildings, South Eastern Provinces ; Revenue :			
Pooree, Construction of a Treasury Guard-house for the Collector's Cutcherry.	-	sanctioned, season 1839-40	-
Canals, Lower Provinces :			
Rajmehal Canal, Construction of.	-- for irrigation, and to supersede the changeableness and uncertainty of the channels of the Nudda Rivers, any permanent improvement of the navigation of which cannot be reckoned on.	-- length, 130 miles, breadth 60 feet, and carrying at the lowest depth 5 feet water.	-
Canals, North Western Provinces :			
Rohilcund Canal	irrigation	-- length, 48 miles; estimates submitted in 1840.	-- from a point on the Ramgunga to Shahpore, on the banks of the Dhela, near Moradabad, with a series of branches for irrigation.
Rajpore Watercourse, Repairs to the.	-- owing to the unusual height of the floods of the year, some injury had been sustained.	sanctioned, season 1846-47.	-

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
1,118 11 9 $\frac{1}{2}$	1,338 10 11	-- completed, season 1844-45.	
	3,221 13 1		
1,386 4 2			
861 14 6 $\frac{1}{2}$		-- completed, season 1846-47.	
648 7 5 $\frac{1}{2}$	1,060 8 4	-- completed, season 1841-42.	-- the difference is owing to its having been found practicable to dispense with eight iron gratings, for which provision had been made in the estimate.
-- the scheme was rejected by the Home authorities in season 1844-45, but a report was called for on another line; viz., from a point near Chinsurah on the Hooghly to one near Monghyr on the Ganges.	38,47,437		-- the boats proceeding through the canal would reach Rajmehal on the great river, by traversing 202 miles instead of 528 miles, as by the Soonderbund route, saving 326 miles in distance, and from 15 to 20 days in time; an impetus would be given by it to the working of the iron-mines and coal-fields. The income from it is calculated at 5,80,000 rupees per annum, or 14 $\frac{1}{2}$ per cent. on the gross expenditure, assumed at 40 lacs, to be raised by a toll of 2 rupees per 100 maunds on all boats.
	4,50,000		-- it is probable that 291 square miles will be susceptible of irrigation, when the whole of the waters of the Ramgunga are turned into it; the revenue to be derived from it is assumed at Rs. 87,531. 4. per annum. The Revenue Board suggested to Government to postpone this scheme until it can be ascertained with greater certainty what advantages it holds out, and whether the undertaking may not interfere with the completion of works of higher importance.
	1,880 7 7		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, South Eastern Provinces :			
Raipore Road : From Calcutta to Bombay	-- for rendering the overland communication with England easy to travellers, and rapid for the conveyance of the mails.	-- length from Bombay to Calcutta about 1,200 miles; suggested by the Bombay Government in season 1837-38.	Bombay
Construction of four large Bridges on the Third Division of this Road.	- - - - -	of 3 arches 30 feet span each - of 3 arches 36 feet span each - of 5 arches 45 feet span each - of 2 arches 45½ feet span each sanctioned, 15 January 1845.	at Sakelle River at Sandrawapah at Choolbuid at Cheekalah
Ruttenpoorah Nullah on the Grand Trunk Road, Construction of a Masonry Bridge over the.	- - - - -	-- length, 222 feet; sanctioned, 2 October 1843.	- - - - -
Roads and Bridges, Lower Provinces :			
Rewah Ghat to Mozufferpore in Tirhoot.	- - - - -	-- length, 23 miles 7 furlongs; sanctioned, 22 November 1836.	Mozufferpore
Roads and Bridges, North Western Provinces :			
Rajpore Dhoodlee, Widening of the Road.	- - - - -	-- length, 14 miles; sanctioned, 12 January 1842.	Dhoodlee
Civil Buildings, South Eastern Provinces ; Judicial :			
Ramree, Construction of a new Gaol.	-- to replace the old gaol which was represented to be in a dangerous state of decay.	sanctioned, 14 August 1843	Ramree
Ramree, New Circuit Bungalow.	- - - - -	-- length, 80 feet; breadth, 64 feet; sanctioned, 1 August 1839.	Ramree
Civil Buildings, Lower Provinces ; Judicial :			
Rungpore Gaol, Additions to	-- to improve the salubrity of the gaol.	sanctioned, season 1841-42	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<p>Rs. a. p.</p>	<p>-- from 30,00,000 to 50,00,000 rupees (30 to 50 lacs.)</p>	<p>- - -</p>	<p>-- in 1838-39, the Court were advised of measures adopted for improving the communication between Calcutta and Bombay, but the information supplied was too incomplete to enable them to decide on the line of transit, or the nature of the road which should be constructed. The Resident at Nagpore reported the willingness of the Rajah to contribute 20,000 rupees towards the road, which he was authorized to accept, with suitable acknowledgments. Two plans were submitted; first, for the construction of a road to be at all times practicable for wheel carriages for travellers, and for transit of trade between Bombay and Calcutta; second, to facilitate the conveyance of mails between the capitals, by rendering the line of communication practicable for horsemen or foot-runners. Of the 1,200 miles, 232 had been made practicable for horsemen or dawk-runners, by means of a grant of 20,860 rupees which had been already authorized, and 968 miles remained. As the plans involved a very large outlay, the Court were desirous that no portion of that which remained should be commenced until a more satisfactory survey of the line was made, and an estimate of the expense submitted to them; but as the main-road on to Bombay could not be completed for some years, the Government were authorized to take immediate measures for forming a road for horsemen and dawk-runners from Ahmednuggur to Midnapore, which would be practicable throughout the year. The Court subsequently (under date the 3d January 1845) informed the Government that they could not sanction the construction of an expensive road, and directed that their exertions be confined to the discovery of the best route, on which such improvements only should be made as the transit of the mails imperatively required.</p>
<p>- - -</p>	<p>10,674 7 4 9,957 4 8 19,888 13 2 7,942 10 8</p>	<p>Rs. a. p. 48,623 2 8</p>	<p>- - -</p>
<p>- - 11,325 11 3</p>	<p>11,325 11 3</p>	<p>-- completed, season 1846-47.</p>	<p>-- this bridge is stated to be a handsome and durable structure, leading the road over two very awkward nullahs, and bringing it up to a horizontal level with the heights east and west.</p>
<p>- - 63,291</p>	<p>- - -</p>	<p>-- completed, season 1839-40.</p>	<p>- - -</p>
<p>- - 1,485 11 1</p>	<p>- - -</p>	<p>-- completed, season 1843-44.</p>	<p>- - -</p>
<p>- - 7,056 8 5</p>	<p>6,739 10 6</p>	<p>-- completed, season 1844-45.</p>	<p>-- the new gaol will be surrounded by a pucca wall 18 feet high, and will consist of one dewanny ward and three foudjarree wards, a hospital, guard-room, &c. The walls of these buildings will be composed of planks, and the roof of thatch.</p>
<p>- - 5,064 16 9</p>	<p>6,071 6 8</p>	<p>-- completed, season 1841-42.</p>	<p>- - -</p>
<p>- - 819 6 2</p>	<p>819 6 2</p>	<p>-- completed, season 1841-42.</p>	<p>-- much sickness had existed at this gaol.</p>

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; Judicial—continued.			
Rungpore:			
Conversion of an old Judicial Cutcherry into a Gaol Hospital.	- - - - -	sanctioned, 28 December 1842 -	- - - - -
Construction of a Circuit-house, Sudder Ameen's Cutcherry, &c.	- - to provide accommodation for the Judge's records, and the property of persons dying intestate at Rungpore.	sanctioned, 8 April 1843 -	Rungpore -
Civil Buildings, North Western Provinces; Judicial:			
Rhotuck, New Gaol - - - - -	- - - - -	sanctioned, 7 December 1839 -	- - - - -
Civil Buildings, North Western Provinces; General:			
Roorkee, Construction of Buildings.	for a Civil Engineering College -	sanctioned, December 1847 -	Roorkee -
Civil Buildings, South Eastern Provinces; General:			
Russapuglah, Additions and Alterations to the Building occupied as the Office of the Superintendent of the Mysore Princes.	to convert it into a school-room -	sanctioned, 15 February 1843 -	Russapuglah -
Civil Buildings, North Western Provinces; Revenue:			
Raneea, in the Bluttee territory; Construction of a Tehsildarry Cutcherry.	- - - - -	sanctioned, 7 November 1840 -	- - - - -
Embankments, Lower Provinces:			
Sarun and Tirhoot Bunds:			
Construction of a new Bund, about 1,000 yards from the Old Bunds.	- - for the protection of the country between the villages of Nowkurrah and Pursadee from encroachments of the Gunduck river.	-- length, 23½ miles; sanctioned October 1841.	- - - - -
Construction of some new inner Bunds at Sarun, and strengthening of a part of the main Bund.	- - owing to encroachments of the river Gunduck.	-- length, 4 miles; sanctioned, 4 April 1845.	- - - - -
Construction of new Bunds.	- - in parts where the main Bund is encroached on by the River Gunduck.	sanctioned, 29 April 1846	- - - - -

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
3,493 6 9	3,493 6 9	season 1842-43	-- the estimate provides for new roofing part of the building, removing partition-walls, and dividing the hospital for the separate accommodation of male and female patients; it also provides a place for the Native Doctor and medicines.
7,728	6,791 2 3	--completed, season 1845-46.	-- owing to the porous nature of the tiles made at Dacca, and the consequent leakiness of the roof, it has been found necessary to replace the tiled roof with a flat roof; the excess of Rs.1,408. 5. 8. on the bill for the above work has been disallowed by Government.
7,790 15 7½	6,742 2 8	--completed, season 1839-40.	-- this gaol is capable of accommodating 350 prisoners; the walls are of cutcha pukka materials, and the roof is of thatch.
	19,000		
-- it was decided by Government, on the 5th July 1848, not to sanction the proposed outlay on this account.	8,851 6 1		-- the board solicited the orders of Government to be allowed to call for tenders for the execution of the work by contract.
6,014 14	5,653 15 1	--completed, season 1842-43.	
4,877 4 5	5,081 4 9	--completed, season 1842-43.	-- the length of these Bunds is 140 miles, and the estimate for their annual repair, Rs. 26,205. 11. 2.; the Executive Officer has been directed to adopt the standard section, making the Bunds 3 feet above the highest known rise of the river, 3 feet wide at top, and giving a slope of 2 to 1 towards the river, and 2 to 1 in the rear.
6,512 7	9,151 4 2½	--completed, season 1848-49.	
2,781 9 2	3,851	--completed, season 1848-49.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
Canals, North Western Provinces :			
Seharunpore, Construction of a Corn-mill House.	-- to replace the former building, set of mills which were destroyed by the failure of the foundations, in December 1844.		
Roads and Bridges, South Eastern Provinces :			
Sandoway, Reconstruction of the Shoo's Bridge st.	-- to keep open the communication between his cutoherry and the most populous part of the Sandoway Valley below the village.	sanctioned, 30 October 1844.	Sandoway
Sowrah Bridge, Repairs to -	this bridge crosses the Sowrah River	-- length of the bridge, 300 feet; width, 20 feet; repairs sanctioned, season 1845-46.	-- crosses the public road between the station and town of Purneah.
Shaikpore, Construction of two Bridges on the Grand Trunk Road.	-	sanctioned, 1 July 1846	-- between Burdwan and Gyretty.
Satgong to Muggra, on the Grand Trunk Road; Widening of the Road.	-- the metalled portion has been widened, and the road straightened.	-- length, 2 miles and 100 yards; sanctioned, 24 March 1847.	Muggra
Roads and Bridges, Lower Provinces :			
Seesaugur to Jypore, in Upper Assam.	-	length, 56½ miles.	
Seesaugur to Borahaut, in Upper Assam, Repair of an old Road.	-	length, 50 miles	Borahaut
Seesaugur to Debrogur	-	length, 17½ miles.	
Seesaugur to Chokey Haut, on the Boores Dehing River.	-	sanctioned, 21 June 1841	Chokey Haut.
Saikwah to Rungagorah, in Assam, Opening of part of the Road.	-	sanctioned, 14 December 1844	Rungagorah
Roads and Bridges, Central Provinces :			
Saugor to Dumoh, Change in the Line of Road.	-- to obtain a line more accessible to the traffic of the country, to which the imperfectly finished ghauts on the old line presented obstacles.	sanctioned, 22 October 1840	
Saugor, Erection of an Iron Suspension Bridge over the Beose River.	-	-	-- 10 miles east from Saugor.
Bridge over the Surjoo River at Lot Ghaut, in the District of Azimghur.	-- for the promotion of the traffic between the districts of Gorukpore and Azimghur.	sanctioned, 24 January 1838	Lot Ghaut

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
648 9 - -	1,111 11 6	-- completed, season 1845-46.	-- a saving of Rs. 468. 2. 6. was effected by a reduction in the rate for carpenters' work.
891 4 1 - -	- - - - -	-- completed, season 1845-46.	
- - - - -	18,458 15 8	- - - - -	-- one bridge, of three openings of 86½ feet each, and arches to be segments of a circle, rising 14 feet; the other of three openings 20 feet each, with similar arches, 5 feet in height.
7,118 10 - -	7,490 11 1	-- completed, season 1847-48.	-- both khoas and gooting have been used in the repairs and extension of the metal.
- - - - -	3,765 - - -	- - - - -	-- this work has been executed by the Political Officers of Government.
2,145 13 - -	2,145 13 -	season 1844-45.	
1,081 4 2½ - -	1,199 9 10	-- completed, season 1842-43.	-- the ascents over the ghauts on the old line were as steep as 1 in 10, or 1 in 12.
38,177 6 - -	- - - - -	-- constructed in 1832.	-- this bridge was constructed in 1832, by Major Presgrave. The span is 200 feet; breadth of platform, 12 feet; height of pillars and piers, 68 feet. Repairs were effected in season 1846-47, at a cost of Rs. 3,448. 5. 9.
8,752 5 11 - -	- - - - -	-- completed, season 1841-42.	-- this bridge is of masonry, and of three arches; the centre arch 34 feet span, and the side ones 28 feet each.

RETURN FOR THE PRESIDENCY OF BENGAL—continued

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Roads and Bridges, North Western Provinces :			
Sehagur River, Bridge over the.	-- to keep open the communication between Futtyghur and Etawah.	sanctioned, 25 July 1840	Sehagur River
Seharunpore, Bridge over the Dholla Khall at.	-- in lieu of a bridge of two arches, which was destroyed by a high flood on the 27th September 1841.	sanctioned, season 1841-42	Seharunpore
Singapore Bridge		sanctioned, season 1838-39	over the Singapore River.
Seharunpore, Repairs to the Dumolah Bridge.	-- injured by the floods of 20 June 1842.	sanctioned, 17 November 1842	
Sukkur and Shikarpore, Construction of a Road.	-- to be passable throughout the year for troops and wheel carriages.	-- length, 24 miles; width, 40 feet; sanctioned 21 February 1845.	Shikarpore
Civil Buildings, South Eastern Provinces ; Judicial :			
Soory, Construction of a Cutcherry for the Native Judge.	-- the accommodation afforded in the Magistrates' cutcherry being quite unfit for holding his court.	sanctioned, 20 June 1842	
Sandoway, Construction of a Treasury Record-room, and Guard-room of Masonry.	-- in lieu of others of a like nature, which were condemned in the annual survey report of the 26th November 1841.	sanctioned, 19 June 1843	Sandoway
Sulkea, Construction of a Thannah of Puoca materials.	-- intended to replace the existing thatch and bamboo houses, which being situated in the heart of Sulkea, are liable to be burnt down.	sanctioned, 11 March 1846	Sulkea
Soory Gaol, Construction of a new Hospital.	-- in consequence of the crowded state of the gaol, the ward heretofore used as a hospital, has been assigned for the use of the prisoners, and the sick removed into a thatched building in the civil gaol.	sanctioned, 17 June 1846	Soory
Civil Buildings, Lower Provinces ; Judicial :			
Sandoway: New Thana House in Arracan.		-- measurement, 60 feet by 30; sanctioned, 14 April 1840.	
New Circuit House	for the use of the Commissioner	sanctioned, season 1838-39	Sandoway
Seehpore in Assam		-- cutcherry, 100 by 40 feet, with wings, 30 by 40 feet; a treasury guard, 52 by 33 feet; a criminal gaol, 100 by 38 feet; a dewanny gaol, 100 by 38 feet; a thana house, 35 by 22 feet; sanctioned 20 February 1839.	

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

133

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
2,513	2,513	season 1840-41.	
2,753 4 9	2,753 4 9	season 1841-42.	
19,511 5 2		-- completed, sea- son 1841-42.	-- this bridge was constructed under con- tract, and it is reported to be of a per- manent and substantial order.
1,582 3 9	1,645 14 9	-- completed, sea- son 1843-44.	
	52,008 2 8		
959 11	1,176 7 7	-- completed, sea- son 1843-44.	
2,800 6 2	2,243 6 5	-- completed, sea- son 1845-46.	
1,126 12 10	1,055	-- completed, sea- son 1847-48.	
	4,334 2 8		-- the enlargement of the area of the gaol, by building a new surrounding wall on the north side, and the elevation of the outer surrounding wall to the uniform height of 15 feet, is intended.
810 3 10	844 13 2	-- completed, sea- son 1841-42.	-- the wall will be of mat, the roof thatched, but the floor will be well raised and planked.
2,347 9 6	2,406 9	-- completed, sea- son 1842-43.	
	2,535 2 10		

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of Intended Termination.
<i>Civil Buildings, Lower Provinces; Judicial—continued.</i>			
Shahabad, Purchase of a School-house.	-- for a cutcherry for the Magistrate.	sanctioned, 4 February 1841	- - - -
Improvement of the Drainage of the Gaol.	- - - - -	sanctioned, 26 January 1842	- - - -
Sebsaugor in Upper Assam, Construction of a Cutcherry.	-- for the Magistrate, in lieu of a cutcherry which was destroyed by fire on the 26th August 1840.	sanctioned, 26 January 1841	- - - -
Sebsaugor, Construction of a new Gaol Hospital, with a new Bamboo Stockade to the Gaol.	- - - - -	sanctioned, 18 February 1840	- - - -
Sebsaugor, Lower Assam, Construction of a Gaol at	-- for 204 prisoners, males and females.	sanctioned, 3 April 1843	Sebsaugor
Silchar, Construction of a new Mohafez Thanna and Treasure-room.	-- for the security of the records and treasures.	sanctioned, 6 November 1844	Silchar
Sebsaugor, Construction of a new Treasury and Thannah.	-- in lieu of similar buildings blown down by a storm in May 1843.	sanctioned, 21 August 1843	Sebsaugor
Sebsaugor, Provision of a New Gaol.	-- the permanent hospital constructed for the light infantry is to be converted into a gaol.	sanctioned, 3 April 1843	ditto
Sylhet, Improvements to the Gaol Hospital.	-- this hospital, which was originally a mosque, is considered by the medical officer, from its extreme lowness, an unfit habitation for the sick.	sanctioned, 15 March 1847	Sylhet
Sebsaugor, Rebuilding of the Circuit-house.	-- this work was necessary in consequence of the damage sustained by the old Circuit-house during a storm on the 28th April 1846, when the walls were so forced out of the perpendicular, as to make the building in imminent danger of falling.	sanctioned, season 1847-48	Sebsaugor
Renewal of the Gaol Stockade.	-- the necessity for this work was reported by the civil authorities.	sanctioned, 8 December 1847	ditto
<i>Civil Buildings, North Western Provinces; Judicial:</i>			
Shajehanpore, Construction of a new Pucca Gaol Hospital and Buildings.	-- in lieu of inferior buildings built by the Civil Officer.	sanctioned, 15 September 1843	Shajehanpore

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.		Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs.	a. p.	Rs. a. p.		
8,000	- - -	- - -	season 1841-42	-- this building had been newly constructed.
1,195	12 6½	1,246 6 6	-- completed, season 1842-43.	
1,516	15 10½	1,329 9 -	-- completed, season 1842-43.	-- the building consists of a room 80 x 20 feet, with a wing 30 x 20, and a 10-feet verandah all round.
887	13 3	- - -	-- constructed, season 1842-43.	-- the building consists of one centre room 84 x 20, with an 8-feet verandah all round.
-- this work was suspended in season 1843-44.		9,008 14 4	- - -	-- the foundation and plinth of the gaol wards will be of masonry, and the remainder of the building will be composed of temporary materials.
2,072	1 7	2,239 4 7	-- completed, season 1846-47.	
618	3 1	- - -	- - -	
17,884	10 4	17,308 2 1	-- completed, season 1845-46.	
- - -	- - -	1,885 - -	- - -	-- the estimate provides for raising the roof 6½ feet higher; and with a view to improve the ventilation, the surrounding wall, with the guard-room, will be removed to a proper distance.
697	8 ½	- - -	-- completed, season 1847-48.	
485	4 1	483 6 9	-- completed, season 1848-49.	
5,276	8 7	5,207 13 3½	-- completed, season 1845-6.	

(continued)

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; Judicial—continued.			
Sirsa, Construction of a Well at.	for the use of the Judicial Department	-- depth, 113 feet; diameter, 8 feet; sanctioned, 26 March 1841.	Sirsa
Seharunpore, Construction of a Pucka Guard-room at the Gaol.	-- owing to the insufficiency of the existing guard-rooms.	sanctioned, 8 December 1843	Seharunpore
Shikarpore, Conversion of the Fort into a Gaol.	-	sanctioned, 3 April 1845	Shikarpore
Shikarpore Gaol, Construction of a Hospital, Cook-room, &c. to the.	-	sanctioned, 24 January 1846	ditto
Civil Buildings, Central Provinces; Judicial:			
Saugor Gaol, Enlargement of the.	-- in consequence of the removal of 100 prisoners from the district of Dumoh.	sanctioned, 16 April 1845	-
Civil Buildings, Eastern Settlements; Judicial:			
Singapore: New Police Office -	-	sanctioned, 13 November 1839	Singapore -
Construction of a Police Thannah at Campong Clang.	-	sanctioned, 25 March 1840	ditto
Civil Buildings, South Eastern Provinces; General:			
Saugor Island; Construction of a Lighthouse at Middleton Point.	-- with a view of replacing the present tripod, which the Superintendent of Marine, after personal inspection, reported to be in a rickety condition, and accordingly recommended a masonry tower in preference to the reconstruction of a tripod, on the score of ultimate economy, as well as superior efficiency.	sanctioned, 18 January 1847	Middleton Point
Civil Buildings, Central Provinces; General:			
Sulkea, Construction of New Salt Golahs.	-	-- orders of Government, 5 July 1837.	Sulkea

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
- - 1,193 10 10 - -	1,193 10 10	season 1841-43.	
- - 930 1 10 - -	930 1 10	season 1843-44.	-- the new building is to accommodate 30 men.
- - 4,531 8 2 - -	4,531 8 2	season 1845-46.	
- - 1,521 - - - -	1,521 - -		
- - 47,386 - - - -	45,528 9 8	-- completed, season 1847-48.	-- Government was of opinion that occasions might arise in which this gaol might aid the military defence of the place, and expressed a desire that the building should be calculated for defence by a small body of men, and that provision should be made within the gaol for the occasional close confinement of all the prisoners. The new gaol has been fortified, and is on a much more extensive scale than the Dumoh gaol.
- - 4,041 9 7 - -	- - - -	-- constructed, 1840-41.	
- - 3,143 7 6 - -	- - - -	-- constructed, 1840-41.	
- - - - - -	25,938 9 4	- - - -	-- the new lighthouse will be a taper column, divided into five vaulted stories, and surmounted by a lantern of copper and plate glass. Total height of the beacon terrace, 109 feet; the shaft 82 feet in height, tapering from 20 feet at bottom, to 12 feet diameter at top, and surmounted with stone coping and battlement. In season 1847-48, the Military Board reported that the encroachment was so great, that it was feared that the masonry lighthouse must be abandoned, and an iron lighthouse substituted, the rough estimate for which, amounting to 44,130 rupees, had been referred to the home authorities. Court, on referring to parties experienced in the construction of iron lighthouses, for their opinion as to the relative merit of Colonel Irvine's, Major Goodwyn's, or some other plan, were satisfied that preference was due, on several accounts, to the shell, or iron-plate mode of construction; they accordingly accepted an offer made by Messrs. Fox, Henderson & Co., to furnish an iron-plate lighthouse, with iron staircase, gun-metal lantern, glazed with plate glass, and covered with copper, reciprocating light, with silvered parabolic reflectors, together with certain stores and lighting materials, for the sum of 2,164 l., or about 400 l. less than the estimated cost of a structure of masonry.
- - 50,901 5 10 - -	57,244 8 4	-- completed, season 1838-39.	-- these golahs, 11 in number, are of pucca masonry, and have been well constructed by Captain Fitzgerald, at a cost of Rs. 6,342. 2. 6. less than the sanctioned estimate.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Central Provinces; General—continued.			
Sulkea: Construction of Division Walls in 27 Salt Golahs.	-- in consequence of the loss resulting from the present plan of separating salt of different qualities by mats in these Golahs, as the mats frequently rot, and the salt becomes mixed.	sanctioned, 19 August 1840	Sulkea
Renewal of the roofs and improvements to some of the Salt Golahs.	-- in consequence of the great wastage of salt occasioned by leakage.	sanctioned, 23 December 1840	- - - -
Secundrabad, Erection of a Staging Bungalow and Out-offices.	- - - - -	sanctioned, 19 August 1843	-- situated on the Grand Trunk Road between Allyghur and Delhi.
Civil Buildings, North Western Provinces; General:			
Shekoabad, Erection of a Staging Bungalow.	-- for the accommodation of travellers proceeding to or from Agra.	sanctioned, 5 September 1840	-- 40 miles from Agra.
Syras, in the Hill District of Subathoo; Construction of a Staging Bungalow.	-- to replace an old bungalow, which did not afford sufficient accommodation to travellers.	sanctioned, 1839-40	- - - -
Simlah, Construction of Public Offices.	for the Civil Officers of the station	sanctioned, season 1840-41	Simlah
Subathoo: Construction of a Protestant Church.	-- this building is to be calculated to hold 500 persons.	sanctioned, 7 February 1845	Subathoo
Proposed construction of a House.	-- to serve for the performance of Divine service on the Sabbath, and for a school-room on other days.	- - - - -	- - - - -
Civil Buildings, Central Provinces; Revenue:			
Seconee, Construction of a Tahsildary Cutcherry.	- - - - -	sanctioned, season 1839-40	- - - - -
Sumeerpore, Construction of a Bungalow and Out-offices at the Cotton Farm.	- - - - -	sanctioned, July 1842	- - - - -
Secundra, in Zillah Cawnpore; Construction of a Tahsildary Cutcherry.	-- in consequence of the lapse of the Secundra Jaghur, and the annexation of the Pergunnah to the Cawnpore District.	sanctioned, 4 November 1842	Secundra
Sheorajpore, Construction of a Tahsildary Cutcherry at.	-- to replace the present cutcherry, which is represented to be very confined and insecure, being surrounded by and connected with the houses of the village.	sanctioned, 9 May 1844	-- Sheorajpore in the Cawnpore District.
Civil Buildings, Central Provinces; Ecclesiastical:			
Saugor Church	-- for the benefit of the Christian community, and of the European soldiery.	sanctioned, 30 December 1835	Saugor

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

139

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
- 7,879 4 3 - -	8,606 9 - 2	-- completed, season 1841-42.	
- - - - -	16,470 3 -		
- - 2,072 13 5 - -	2,133 4 4	-- completed, season 1843-44.	
- - 794 10 6 - - and 80 13 7 for furniture.	644 13 9	-- completed, season 1841-42.	
- - - - -	1,282 6 9		
- - 6,053 4 4 - -	4,643 14 -	-- completed, season 1842-43.	-- the excess was owing chiefly to the erection of out-offices, which were not included in the estimate.
-- this work was suspended : vide paragraphs 322 and 323 of Report of 1845-46.	16,798 7 6	- - - - -	-- the masonry throughout to be of dressed stone, with lime cement, but without plaster, and the roof to be formed of shingles on battens, rafters, purlins and trusses.
- - - - -	5,491 15 6	- - - - -	
- - 986 14 8 - -	1,304 13 9	-- completed, season 1841-42.	
- - - - -	9,944 10 7	- - - - -	-- the execution of this work was subsequently entrusted to the Civil Department, not however before an outlay of Rs. 1,587. 12. had been incurred by the Executive Engineer in the collection of materials.
- - 5,491 2 - 2 - -	5,139 13 8	-- completed, season 1844-45.	
- - 5,624 2 1 - -	5,679 15 -	-- completed, season 1846-47.	
- - 10,272 14 6 - -	- - - - -	-- completed, season 1840-41.	-- this church was surrounded by a wall in 1842-43, the cost, Rs. 1,598. 14. 10, was paid by subscription.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, North Western Provinces; Revenue :			
Soneput, in the Northern Division of the Delhi District; Construction of a Cutcherry.	-- to replace a cutcherry built by the late Baba Bhae, which was in a state of disrepair, and in an objectionable situation.	sanctioned, 18 December 1838	- - - - -
Shahjehanpore, Additions and Alterations to the Collector's Cutcherry.	-- rendered necessary by the union of the offices of Collector and Magistrate of the district.	sanctioned, 16 September 1845	Shahjehanpore
Civil Buildings, North Western Provinces; Political :			
Shikarpore, Repairs to the Old Agency Buildings.	- - - - -	sanctioned, 22 July 1844	Shikarpore
Scinde, Construction of an Office.	-- for the Secretary to the Government of Scinde.	sanctioned, 9 November 1844	Scinde
Embankments, South Eastern Provinces :			
Twenty-four Pergunnahs: Construction of a new Line of Bunds from Kalkapore towards Moneergong, and back to Borensbaugh, to include the Village of Gillarchat.	- - - - -	sanctioned, 1 June 1841	- - - - - Twenty-four Pergunnahs.
Construction of Eleven Bungalows on these Embankments.	-- for the use of the Superintending Engineer, and the Superintendent while on inspection duty.	sanctioned, 24 May 1843	ditto
Embankments, Lower Provinces :			
Twenty-four Pergunnahs: Bunds	- - - - -	-- the reconstruction of these bunds was sanctioned on the 1st November 1842. Their entire length is 300 miles; the cost of their annual repair is estimated at Rs. 18,751. 14. 6.	- - - - -
Ditto	-- the construction of a bund has been authorized for the protection of an estate situated on the verge of the Soonderbund Forest, near the Channel Creek.	-- length, 11 miles; commenced in season 1839-40.	- - - - -
New Line of Bunds from Calcutta towards Moneergong, and back to Borensbaugh Khal, to include the Village of Gillarchat.	- - - - -	-- length, 14 miles 3 furlongs; sanctioned, 1 June 1841.	- - - - -
Construction of Hussea Bunds and Dam across the Khas Mehal Nunoraj.	-- with a view to the improvement of the Mehal.	-- the Bhoorda Khall has been excavated to the length of 3,000 feet, and Hussea three feet in height, with a dam, has been constructed, under orders 19th October 1841.	- - - - -
Canals, South Western Provinces :			
Tully's Nullah, Strengthening Banks opposite to the Kidderpore Toll House.	- - - - -	sanctioned, 10 May 1847	Kidderpore

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

141

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>		
86,405 11 4			
7,864 11 6	7,700	-- completed, season 1847-48.	-- the old cutcherry was disposed of for a sum of 8,100 rupees, to Captain Ludlow.
7,000	7,000	season 1844-45.	
	2,189 4 8		-- the walls will be of brick and mud, and the roof tiled.
5,398 14	8,333 14 4	-- completion reported, season 1844-45.	-- a considerable saving on the estimate was effected, by dispensing with a portion of bund where the damming of a khall had sufficed.
1,070		-- constructed, season 1844-45.	-- the inspection bungalows on the embankments in these provinces, have been made available to the Magistrates, Collectors, and other Government officers, for occasional use when their duties call them into the interior.
1,30,000	95,160 14 0 1/2	-- completed, season 1843-44.	
6,068	6,068	season 1840-41	-- this estate ought, it is stated, to yield at least 20,000 rupees, if properly cultivated; whereas in its present neglected state, it does not pay to Government one-fourth of that sum.
8,333 14 4	8,333 14 4	season 1841-42.	
1,248 6 3		-- completed, season 1843-44.	-- it is expected that the returns from this estate (8,000 rupees per annum) will be almost doubled, when a proper system of drainage has been established.
217 10	501 5	-- completed, season 1847-48.	-- the banks have been protected by piling, and with stone ballast.

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK.	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Canals, North Western Provinces :			
Tajjswalla New Cut, Enlargement of the.	-- the width, 40 feet at the base, was found to be insufficient to pass the water accumulated at its mouth.	-- length, about 900 feet, the width at the base to be increased from 40 to 50 feet; sanctioned, 24 April 1844.	- - - - -
Roads and Bridges, South Eastern Provinces :			
Tumlook Road, Construction of Drain Bridges.	-- the road interfered with the natural drainage of the country.	-- sanctioned, 27 March and 24 July 1843.	- - - - -
Topschancee :			
Construction of a Bridge two miles east of.	- - - - -	sanctioned, 16 October 1843	- - - - -
Construction of two Masonry Bridges, one three miles and one four miles east of.	- - - - -	sanctioned, 16 October 1843	- - - - -
Roads and Bridges, Lower Provinces :			
Tezporo Bridge, in Lower Assam.	-- to complete the communication between the station and the gaol.	sanctioned, 12 January 1841	- - - - -
Titillya Ghaut across the Cosyah Hills, to Pansegong in Assam.	- - - - -	-- length, 44 miles; sanctioned in season 1838-39.	Pansegong
Roads and Bridges, North Western Provinces :			
Tongra to Goona, Straightening the Road from, and Construction of a Bridge across a Nullah at Lockwas.	- - - - -	sanctioned, 1 August 1845	Goona
Umballa to Pinjore, Construction of a Military Road.	-- with reference to Government General Orders of 17 November 1842, relating to the opening of roads adapted for all military purposes in the North Western Frontier.	-- length, 84 miles and 7 furlongs; sanctioned, 29 November 1844.	Pinjore
Civil Buildings, South Eastern Provinces ; Judicial :			
Twenty-four Pergunnahs, Construction of a new Insane Hospital.	- - - - -	sanctioned, 26 January 1844	-- situated between the Sudder Dewannees Court-house and the Iron Bridge Yard.
Tavoy : Construction of new Buildings.	-- a new house for the gaoler and gaol cooking sheds, the former required to replace the gaoler's house, which had decayed, the latter in lieu of the present sheds, which, from their objectionable position, afford means of escape to prisoners.	sanctioned, 26 March 1845	Tavoy
Construction of Circuit Houses and Out-offices.	- - - - -	sanctioned, 17 September 1845	Tavoy

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount: for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p.	Rs. a. p.		
not reported - - - -	1,930 1 2	season 1844-45 -	-- this cut was originally excavated by Colonel Colvin, immediately below the junction of the two canal heads.
- - 3,126 8 1 - -	3,602 11 8	-- completed, season 1844-45.	-- such of these drains as it may be desirable to adapt to purposes of irrigation, will have sluice-gates attached to them at the cost of the landholders.
- - 3,988 11 7 - -	6,009 7 3	-- completed, season 1846-47 -	-- the bridge has two semicircular arches, 22 feet in span. The saving is owing to a great reduction in the quantity of masonry work, and in the rates generally.
- - - - -	7,013 1 2	- - - - -	
- - 716 12 7 - -	841 - -	-- completed, season 1843-44.	
- - 8,888 1 6 - -	- - - -	-- completed in season 1841-42.	-- the whole line as it exists now, may be traversed in every part by troops and laden cattle. The bridges are of wood, and being built of large trees, they will answer even for laden elephants.
- - 1,993 13 11 - -	1,993 13 11	-- completed, season 1846-47.	
- - - - -	91,081 8 6	- - - - -	-- the estimate provides for the construction of two bridges across the Labrow Nullah and the Choar, near Moolhampore, and 76 drain bridges of sorts.
- - 47,847 15 5 - -	47,822 5 10	-- completed, season 1848-49.	
- - 1,253 10 9 - -	1,751 8 -	-- completed, season 1846-47.	
- - Rs. 3,898. 6. 8. was incurred in the construction of the circuit-house.	7,527 13 6	-- the completion of the circuit-house was reported in season 1847-48.	

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

NAME of WORK	OBJECT of CONSTRUCTION.	Length, and Date of Commencement.	Place of Termination, or of intended Termination.
Civil Buildings, Lower Provinces; Judicial:			
Tezpora, in Lower Assam : Construction of a Treasury and Record-rooms.	-- to secure the records of the Magistrates' office.	sanctioned, 30 March 1841	Tezpora - -
New Gaol - - -	-- the existing gaol building being in a very dilapidated state.	sanctioned, February 1841	Tezpora - -
Construction of a Thatched Roof Cutcherry.	-- at the requisition of the Commissioner of Assam, in lieu of the present cutcherry, which is in a dilapidated state.	sanctioned, 24 June 1846	Tezpora - -
Additions of Cutocha Pucca Walls to the Circuit Bungalow.	-- in lieu of the present temporary walls which are liable to be destroyed by storms.	sanctioned, December 1845	Tezpora - -
Civil Buildings, South Eastern Provinces; General:			
Tavoy, Construction of a new Wharf.	-- in lieu of the old wharf, which is in a decayed state, and of little use except at high water, owing to there being a space of 73 feet of soft mud between it and the stream.	sanctioned, 9 September 1844	Tavoy - -
Civil Buildings, Lower Provinces & General:			
Titalya, Construction of a Staging Bungalow.	-- to provide accommodation to travellers to and from Darjeeling.	22 September 1847	Titalya - -
Civil Buildings, Central Provinces; Revenue:			
Toshaum, in the District of Hissar, Construction of a Tuhseeldarry Cutcherry at.	- - - - -	sanctioned, 1839-40	Toshaum - -
Civil Buildings, North Western Provinces; Revenue:			
Tirwah, Construction of Buildings.	-- for the accommodation of the Tuhseel and Thannah Establishments.	sanctioned, 18 February 1846	- - - -
Civil Buildings, North Western Provinces; General:			
Umballah, Staging Bungalow at.	-- for the convenience of travellers proceeding to or from Simla.	sanctioned, 1839-40	Umballah - -
Umballah Church, Purchase of the Private Church.	- - - - -	sanctioned, 8 December 1846	Umballah - -
Civil Buildings, North Western Provinces; Judicial:			
Umballah, Construction of Buildings.	for the police battalion - - -	sanctioned, 12 June 1844	Umballah - -

LAST TEN YEARS, AND OF THOSE NOW IN PROGRESS.

145

RETURN FOR THE PRESIDENCY OF BENGAL—continued.

Amount of Expense incurred.	Estimated Amount for Completion.	Probable Time of Completion.	REMARKS.
Rs. a. p. - 4,589 14 4 - -	Rs. a. p. 2,563 2 4 exclusive of convict labour.	-- completed, sea- son 1846-47.	
- 13,923 1 5 - -	13,805 12 6 This amount it is ex- pected will be consi- derably reduced by the employment of convict labour.	-- completed, sea- son 1846-47.	-- this consists of four criminal, one hazut, one civil, one female and one hospital ward, with dead-house and out-offices. The whole of the buildings are of kutchha pucca masonry with thatch roof, with the excep- tion of the cook-rooms, which have tiled roofs.
- 4,299 15 4 - -	4,402 - -		
	2,008 - -		
- 1,778 11 2 - -	1,778 11 2	season 1844-45.	
	- - an advance of 2,000 rupees was made. An estimate, amount- ing to Ra. 3,230. 14. 8. was subsequently (5th September 1848) sanc- tioned.	- - - -	-- will supply the place of an hotel which existed at the spot, but was burnt down in 1847.
- 3,568 3 7 - -	3,568 3 7	season 1839-40.	
	7,127 - -	- - - -	-- the execution of this work was entrusted to the Civil Officer.
- 1,645 4 5 - -	1,645 4 5	season 1840-41.	
- 3,000 - - - -	- - - -	-- purchased, sea- son 1846-47.	-- the sum of 3,000 rupees provides also for alterations and purchase of church fur- niture.
- 8,634 14 10 - -	- - - -	-- completed, sea- son 1846-47.	-- these buildings consist of a bungalow, with out-offices for the Adjutant, a magazine, eight bells of arms and a rear-guard, and are constructed of permanent materials.

Presidency of
Bengal

INDIA, PUBLIC DEPARTMENT.

(No. 2, of 1850.)

COPY of a Despatch of the Honourable the Court of Directors to the Government of India in the Public Department; dated 30 January 1850.

Our Governor-General of India in Council.

Para. 1. SEVERAL very important and intimately connected questions, in relation to the superintendence and management of Public Works, have been brought under our consideration in letters from all the Presidencies; we have thought it desirable to embrace the subject in one view, and to communicate our opinion on it to your Government.

2. We shall notice these questions, and the subjects from which they have arisen, in the following order:

- 1st. The Great Trunk Road.
- 2d. The Agra and Bombay Road.
- 3d. The District Roads of Madras.
- 4th. The Bombay Road and Tank Department.
- 5th. The separation, for India and Bengal, of the Civil Branch of Public Works from the duties of the Military Board.
- 6th. The Education of Young Natives as Assistant Engineers.

The Great Trunk Road.

See below.

3. The documents connected with the letters noted in the margin,* report the progress of the works on the Great Trunk Road; the amount already expended; the amount required for the completion of the road, and the probable annual sum which will be required for its maintenance.

4. The report of the superintendent, Captain Willis, of 14th December 1847, gives a summary of the work that had been done up to that date; of deficiencies in the execution, and of the causes of those deficiencies.

5. Of the work that has been done, including a quantity of extra work resulting from damages by the floods of 1845, the report is on the whole satisfactory. Of the deficiencies, the causes are recapitulated as follows:

- The ignorance of overseers.
- The increase of work from the unprecedented floods of August 1845.
- The delay in passing estimates.
- The ignorance of accounts in one executive officer.
- The dilatoriness of another.
- The increase of Captain Willis's charge.
- The alteration of limits, causing delay in transfer of duty.
- The cholera.
- The absconding of workmen from unhealthy districts.
- The illness and death of many overseers.
- The illness of Lieutenant Beadle, from the unhealthiness of his locality.
- The seizure of hackeries for troops.

6. The report of the Military Board, dated 15th December 1848, brings down the statement of expenditure to 30th April 1848.

7. The

* India Public, 28th August (No. 39) 1847, paras. 74 to 83; 10th December (No. 52) 1847, paras. 105 to 111, and 115 to 117; 31st December (No. 55) 1847, paras. 83 to 89; 11th March (No. 17) 1847, para. 30; 20th May (No. 30) 1847, paras. 88, 89 and 95; 19th August (No. 43) 1847, paras. 108 to 110, and 121 to 124; 21st October (No. 55) 1847, paras. 64 to 70, and 72; 13th January (No. 1) 1849, paras. 74, 75 and 78.

Bengal, 21st March (No. 9) 1849, paras. whole.
India Judicial, 10th July (No. 9) 1847, paras. 19 to 22; also, p. 15, Public, No. 51, of 1847; paras. 12 to 15, Public, No. 41 of 1848, whole; Public, No. 2 of 1849.
Bengal Judicial, 18th November (No. 24) 1847, paras. 4 and 5.

7. The statement submitted to Government with the Military Board's letter, dated 21st August 1846, showed the expenditure to 30th April 1845, as - - - - -	Rs. a. p.	Presidency of Bengal.
The expenditure in the three years succeeding was - - - - -	38,41,489 2 11½	10,50,108 11 3
Making the total expenditure to 30th April 1848 - - - - -	48,91,597 14 2½	

8. The estimate for the completion of the works was given in August 1846 as Rs. 43,68,818. 8., which included 18 lacs for the Soane and Jumna Bridges. In December 1848 it is given as

For the road-works - - - - -	33,02,507
For the bridge over the Soane - - - - -	60,00,000
For the bridge over the Jumna - - - - -	10,00,000
Total - - - - -	1,03,02,507

9: The estimate for the completion of the works, after deducting the intermediate expenditure, remains nearly the same in 1848, excluding the Soane and Jumna Bridges, as it was in 1845 including them; it therefore appears that there is an increase on the estimate for road-works of 18 lacs, and a new estimate of 70 lacs for the two bridges in question, making a total addition to the estimate of 88 lacs.	Estimate for completion of works 1845-46 - - - - -	43,68,818 8
	Expenditure in three years to April 30th 1848 - - - - -	10,00,108 11
	Balance of Estimate, including 18 lacs for S. and J. Bridges - - - - -	33,18,709 13
	Balance of Estimate, deducting the 18 lacs - - - - -	15,08,709 13
	Estimate 1848, excluding bridges - - - - -	39,02,507 -
	Increase of Estimate for road works - - - - -	17,83,797 3
	New Estimate for S. and J. Bridges - - - - -	70,00,000 -
	Increase of Estimate - - - - -	87,83,797 3

10. We observe on your proceedings of an earlier date, that the Governor-general, in anticipation of railways, and in consideration of the great outlay in 1848 on the Ganges Canal and on Aden, had proposed that the construction of all great bridges on this road should be suspended, and that this proposal had been adopted, one exception being made in favour of the Burrakur Bridge, in consideration of its forward state, and of the great accumulation of materials.

11. The estimate for the maintenance of the road after completion, was roughly given by the Military Board (21st August 1845) at 350 rupees per mile, or 3,50,000 rupees per annum for the entire distance from Hooghly to Delhi.

12. The drawings of the second division of the road transmitted with your letter dated 21st March (No. 9) 1849, reflect the highest honour on Captain Beadle, the late assistant surveyor, by whom they were executed, as he states, in hours of leisure; and it was his especial request that they might be transmitted to us. We desire that our acknowledgments and approbation may be communicated to him.

The Agra and Bombay Road.

13. The Agra and Bombay Road was planned under the Government of Lord Auckland.* The projected expenditure was as follows:

For the road from Agra to Dewas, with a branch road from Gwalior to Seepree - - - - -	60,000
For the road from Dewas to Akburpore on the Nerbudda - - - - -	60,000

Thus contributed:

British Government - - - - -	20,000
Holkar. - - - - -	20,000
Dewas - - - - -	10,000
Dhar - - - - -	10,000
Total - - - - -	60,000

Carried forward - - - 1,20,000.

* India, Public, 4th February (No. 8) 1848, para. 74; 20th May (No. 30) 1848, para. 67; 10th August (No. 40) 1848, whole; 14th August (No. 41) 1848, para. 13; 19th August (No. 43) 1848, para. 125; 21st October (No. 65) 1848, para. 73 & 74; 13th January (No. 1) 1849, para. 79 to 82; Bombay, 24th December (No. 182) 1848, whole; 1st April (No. 22) 1849, whole; 16th October (No. 84) 1849, whole; 15th November (No. 100) 1849, whole; 14th February (No. 6) 1849, para. 62 to 66; 63 to 67; & 69.

Presidency of
Bengal.

	Brought forward - - -	1,20,000
In November 1842, a further sum was sanctioned on account of this portion of the road of - - -		43,000
Two estimates subsequently sanctioned as portions of the intended expenditure, 15,279 rupees for the first portion of the road, and 11,772 rupees for the second portion, were erroneously set down as additional grants - - -		27,051
		<u>Rs. 1,90,051</u>

14. The expenditure to November 1847 is stated as follows :

New work of road - - - - -	1,94,310
Superintendence - - - - -	1,13,106
Repairs and contingencies - - - - -	47,542
	<u>Rs. 3,54,958</u>

15. The new work, therefore, exceeded the whole amount sanctioned intentionally and inadvertently, and the expense of the superintendence, repairs and contingencies, carried on the amount to more than double the original intentional sanction.

16. We cannot suppose that the original sanction did not include the probable charge for superintendence, for from the manner in which this portion of the expenditure is stated, "Salaries and Establishments" for superintendence, it appears to be all special charge for this particular work; yet the statement that the charge had exceeded the estimate by 31,300 rupees, would seem to imply that an indefinite charge was to be understood as necessarily added to the original sanction. This is a point which requires to be distinctly cleared up and explained, with reference not to this work only, but to all public works, as it is impossible to know what is sanctioned if superintendence and contingencies are not included in the estimate.

17. Our sanction is now requested to an annual expenditure of 28,700 rupees, for the repair and maintenance of this road.

Madras District Roads.

See below.

18. The letters noted in the margin* from the Government of Fort St. George, relate chiefly to the formation and maintenance of roads under that Presidency. The letter dated 3d January 1849, transmits a general report of the Road Department from its establishment to the 1st May 1848, and the orders passed thereon by the Government.

19. The whole of the proceedings referred to in these letters lead to the following conclusions :

20. The roads in some instances, from want of previous survey and other causes, have not been well planned with respect to the line, so that a road on a new line becomes desirable and even necessary for permanent traffic.

21. They have been carried below the level of tanks, when they might have been carried above it, and embankments have been broken and bridges carried away by inundations, which, on the higher line, would have been comparatively innocuous.

22. They have been constructed without due provision for their permanent maintenance, so that either the entire road has gone to decay, or one portion of it has become unserviceable, while another portion was in progress of construction.

23. In many parts of the Presidency it is impossible, from the want of local materials, to construct metalled roads, except at an altogether disproportionate cost.

24. The

* Madras, Public, 17th January (No. 1) 1848, para. 3; Madras, Public Works, 26th May (No. 6) 1848, para. 17; 14th January (No. 1) 1848, whole; 29th January (No. 2) 1848, whole; 4th February (No. 3) 1848, whole; 13th March (No. 4) 1848, paras. 2, 12, 15, 18 & 22 to 24; 21st March (No. 5) 1848, whole; 15 April (No. 7) 1848, paras. 2 to 6, 15 & 16; 12th July (No. 9) 1848, paras. 2, 3, 9 & 10; 25th September (No. 11) 1848, paras. 6 to 9; 27th October (No. 12) 1848, paras. 2 & 3; 3d January (No. 1) 1849, whole; 12th April (No. 8) 1849, paras. 2 to 4, 6 & 8.

24. The carts generally used are constructed on a principle calculated to destroy the roads. This principle was introduced about 50 years ago, and it may be therefore presumed that the people would not object to the introduction of an improved form.

25. To construct a system of trunk and branch roads on a permanent and generally useful principle, would require a greater outlay than can be afforded by Government, unless aided by one or all of three modes of contribution—the levy of tolls; the levy of a cart-tax; the requisition of village labour. The objections to the first of these methods are clearly and forcibly stated by Captain Best, who advocates the second and third. He calculated that the requisition of a day's labour at the rate of one cooly per cawny from places within two miles of a road, and of a commutation of two annas per cawny from places within that distance, and of one anna per cawny from places at a greater distance, would yield 34,00,000 days' labour and 3,18,750 rupees per annum; but he does not state by what machinery, at what cost, and with what checks and securities against exaction and oppression these very minute contributions of labour and money could be levied.

26. Captain Best appears also to regret the prohibition of a fourth mode of assistance—convict labour, which he thinks not liable, in the Madras territory, to the objections which were taken to it in Bengal.

27. Labourers require vigilant superintendance, and there is a great deficiency of practical knowledge in local overseers. Lord Tweeddale, in his minute of 25th January 1848, dwelt very strongly on the necessity of having men of practical experience to do justice to the science which is abundantly possessed by the engineers of the Presidency. The letter from the Government, dated 4th February, No. 3, of 1848, requested that two practical overseers who understand the business of road-making in all its branches, should be sent out from England for the purpose of instructing the local overseers and operatives.

Bombay Road and Tank Department.

28. The letters noted in the margin from the Government of Bombay,* relate to the operations of the Road and Tank Department, which was established at that Presidency in 1835. See below.

29. A proposal for abolishing this department and forming a new system of local agency under the superintendance of the Military Board, has been long under the consideration of the Government of Bombay. The Chief Engineer and the Military Board proposed the abolition in 1844. The government of Sir George Arthur did not concur in the expediency of the measure. The government of Sir George Clerk was divided in opinion, but the measure was resolved on by the Governor and Commander-in-Chief in opposition to Mr. Reid and Mr. Willoughby. The government of Lord Falkland has suspended the abolition, and has referred the question for our orders on the measure generally, and on the several points on which a difference of opinion exists in regard to its details.

30. The arguments for the abolition are principally that the machinery is too costly for the amount of work executed, and that the tank branch of the work has been either ill done, or not done. Of this, some remarkable instances were given in the reports of 1844 from the Chief Engineer and the Military Board. Sir George Clerk says in his minute of March 1848, "My objections to the continuance of the Road and Tank Department have been formed after much observation of its defects; these, among others, are inutility and costliness. These, my objections, are insuperable, because founded on its enormous waste of public money, during 10 years, and on its entire disregard, during the whole period, of that important means of fertilising our territories which was one of the two purposes for which ostensibly it was instituted, and which it is quite evident it has never been capable of applying."

31. The

* India, Public, 19th May (No. 13) 1845; Bombay, Public, 26th November (No. 116) 1845; 31st December (No. 135) 1845; 5th August (No. 82) 1846; 31st March (No. 31) 1849.

Presidency of
Bengal.

31. The expense of the department for superintendence was stated by the Chief Engineer in 1844 to have been for the nine years of existence Rs. 7,27,921. 2. 4. Within the same period, the total expenditure on tanks has been 42,000 rupees, a great portion of which had been lost by the failure of the works. The value of the Department was, therefore, to be sought only in the road branch of its services; in this the charge for superintendence had been about 50 per cent. on the work performed. The Military Board saw no necessity for working out such an expenditure by such expensive machinery.

32. Mr. Reid, however, observes, that much of the charge does not especially belong to the Department, the separate expense of which consists solely of "the salaries and personal establishments of European officers of the Department, since the charges of subordinate officers who are employed on particular works would be incurred under whatever system of management those works may be conducted."

33. Captain Berthon, Superintendent of the Department, in his last report, dated 22d September 1848, represents that the work done by the Department had greatly increased, and had been all well done, and that the per centage had been reduced from 50 to 18½ per cent., and submits that a more rapid advance from inexperience towards perfect efficiency was perhaps never accomplished by any Department that had ever been formed in India.

34. The Military Board, 23d September 1848, submitted a plan for the organization of the proposed new Department of Public Works. Into the details of this plan it is not at present necessary to enter; the whole subject is well and fully discussed in the Minutes of Government of December 1848 and January 1849, which terminate by referring the question for our decision.

INDIA AND BENGAL.

Proposed separation of the Civil Branch of Public Works from the Duties of the Military Board.

35. This proposal was discussed in Council in November 1846, and the opinion of the Military Board was requested on,

1st. The constitution of a distinct agency for each division of the Presidency, to be vested with the charge of all civil buildings, and with the superintendence and management of public forests, canals and embankments, roads and bridges.

2d. On the details of the proposed plan.

36. The Military Board, in reply (27th April 1847), were of opinion that public advantage would arise from the proposed separation, and submitted the outlines of a plan for carrying it into effect.

37. The Board incidentally submitted the question, whether the Great Trunk Road should be considered a civil or military work, with reference to the importance of retaining the superintendence of Captain Willis, and to some other details.

38. The President in Council determined (17th May 1847), to await the opinion of the Governor-general. This opinion has not yet been received, and here for the present the question rests.

Education of Young Natives as Civil Engineers.

39. The importance of educating young natives as assistant engineers, is brought especially to our notice in your letter, dated 2d September (No. 48) 1848.*

40. The proceedings previously examined, contain many valuable remarks on this subject. The reports of all the superintendents dwell much on the necessity of having properly qualified assistants, capable of enduring the climate, and

* India, Public, 2d September, (No. 48) 1848; Bengal, Public, 27th December (No. 35) 1848; Madras, Public, 22d February (No. 6) 1848, p. 6-10; Bombay, Public, 16th October (No. 85) 1848.

and conversing with the natives. The local experience of the ryot, it is observed, is often of great value, and is lost to those who cannot communicate with him in his own language.

Presidency of
Bengal.

41. The authorities at the several Presidencies, for the most part, appear to consider necessary for the purpose a higher degree of scientific attainment than is contemplated by Lord Tweeddale, or by any of the superintendents, with whom a certain proficiency in arithmetic, geometry, levelling, surveying and mechanical drawing, combined with bodily activity and taste for the pursuit, seem to constitute the principal scientific requisites. Young natives, thus qualified, receiving practical instruction from persons who, in addition to the necessary scientific knowledge, have had ample experience in the classes of public works, in which those trained under them would be employed, would supply one of the greatest desiderata to the efficiency and economy of this department of the public service.

42. The want of properly qualified subordinates, and in addition to the want of qualification, the frequent illness and frequent removal, and change of European assistants, is strongly dwelt on by all the authorities who have recorded opinions on the subjects previously noticed. These circumstances are placed most prominently forward as a principal cause of all the failures and disappointments, the combined costliness and inefficiency, which have been experienced in a greater or less degree in all the subjects of our previous examinations.

43. Bridges, embankments, annicuts, though essentially connected with and indeed component portions of roads and canals of irrigation, are severally in themselves great branches of practical engineering, and in all these, separately considered, the inefficiency of subordinate agency has been experienced.

44. The question appears to have been considered, whether native youths would be induced to undergo the necessary preliminary studies, by attending institutions, which might be formed for that purpose, without a tolerably certain prospect that they would be employed in the public service, if found qualified for it. It appears that the want of sufficient encouragement in the public service, to young men who have distinguished themselves in this branch of study, has caused the engineering class in the Elphinstone Institution at Bombay to be deserted; and that you have expressed to the Bombay Government a desire that the youths, who have been trained in that class, and whose qualifications are so highly spoken of, should have employment found for them as vacancies occur. We scarcely know how to reconcile these circumstances, with the necessity for such assistants so urgently pointed out by the Superintendents of Public Works, unless it should have been found that the education which they have received has been more scientific than practical.

45. We shall now communicate to you the conclusions at which we have arrived on the several points which have been previously examined.

46. We attach great importance to the completion of the Great Trunk Road. We desire to see it completed with substantial bridges; those over the Soane and Jumna should be for the present suspended, but you will carefully consider whether the prospect of a railway through the North Western Provinces is sufficiently near to justify the suspension of any other portion of this great work.

47. The three superintendents of the Great Trunk Road, of the Madras District Roads, and of the Bombay Road and Tank Department, Captains Willis, Best and Berthon, appear to be well qualified and efficient in their respective departments; in so far as they are personally concerned, no change is desirable.

48. But there are several points in respect to the authorities under whom they act, and the subordinates whom they employ, which admit of material amelioration.

49. To the first class belongs the delay in passing estimates, whereby the sanction for emergent work is frequently not given till it is too late in the season to execute it; on this point we cannot doubt that a due degree of energetic activity in the various departments, through which the estimates pass, would ensure in most cases the timely performance of that duty. We are much averse, if it can be avoided, to confer any greater degree of discretionary

Presidency of
Bengal.

authority upon the superintendents, and it is desirable that you should prepare, and submit for our sanction, some rules calculated to expedite the progress of references respecting public works or repairs of an emergent nature, by limiting the time within which reports upon such subjects are to be made to you, or by other regulations, and by instructing your secretaries to pay the earliest attention to such references. It is most desirable that your authority should, if possible, be obtained for every such work; where it is evident that time will not admit of the requisite delay, a discretionary power to commence a work might be lodged with the authority under whom the superintendents shall eventually be appointed to act, but it should be so guarded as to bring the question at the earliest practicable period under your supervision.

50. To the second class belongs all that has been said of the inefficiency of local assistants; on this point we are disposed to entertain favourably the several proposals before us, for educating young natives as civil engineers; and for giving a fixed position in the public service to a limited number of pupils of distinguished proficiency; but we fully concur in the reasons already noticed, for thinking that this education should be in a great measure practical, that a mere scientific class at the Presidencies, though essential as a preliminary, should be but the first step of the system, and that the education of the assistants should be practically completed, under properly qualified persons, on the scene of operations.

51. We are disposed to approve the establishment of a course of lectures on geology, and we think it should be connected with the class of civil engineering, should such a class be constituted; the importance of geological knowledge to engineers is well pointed out in the memorandum of Mr. Simms; we think also that the Museum of Economic Geology should be assigned to the same class, and that the expense of the lectures and the museum should be brought under one head.

52. We observe that the Military Board had proposed to assign a portion of the allowance made to the museum for the establishment of a course of lectures on the subject; you do not express an opinion on this suggestion, nor notice in any way the passage quoted in the margin from the Military Board's letter of the 25th April 1848.

53. The 9th para. of your letter dated 2d September (No. 48) 1848, adverts to the several applications for Professors of Civil Engineering.

54. The application for a Professor of Civil Engineering, for instructing the students in the Hindoo College at Calcutta, was suspended by the Bengal letter dated 7th September (No. 26) 1847, and the appointment of Mr. Sutcliffe as Professor of Natural Philosophy and Civil Engineering in that institution, at a salary of 400 rupees per mensem, was reported to us in the letter dated 27th December (No. 35) 1848.

Fort St. George
letter, 22d February
(No. 5) 1848, para.
6 to 8.

55. The application from Madras was made conditional on our approval of the plan for the establishment of a class in the Madras University for training Civil Engineers.

Bombay letter,
10th October (No.
35) 1848.

56. As regards Bombay, it has been intimated, that until a scheme shall have been matured for the employment of those who are to be trained in civil engineering, it will not be desirable to engage a teacher.

57. The result of our inquiries satisfied us that the services of persons properly qualified for these professorships could not be again obtained on the terms formerly accepted by Mr. Pole; although the Bengal Government, by engaging a person

* This proposal arrived in India at an unfortunate time, in November 1841, or thereabouts, and Lord Auckland transferred the matter to the Asiatic Society temporarily, together with the (300) three hundred rupees per mensem, and the society made the money over to Mr. Piddington, who, though since appointed coroner, still retains the nominal duties; the specimens remaining in the rooms of the Asiatic Society a sealed book, instead of becoming, as they would do in the Medical College, the groundwork to a course of lectures for the instruction of native youth, where science may be made available towards the gradual accomplishment of the views of the Honourable the Court of Directors, the utility of which the Council of Education, as well as Mr. Simms, have so strongly pointed out."

a person on the spot, appears to have obtained his services on nearly similar terms; but whenever you may find it necessary to bring the subject again to our notice, it is desirable that you should state the amount of salary which you think should be assigned to the office.

58. In a foregoing para. we noticed, as a most valuable qualification of the subordinate officers whom it is proposed to educate for the public service, the knowledge of the native languages which they would certainly possess, and which should be in all cases an indispensable condition of their employment; this knowledge is not less necessary for our officers of engineers, and it is our intention to address you on the subject in the Military Department.

59. With respect to the chief superintending authorities, the present practice at the several Presidencies is different.

60. Under the Presidency of Fort William the superintendence of public works is vested in the Military Board in two branches, military and civil; it has been proposed to separate the latter altogether from the duties of the Military Board, and create a new department for the superintendence of the civil branch of Public Works; the duties of the military branch are stated to be fully as much as the Military Board can attend to. This proposal has been suspended for the opinion of the Governor-general.

61. Under the Presidency of Madras, the control of all works connected with the Land Revenue, especially all works of irrigation, is entrusted to the Board of Revenue in the Department of Public Works, which consists of the ordinary members of the Board, with the addition of the chief engineer, and with a distinct establishment, at the head of which is placed an engineer officer as secretary; all other works are placed under the superintendence of the Military Board.

62. Under the Presidency of Bombay, the Military Board has the superintendence of all Public Works in two departments, one of which, the Road and Tank Department, created in 1835, is, under the circumstances previously stated, proposed to be abolished by the majority of the Bombay Government.

63. It is most important that the system of the superintendence of Public Works should be assimilated at all the Presidencies; but considering that the opinion of the Governor-general has not yet been given on the division of Public Works in Bengal; considering also the unsatisfactory working of the system at Madras, which formed the subject of our despatch to that Presidency, 29th May (No. 12) 1845, and the great differences of opinion in relation to the change of system at Bombay, the subject is not brought before us in a state for final decision; it is desirable that the entire question in relation to all the Presidencies should first pass under the deliberate review of your Government.

64. In forming a judgment of the system of superintendence, it is necessary to have a clear view of the actual state of all the work which is the subject of superintendence; this, in the districts, and especially in the district roads, embraces a most extensive field of operations; the documents which we have examined exhibit many proofs of cost and labour thrown away, of work done over again and again without a good final result, of great excess of expenditure over estimates; in short, an extensive admission of defects, and a great diversity of opinion as to the mode in which those defects should be remedied.

65. We think it desirable that you should select two or three competent officers, from persons already at the Presidency, and whose services can be either wholly or partially spared for the purpose, to form a temporary commission, to inquire into the whole subject of the superintendence and execution of Public Works, not omitting any subject noticed in this despatch; that similar commissions should be formed at the other Presidencies; that they should make full and detailed reports to their respective Governments, embodying such suggestions as may appear to them advisable; that these reports should be submitted to you, and that we should receive from you such a distinct opinion on the whole of the questions herein considered, as shall place it in our power to come to a decision respecting them.

66. In conclusion, as the letters before us make some specific applications, we sanction the proposed expenditure of 28,700 rupees per annum for the maintenance of the Bombay and Agra Road.

154 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bengal.

67. We do not consider that any great public advantage would result from the engagement of two practical overseers thoroughly conversant with road-making in all its branches, as proposed in Lord Tweeddale's minute of January 1848, especially as it would be impossible to send out persons possessing the essential qualification of a knowledge of the native languages.

68. Of all other applications and suggestions for purposes of permanent utility but not of immediate temporary necessity, we shall postpone the consideration till we are in possession of the opinions with which we have required you to supply us.

We are, &c.
(signed) *A. Galloway.*
J. Shepherd.
&c. &c. &c.

London, 30 January 1850.

STATEMENT exhibiting the EXPENSES incurred on WORKS, SALARIES, ESTABLISHMENTS, &c., in the CIVIL DEPARTMENT of PUBLIC WORKS, as they stood in the Military Board Office Bill Books, within the Ten (10) Years, from Season 1839-40 to Season 1848-49 inclusive.

	Rs.	a.	p.
Season 1839-40	15,22,222	14	4
" 1840-41	18,06,020	13	9
" 1841-42	24,87,668	2	7
" 1842-43	18,72,164	8	-
" 1843-44	21,02,496	8	2
" 1844-45	21,67,166	12	4
" 1845-46	21,41,388	14	8
" 1846-47	21,85,147	2	6
" 1847-48	26,76,947	9	1
" 1848-49	33,14,371	9	8
TOTAL	Rs. 2,23,65,343	15	1

RETURN FOR THE PRESIDENCY OF FORT ST. GEORGE.

ROADS.

Presidency of
Fort St. George.

In April 1845 the Honourable Court of Directors confirmed the appointment of a Superintendent of Roads for the Madras Presidency, and gave their consent to a proposition of the Madras Government, that four lacs of rupees (4,00,000 rupees) annually, might be allotted to the improvement and maintenance of the roads; the improvements and repairs of branch roads not being allowed for in this sum. Under date the 9th August 1848, a General Report on the Road Department, from its establishment to the 1st May 1848, was submitted by the Superintendent of Roads, from which it appears, that in 1847 an arrangement was approved of by the Government by which ten (10) of the most important roads in the Presidency were selected, the management of which, under the denomination of "Trunk Roads," specially devolved on the Road Department, some portion of them in accordance with this decision, to be constructed under the immediate supervision of the Superintendent of Roads and his assistants, the remainder under that of civil engineers of divisions, corresponding on the subject of trunk roads with the Superintendent of Roads, as they do with the Board of Revenue in the Department of Public Works, regarding branch and minor roads, and works of irrigation. By order of Government, dated in April 1849, a new line of road from Madras, by Roychotty, the Goolbarro Pass and Cuddapah to Bellary, was placed under charge of the Superintendent of Roads as "Trunk Road No. 11." The amount placed at the disposal of the department from May 1845, when the order for forming it was issued, to the 30th April 1848, was Rs. 4,12,147. 3.; the sum actually expended within the same period was Rs. 2,79,870. 5. It was remarked by the Superintendent, "Had more estimates been sent in by me, no doubt the Government, under the permission granted by the Honourable the Court of Directors, to expend four lacs of rupees (4,00,000 rupees) annually, on the trunk roads, would have granted more money; but, considering that the department was new, and believing that what has been expended has been laid out with due attention to economy, and with a fair result of useful and permanent work, I

trust

trust the Government will be satisfied." Trees had been prepared for planting all along the roads; as far as work was in hand, palmyras had been sown to mark the limits of the road ground, parkimsaiwa along the foot of the raised banks in sandy soil; and in addition to these, avenues, chiefly of tamarind trees, will be gradually planted out. In order that a road should be well and cheaply made, three or four years time was stated to be necessary, whatever its length may be: "the marking out and the earth-work will occupy the first year; the bridges cannot well be completed in less than two more: the safest plan is to build foundations and piers one year, and the arches of the bridge a year after. Raised earth continues to subside for at least two monsoons, and until it has sunk and consolidated, the application of gravel or broken stone is wasteful and unsatisfactory; but a chief and cogent reason for proceeding deliberately with the construction and improvement of roads is, that if a large sum is to be laid out in one year on a few miles, the work is liable to be obstructed for want of labourers."

TRUNK ROADS.

No. 1. *Western Trunk Roads, Madras, towards Bangalore.*

Length, about 200 miles; commenced in 1838, to terminate at the frontier of Mysore near Hebbagode, on the road from Ossoor in Salem to Bangalore. This road cost to 1848 (including food and expenses of convicts) nearly 12 lacs of rupees for 121 miles, or about 10,000 rupees a mile. Estimates for an increased annual allowance for this road, and for an additional metalling to its surface, were forwarded for the sanction of Government in April 1849, the amount is 81,244 rupees annually, for four years, and afterwards 39,178 rupees per annum; the estimate from Madras to Vellore was Rs. 46,686. 2. 2. It had been under construction by convicts until the end of 1844, when orders were issued to discontinue convict labour, unless in the immediate neighbourhood of gaols. A line has been marked from Pulmansir to Yelloopelly, where the Mysore Road terminates: this and the improvement of the road from Chittoor down the Moogly Ghaut to Paulsamoodrum and thence to Arcot, are required to render this route perfect. The proper way from Madras to Bangalore is by the Moogly Ghaut, and when the line is made good, the Western Road will be the road to Arcot, Vellore and Waniambaddy, but not the road to Bangalore.

No. 2. *Frazerpett, on the Cauvery River, to Mangalore.*

Commencing at the Western frontier of Mysore, crosses the Coorg country and passes through Mercara, the chief place, and having entered Canara, near Sumpagee, descends the Ghaut known as the Sumpagee or Mercara Ghaut, and proceeds to Mangalore on the coast; an annual outlay of Rs. 5,262. 8. 4. (being at the rate of 50 rupees per mile) for annual repairs, to the part of the road from Frazerpett in Coorg to Mangalore, was sanctioned in 1847. This road was commenced by the sappers in 1838, after the termination of the Coorg war, and from that time until the end of 1838, parties of sappers were employed, by whom, with the aid of Coolies, the road from Frazerpett to Mercara was chiefly made. The tracing out and construction of the Ghaut had been commenced in 1837, by a party under the late Lieutenant Fast, of the engineers, and by that officer and Lieutenant Collyer the work was carried on until 1839. The completion of the Ghaut was reported in March 1846.

No. 3. *From the North Western part of Mysore, towards Canara, by a Pass descending from the Table Land near Munzerabad.*

Length, 46 miles; this road joins the Western line at Buntwal. Its construction was commenced under the orders of the Board of Revenue in the Department of Public Works, and has been under their control until completed.

No. 4. *From Hoonsoor, in Mysore, to Cannanore by the Parumbaddy Pass.*

Strong arguments were advanced for the construction of this road. It unites with the road from Seringapatam to Mercara and Mangalore at Hoonsoor, and will complete a first-rate line of communication between Cannanore and Madras.

Presidency of
Fort St. George.

Length, 68 miles, was sanctioned by the Court of Directors under date the 3d November 1847, to terminate at Cannanore. Estimated cost, Rs. 2,00,376. 3. 8.; of which sum 98,285 rupees are for the portion that lies in the Coorg country, 85,091 rupees for the part that is in Malabar, and 17,000 rupees for 17 miles in Mysore. All the intersecting streams are to be bridged, with an exception at the Irrity Cadavoo, where a ferry is to be established. The Ghaut, of which the steepest part ascends 1 in 20, will be very much superior in every respect to the Peria and other Ghauts which are now in use, but are not fit for traffic by means of carts.

No. 5. *From Waniambaddy, by Salem and Coimbatore, to the Western Coast at Ponany.*

Sanctioned in May 1845, to terminate at Ponany. The amount (35,111 rupees) sanctioned in 1848, was for making the road from Walliam to Ponany practicable throughout for wheel carriages.

No. 6. *Great North Road from Madras to Calcutta.*

Length, about 900 miles; to terminate at Calcutta. Between 1824 and 1845, inclusive, 2,70,935 rupees were laid out on the northern road south of Ulloor. An expenditure of 5,760 rupees per annum was sanctioned in 1846, for the gradual repair and improvement of the road. Rs. 6,912. 14. were granted for improvements of the 18 miles between Berhampore and Itchapoor, and 720 rupees per annum for the preservation of this portion, and 1,680 rupees for that of the portion between Berhampore and the Bengal frontier. In the years 1847 and 1848, the sum of 19,410 rupees was expended on this road. The country is very difficult, much of the soil, an extremely fine sand, mingled with soda and salt earth. The inundations of the rivers Cortchi-aur and Poinay and their branches, extend far and wide in heavy monsoons for days together, swamping the lands for 50 miles north of Madras, and in some parts from 10 to 20 miles inland, and combining a multitude of tanks, and the Pulicat Lake in one sheet of shallow water, above which the red hills, and the sites of villages rise as islands; as the water subsides it collects in deep muddy channels, which take weeks to run dry, and the position and extent of these drains is continually varying. The ground south of the Peimaur or Nellore River, is an alternation of gravelly ridges and of valleys of loose soil, in great part cultivated with paddy; across the valleys great embankments were made, with the intention of topping the floods which pass through them to the coast; in some parts these are 15 or 18 feet high, the sum of their lengths being about 32 miles; a great number of bridges were made in these embankments, to allow the passage of the obstructed waters. In 1837 and 1838 the rains were excessive, and the extent of embankments carried off was very great. Several new bridges were built in the subsequent years, and to provide water-way, the system of overtopping the inundations was so far abandoned, that several gaps from 120 to 350 feet were left in the embankment; these gaps were paved with saterite, so that when the waters moderate, they can be crossed; but so long as the floods continue, they are impassable, the water flowing through them five to seven feet deep. The water-way is not yet sufficient; both in the monsoon of 1846 and that of 1847, the embankments were extensively breached, and for long distances, where there were no gaps made in them, the water rose above the embankments, and swept away all the gravel with which their tops were covered. Great as has been the expense already incurred on this road, a further large outlay will be necessary. The selection of the line north of Nellore is bad; from Ulloor the track crosses swamps and paddy-fields, and continues over low sands, partly inundated, until it reaches the river of Singaroyconda. Material for making the swampy and sandy track into a good road is so distant that it may be looked on as impracticable, and the selection of a new line is contemplated. From Tungatoor north to Ogle, thence to Guntoor, the road is over cotton soil, it requires much work to make it passable after even moderate rains; near Ongool and in Guntoor some good bridges have been built, and in the year 1841 a considerable part of the road in the Guntoor district; but having been raised above the level of the country, and running in a north and south direction, so as to impede the flow of water towards the coast, it was swept away for miles together, and in such parts it is only to be traced by the hollow which was formed where the water cleared the bank away. Most of this road

road was made by convicts. North of the Kistna River, the road continues on good soil chiefly, to about nine miles south of Ellore; this part of the road was made by the Pioneer Battalion in 1827, and following years, but not finished; there is but little trace of their labours; the pioneers did not construct bridges, but wherever a shallow stream crossed a road, their remedy for it was a paved dip; the pioneer roads are generally discoverable now chiefly by the pavements of solid construction at short intervals along the lines; these pavements are fatal to cart axles. In the neighbourhood of Ellore, and up to the Godavery, opposite Rajahmundry, the line chiefly passes over very heavy muddy country.

Presidency of
Fort St. George.

No. 7. *From the Great North Road near Ongle, to the Nizam Frontier.*

Length, about 22 miles. A great deal of trouble, and some money, were given to form avenues of trees along this road, but they are all of fruitless sorts, and planted along a track which is crooked, and which ought in some parts to be abandoned for better ground; these avenues are rather an impediment to improvement. This road passes over some cotton-ground, but on the whole the soil is hard and more favourable than through the corresponding part of road No. 6, except in the two stages nearest the Kistna.

No. 8. *Inland Southern Road, as far as Trichinopoly.*

Length, about 215 miles. The 12 miles to Palaveram are kept good by the Superintendent of Government Roads; the next 24 miles, by convicts from Chingleput, and for the next 56 miles, an estimate of Rs. 1,27,875. 5. 8. was sanctioned in January 1847. In March 1849, the portion of this road between Chingleput and Vikravandy was reported to be fast advancing towards completion, and estimates were submitted for continuing the line from Vikravandy to Oolundoorpett, by a new and shorter line; these estimates amounted to Rs. 99,610. 1., and provided for bridging all the rivers on the road (save the Pennaur and Mulletam, 1,410 and 900 yards respectively in breadth). Of the above amount, a portion, viz. 54,899 rupees was sanctioned to enable the earth-work and the construction of the smaller bridges and tunnels to be at once proceeded with. A bridge of seven arches of 36 feet span near Caroongoly was completed in 1849; the foundations are built on solid rock; up to the spring of the arches, the whole is built of stone taken from the ruins of the Carrongooly Fort, and laid in mortar. Six other bridges of considerable size will be built north of Vikravandy, and entirely finished in 1849; the foundations are all of stone on mortar, on rock or hard soil; the piers and superstructure are of brick-work; the cost of them will be less than the estimates. In February 1850, the Government sanctioned an estimate amounting to 1,10,488 rupees, for a bridge over the Coleroon River at Trichinopoly; a new road has been designed across the island of Soringham to it, from the end of the bridge over the Cauvery, already commenced. North of the Coleroon the road proceeds in a very winding course to the village of Munshenellow to Samaaveram, a little beyond which village it crosses two rivers, called Oopaur, that unite only a few yards to the eastward. It is proposed that a new road be made which shall avoid the winding, and cross the Oopaur Rivers below their junction, so that one bridge may serve instead of two. Between the river of Vicavandry, at 93 miles, and the Geddelum, at 115 miles from Madras, is a tract of country which is all sandy to an unexplored depth; the southern Pennaur River runs through it, and disembogues near Cuddalore; this stream occupies a shallow sandy bed; that where the road will cross it is 1,410 yards wide; in this tract, and in many other parts of the Madras Presidency, as the alluvial part of Tanjore, metalled roads would appear to be out of the question; such parts admit of very little improvement of surface, but the establishment of ferries over the wide, and of bridges over the narrow waters, would be very beneficial.

No. 9. *Proposed to branch from No. 8, and take a more easterly direction, so as to lead to the new Annicut, lately built over the Vellaur River, thence across the Coleroon River at its lower Annicut, into the Tanjore district, near Combacunum and Myaveram.*

Length, about 102 miles. Estimates for the improvements of the portions of this road aggregating Rs. 31,098. 9. 6. were sanctioned on the 5th January 1849, also the expenditure of 10,000 rupees for the preparation of materials for bridging the Coleroon River. In April 1849, an estimate amounting to Rs. 18,480. 4. was sanctioned for arching the Vellaur Annicut; also an outlay of 1,845 rupees

Presidency of
Fort St. George.

in clearing jungle, and marking out the line of road proposed between Vikravandy and the lower Coleroon Annicut.

No. 10. *Proposed Road from Madras through Chittoor, Palmanair, Balsanoodram, to Bellary.*

Length, about 309 miles. This road, as far as Wallagunuggur, follows the high Western Road, then goes to Poinay, on the bank of the river of that name, and afterwards winding among hills, goes on to Chittore, a distance of 98 miles in parts over the sandy bed of the river, in other parts over the rugged surface of rocks. A new line has been examined, which will be only 88 miles long, and of which 24 miles being on the road to Cuddapah has a double claim to attention. Beyond Chittoor, the road, as far as the border of the Cuddapah Districts a little beyond Balmanair, is very good; it comprises the Moogly Ghaut, which is very easy for carts, two bullocks drawing a load of 1,500 lbs. up it.

No. 11. *New Line from Madras by Roychotty, the Goolcherroo Pass, and Cuddapah, to Bellary.*

The estimated amount for opening the Goolcherroo Pass was Rs. 7,359. 6. The Superintendent of Roads in his report for January 1849, discussed the comparative merits of the lines of road to Cuddapah, and came to the conclusion that when the Goolcherroo Pass is opened, there will remain no doubt of the inferiority of the others. No great amount of labour or expenditure appeared requisite to make this line to Cuddapah sufficiently good for ordinary traffic. Government, in April 1849, directed that "measures be immediately adopted for improving it, and thus make, at the least cost and trouble, one good road to Cuddapah;" the road to be included among the Trunk Roads under the charge of the Superintendent.

DISTRICT ROADS.

REPORTS from Collectors on the state of the roads in the districts under the Presidency of Fort St. George, were submitted to the Court of Directors by the Government of that Presidency, under date the 6th May 1850. In reference to these reports, the Board of Revenue in the Department of Public Works remarked, that "the want of money for road improvements, once the greatest difficulty, is now lessened by the liberal regard which has been of late displayed to the subject, but the want of officers to prepare for and superintend the works, remains at present a serious and almost insuperable obstacle to efficient progress." In a minute by the Governor, it was remarked that when well prepared plans for the formation and improvement of District Branch Roads have been laid before him, he has not withheld his sanction to them; and he is still ready to consider favourably propositions of this character, and to give them his sanction when satisfied that dependance can be placed on the energy, exertions and means of the local officers to carry them into effect. It was stated, that estimates aggregating Rs. 29,535. 4. 8. had been sanctioned within the last two years; that the Board's recommendation that each district should be provided with one permanent Engineer Office was at present under consideration, and would in due course be laid before the Government of India, and that the proposition for allotting to each district an annual sum for the maintenance of Branch or District Roads, had been urged on the attention of the Court of Directors.

Ganjam.

In this District, with the exception of the Northern Trunk Road, on which a considerable sum has been expended during the last six or eight years, there is no made road; the opening of the Hurdumooloo Ghaut near the Bengal frontier, has afforded much facility to the communication with Cuttack.

Vizagapatam.

There are no made roads in this District.

*Rajahmundry.*Presidency of
Fort St. George.

The high north-road has undergone repairs under the sanction of Government, dated 8th April 1837. Estimates are in preparation for opening a road between Samulcottah and Coconada. A lattice bridge over the river between Coconada and Juggernaik, has been completed. The road between Cankarapurroo and Nursapoor has been partly made, and will shortly be completed.

Masulipatam.

The Hyderabad Road between Masulipatam and Neerdonole, and from thence towards Weyoor, has been cleared of the prickly-pear bush which covered it, and near the Nabobpettah tank it has been repaired, and two sluices have been built under it. The road from Bezwadah to Rajahmundry has been repaired through the town of Ellore. On the road from Masulipatam to Ellore, a mile of road has been raised and put in good order. What is principally required to facilitate traffic, is the bridging of small nullahs, and tunnelling watercourses, without which the lines of road must remain traversable with difficulty in dry weather, and in the rainy season impassable.

Nellore.

The repair of the roads and bridges about Nellore and Ramapatam have recently been effected. A parapet wall has been raised to a bridge at Sangum on the Dovoer Channel, a work of great utility, suggested by the Civil Engineer Department. A road has been opened to Kishnapatam, shortening the distance two miles, and will be completed in 1849; in the district west of the high North Road as far as Venecatagherry and on the north and south banks of the Pemair River, the roads are reported fair, and no impediment is experienced to the progress of bandies.

Cuddapah.

The roads in this district are in a bad state. A sum of 550 rupees per annum has been placed at the disposal of the Collector, to be expended at his discretion in the repair of such portion of the Southern Road to Chittoor, Bangalore and Wallajapett, where impediments to transit rendered such disbursements absolutely necessary. The plan of establishing tolls to compensate for the outlay incurred in proposed improvements to the internal communications of the district, is advocated.

Bellary.

The roads in this district are in a wretched state. Excellent roads, feasible not only for the common country carts, but for spring carriages, have been made in many directions throughout the Mysore country, which borders for a distance of about 200 miles on the south boundary of Bellary, but there are no corresponding roads to meet them in that district, and consequently not only the town of Bellary, but the whole district is cut off from the advantages which are offered by an open and easy communication with the Mysore territories, with the ports on the Western coast, and the whole Southern Peninsula. The lines from Bellary to Baugulpilly, being the high road to Bangalore, and the Bombay and Madras Road from Bellary to the river Toombadra, are comprised in the trunk roads under the charge of the Superintendent of Roads, as part of the road No. 10, from Bombay to Madras. The road from Bellary to Dharwar has been partially made. There are nine different lines of road, containing about 700 miles, which it is desirable should be surveyed, marked out and levelled, to be completed by degrees, at a cost estimated at between four and five lacs; there are no arched bridges in the district out of the town of Bellary, but one; there are a few stone flat bridges.

Canara.

The interior of Canara has hitherto been, to a great extent, locked up, owing to the difficult nature of the country, and it will require years of perseverance and energy before there will be any lack of objects deserving of and calling for attention. Within the last few years, large sums have been expended; the

Presidency of
Fort St. George.

amount of estimates sanctioned, and now under execution, is 1,74,540 rupees, but the greater part of these works are as yet unfinished, and the benefit which will result to the trade of the country will not be fully developed until their completion. There is, however, a very perceptible increase in the trade of most of the ghauts, partly owing to the improved state of the roads, even in their incomplete state, but perhaps fully as much to the stimulus given to trade by the removal of all restrictions on transit within the Company's territory, and to their late partial removal in the neighbouring territories of Mysore.

Canara (Sumpajee Ghaut or Military Road).

This road lies between Mercara and Mangalore, and is the only one which at present furnishes a direct and perfect communication for cart traffic between the interior of Mysore and the coast; the traffic on it has greatly increased. The principal articles of trade are salt and betel-nut exported from Canara, and cotton piece-goods, rice, dry grains, and castor-oil from the upper country; the value of imports and exports in Fusly 1257, was 3,38,412 rupees or 25,616 rupees in excess of the previous year; this road is in very good order, and will be kept up under the orders of the Superintendent of Roads.

Canara (Munjarabad Ghaut).

This ghaut is at present under construction, the estimate for it being Rs. 59,862. 14. 6.; most of the road-work has been completed, but the bridging is only partially executed, and two more seasons will be required fully to open the ghaut for cart traffic. All the tobacco for the monopoly of this district, which used before to be brought down the Kuddakul Ghaut, was last year brought by Munjarabad. The salt from Canara by this route increased from 10,888 rupees to 27,284 rupees; the total value of goods passing in Fusly 1257, was 1,54,363 rupees or 1,26,300 rupees in excess of the previous year.

Canara; Agoomby Ghaut, and communicating Lines of Road.

The passage down the mountains has now been completed for about seven years, but it is only very recently that any measures have been taken for continuing the communication with the coast, as originally designed; the trade by this ghaut shows a falling off in value in Fusly 1257, as compared with Fusly 1256, of 12,792 rupees; the cause being, that the trade was made up of more bulky and less valuable articles; the increase being in sandal-wood, rice and dry grains, and the decrease in salt, piece-goods and sundry articles. The sanction lately given for opening the communications with the river in two directions; viz. at Beyjee and Kulladi, at a cost of Rs. 4,483. 3. and Rs. 2,239. 8. respectively, are being carried out as quickly as possible, as well as the sanction for overcoming the principal obstacles on the road between this ghaut and Mangalore, at an estimated cost of 5,700 rupees.

Canara; Colour Ghaut.

The construction of this ghaut on a limited and cheap plan was sanctioned in 1846, and it has not yet been wholly completed. The Mysore authorities are fully sensible of the advantages to be expected from this work, which will open a direct communication between the heart of the Nuggur country, and the coast at Cundapoor and Byndoor; the Commissioner of Mysore has liberally contributed to advance this work, and has sanctioned the continuation of the road being made from the head of the ghaut to join other roads traversing the Nuggur country. About 10 miles of this latter portion of the road runs through the Company's territory before it reaches the Mysore country; the length of road from Wimsay on the Cundapoor River, to Jalah, at the extremity of the Hannar Magain above the ghauts, is about 30 miles, and a hope was expressed that it would be opened during season 1849-50. No regular accounts of the trade on this ghaut have hitherto been taken with respect to any article except salt, the value of which has increased during the year from 1,424 rupees to 5,916 rupees.

*Canara; Guersippah or Hossamukky Ghaut.*Presidency of
Fort St. George.

This is an important line of communication with the upper country, leading from the northern part of Mysore down to the port of Honore, to which the Guersippah River is navigable from the neighbourhood of the ancient ruined city of that name, a distance of about 18 miles; the ghaut is bad and rocky at present; the value of the trade by this ghaut has considerably more than doubled during the past year, being in Fusly 1256, 82,541 rupees, and in Fusly 1257, 1,84,650 rupees, or an increase of 1,02,109; the principal item of increase is in cotton piece-goods imported, which from some unexplained cause, but probably with the view of avoiding the Mysore chokies, appear to have been brought down into Canara by this route instead of by the Agoomby Ghaut; the increase by the one nearly corresponding with the decrease by the other; the quantity of salt exported shows an increase of about 2,500 rupees.

Canara; Neelkond Ghaut.

The trade by this ghaut greatly exceeds in value that of any of the other roads, owing to its being the route by which the principal part of the cotton is brought down from Dharwar and Bellary, for shipment to Bombay and Comptah. The value of the trade which in Fusly 1256, was 12,32,945 rupees, was in Fusly 1257, 17,62,192 rupees, or an increase of 5,29,247 rupees. The increase in cotton alone is 4,25,820 rupees, the remainder principally consisting in cotton piece-goods, cardamums and salt. The value of salt exported shows a net increase of 4,649 rupees.

Canara; Devamunni Ghaut.

This ghaut, which will almost entirely supersede the former when completed, will open a direct route for wheeled-carriages the whole way from Dharwar to Coomptah; the sanction for opening this as a first-class road, at an estimated cost of Rs. 71,729. 10. 10, was communicated last year. The present width of the road is insufficient for the transit of cotton bales. The value of the trade increased from 2,13,000 rupees, in Fusly 1256, to 2,51,000 rupees, in Fusly 1257; the increase being principally in jaggery, coarse sugar, sandal-wood, and other articles imported from the upper country.

Canara; Arbyle Ghaut.

This is the last ghaut towards the north by which any great amount of trade is carried on. Sanction was granted in 1848 for expending a sum of 5,601 rupees in improving the ghaut itself, and opening a small road from its head as far as Yellapoor, the Cusbal station of the Soopah talook, and for two branches leading from the foot of the ghaut, one to Meerjan on the Tuddri, and the other to Sanicutta, the great salt depôt on the back water. Great importance is attached to this road, both because it is the nearest from Dharwar to the coast, is very easy, has abundance of forage for cattle, and because of the excellence of the harbour at the mouth of the Tuddri. The trade by this ghaut, which in Fusly 1256 was of the value of 2,62,089 rupees, was in Fusly 1257 of the value of 3,82,913 rupees, showing an increase in the latter year of 1,20,824 rupees; the chief increase is in raw cotton, and cotton piece-goods imported.

North Arcot.

An estimate has been framed for a new line of road between Arcot and Chittoor by Bommasamoodrum, which is shorter than the present line. The plan comprises the formation of a branch from Bommasamoodrum to Arcot; and 13 miles of it, viz. from Chiitoor to Bommasamoodrum, will serve for both roads to Vellore as well as to Arcot. From Chittoor to Moogly there is a tolerable road for light traffic; the ghaut between Moogly and Palmanair is under the charge of a small permanent establishment from the head of the ghaut to the Cuddapah frontier on the route to Bellary. The road was made at the same time with the ghaut in 1841, but has fallen into bad repair; a sum has recently been sanctioned for its repair. At Palmanair the road branches off to Bangalore. The road between Pullycondah and Goriatum has been executed, but the communication with the Mysore country by that line is almost closed,

Presidency of
Fort St. George.

owing to the bad state of the Nackenry Pass. From Arcot, two important lines of road proceed southward; one, the Poloor to Trichinopoly, the other through Trivatoor and Vendarash to Cuddalore, neither of which have ever received much outlay, and there are many parts in both where they are hardly practicable in wet weather. There are two other important lines of road through this district, viz. the road from Madras to Cuddapah through Curcumbady, and that from Chittoor by Tripetty and Calastry to Vellore; neither of these appear ever to have received much expenditure, and both are represented to be much in need of repair; they are shortly to be surveyed.

Chingleput.

The Southern or Trichinopoly Road is in good order as far as Chingleput, and is being carried on to the limits of this district. The bridge over the Cullar River, running from the Callingulah of the Madrantacum Tank, which was under construction during last year, has now, with the exception of the wing-walls, been completed. The new line for the Northern Road has been laid out, and the necessary embankments, &c. are being made. The old Arcot Road *vid* Codambankum, and that leading from the Elphinstone Bridge by the coast, have been repaired, as also the two roads to Trivatore from the limits of the Presidency.

South Arcot.

The road-expenditure of this district from 1821 to 1840, although considerable, was spread over a number of small works, and the roads, with the exception of small portions, are in a ruined state; the only annual allowance at present proposed is 150 rupees for the maintenance of the Mareanum Causeway; but the expenditure on bridges and tunnels in the same period was nearly 1,50,000 rupees; and rather more than the same amount has been disbursed from 1833 to 1847, for the same purpose, from private Chuttrum and Devastanum funds.

Salem.

The roads in this district are kept in repair without expense to Government. It is worthy of remark, that in 1847 there were no less than 400 miles of road traversed by carriages without obstruction at all seasons, besides branch-roads, which only require some bridges to place them in equally good condition. The amount expended by Government from 1821 to 1840 was large, but the results were also very great. In 1848, the number of carts employed by the community exceeded that of the previous year by 80, which is attributed to extended trade from the improved state of the roads. The roads and side channels are kept in good repair, and the avenue trees are in a flourishing condition. The new road between Namoul and Moganoor is not quite completed, but is passable for carts. The line between Shenkerrydroog and Womaloor is in progress. A line is under construction between Razapoor and Attoor. The bridges which have been sanctioned have been some completed, others in progress, and many covered drains have been made through the different lines of roads.

Tanjore.

Considerable improvement has been recently effected throughout the province in the formation and opening out of roads, and the bridging of streams. The public have been greatly benefited by the completion of the repairs sanctioned in 1847 for the line between the towns of Tanjore and Tivady, Tanjore and Combaconum *vid* Pampanasem, and the chain of communication is thus rendered perfect. The new line between Titrapoondy and the sea-port of Moottoopettah has been finished, with the exception of two bridges over the Mercalcurray and Corryaur streams. The construction of the Corryaur Bridge has been recently sanctioned, and when finished, this line will be perfect. Improvements on the great road connecting Negapatam and the south and western parts of the district, towards Ceylon and Titrapoondy, have been fully executed, leaving only the bridge over the Cuddayaur to be finished, which will shortly be opened; this line will be very complete as soon as the bridges sanctioned across the Vullyaur and Taltan Choultry Cut are built. The bridges
over

over the Arsalaur and Trimalrojen having been completed, opens the line successfully from Negapatam to Myaveram, and so on to Madras. The two great roads from Trichinopoly, the one leading to Madras *via* Trivady and Combaconum, the other to Negapatam through Vellum, Tanjore and Aumpettah, have been thoroughly repaired and tunnelled, proving most beneficial to the traffic and transit of the province. The near completion of the new routes from Combaconum to Tranquebar and Hurrical, along the banks of the Veerasholagen and native Vorkal streams, offers every facility to commerce and convenience to travellers, shortening the distance between Trichinopoly and the eastern coast. The new road between the Cusbah Shealtry and Trimuloassel has been finished, and this gives a more direct communication from the sea-coast to the Great Madras Road than the old route. There are several bridges and other improvements throughout the district now in hand, which, when finished, will place the interior communication on a most efficient footing.

Presidency of
Fort St. George.

Trichinopoly.

The road from Trichinopoly to Tanjore, Negapatam, &c. will shortly be finished; that from Trichinopoly *via* Keelikoodoo to Tanjore, is impassable, and only frequented by foot passengers; that from Trichinopoly to Combaconum, Pondicherry and Madras, is much frequented, and is in good order. The whole of the line from Trichinopoly to Arrealone and Oodiarpolliem is in a bad state, particularly in the limits of Poonaloor; it is being repaired. The repair of the line from Trichinopoly to Madura and Tinnevely has been sanctioned, and will shortly be completed. The lines from Trichinopoly to Dindigal, from Trichinopoly to Sevagunge and Ramnad, and from Trichinopoly to the Tondaman's country, are in a bad state, and scarcely to be passed but by foot travellers; no repairs have ever been made to these roads at the expense of Government. A sum of money has been sanctioned for filling up deep cuts on the line from Trichinopoly to Coimbatore *via* Mangaveram and Caroor; the road-work on the line from Trichinopoly to Caroor, along the course of the River Cauvery, is being proceeded with under an estimate, amounting to Rs. 8,683. 12., sanctioned in 1846. The greater part of the line from Trichinopoly to Salam *via* Vatalaygoodooloor requires to be widened, and the whole to be extensively repaired. The alteration of the line to Bangalore *via* Manachenelloor is under consideration; the repair of the high road from Trichinopoly to Madras *via* Oottaloor, has been partly effected; the repair of further portions of the road in the same line from the north bank of the Coleroon to Poongooney Nullah, was sanctioned in November 1847, as well as that of a portion of road in the limits of Suranjam.

Coimbatore.

The road from Coimbatore to Walliaur is in urgent need of repair; the repair of the road to Seugarellore, on the line of communication to Trichinopoly, for which an estimate was sanctioned in 1848, will be executed promptly, and when completed, will be a great convenience to travellers. The trade of the district in Fusly 1257 exhibits an increase of 7,17,131 rupees over that of the previous year, which is attributed to the favourableness of the season. The cost of repairs to the roads in this district in 1846 amounted to Rs. 7,689. 7. 3., and in 1847, to Rs. 11,795. 7. 5.

Malabar.

A general Report on roads in this district was submitted to Government in 1847. The total length of the roads for which an annual grant was required was 900½ miles, and the proposed amount 12,600 rupees, or 14 rupees per mile: the amount required for disbursements on the same roads, on estimate, was Rs. 30,559. 8. The roads are, No. 1. The Coast Road, 95 miles in length. No. 2. From Trichoor to Palghaut, 24½ miles. No. 3. From Palghaut to Colongode, Palachy, 22 miles. No. 4. From Palghaut to Palachy, in Coimbatore *via* Elapully, 11 miles. No. 5. From Ellapully to Wadakenjerry, 25½ miles. No. 6. From Pal Ghaut to Manar Ghaut, 15½ miles. No. 7. From Tertallah to Cherpoolcherry, 15 miles. No. 8. From Cherpoolcherry to Vaniasolum, 3½ miles. No. 9. From Cherpoolcherry to Lackaduttah, 15½ miles. No. 10. From Tirtallah to Amgarripooram, 13½ miles. From Amgarripooram to Mana Ghaut, 20 miles. No. 12. From Amgarripooram to Terooraugaddy, 22 miles. No. 13.

Presidency of
Fort St. George.

Panoor to Tirtallah, 26 miles. No. 14. From Porpanaugaddy to Mulipooram, 18 miles. No. 15. From Mulipooram to Angaripooram, 9½ miles. No. 16. From Mulipooram to Mangerry, 5½ miles. No. 17. From Mulipooram to Coondotty, 7½ miles. No. 18. From Mungerry to Wandoor, 12 miles. No. 19. From Mungerry to Nelumboor, 7½ miles. No. 20. From Mungerry to Ariacode, 8 miles. No. 21. From Tirooraugaddy to Coondotty, 9 miles. No. 22. From Tirooraugaddy to Kacunjarry, 11 miles. No. 23. From Calicut to Palghaut *via* Angaripooram, 81½ miles. No. 24. From Calicut to Ariacode *via* Coondotty, 9 miles. No. 25. From Calicut to Ariacode direct, 25 miles. The Koondah Ghaut being daily more and more used, the road from Calicut to its foot will be made quite perfect, so as to induce Coolies and the people coming down from Ootacamund with bullocks, to take back salt and other produce from the coast. No. 26. From Ariacode to the foot of the Akoonda Ghaut, 27 miles. No. 27. From Calicut to Tambecherry, 22 miles. No. 28. From Tambercherry to Cooteaddy, 1½ miles. No. 29. From Coondatty to Tambercherry, 16 miles. No. 30. From Calicut to Cooteaddy, near Nodawnoor, 31 miles. No. 31. From Baddagherry to Cooteaddy, 22 miles. No. 32. From Cooteaddy to Tellicherry, 17 miles. No. 33. From Tellicherry to Perriah, 26 miles. No. 34. From Cannanore to Perriah, 16 miles. No. 35. From Cananore to Khealooor (included in estimate for Perambaddy Road). No. 36. From Cananore to Vythur, 35 miles. No. 37. From Cananore to Talliparamba, 9 miles. No. 38. From Noadcaim to Goodaloor, 3 miles. No. 39. From Perriah to Goodaloor, 72 miles. No. 40. From Sultau's Battery to the foot of the Tigoor Ghaut, 24 miles. No. 41. From Vytherry, top of the Tambercherry Ghaut to Maniemptoddy. No. 42. From Maniemptoddy to Bawali, 9 miles. No. 43. From Maniemptoddy to Corotha, 11 miles. No. 44. From Punnawarancottah to Corotha, 12 miles. In no instance can the original cost be ascertained.

Madura.

The road from Trichinopoly *via* Mansper to Dindigal, Ediacottah, Darapooram and Palghat, 75 miles in length, is in fair order; parts of the road from Dindigal to Palney and Palghat, 48 miles within the Madura District, are under repair. A bridge over the Shunnoogun River is much required between Palaney and Vayloor, for which an estimate will be submitted. The line from Madura by Nuttoor to Trichinopoly is here and there in bad order. The road from Trichinopoly through Madura to Palmacottah has bungalows for travellers along the whole line; much expense has been bestowed on it: it is in fair order, but repairs are required within the limits of Tellanaikenputty, for which estimates have been sanctioned. On the road from Meybor to Poodocottah and Tanjore, which is a second-class road, 29 miles in length, to Pulavessel, in the Poodocattay territory, a bridge of three arches has been recently constructed over the Oopaur River, about six miles from Meyloor; the soil is very bad in this part, and the road heavy; repairs are required in other parts of this line. The road from Puttoocattay and Arandhonge, in Tanjore, to Sahai and Cunnoozoody, in the Sheevagunga zemindary, 33 miles in length, is a road of little importance, and runs over a naturally favourable soil; as also the line from Arundhangy to Ramnad, 59 miles in length, which is but little frequented. The road from Chetto Bova Chuttram, in Tanjore, to Ramnad and Tutacorin, south of the Tanjore frontier, lies entirely in the Ramnad zemindary, and is much frequented by pilgrims to Ramiswarun, 69 miles in length to Ramnad, and is generally over firm sand, but it is raised in places, and is heavy. For the repair of the cross road from Ramnad by Moodookaolattoor to Madura, 77 miles in length, estimates are being prepared. The cross road from Ramnad by Mundahnankem to Madura, 75 miles in length, is not much frequented. The road from Trichinopoly to Shevagunge, and thence to Ramnad, 74 miles in length, in the district, is an important road, and an estimate of Rs. 6,520. 3. 3. has been submitted for its improvement. The cross road from Trichinopoly by Culliarcovil to Ramnad, 111 miles, is not much frequented. The road from Tondi by Nuthum to Dindigal, 87 miles in length, is of great importance to the salt trade, and is also a Tappaul route. A bridge and pavement have lately been completed at Ooralipillay. The line from Tondi to Madura, 66 miles in length, is also important to the salt trade, and requires repair. The route from Ranagswarum by Mahura to Dindigal, 143 miles, is the most important route, and is much out of repair, owing

to the rains of 1847, and a naturally bad soil. The road from Madura to Sayagoody, in Ramnad, and thence to Tutycolin, 61 miles in length, is of some importance to the cotton trade; scarcely any money has ever been expended on its repair. Cross road from near Palaputty to Pulknooth, 24 miles in length, is a route much frequented by the cotton traders, and by pilgrims to Palaney; it is under repairs which, when completed, it will be in moderately good order. The road from beyond Neltacolay by Perea Colum to Goodaloor, at the end of the Cumboon Valley, 72 miles, is a most important road, by which the produce of the Dindigal or Cumboon Valley is conveyed; it requires raising and graveling in some places, and the construction of one bridge at Pereacolom, and two others between Battagootah and Nellacottah, for which estimates will shortly be prepared. The road from Dindigal to Nellacotlay is not a very important road. On the line from Madura to Audiputty and Chinnamanaikoor, 59 miles, the pass at Audiputty will be repaired; between Audiputty and Vellalonaddy, a bridge is urgently required over a jungle stream; in other respects, the road is in fair order. Road from Devadhanaputty or Pereacolum, across the Varahara or Palaney Hills, 66 miles; there are four passes from the eastern side of these hills, one very steep, but comparatively short, from Pereacolum to Shembaganoor; another called the Adakun Pass, very steep and bad, but direct to the Godowns at Seeradunkannel; a third called the Coopum Pass, from Valcat, 6 miles from Pereacolum, and a fourth from Devadhanaputty. On the road from Meyloor to Heerochoole, in Ramnad, 37 miles in length, the approaches to the bridge over the Krithamanuddy River, near Hurpooanam, are under construction, and a bridge is necessary over the Oopar Oday, at the north entrance of the Thiroorador; the road requires earth repair. The route from Strevallepootoor, in the Tinnevelly district, to Pulchamalacotay Chuttram, on the route to Pulknooth and Palavey, 49 miles, in Madura, is one on which there is considerable traffic, and it requires repair; on both sides of the village of Ooshempetty it is nearly impassable after rain. The line from Meyloor, through Shevagunga and Ramnad, to Cadoogochemthoo, 67 miles, is considered not to be of very great importance.

Tinnevelly.

On the road from Madras to Quilon *via* Streevellypootoor, Tencausay and Arambooly, distance 138½ miles; a bridge is being built at Lmboor. The construction of an improved road from Palamcottah to Tentacorin will be undertaken; the repairs sanctioned to the line branching from this, and leading to Coilpatam salt-pan are still under progress. The repairs to the minor roads do not require particular notice from their importance or their extent of repair; every effort has been made to improve the communications generally.

Kurnool.

There are three principal roads in the district; viz., from Kurnool to Bellary *via* Coadmoor; that from Kurnool to Ghooty *via* Dhona, and that from Kurnool to Cuddapah, through the Kusbah towns Nundial and Chagulmurg; the soil prevalent throughout these lines is generally rich black cotton-ground, in which it would be impracticable to form a good metalled trunk road, unless at an outlay far exceeding the advantages likely to be derived from such a work. During the dry months of the year, these roads are smooth, and very easy of passage for carts of every description; there are, however, a few nullahs which it would be advantageous to have bridged. A large bridge is in course of construction at Candurabad. The road from Kurnool to Pannen, the Cusbah town of the Panneen talook, is interrupted by a short difficult pass near the village Timmarazupully; this and the opening of the pass through the Nulla Mulla range of hills, into the subdivision of the Cuddapah collectorate, should be opened sufficiently for cart traffic.

166 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of Fort St. George. STATEMENT of CHARGES incurred in the Repair and Construction of WORKS connected with IRRIGATION, and on ROADS, BRIDGES, and GHATS, in the Collectorates under the Presidency of Fort St. George, for the Years 1838 to 1847 inclusive.

Y E A R	On Works of Irrigation.		On Roads, Bridges and Ghats.		TOTAL.	
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
1838 - - - -	5,96,668	8 6	4,00,665	14 6	9,97,334	7 -
1839 - - - -	5,14,818	- 6	3,01,558	12 6	8,16,377	- 2
1840 - - - -	6,25,013	3 10	4,19,412	6 3	10,44,425	10 1
1841 - - - -	5,69,937	15 5	2,69,855	2 10	8,39,793	2 3
1842 - - - -	5,30,845	7 11	4,56,532	8 7	9,87,378	- 6
1843 - - - -	3,98,016	8 8	1,43,294	9 2	5,41,311	1 10
1844 - - - -	6,09,687	13 2	1,46,034	13 6	7,55,722	10 8
1845 - - - -	5,80,631	8 2	1,16,670	5 10	6,97,301	14 -
1846 - - - -	5,65,186	14 10	1,18,502	14 10	6,83,689	13 8
1847 - - - -	7,85,630	13 4	1,52,222	6 8	9,37,853	4 -
TOTAL - - -	57,26,436	14 4	25,24,750	1 10	82,51,187	- 2

Presidency of Bombay.

RETURN FOR THE PRESIDENCY OF BOMBAY.

[A Return to an Order of the Honourable The House of Commons, dated the 20th December 1847, was presented on the 7th February 1848, which Return contained Copy of the Annual Reports of the Superintendent of Roads and Tanks within the Presidency of Bombay, from the first (viz: that for Season 1835-36) to the latest received to that time, or to Season 1844-45, inclusive. The Reports for Seasons 1845-46 and 1846-47 are now furnished.]

ANNUAL REPORT of the ROAD and TANK DEPARTMENT at Bombay, for the Official Year 1845-46, dated 29 July 1846.

No. 1,073, of 1846.—General Department.

(V. 6,504.)

To E. H. Townsend, Esquire, Revenue Commissioner, Southern Division, Poonah.

Sir,

Handing up report. Expenditure for the past year.

I HAVE the honour to submit the following Report of the proceedings of the Road and Tank Department for the official year which terminated on the 30th April last, with a statement appended of the expenditure incurred in the construction and repair of Public Works, and a memorandum of the comparative cost of superintendence, whence it will be seen that the entire outlay for the past season amounts to (1,96,357) one hundred and ninety-six thousand three hundred and fifty-seven rupees, and the average charge for superintendence (26½) twenty-six and three-quarters rupees per cent.

Working of the department.

2. Since the transmission of my report of last year, opportunities have not been wanting of enabling me to judge of the correctness or otherwise of the opinions therein expressed on the subject of the division of duties of the First and Second Assistants of the department, and I may venture to affirm that, repeatedly as the capabilities of many of the Second Assistants have been tested, in estimating, and occasionally even in designing, in no single instance has a case of incompetency been brought to light. Should this assertion appear to stand in need of confirmation, I think I might with success respectfully appeal to the Military Board, whose opportunities of judging of the comparative merits of the Second Assistants' performances, are as superior to mine as would be the weight of their decision.

3. The

3. The merit of the introduction of measures which have led to this degree of proficiency on the part of the Assistants supplied from the Artillery or Infantry regiments, of course rests with my predecessor, for I consider it to be almost entirely owing to the examination which candidates are subjected to, previous to admission into the department, that their general efficiency is so far superior to what it used formerly to be. I am firmly impressed with the belief, however, that sufficient stress has not been assigned in the prescribed scale of qualifications to an acquirement, which experience has taught me to believe is an all-important one, either in this or any other branch of the Engineer Department—I mean the art of drawing. An officer who possesses not this accomplishment, finds the duties he is called on to perform irksome and distasteful, and is incapable, moreover, however talented he may be in other respects, of rendering such service as must occasionally be expected from him.

Qualifications of Assistants; drawing, an essential one.

4. Inefficient as the subordinate ranks of the department are, both numerically and professionally, the qualification I have first alluded to is the more essentially necessary on the part of the Assistants themselves; and if the experience of several years entitles my opinion to any weight, precautions will no longer be neglected of ensuring, in all future candidates for engineer employment, a certain standard of proficiency in civil, military and plan drawing.

Proficiency in drawing ought to be provided for.

5. But if drawing is an acquirement that cannot be dispensed with in the in-door duties of an Assistant, so also is bodily activity as absolute a *sine qua non* in the proper performance of his out-door business. The first may always be ensured, the latter can only be hoped for. But supposing both qualifications to exist in the same individual, there remains but to be added a correct knowledge of arithmetic, levelling and surveying, together with a strong taste for his duty, to render the possessor perfect in his sphere.

Description of perfect Assistant.

6. The changes which have taken place amongst the First and Second Assistants of the department since the date of my last Report are as follows:—Captain Ash was compelled, on account of ill health, to take his departure for Europe early in August last, and was succeeded in his First Assistantship by Captain Jacob, of the Engineers, in the latter end of September; Lieutenant Bruce, who acquitted himself with some credit as a First Assistant before the Examination Committee assembled in September last, was once more placed at the disposal of his Excellency the Commander-in-Chief for regimental duty, in January of the present year, and Lieutenant North, of the Engineers, in the following month was placed in temporary charge of his office by Government, and conducted the duties thereof till Lieutenant Bruce's return, in May last. Captain Owen, who also passed his examination last year as Second Assistant, was absent from the department for the space of four months on regimental duty in Scinde, but no officer was appointed to perform his duties, and they consequently fell considerably into arrears. Lieutenant Dickinson, of the Engineers, having received the appointment of Executive Engineer at Ahmedabad, quitted the Road and Tank Department on the 1st June last; and Lieutenant Scott, of the same corps, succeeded to the situation of Second Assistant at Tannah, and assumed charge of the office on the 20th idem. In all other respects the officers of the department retain the position they respectively held at the date of my last Report.

Changes and appointments.

7. I now proceed to a description of the performances of the First Assistants during the past year, taking up the narrative of their proceedings from the day on which my last account was submitted, at which period Captain Ash was engaged, as therein stated, in preparing plans and estimates for the works required on the two proposed junction lines between the Akoordee new road and the main road to Seroor. The same duty furnished him with employment for the short time that he subsequently remained, and on his departure the designs were completed and the estimates proceeded with by myself, till Captain Jacob's joining enabled me to transfer the completion of the latter task to him. The surveys, sections, designs and estimates connected with these two lines of junction were accordingly received in this office on the 22d November last, and were transmitted on the 27th idem to the Military Board, with a letter from myself, deferentially attempting to prove that the construction of neither of the lines would be absolutely incumbent on the completion of the Akoordee new road, a work which I looked upon and still consider as one of downright

Performance of the First Assistants, Captain Ash and Captain Jacob. Akoordee new road and junction lines.

Presidency of
Bombay.

necessity, and which ought not to be deferred for a moment longer than can be helped. The estimated cost of the longer of the two lines of junction, by Kullus and Kessurwady, amounted to (55,099) fifty-five thousand and ninety-nine rupees, while that of the shorter, by the Daporee and Holkar bridges, amounted to (7,877) seven thousand eight hundred and twenty-seven rupees.

Captain Jacob; new
terminus to Mail
Road.

8. The duty on which Captain Jacob has been since employed, by order of the Military Board, and with the approval of Government, is one to which a good deal of public interest attaches, and it is fortunate, therefore, that it has fallen into such hands. It consists of the survey of the proposed new terminus to the Bombay and Poonah Mail Road on Hog Island, and of the country through which the connecting line will pass, together with the projection of the road, and of all the works that will be required thereon, a distance which is slightly in excess of 12 miles. The survey has been finished, the line laid down, the works designed and partly estimated for, and the whole of the papers connected with the subject will be laid before the Military Board before the close of the monsoon.

Lieutenant Bruce;
Thul Ghaut Road,
Wagoolto new line.

9. The account which I gave last year of Lieutenant Bruce's performances was unsatisfactory; not that any great amount of blame attached to that officer, but that circumstances, as detailed in the report, had conspired to prevent his making himself so useful as his capabilities and acquirements would otherwise have enabled him to be. It appears, that at the date of my report Lieutenant Bruce had made but little progress with the survey below the Thul Ghaut, beyond commencing the projection of a new line of road, and taking a set of levels on the old one, and he was unable to take any further steps towards the completion of that performance before he was temporarily removed for regimental duty. He had contrived, however, previous to his departure, to finish the survey of the proposed new line between Comah and Wangoollee, and to prepare designs for the several bridges and other works required thereon, and he is now engaged in perfecting the plans and in framing estimates of the cost. The whole of the papers relating to the construction of this proposed new line will probably be submitted before the determination of the rains.

Lieutenant North;
Thul Ghaut Road and
survey of new line.

10. The extent of Lieutenant North's performances during the time that he held charge of Lieutenant Bruce's office is as follows: He surveyed the hilly and difficult country lying between Kussara and Kurdee, below the Thul Ghaut, and selected and took the levels of a line of road between those places, so far superior to the present one, that anticipations have been formed of the slope in no instance exceeding 1 in 20. Whether these expectations are to be realized or not, will be shortly known, as Lieutenant North, though in possession of his appointment at Belgaum as Executive Engineer, has been permitted by the Military Board to plot and prepare a report on the work, on which he was lately engaged. To aid him in this duty, he has been allowed the services of one of Lieutenant Bruce's Assistant Surveyors, the only one indeed whose services were worth having, as the deficiency in the most essential qualifications of the remaining one incapacitate him from rendering any effectual assistance in the most ordinary of engineering duties.

Commencement of
details of work per-
formed by the De-
partment.

11. I now come to the commencement of my description of the out-door labours of the department, and in the details that I am about to offer for your consideration, will still adhere, for the sake of uniformity, to the routine that has been hitherto observed in the manner of arranging the various subjects. First, therefore,

I. The Agra Road.

State of repair and
expenditure.

12. From Kussowlee to Bhewady, from the latter place to Purgah, and from thence to Shapoor, this road, considering that it is not metalled, may be characterized as good; and both from its appearance as well as from the regularity of the moorum heaps, I should say that the repairs have been very carefully attended to by Lieutenant Dickinson, since he has been in charge of this portion of the line. From the last-mentioned place to Kurdee, owing to the undulating nature of the ground, the state of the road can only be described as tolerable, and from thence to Kussara, at the foot of the ghaut, there are so many steep descents and acclivities,

activities, that it would be beyond the power of the most scientific road-way engineer to keep it, exposed as it is to a heavy traffic, in anything like a decent state of repair, even with a far greater expenditure than is at present allowed. The outlay on the periodical repairs for the past season, between Colsette Bunda and the top of the ghaut, amounted altogether to 9,262 rupees, (nine thousand two hundred and sixty-two), thus averaging 159 rupees per mile.

Presidency of
Bombay.

13. Having mentioned Colsette Bunda, it may not be out of place to inform you, that the ferry there established, appears to have been for some time past in an inefficient state, though there are few situations on this side of India where a safe and expeditious transit, both for passengers and merchandize, would be more desirable. The circumstance, however, has been duly represented, and Government have sanctioned a new raft for the ferry, which is now under construction in the dock-yard, and which, with the one already plying, and another that has been lately transferred from between Mahim and Bandora, will, probably, suffice for present wants.

Inefficient state of
Colsette Ferry
rectified.

14. What effect the proposed railroad, when completed, may have in diminishing the traffic on this line, it is difficult to say; but were it not for this doubtful point, it would be well worth the consideration of Government, whether a steam ferry, similar to that which plies between Gosport and Portsmouth, might not be most advantageously substituted at Colsette for the present establishment of decked double boats. A locality better adapted for the purpose could not possibly be desired, and I should conceive that the expense of fuel and maintenance could hardly exceed the cost of keeping in an efficient state the rafts now in use, with crews of the needful strength.

Steam Ferry sug-
gested at Colsette.

15. The want of water at Kussara and on the ghaut still furnishes cause for complaints, though during the past season the evil was unquestionably enhanced to a very great degree by the unfavourableness of the preceding monsoon. The well, which was deepened and enlarged in May of last year, at the village just named, and which is now being completed, was full nearly to the brim, notwithstanding the scantiness of the rains, when I saw it in December last, but great as was the increase, the supply was insufficient, and failed towards the end of April.

Scarcity of water at
Kussara.

16. From the account which I gave in my last year's Report of the progress of the experimental mile on the Thul Ghaut, no expectations will have been formed that are likely to be disappointed, when I state, that it is now only approaching completion, and that it will not be available to the public till after the present monsoon. This piece of work, it will be remembered, was commenced in March 1843, and I need hardly say, has turned out a far more laborious undertaking than Major Peat could have anticipated, when he predicted that it would be open to traffic by the close of the year following. That officer, however, at the period of holding out these hopes, did not contemplate the construction of a parapet till the whole of the ghaut should have been in other respects completed, whereas, for unanswerable reasons, it has been judged advisable to proceed with the parapet simultaneously with the rest, and the consequence is, that a well-built wall, three feet in height, and 4,445 feet in length, has most materially swelled the amount of Lieutenant Chapman's past year's labours on the ghaut.

The Ghaut; experi-
mental portion
when likely to be
opened; cause of
delay.

17. With the view of preventing the ill effects and inconvenience which would have been occasioned on the completion of the experimental mile, by the disbanding of the work-people and the temporary cessation of further operations, Government were pleased, under date the 10th November last, to authorize another portion of the line being taken in hand, and the lower portion of the ghaut, which connects the experimental mile with the road below, was accordingly commenced in the month of December following. The length of this portion does not exceed 1,837 feet, and as the progress of the works has advanced with greater comparative celerity than was the case on the former piece, it is expected that, with the exception of the parapet, it will be so far completed by the close of the year, that there will be no obstacle to its being thrown open to the public in conjunction with the upper portion, thus forming a clear line of communication of very nearly a mile and a half in length, between two points on the old road.

Reasons for com-
mencing new por-
tions; progress.

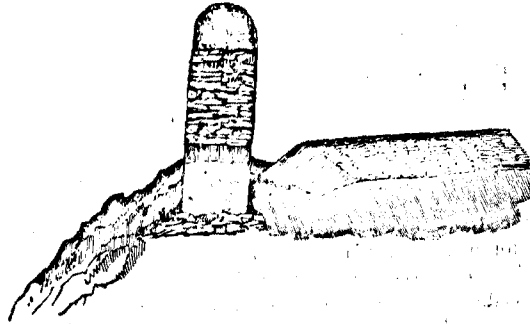
18. Having alluded to the parapet as a work that considerably tends to retard the completion of the road over the ghaut, it is now necessary I should mention that it will also add most materially to the cost of the undertaking, for lying, as the greater part of the line does, along the sides of steep hills, accidents must of necessity

Parapet; expense,
description.

170 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

necessity be guarded against by some protection on the outer edge of the road-way, and it has been found, that the entire distance requiring to be so defended, does not fall short of three miles four furlongs and twenty-five yards. To have made this protection of anything but of good and substantial masonry, would have been imprudent, and calculated to lead to much future trouble and expense. It has, therefore, been constructed of rubble and choonam, with a stone coping roughly cut, in the manner of the subjoined sketch.



Difficulties to be
contended against on
the Ghaut.

19. Unusually tardy as the progress of the works has been on the ghaut, there have yet been many causes for such a circumstance, which may almost be deemed peculiar to the place; or which, at all events, if felt in other localities, would have had a less painful influence. One peculiarity for instance is the position of the work, far removed from any large town, and in a remarkably thinly populated country, where work-people and labourers are not procured with that facility they are in other places. Another difficulty that has to be encountered is the climate, which is notoriously unhealthy, and deservedly shunned. A third objection is the scarcity of water, the supply of which, towards the close of the hot season, occasionally fails *in toto*, and the neighbourhood is, in consequence, partially deserted. With the exception of stone, building materials are also expensive, and have to be brought from a distance, so that all things considered, the Thul Ghaut may be deemed a very ineligible site for engineering operations.

Ghaut estimates.

20. The estimate for the unfinished portion of the ghaut, or that part which lies above the experimental mile, a distance of 20,164 running feet, was received from Lieutenant Chapman on the 18th ultimo, accompanied by plans of all the works required, and is now in course of examination by myself.

Egutpooree to Chandore; state and expenditure.

21. From Egutpooree at the top of the ghaut to Nassick, the road is in much the same state, generally speaking, as it was last year, though some places appear to have had a greater amount of attention bestowed on them than others; on the whole, however, it may be said to have undergone some improvement, and to be in very fair order. The remainder of the road under Lieutenant Chapman's charge between Nassick and Chandore has also benefited in a certain degree by the care it has met with, but there is still great room for improvement, and it will require more than one favourable season, joined to careful superintendence, to restore it to tolerable order. The expenditure on this road for the past year, from the Thul to the foot of the Chandore Ghaut, amounted to 12,456 rupees, or an average of 155 rupees per mile.

Demolition of the
Undwell Lattice
Bridge.

22. No offer having been received for the purchase of the materials of the Undwell Lattice Bridge, the superstructure of which during the past year had become still more unsafe than previously reported, the frame-work has been carefully taken down under the authority of Government, dated 15th July last, and portions of the wood-work applied to the construction of the doors and windows of a regimental hospital now in progress at Nassick; the remainder of the wood will be carefully expended in the construction of a railing for the Nassurdy causeway, of the present want of which complaints have been frequently made.

Three streams require bridging.

23. There are three small rivers on the portion of the line last described, which on account of their depth, and the consequent hindrance offered to the passage of the dawk, should be permanently bridged; these streams are met with at Argaum, Wagur and Pimplegaum, and at the two former places might be bridged at comparatively small cost.

24. The

24. The breast-walls on the Chandore Ghaut, which were reported last year in some instances to have bulged, have not yet been reconstructed, nor indeed has the estimate of the probable cost been, up to the present moment, received, in consequence of the greater portion of Lieutenant Chapman's time having been engrossed in the more difficult and important duty of attending to the works on the Thull Ghaut; as the symptoms of weakness above alluded to, however, have neither extended themselves, nor become more manifest, the delay hitherto has been attended with no unpleasant consequences.

Presidency of
Bombay.
Chandore Ghaut.

II. *Mail Road from Panwell to Poonah.*

25. Captain Pruen still remains in charge of that portion between Panwell and the foot of the Bore Ghaut, and Lieutenant Cowper of the remainder, as far as Poonah; the expenditure for the past season under the former officer, amounts only to 4,942 rupees, or something more than 2,048 rupees below the estimated cost; but as this is attributable to the circumstance of labourers having been latterly quite unprocurable in consequence of the general prevalence of cholera along the line, it is not to be inferred that the whole of this balance will lapse to Government; for a great deficiency of metal has yet to be prepared out of last year's funds. The expenditure under the latter officer has been the same as during the preceding year, and amounts therefore to 18,200 rupees, the work having been performed by contract under the same engagement that was entered into on the 1st May 1844.

Expenditure.

26. As the stipulated period of the contractor's responsibility will have expired on the 30th April 1847, it may not be amiss to make you acquainted with the manner in which his agreement has been hitherto fulfilled, though as I shall have occasion, before I conclude this Report, to bring more strikingly to your notice the merits and defects of the contract system generally, as it exists in the Deccan, I will refrain at present from troubling you with anything beyond a few facts connected with the repair of the Mail Road, which have fallen under my own observation.

Contract for road
repairs.

27. The road itself between Poonah and Khandalla is for the most part in good order, and it might at first sight be supposed, therefore, that the contractor was entitled to some credit; but a more intimate acquaintance with the merits of the case suffices to prove that his conduct is more deserving of censure than applause, and that but for the exertions of the officer in charge, the state of the road, so far from being satisfactory, would be quite the reverse; the contractor indeed has got so many works of magnitude to attend to at Poonah, that were he the most energetic and enterprising native in the country, and even did he reckon amongst his qualifications the knowledge and skill of a civil engineer and architect, his effectually attending to the whole of those works would yet be beyond the bounds of possibility; that he should neglect the roads, therefore, for the repair of which he is responsible, is a sequence that might reasonably have been expected, and accordingly it will be found that Lieutenant Cowper has had the greatest amount of trouble in inducing him to perform his work at the appointed seasons, and has even been repeatedly compelled to hire the requisite number of labourers, and complete a portion of it himself. The operation of rolling, of the necessity of which the more I see the more do I feel convinced has been amongst other things most culpably neglected; and all menaces and warnings have been attended with but little beneficial effect; were the contractor at liberty however to devote a small portion of his time to the state of the roads entrusted to his management, I doubt not that he would show a greater desire than he now does to make them as perfect as his own interests would permit; but under the circumstances above described, his will to execute appears to be on a par with his knowledge of what is required.

State of the road;
contractor's delin-
quencies.

28. Having alluded to the necessity for the use of rollers on the Mail Road, I will now endeavour to point out how it happens that such necessity should exist, when, in England, probably no such precautions are found to be required for the due consolidation of the metal. The season of repair in this country is unavoidably confined to the four monsoon months, during which period traffic may be said to have come to a comparative stand-still, if not to have entirely ceased; and the surface of the road is completely retailed therefore at a time when there is no possibility of ensuring the binding of the metal except by means of rollers. The mail carts, and the few other carts and conveyances which frequent the road, closely follow the track which may have been formed by the transit of

Causes of the ne-
cessity for rolling
system of repair

Presidency of
Bombay.

the first pair of wheels after the renewal of the surface, and the consequence is, that if rolling should be neglected, these tracks or ruts are the only places where the metal will be found to have amalgamated, or where the road is traversable on the opening of the season; when that season arrives, it is then too late to attempt to consolidate the loose metal with which the road is strewed; all the traffic in India would not effect it properly, and hitherto it has consequently been the custom to remove a great portion of all such material, and *once* more pile it for future use, or possibly even for a repetition of the process just described, at the road-side; with such a system, it is not surprising that the roads should not be in first-rate order, and by avoiding it in future, I really do not see why a very palpable improvement should not be effected. My impression is, that metal once laid down should not be removed, if by any possibility it can be worked into the surface of the road, and the only means by which this object can be accomplished in this country, however opposite may be the necessities of the case at home, is, as I have above shown, by rolling.

Charge for rolling.

29. The rate for rolling, which amounts to 10 per cent. on the estimate, has been complained of as insufficient, and possibly such may be the case; but I see no necessity for its increase until actual experiment shall have proved beyond a doubt, that without a further allowance the operation cannot be effectually performed. At present, as far as my knowledge extends, the contractor has never attempted to test its inadequacy, much less to prove the fact.

Omission of upwards
of nine miles of Mail
Road in annual repair
estimates of current
year.

30. An omission has been made in the annual estimates for the current season, of all provision for remetalling that portion of the Mail Road which lies between Dapooree Bridge and the western point of a junction of the new Akoordie line, a distance of upwards of nine miles. This reduction was resorted to in consequence of the expressed opinion of the Honourable the Governor in Council, that the yearly process of remetalling was not necessarily required throughout the whole length and breadth of the road, and that it would be sufficient to relay those portions only where depressions and inequalities were observable; the piece selected to experimentalize on, was in fair order, and in good form, and exposed to far less traffic than any other portion of the Mail Road, and even should the neglect of one season's repair prove injurious to its state of efficiency, it will be matter of little moment, as there is every prospect of its abandonment on the completion of the Akoordie new line. Whether the mode of repair recommended by his Honor in Council can be systematically adopted, remains to be seen; but there would be a much greater prospect of success than there now appears to be, were the metal applied invariably of the first quality, and well consolidated.

Quality of the metal,
occasional inferiority,
probable
cause.

31. The inferiority of the metal used on this line has formed a subject of complaint in former Reports from this department by both of the officers who have preceded me, and a few visits to Khandalla in the rains have also led me to a somewhat similar, though to a less general conviction. The metal, though rarely if ever the best the country might afford, is ordinarily very passable, it is seldom that really objectionable material is to be observed, and the instances that occur are confined chiefly to the neighbourhood of the ghauts, where the rocky material which is used, though to an inexperienced eye well enough adapted for the purpose, is yet, after a few days' exposure to a heavy soaking rain, reduced to a substance of the consistency of mud, on being crushed by the wheels of carts and carriages. This, no doubt, is owing to its being in the first stage of decomposition at the time of being quarried, and consequently liable to be speedily dissolved on being subjected to the same trial that metal in the neighbourhood of the ghauts usually is. As the material alluded to, however, is easily detected by its porous appearance and want of uniformity in colour, precautions may possibly be taken to guard against its future use on the Mail Road.

Drains and culverts
required on Mail
Road.

32. Having observed on the occasions just referred to of inspecting road, that there were many streams and watercourses requiring to be bridged or drained, which now cross the line with no inconsiderable force and volume, to the injury of the road and occasionally to the obstruction of the post, a representation was made on the subject to the Military Board, and plans and estimates have consequently been called for. These are under preparation by Lieutenant Cowper, and I trust will be, ere long, ready for transmission.

Panwell Bunder.

33. The raising of the platform on which the custom-house of Panwell is situated, together with the reconstruction of masonry revetments, were sanctioned by

by Government to be performed by contract under date the 2d January last, at a cost of 5,725 rupees, but as the stipulated period was five months, and the contractor did not conceive himself capable of completing the work before the setting in of the monsoon, its commencement has been postponed till the opening of the season.

Presidency of
Bombay.

34. The few additions which were required to the tank at Khandalla to render it efficient and complete, have been duly effected by Lieutenant Cowper, at a cost of 1,421 rupees. The retaining wall has been raised to a uniform height, and a coping added of three feet broad; coping stones of angular formation have also been affixed to the tops of the well walls, so as to prevent people washing in the water they contain. The whole of the stone-work is very good, and I should say unprecedentedly cheap, but the choonam, like almost all choonam in the Deccan, is of inferior quality.

Tank at Khandalla.

35. A small double tiled building of stone and choonam masonry has also been erected at Khandalla, at a cost of 286 rupees, to answer the purpose of a post-office, the outlay having exceeded the estimate by 30 rupees, chiefly in consequence of teak having been used instead of jungle-wood in the construction of the doors and windows.

Post-office at Khandalla.

36. The only other works which have been constructed or improved during the past season on this line are a traveller's bungalow and a public well at Karlee; the former entirely new, at a cost, including out-houses, of 2,289 rupees, and the latter a complete re-construction of cut stone masonry, at an expenditure of 770 rupees.

New traveller's
Bungalow, and Well
at Karlee.

III. Road between Poonah and Nuggur.

37. This line still continues under charge of Mr. Scott, and has been repaired during the past season at an expenditure of 7,878 rupees, or at an average of 104 rupees per mile. Several rollers having been constructed out of the amount of last year's sanction, and carefully used, an improvement has been effected in portions of the line, but as the fall of rain during last monsoon was extremely scant, the operation was not attended with such good effects as would have been the case in a more favourable season. The little rain that did fall too, was not sufficiently taken advantage of, in consequence of the material of the roadway not having been renewed in time, but steps have been resorted to to ensure the moorum being spread during the present season, as well as future ones, early enough to derive the full benefit of the brunt of the monsoon, whatever the fall of rain may amount to.

State and expenditure; relaying and rolling.

38. Bridges were sanctioned by Government under date the 30th January last for the Roudeypore and Wasudey Nullahs, the streams of which have hitherto, at flood, invariably impeded the passage of the dawk, occasionally for as much as three hours. They are both to be built by contract, on designs by Major Peat, the former at a cost of 6,995 rupees, and the latter at a cost of 4,305 rupees.

Two new bridges.

39. Wire ropes have been substituted this year at the Kore Gaum Flying Bridges, for the hempen hawsers commonly in use, and, as far as I am at present able to say, the alteration appears likely to prove a very judicious one, both in regard to economy and expediency. The only perceptible objection they are liable to, is the circumstance of their wearing out the traversing blocks, though the sheaves of the latter are made of brass. I am now engaged, however, in experimentalizing on the merits of a contrivance which appears to me well suited to answer as a substitute for the block hitherto in use, and it is not impossible that before the close of the rains, I may have it in my power to report on its adaptation to the desired purpose.

Wire ropes for flying bridges in lieu of hempen hawsers.

40. As in sinking the masonry cylinder in the bed of the Seena River at Nuggur, under the idea that such would be the best method of forming the foundations of the proposed bridge, it was ascertained that at the depth of about 12 feet a rocky stratum is met with, it has been decided by the Military Board that the foundations may be constructed without difficulty in the usual manner, and further experiments have been accordingly discontinued. Feeling satisfied, however, that no reliance could be placed on the section of the river received from the Executive Engineer's Office at Nuggur, I have directed Mr. Scott, of this Department, to take fresh levels at the earliest opportunity, and as soon as that

Bridging the Seena river, experimental cylinders.

Presidency of
Bombay.

duty shall have been performed, the bridge will be designed and estimated for without delay.

New line between
Poonah and Wau-
goolie.

41. The new line between Poonah and Waugoolie, which I have already stated is now being estimated for by Lieutenant Bruce, will be so much more direct than, and at the same time so superior to the present one, that it can hardly be doubted the improvement will be eventually carried into effect. When this shall have come to pass, the present circuitous route by Holkar's Bridge and Soogaum, will be entirely forsaken as far as traffic and communication between Poonah and Nuggur are concerned, as well during the rains as in the fair season; and it is by no means unlikely that the Poonah route may be preferred, both in a commercial and a military point of view, even between Bombay and Nuggur, for the increase in distance does not exceed a couple of miles, while the road will be incomparably easier. Should this view of the case appear to merit consideration, it follows that the necessity of a junction line between the new Akoordie Road and the road to Seroor, will be more than problematical, if not clearly refutable.

IV. Road between Poonah and Neera Bridge.

Present state and
expenditure.

42. This road, which is still under charge of Mr. Scott, has been repaired during the past year at an expense of 2,471 rupees, or an average cost per mile of 60 rupees, out of which a few additional rollers have been supplied, and the state of the road somewhat improved. Deficiency of rain, however, has militated here, as elsewhere, against the rollers being used with that effect which was anticipated.

Neera Bridge.

43. But little injury was sustained by the Neera Bridge during last monsoon, and such repairs as became necessary were effected for a few rupees. The annual repairs for the past season have been performed at an expenditure of 20 rupees, or thereabouts.

V. Road between Nagotua and Mahableshtar.

Expenditure.
Remarks on present
state.

44. This road, which is under charge of Captain Pruen, has been repaired by contract at an expense of 5,025 rupees, or at an average cost per mile of 70 rupees. The portion which lies between the foot of the ghaut and Mhar is in fair order, though in the total absence of cart traffic, it would not be unreasonable to entertain expectations of considerable improvement. The remainder of this line at the time of my inspecting it, had not been repaired, and it appeared to me doubtful whether the contractor had been so mindful of the interests of Government as I had been induced to suppose; steps have been taken, however, to ensure the completion of the repairs for the present season at an earlier date than those of last year, and due attention will also be paid to the shape and convexity of the road.

45. A new bungalow has been built for the use of travellers at the village of Parr, with out-offices attached, at a contract cost of 2,000 rupees. The accommodation, though not very extensive, is yet ample for all purposes in that locality.

Chowdar Tank,
Mhar.

46. The clearing out of the Chowdar Tank, which the inhabitants of Mhar represented themselves to be so greatly interested in, was not commenced this year in consequence of the prevalence of cholera during the working season, and the impossibility of procuring labourers in sufficient numbers to complete the work before the rains; and as this malady appears to be of annual occurrence in that neighbourhood, it is to be apprehended that the work may have been indefinitely postponed. The inhabitants, it will be recollected, were to have been responsible for the sum of 2,000 rupees, Government paying the remainder of the amount required, but as in realizing the subscriptions, there turned out to be a defalcation on the part of the Mussulman population of 497 rupees, which has been since made good by Government, the whole amount to come from the treasury will be 4,544 rupees.

VI. Cross Roads in the Poonah Collectorate.

Expenditure. Con-
tract for Narraing-
aum Road.

47. The roads which are included under this heading have been repaired during the past season at an aggregate expenditure of 4,602 rupees. The principal line under this denomination is the Narraingaum Road, the repairs to which

which have cost about 65 rupees per mile; but as they are entrusted to the management of the same contractor who has been unfavourably mentioned in a previous section of this Report, it is not to be wondered at that they have been less carefully attended to than could have been desired. The moorum appears to be generally of fair quality, and the traffic is certainly light; under these circumstances, therefore, the road ought unquestionably to be in good order, which is not invariably the case.

Presidency of
Bombay.

VII. Cross Roads in the Nuggur Collectorate.

48. The repairs to these roads, which are under charge of Mr. Scott, have been made during the past season at an expenditure of 719 rupees, and the roads themselves are represented to be in tolerable state.

Expenditure.
Present state.

VIII. Cross Roads in the Nassick Sub-Collectorate.

49. The outlay on these roads for the past season amounts to 1,580 rupees, and the dips on the Sinnur Road, which is the principal one under the above heading, have been paved at an expense of 861 rupees. Had the traffic been sufficient to have justified the recommendation, I should have most strongly advised the erection of bridges in place of constructing dips, as the latter are in most instances open to objection on the score of liability to injury from floods.

Expenditure. Dips
paved.

IX. Cross Roads in the Tannah Collectorate.

50. The aggregate expenditure on these roads for the past season amounts to 3,038 rupees, the repairs to that which connects Khapoollee with Penn having been performed by contract, the rest departmentally. The state of the former has been much complained of, and as Captain Pruen has vainly attempted to persuade the contractor to pay due attention to his work, it has been resolved that the agreement shall not be renewed, and that the road during the present season shall be repaired, like the rest, under that officer's immediate superintendence.

Expenditure. Indif-
ferent state of
repair.

X. Cross Roads in the Rutnagherry Collectorate.

51. The roads in this collectorate, during the past year, have been repaired at an expense of 1,077 rupees, and three miles of road leading into Chiploon have also been completed, at a cost of 2,700 rupees, thus perfecting the communication between that town and the Kocmbarlee Ghaut, which was represented in my Report of last year to be defective.

Expenditure. New
piece near Chiploon.

XI. Roads in Salsette.

52. These roads, which are still under charge of Mr. Mungavin, consists of 17½ miles of the Agra line, between Sidu Causeway and Colsette Bunder, of 21½ miles between Baudora and Ghorabundar, and Saukey and Audherria, of 5½ miles between Trombay and Sion Chowkey, and they have cost in repair, during the past season, the aggregate sum of 12,113 rupees, or an average per mile of 269 rupees.

Expenditure.

53. With so large an annual outlay, it would be difficult to conceive how the state of these roads is generally so objectionable as it is, were it not that on Major Peat's authority we are cognizant of the fact of their having been handed over to Mr. Mungavin by the former contractor, in a lamentable state of disrepair. On a late personal inspection of the several roads alluded to, however, I could not shut my eyes to the fact that the system of repair adopted by Mr. Mungavin was far less perfect than that usually pursued in the other offices of the Road and Tank Department, and that if inattention and negligence on the part of the former contractor had been the primary cause of the censurable state of the roads, that want of proper management on the part of Mr. Mungavin had also tended in no slight measure to the circumstance of their having undergone so little improvement subsequently.

State of disrepair;
caused.

54. The chief objections which were noticeable in Mr. Mungavin's mode of repair, consisted firstly in the admixture of a preponderating proportion of moorum and common earth with the metal, for the purpose of binding it; and secondly, the application of this mixed material at a season of the year when

Objections to Mr.
Mungavin's mode of
repair; prospect of
improvement.

Presidency of
Bombay.

road repairs in this country are unattended with advantage. Had the whole of the sums allowed for the repair of these roads, since Mr. Mungavin took charge, been expended in laying down good and unadulterated metal, and in rolling the same during the monsoon, instead of being laid out as in the manner just described at unseasonable periods, it is not to be doubted that a very favourable change would have been observable in the state of the roads generally, nor is it now too late, by the adoption of ordinary prudential measures, to effect a palpable improvement before a couple of seasons shall have passed. That Mr. Mungavin possesses both the energy and will to give complete effect to this design, is not for an instant to be doubted; and the wished-for improvement may therefore be confidently looked forward to, as steps have been taken which can hardly fail of success.

New line sanctioned to be constructed by Subsidiary Gaol under Mr. Mungavin.

55. As the Government of India have been pleased to sanction the construction of the line of road proposed by Lieutenant Crawford, between Coorla and the 20th milestone, *vid* Bhaudoop, the work will be commenced on the opening of the season by a Subsidiary Gaol, under the orders of Mr. Mungavin, who, from his previous experience in the management of large bodies of convicts, and from his general energy and activity, has been selected by Government for the performance of the duty. On the completion of this new line, it is presumed, that the existing one by the Vehar Khind will be totally abandoned.

Small bridge built near the 21st milestone.

56. A bridge of 25 feet span, and consisting of masonry abutments and wooden superstructure, has been constructed between the 21st and 22d milestones on the main road, at an expenditure of 1,310 rupees, in lieu of one which had fallen into a state of decay, and become dangerous.

Proposed new bridge at Erla Pucla, with description.

57. A plan and estimate have also been prepared for a bridge at Erla Pucla, about five miles from Bandora, in lieu of one which was represented by Sir Jamssetjee Jeejeebhoy to be so inconveniently shaped and situated, as to impede the increased traffic which the new causeway was calculated to attract. On examination it would appear, that the circumstance complained of is attributable to the bridge having been built at right angles with the course of the stream, while the direction of the road is very oblique; the remedy consists therefore in the erection of a skew bridge, for which description of work the plan and estimate accordingly provide, the proposed structure consisting of two brick arches of 20 feet span, with stone pier and abutments; the estimated cost is 5,224 rupees, out of which Sir Jamssetjee Jeejeebhoy has expressed his readiness to furnish 4,000.

Proposed Wharf at Ghorabunder set aside.

58. All intention of building a new wharf at Ghorabunder has been for the present laid aside, with the concurrence of the Revenue Commissioner, Northern Division, in consequence of the present manifestations of an increased amount of traffic having been considered too slight to warrant so extensive an outlay.

Tannah Causeway; guns removed, mooring-rings substituted.

59. The work which is designated the "Tannah Causeway," consists, strictly speaking, of but a couple of ramps, one on either bank of the estuary, which approach each other towards the centre of the stream, where there is a flooded interval of the natural bed of considerable length at ebb tide, and never less than five feet deep; the greater portion of the ramps is consequently submerged at high-water, and the guns erected along the sides for the purpose of fastening vessels to, have been complained of as causing, while thus invisible, much damage to the native craft; they have therefore been removed, and mooring rings substituted.

XII. Poonah and Sholapore Road.

Completion of new piece leading out of Poonah Cantonment.

60. The works which at the date of my last Report were stated to be in progress by contract under the orders of Mr. Scott, have been completed during the past season at a total outlay of 8,230 rupees, and the length of roadway which has been thus added to the line of communication under charge of this department, together with the bridges constructed thereon, may be justly characterized as a work of very great utility, as the traffic in the vicinity of such an extensive cantonment is even now any thing but trifling.

New line undertaken between Patna and Indapore, under the orders of Sergeant Overseer Armistead.

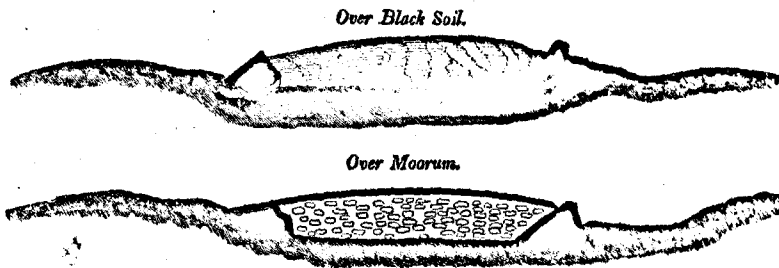
61. A line of works of far greater importance however has been undertaken by order of Government since the beginning of the present year, with the charitable intention of furnishing food and employment to the distressed population of the Bheemturry and Indapoor districts, who were represented to be suffering

suffering severely from the high prices and scarcity consequent on a succession of unfavourable seasons. This addition to the labours of the department consists of no less than the construction of a road between Patus and Indapoor, of 40 miles in length; the superintendence of the work, as well as the organization and management of the labourers having been entrusted to Serjeant Overseer Armistead, whose constant and severe attacks of ill health at the Thul Ghaut had incapacitated him from further employment in that neighbourhood, except at the risk of life.

Presidency of
Bombay.

62. The road under construction is of the same formation as the Akoordee new line in its unfinished state; that is to say, it is trenched and raised, and will be curbed and drained after the same fashion; but it is not designed to be metalled, as is the Akoordie line, and its breadth is greater by two feet. Lest this description should afford but an imperfect idea however of the nature and formation of the work in progress, I beg to subjoin a couple of sections of the road, one over black soil, the other over moorum.

Construction of new
line.



63. The cost of roads completed by this department seems to have varied considerably more even than would have been warranted by the difference in the nature of construction, and it is difficult therefore to institute a fair comparison between the present and preceding instances; but there can be little doubt that the Patus and Indapore line, when completed, will have averaged a much higher rate of expenditure than did its prototype the Akoordee line, although it may possibly not be in excess of others.

Cost of new line, as
compared with
others.

64. That a work undertaken as this has been, principally from motives of charity, should be more expensive in execution than one that was decided on from necessity or expediency, and carried into effect under the usual amount of departmental and professional assistance, is by no means surprising, however; and the circumstance can hardly be considered a legitimate ground for disappointment, provided the road be so constructed as to be permanently useful.

65. The numbers of people who have been furnished with employment since the work was set on foot, have been gradually on the increase up to the present time, the month of February having exhibited an average daily total of all ages of 1,012, while the past month shows no fewer than an aggregate daily muster of 6,470. It is exceedingly difficult, however, to control and exact work from such masses of people with due advantage to Government, and I am not without hope that the present indications of a favourable season will be the means of ameliorating the distress which has latterly prevailed in the Indapore districts, and of reducing the numbers of applicants for work to more manageable limits.

Numbers of people
employed.

XIII. Nagpore Dawk Line.

66. The works on this line included between Nuggur and the Wurdar River, are now under charge of Captain Dennis, of the 5th Regiment Native Infantry, who has succeeded Captain Eckfold in the appointment of postmaster, the latter officer having been compelled by ill health to take his departure for England in the month of January last. The repairs and reconstructions on the line during the past season amounted to 6,352 rupees, and as no complaints reached me from the post department of the inefficiency of the works, or of any unusual detention to the dawk, I conclude that they answered the purpose moderately well.

Captain Dennis suc-
ceeds Captain Eck-
fold. Expenditure.

67. Having had occasion, however, to make inquiries regarding the nature of construction of those works which come under the denomination of "flying bridges" in the estimates, I was so struck with their clumsiness, fragility and costliness, that I could not avoid suggesting the adoption of some other means more simple and efficacious, but less expensive; I therefore proposed the sub-

Defects of present
method of crossing
the rivers and
nullahs, with pro-
posed improvements.

Presidency of
Bombay,

stitution of caubes, with hauling lines affixed at each extremity, and attached to rings on either bank, so that each or any dawk runner, as he arrived at a nullah, might haul himself across without difficulty, and possibly without assistance; a trial of this scheme was authorized by the Military Board, but as they at the same time pointed out a far more perfect arrangement, my attention has been confined to giving effect to their suggestion. The plan devised by the Board, in which a trifling modification has since been made, will be clearly enough comprehended by a reference to the annexed sketch, in juxtaposition with which I have also represented the mode of crossing hitherto in vogue under the misnomer of a "flying bridge."

Present Method of Crossing.
a, fixed rope.—b, pulling rope.



Proposed Method.

Further description
of the two methods.

68. By a comparison of the foregoing methods, it will be observed, that while by the old plan of crossing, the dawk is calculated to lead to the annual consumption of much material and money, both by reason of the perishable nature of the wood, and the establishment required to be kept up; the new plan has only to be carefully attended to in the first instance to ensure continued efficiency for the future, at a very inconsiderable outlay; as will be seen indeed, it is nothing less than a rude description of a suspension bridge, in which, should the abutments be well built, no after expense whatever will have to be incurred, save on account of ropes and flooring as they may happen to become expended or unserviceable; while the time that will be gained in crossing, as compared with the old plan, will be of no trifling importance.

Non-arrival of ropes,
and consequent dis-
appointment.

69. I was sanguine enough to hope, that with the description I have now given, I should have been able to make you acquainted with the success attendant on the first trial; but a disappointment in the arrival of the ropes from Bombay has put it out of Captain Dennis's power to complete a specimen of the proposed bridges.

New raft at Toka
on the Godavery.
Excess.

70. A decked double boat or raft has been constructed at Toka on the Godavery under the orders of Mr. Scott, at an expense of 2,435 rupees, being in excess of the estimated cost, of 323 rupees. The details of the causes of this excess have not yet been received, and I cannot therefore form a correct opinion of its justifiableness or otherwise; but whether they should prove to be satisfactory or the reverse, I cannot here omit the opportunity of stating that "boat-building" is a handicraft of which I myself and the officers of this department are necessarily, and therefore excusably ignorant; and that as it is impossible to procure qualified artificers to make up for this deficiency, blunders and partial failures ought not to be visited with a heavy amount of censure. This raft I propose handing over to the charge of Captain Dennis, after the present monsoon, as it is on the direct line of works entrusted to his care, and very remote from the scenes of Mr. Scott's duties.

XIV. Works of the Regular Lines of Roads.

Poonah Bridge.

71. The first in point of importance is still, as it was last year, the new Poonah Bridge, now progressing towards completion, by contract, on a design of Major Peat's; the arches had been constructed and the centerings struck, before the setting in of the monsoon, and the circular openings, as well as some portions of the backings and spandrils, have been since completed.

Style of work.
Contractor.

72. Though the brick-work of the arches has been very creditably performed, and is infinitely superior to the ordinary run of this description of masonry about Poonah;

Poonah ; the circumstance is almost solely attributable to the incessant care which Lieutenant Cowper and his subordinate Serjeant Taylor, have bestowed upon the work during its progress ; and is ascribable, but in a very remote degree, to the merits of the contractor. This man indeed is no other than the one who has been previously alluded to in this Report, and who has his hands too full of engagements therefore to pay as much attention as would be desirable to the due fulfilment of each.

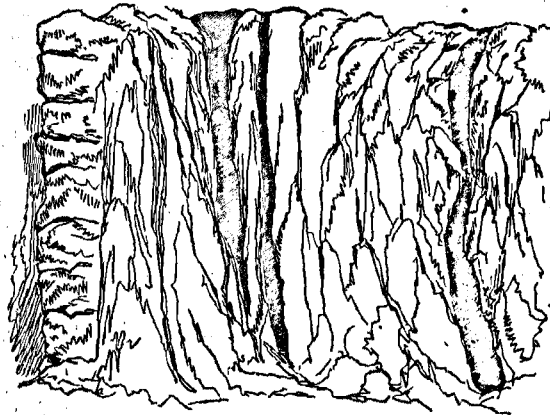
Presidency of
Bombay.

73. The special repairs to the roof of the Tannah Church were completed by Lieutenant Dickinson, in the month of April last, at a cost of 5,070 rupees, and, as far as I could ascertain from an inspection of the building, were well done ; but from a report since received from that officer, it would appear that the sheet lead wherewith some parts of the terraces over the church and porticos were covered, was much warped and damaged by the extreme heat of the sun in April and May last, and leakage has in consequence resulted since the setting in of the monsoon.

Repairs to Tannah
Church.

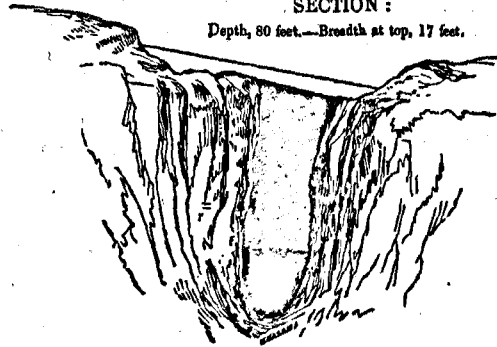
74. Having had an opportunity of visiting and examining the site of the proposed foot-bridge over the Wyturna, near Kougaum, which was alluded to in my last year's Report, I became convinced of the inutility of constructing any bridge whatever, whether wooden, masonry or suspension, as it would not only be thrown away in a country so wild and thinly populated, but would be endangered by floods during every monsoon, and sooner or later most inevitably destroyed. As a safe and permanent means of transit appeared to be required, however, by the few villagers who dwell in that neighbourhood, I proposed stretching a couple of wire ropes across the chasm, which is only 17 feet wide, with a flooring of rough planks, or battens or split bamboos, or whatever might happen to be the easiest procurable materials, and a single rope as a guide or hand-rail, three feet above the level of the pathway, after the manner of the subjoined sketch, which will possibly give a better idea of the peculiarities of the place, and the proposed method of crossing, than could be gathered from a written description.

Wyturna River ;
proposed mode of
crossing.



SECTION :

Depth, 80 feet.—Breadth at top, 17 feet.



180 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

- Postponed temporarily. 75. The proposition, which you will observe may be carried out for a very few rupees, met with the approval of Government, and was sanctioned under date the 7th February last; but as the wire rope was not available at a sufficiently early period to admit of the work being completed before the rains, its commencement has been postponed till the re-opening of the season.
- Gakhirwa Bridge. 76. A plan and estimate were prepared by Lieutenant Dickinson, for the improvement and partial reconstruction of the Gakhirwa Bridge, connecting the island of Bassein with the main-land which had been for some time in a state of great dilapidation, and the latter, amounting to 5,702 rupees, was sanctioned by Government, under date the 31st March last; but the work has not as yet been taken in hand. This bridge was represented by the Collector of Continental Customs and Excise to be much required, on account of its being on the high road from Bassein to Bhowndy, and in the neighbourhood of extensive salt-pans, the produce of which is conveyed over it to the interior of the country.
- Cooly Bridge, near Bassein. 77. An estimate was also prepared by the same officer, of the cost of repairing the Cooly Bridge on the west of the town of Bassein, amounting to 569 rupees, which was sanctioned by Government under date 26 December last; these repairs were nearly completed on the 30th April last, and have since no doubt been brought to a close.
- Kusseylee Bunder. 78. Extensive repairs to the Bunder at Kusseylee, were provided for in an estimate by the same officer, under date the 29th July last, the amount of which was sanctioned by Government on the 3d November following; considerable progress has been made in the execution of these repairs, but their completion has been deferred in consequence of the setting in of the rains.
- Project for supplying Tanna with water. 79. A report was also prepared and sent in under date the 15th May last, by the same officer, regarding the feasibility of a project which had been entertained by one of the inhabitants of the name of Shaik Ahmed Cubbey, for supplying the town of Tanna with water at his own expense. Levels were taken between the contemplated point of supply, which is at a distance of two miles from the town, and the site of the proposed reservoir near the cutcherry; and the result, which was highly favourable to the probable success of the undertaking, was duly communicated by the Military Board to the Collector of Tanna, under date the 28th May last.
- Oomergaum Ferry, new boat. 80. A boat for the Oomergaum Ferry was sanctioned by Government on the 23d March last, at an estimated cost of 576 rupees, and was, till latterly, under construction by Mr. Mungavin; but in consequence of the impossibility of procuring competent artificers at this season of the year, it has been temporarily postponed.

XV. Military Buildings.

- Accession of work. 81. A slight accession of work, in the shape of the construction and repair of military buildings, has been included in the list of labours of the Road and Tank Department, during the past season.
- Regimental Buildings at Tannah. 82. In addition to the usual annual repairs to the pendalls occupied by the Native troops at Tannah, Mr. Mungavin completed in the month of October last, two new buildings of this description, at a cost of 2,362 rupees, and he has since sent in an estimate, on the requisition of the military authorities, for still further additions and alterations, the probable cost of which amounts in the aggregate to 4,250 rupees. This estimate was sanctioned by Government under date the 23d of May last, and the works are now in progress.
- Regimental Buildings at Nassick. 83. An estimate for a temporary hospital, quarter-guard, and store-room for a wing of the 9th Regiment Native Infantry at Nassick, amounting to 3,042 rupees, was also sanctioned by Government, under date the 11th of May last, and those building are now in progress under the orders of Lieutenant Chapman.
- Regimental Buildings at Bhowndy. 84. Besides the above, there are sundry trifling repairs made annually to the military buildings at Bhowndy, under the direction of the Second Assistant, who has charge of the works on that line. For last year, the cost of these repairs amounted only to 172 rupees.

XVI. Building

XVI. *Building and Building Materials.*Presidency of
Bombay.

85. The custom has prevailed to an impolitic extent in this department, of resorting to the too frequent use of an inferior description of work along the lines of communication, in the construction of bridges and drains, and other Public Works, so that few of them are calculated to be of any lengthened durability, much less to be anything approaching a lasting memorial of the superiority of European skill.

Inferior construction.

86. This has, doubtless, arisen from motives of economy, but it would take but a short time to prove that the view is an entirely mistaken one, and that the better a work is constructed in the first instance, the cheaper it will eventually prove. Let two bridges be supposed, for instance, to have been constructed in the Deccan about the same period, one of cut stone masonry, the other of rubble piers, and abutments with wooden superstructure. The former may possibly have led at the outset to an expenditure of half as much again as the latter, and may in consequence have been originally sanctioned with less alacrity; but in the course of some five-and-twenty years the circumstances of the case will be found to have widely altered. The bridge of temporary construction will have required periodical repair from the day it was erected, and put the Government to a certain expense as regularly as the seasons have come round; it is not too much to suppose, indeed, that the whole of its superstructure will have been once renewed, and that its abutments and retaining walls may have been occasionally damaged and rebuilt; but notwithstanding this constantly increasing outlay, the bridge will be still liable to decay and further damage, and in all probability will ultimately become so bad, that there will be no alternative but to replace it with a better one. The cut stone bridge meanwhile, will never once have been repaired, and at the expiration of the twenty-five years will be found to be as good as when it was built, and still calculated to out-last several successive generations.

Argument in favour
of the best work
being the cheapest.

87. That the foregoing supposition may not be deemed likely to prove fictitious, I have only to mention a couple of instances in elucidation of its truth. The cut stone bridge across the Indrownee, near Kurkulla, on the Mail Road, was built, I believe, by the Pioneers many years back, but whatever its age, or by whomsoever built, it has never been repaired, nor is it likely to require repair for years to come. Three bridges, on the other hand, which were built across three large nullahs by the Engineer Department within the last 10 or 12 years, on the same Mail Road between Poonah and Kirkee, though they have been periodically pointed and plastered, and dammered and patched, and occasionally otherwise repaired, are even now showing symptoms of failure. The retaining and parapet walls of the approaches of one of them were washed away, indeed, by the first flood of the present monsoon, and there is not one of the others but what would have suffered in a precisely similar way had it been exposed to a like destructive power.

Argument supported
by proof.

88. As far as my experience goes, I should say that on all fixed and permanent lines in the Deccan, cut stone should be generally, if not the only material, used in bridges and other Public Works, not only because it is the most durable, and eventually the cheapest, but also because its stability is not so dependent on the quality of the mortar as is that of rubble or brick-work, and because more adepts in the art of stone-cutting are to be met with amongst Deccan artificers, than in any other description of work whether of masonry or carpentry.

Cut stone preferable to all other
descriptions of work.

89. Brick-work is rarely to be met with good, never of first-rate quality, both by reason of the inferiority of the material and the unskilfulness of the bricklayers; good carpentry is equally rare, by reason of the scarcity of wood and workmen; but cut stone work is almost invariably of an undeniably good sort, and is, par excellence, the standard work of the Deccan.

Inferiority of brick-
work in the Deccan.XVII. *The Contract System at Poonah.*

90. I believe it to be an acknowledged fact, that there is neither law nor measure, however just or benevolent may have been the motives in which it originated, that may not, for want of due attention to its mode of working, be converted into an abuse, and become the very reverse of what was contemplated. The contract system, as it exists at Poonah, is no exception to the rule, for, whereas it was intended by the Honourable the Court of Directors, that by the competition it

Venkuttiah Nar-
rayen's Monopoly.

Presidency of
Bombay.

should engender, and the general influence it should maintain, it should become "an important element towards the improvement of the native character;" it is literally fast sinking into a monopoly, and is now chiefly beneficial as concerns the pecuniary interests and aggrandizement of one individual.

Disadvantages of
monopoly.

91. I need hardly detail the disadvantages which necessarily result from such a state of things, such, for instance, as the undue power acquired by the contractor over all classes of artificers and labourers, the impossibility of his personally attending to all the works entrusted to his management, the consequent necessity of resorting extensively to the practice of sub-letting, and lastly, to a professional man, the most to be regretted of all, the extreme likelihood of failure, either in the fulfilment of some of his many engagements, or in the stability of the works themselves. These are the evils, though possibly not all, which are the self-evident result of the system animadverted on; a mere allusion to them, therefore, is all that is here deemed sufficient, a substantiation of my statement being the only additional requisite, and that will be found in the following enumeration of works now progressing by contract in one man's name, and under one man's responsibility:

Under the Department of the Superintending Engineer.

Sir Jamssetjee Jeejeebhoy's Bund, Reservoir, Fountain, &c., opposite the Parsee Church, at the end of the Sudder Bazaar.—Reservoir in the Arsenal Compound.

Contractor, Venkuttish Narrayen.

Under the Department of Roads and Tanks.

The Poonah Bridge.
Mail Road Repairs,
64 miles. Narrain-
gaum Road, 46 miles.
Bungalow Repairs.

Contractor, Venkuttish Narrayen. In addition however to this list of works held in contract under the name of Venkuttish Narrayen, there are many others, and some of them important ones, which are nominally concluded and carried on by his inferior agents, and in which, though his name is kept in the back-ground, he is to all intents and purposes the virtual contractor, and the chief appropriator of the profits arising from those transactions.

Under proper re-
strictions, contract
system deserving
of encouragement.

92. With so many works, and some of them of such magnitude, under one man's hands, it ought to afford no matter for surprise were an occasional failure to take place; but it would be eminently unjust to condemn the contract system on a trial so partial and unsatisfactory. Full well knowing as I do that the stability of the Poonah Bridge has only been ensured by Lieutenant Cowper's unremitting exertions, and the adoption of the most stringent measures to counteract the ill effects of the contractor's inertness; feeling convinced, moreover, that the work would have run the risk of being ere this a mass of ruins, had the contractor been left to his own devices; and believing as I do, that constant surveillance on the part of the Executive Officer or other Government servant, is absolutely necessary to ensure good work on all occasions, I yet have such an opinion of the system, under due restrictions and management, that I should be glad to see it more generally introduced into this department than it is at present.

Not advisable for
road repairs.

93. For repairs to roads, extending over tracts of many miles, I am inclined to think the contract system is not calculated to answer, as efficient supervision is almost unattainable to such an extent; but for bridges and other buildings of more definite proportions, I am persuaded it might with advantage be more generally acted on and encouraged.

Advantages of
system when well
conducted.

94. The advantages of contract work are, first, the saving effected on the estimated cost; secondly, the diminution of office labour and accounts; and thirdly, a freedom from all apprehension of an excess, which in the case of work departmentally performed, either by an extravagant or inexperienced officer, is unfortunately not always to be expected. The sole disadvantage is, the absolute necessity for constant and strict supervision, from the knowledge, that the slightest laxity on the part of the superintending officer or his subordinates is liable to be turned to his own account by the constructor, and in the absence of efficient establishments, this amount of attention is not always to be ensured.

XVIII. Department and Establishment.

European subor-
dinates. Changes
and appointments.

95. Amongst the European subordinates of the department, several transfers have been made, consequent on Serjeant Overseer Armistead's departure from the
Thul

Thul Ghaut, and Corporal Daviss quitting the department from ill health; Serjeant Butler has been remanded to his corps, in consequence of unsteady conduct and neglect of his duties; and as this is the only removal that has occurred in addition to Corporal Daviss, while three new comers have lately joined the department, the number available for duty exceeds by one that which was at the disposal of the department this time last year, and at the present moment amounts to eleven.

Presidency of
Bombay.

96. The conduct of these European overseers has been in most instances satisfactory, in some praiseworthy; and, with the exception of Serjeant Butler, in no instance very reprehensible. Those who have most distinguished themselves either by superior attainments or exemplary behaviour, are Serjeant Overseers Armistead and Taylor, and Serjeant Assistant Overseers Levien and Anges.

Conduct.

97. The only change of any note which has taken place amongst the Assistant Surveyors and Builders is the transfer of Narrayen Moraba from Mr. Mungavin's office to the Department of the Superintending Engineer Southern Provinces, in consequence of his being incapacitated from ill health to perform duties which constantly entailed a certain amount of exposure and suffering. As his place has been supplied, however, by an Assistant Surveyor from the Superintending Engineer's office, the total available number attached to the department remains unaltered, and amounts to 13, the same as at the date of last year's Report.

Native subordi-
nates. Assistant
Surveyors' changes.

98. The conduct of each and all has been, with one or two trifling exceptions, satisfactory on all occasions; and in the case of Venaick Bhiccajee and Ragoba Hurjee, commendable in a high degree, but it would have given me a far greater amount of satisfaction had it been in my power to represent that the professional attainments of all were on a par with their general behaviour; if I have found it necessary however at the commencement of this Report to urge the advisability of ensuring a due degree of proficiency in drawing in all future candidates for engineer appointments, I will not now conclude without recording my firm conviction, that an Assistant-Surveyor, unpossessed of this qualification, is of comparatively little use, and that if he is at the same time an indifferent arithmetician, he is unfit for the performance of duties he is daily liable to be held responsible for.

Conduct. Deficiency
in qualifications.

99. With but 11 Europeans and 13 Native subordinates at the disposal of the department, it may be readily conceived that the offices of the First and Second Assistants, amounting with Captain Dennis's to no less than nine, would at the best be but very scantily supplied with professional aid; but when it is considered that out of the above number of European Overseers, the best qualified of all has been for some months employed on a special duty, and is himself for the time being at the head of an office and in need of assistance; when it is recollected, moreover, that three of the number have joined since the close of the official year, that they are mere novices, and as yet but ill acquainted with their duties, it will hardly be denied that the accomplishment of what has been detailed in the foregoing narrative must have called into activity the energies of the department generally, if not of all its individual members.

Inefficiency of
establishments.

100. If this be an admitted fact, as I trust it will, it only remains for me to express my own opinion of the performances of the Assistants, and to state, that if in the aggregate the work of the department for the past season shall be deemed a tolerably satisfactory allowance by yourself, by the Military Board, and by the Government, so also do I feel assured and satisfied that the duties of each of the Assistants have been performed both willingly and well, and that had it not been for the compulsory absence of Lieutenant Bruce and Captain Pruen on field service, a proportionate amount would have been rendered by each of those officers.

Increased amount of
work satisfactorily
performed.

I have, &c.

(signed) H. Berthon, Captain,
Superintendent Roads and Tanks.

Poona, 29 July 1846.

184. PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

STATEMENT of EXPENDITURE in the Construction and Repair of Public Works in the ROAD
and TANK DEPARTMENT, from the 1st May 1845 to the 30th April 1846.

NAMES OF WORKS.	AMOUNT.			TOTAL.		
	Rs.	a.	p.	Rs.	a.	p.
Works connected with the Communication of the Country:						
Annual repairs to Mail Road, Poonah to Khapoolie, for 1844-45	6,119	1	3			
Ditto ditto for 1845-46	11,437	1	2			
Ditto - - to Bridges on, for 1844-45	740	-	-			
Ditto - - ditto for 1845-46	308	-	-			
Ditto - - to Cross Roads, for 1844-45	60	14	1			
Ditto - - ditto for 1845-46	3,041	5	4			
Ditto - - to Fair-weather Roads, for 1845-46	155	-	-			
Ditto - - to Flying Bridges, for 1844-45	80	-	-			
Ditto - - ditto for 1845-46	240	-	-			
Constructing a Bridge in Poonah	16,494	8	0			
Overseers superintending ditto	473	-	2			
Removing Buildings near the site of ditto	850	-	-			
Constructing Drain on the Bombay Road	140	-	-			
Repairing three Bridges on ditto	121	8	-			
Constructing two Traversing Blocks, with brass sheaves	95	8	1			
Repairs to the Ford of the River Yell	40	9	4			
Smoothing the bed of the River Meena	166	5	2			
Enlarging the Waterway of a Drain on the Mail Road	95	1	-			
Minor Works	212	14	4			
Felling down the Pritseeneedee's House, near the Poonah Bridge	3	14	-			
Repairing a Gully on the Narraingaum Road	81	13	5			
Repair to Fords	14	15	2			
Annual repairs to Seroor Road, for 1844-45	281	6	5			
Ditto ditto for 1845-46	4,868	10	6			
Ditto - - to Bridges and Drains on ditto	345	14	10			
Ditto - - to Road from Poonah to Neera Bridge	2,471	12	2			
Ditto - - to Bridges and Drains on ditto	318	6	7			
Ditto - - to the Sholapore Road	336	2	5			
Ditto - - to Bridges and Drains on ditto	26	18	1			
Ditto - - to Flying Bridges	616	-	6			
Ditto - - to Cross Roads	425	12	2			
Ditto - - to Bridges and Drains on ditto	64	1	5			
Ditto - - to Seroor Cantonment Road	384	2	3			
Improving the Sholapore Road	5,896	-	-			
Shortening the communication between the Hospital and Burial-ground at Kirkee	920	-	-			
Minor Works	180	13	2			
Constructing three Stone Rollers	201	-	4			
Annual repairs to Main Road from Seroor to Nuggur	3,009	5	5			
Ditto - - to Bridges and Drains on ditto	348	12	8			
Ditto - - to Cross Roads	719	3	5			
Ditto - - to Bridges and Drains on ditto	74	-	-			
Constructing new Ferry-boat at Toka	2,435	4	11			
Ditto - - new line between Patua and Indapore	16,562	15	1			
Annual repairs to Works on Nagpore Dawk Line for 1845	4,877	11	8			
Ditto ditto for 1846	1,071	11	5			
Taking charge of Stores on Nagpore Dawk Line	168	-	-			
Maintenance of Ferry-men for 1845	2,779	1	3			
Annual repairs to Main Road from Thul to Chandore Ghat	12,466	6	8			
Special repairs - - ditto ditto	398	5	7			
Annual repairs to Bridge and Drains on -	232	-	1			
Ditto - - to Cross Roads	1,530	-	-			
Ditto - - to Ferry-boats	270	3	3			
Widening Bridges and Drains on Main Road	523	1	2			
Converting Kadoo Ferry-boat into a Flying Bridge	510	15	4			
Cutting and Paving Dips on Sinnur Road	861	7	4			
Minor Works	9	14	-			
Constructing new Road on Thul Ghaut	28,346	14	10			
Repairing and improving Callian Pier	299	9	8			
Annual repairs to Main Road from Colsette Ferry to Thul Ghaut	3,262	2	7			
Special ditto ditto	667	9	5			
Annual repairs to Bridges and Drains on ditto	14	7	10			
Minor Works	16	4	8			
Repairs to Coolie Bridge at Passein	465	8	9			
Providing Sails and Masts for the Colsette Raft	53	9	6			
Special repairs to Callian Pier	776	2	1			
Annual repairs to Roads in Bhowdy	182	3	6			

TEN YEARS, AND THOSE NOW IN PROGRESS.

185

NAMES OF WORKS.	AMOUNT.			TOTAL.		
	Rs.	a.	p.	Rs.	a.	p.
Constructing Tannah Causeway	210	-	-			
Annual repairs to Sion Main Road	5,214	-	-			
Ditto - - to Bandra ditto	5,888	14	3			
Ditto - - former unexpended balance	672	8	11			
Ditto - - to Trombay Main Road	1,310	-	-			
Constructing a new Bridge on the Bombay Road	1,310	-	-			
Improving Anick and Chamber Road	913	11	7			
Repairing three Bridges on Bombay Road	45	8	-			
Ditto - Ramp at Trombay Pier	23	8	8			
Minor Works	165	4	5			
Building a new Boat for the Omergaum Ferry	150	-	6			
Annual repairs to Mail Road, Panwell to Kapoolea	4,041	14	9			
Ditto - - to Bridges and Drains on ditto	85	13	3			
Ditto - - to Nagotua Road	2,000	-	-			
Ditto - - to Cross Roads, Northern Concan	3,038	8	2			
Ditto - - ditto - Southern ditto	1,077	4	1			
Constructing new piece of Roads leading into the Town of Chiploon	1,500	-	-			
				1,76,906	5	0
TANKS, WELLS and BUNDS:						
Clearing out Well at Karlee	770	-	-			
Ditto - two Wells at Bojapoor	230	-	-			
Clearing out and repairing Wurgaum Tank	280	-	-			
Coping of Cut Stone to Wells, and retaining Walls of Tank at Khandalla	863	14	9			
Opening Sluices of Kutress Tank	6	2	10			
Closing ditto - ditto	40	-	-			
Repairs to Wells, N. S. Collectorate	15	-	-			
Clearing out Tanks and Wells, ditto	31	13	1			
Improvement to Well at Kussarah	627	9	11			
				2,864	8	7
BUILDINGS:						
Annual and special repairs to Traveller's Bungalows, and Furniture	4,150	7	11			
Pulling down and rebuilding portion of Wurgaum Bungalow	71	-	-			
Constructing new Bungalow at Karlee	2,289	15	7			
Constructing new Outhouses to Karlee and Wurgaum Traveller's Bungalows	742	-	-			
Repairs to Station-house at Seroor	110	-	-			
Alterations to Islampoor Bungalow	171	-	-			
Completing Bordered Ceilings of the Kurdee and Kussara Traveller's Bungalows	18	8	7			
Constructing Pinfold at Bhowndy	410	-	-			
Constructing Cutcherry at ditto	100	-	-			
Special repairs to Tanna Church	2,376	9	9			
Annual repairs to Military Buildings at Bhowndy	172	6	-			
Ditto - - to Store Room ditto	72	5	11			
Special repairs to ditto	45	1	-			
Repairs to Store-houses, Nagpore, Dâk Road	12	14	-			
Erecting new Stable and Cook-room to Traveller's Bungalow at Tannah	687	1	2			
Constructing a Privy in Tannah Fort Walls	595	11	8			
Constructing Wooden Shutters to Civil and Detachment Hospitals	678	-	-			
Annual repairs to Civil and Detachment Hospital	111	2	-			
Ditto - - to permanent and temporary Pendalls	369	7	3			
Special repairs to permanent Pendalls	288	-	-			
Erecting two permanent Pendalls	2,362	3	10			
Erecting new Bungalow at Farrgaum	750	-	-			
Alterations to Bathing Rooms of Traveller's Bungalow at Hernee	82	14	6			
				16,596	13	2
GRAND TOTAL	Rs.			1,96,357	11	3

Presidency of
Bombay.

Presidency of
Bombay.

ANNUAL REPORT of the ROAD and TANK DEPARTMENT at Bombay, for the
Official Year 1846-47; dated 4 August 1847.

To E. H. Townsend, Esq., Revenue Commissioner, S. D., Poonah.

(V. 2,347.)

Sir,

Handing up report.
Expenditure,
3,14,786 rupees.

I HAVE the honour to submit the following Report of the proceedings of the Road and Tank Department, for the official year 1846-47, with a statement appended of works performed, showing a total expenditure of 3,14,795 rupees, and an average charge for superintendence of 18 $\frac{1}{2}$ rupees.

Cost of superintendence.

2. The mode of calculating the cost of superintendence is the same that was adopted by Major Peat, and is also similar, I believe, to the practice pursued in other branches of the Public Work Department, but as the per centage varies so widely, a word or two of explanation may be appropriately introduced in order to render the causes intelligible.

Mode of calculating cost of superintendence.

3. In addition to the consolidated staff-pay and tentage of the Executive Officer, the pay and allowances of the "permanent establishment" are alone admitted into the calculations from which the per centage is derived; the cost of maintaining "temporary establishment" that may be required is not taken into account. Now, when there is no permanent establishment whatever under the Executive Officer, or when it is inadequate for the duties required, there is no alternative but to make up the deficiency by the temporary employment of the best qualified maistrees and carcoons procurable, and the pay of these men is not taken into account in calculating the per centage.

Ditto.

4. In the case of Mr. Armitstead, I do not mean to say, that even were the pay of the temporary establishment he has been thus compelled to employ included in the calculation, it would materially increase the rate for superintendence, or cause it to exceed 2 $\frac{1}{2}$ per cent. The rates at which his karkoons and other temporary employes are paid have been so low, and the numbers of labourers so unusually great, that the total charge for the former is the merest trifle when compared with the expenditure incurred on labour and materials on such an extensive line of works, but under different circumstances, and with works scattered over the country and of greater variety, the addition of the pay of the temporary establishment might very perceptibly affect the charge for superintendence; and this I mention, for the purpose of showing that rates, deduced as at present, are not to be considered undeviatingly correct.

Ditto.

5. I have mentioned that the whole of the staff pay of the Executive Officer is included in the charge for superintendence, and although it would be impossible, perhaps, to do otherwise, still it cannot be doubted that the practice is calculated to convey erroneous impressions. The duties of the Executive Officer are as much those of a designer and estimator and accountant, as an actual supervisor of work, and in truth it may be asserted as a general rule, that a far greater proportion of his time is passed in the varied labours of his office, than in personally watching the progress of the buildings and other public works he may have in hand. To debit the whole of his pay to the charge for "superintendence" when probably two-thirds of it ought to be allotted to other items, is clearly, therefore, a mistaken principle.

Performances of First
Assistant, Captain
Jacob: New Terminus to Mail Road on Hog Island.

6. In my report for 1845-46, I stated that Captain Jacob had finished a survey of the proposed new terminus to the Mail Road, and was then employed in designing and estimating for the works required thereon. These estimates were duly completed in October, and together with several designs for bridges, drains, causeways and pier were submitted to the Military Board on the 12th of that month. As the depth of the creek which separates Hog Island from the reclaimed flats had not been tested, however, with sufficient accuracy, instructions were received from the Board to probe it to the bottom, and it was at the same time requested, that the slopes over the hilly ground, on other parts of the proposed line,

line, might be reduced to a maximum of 1 in 20, instead of 1 in 18, as designed by Captain Jacob.

Presidency of
Bombay.

7. The bed of the creek was accordingly probed in various places, and as a rocky stratum was invariably met with within 15 feet of the surface, it was found unnecessary to make any alteration in the estimate for the causeway, which already allowed for a foundation of that average depth, but provision was made for the improved slopes recommended by the Board, and the estimate for the entire line of works thus corrected amounted to 2,65,539 rupees. In this estimate the construction of the road across the flats reclaimed from the sea was incomparably the heaviest item, amounting to no less than 40,000 rupees a mile, while the rest of the line, inclusive of piers and bridges, barely averaged 17,000.

Ra. 2,65,539.

Ra. 40,000.

8. A discovery was made in regard to the nature of the flats, however, while the bed of the creek was being examined, which materially interfered with the mode of construction proposed by Captain Jacob; for it was ascertained, on removal of the surface crust, a layer which extended only to the depth of a foot, or little more, that the substratum was soft enough to admit of its being penetrated to the very bottom, with almost as much facility as the mud in the creek. Under these circumstances, as wooden piles would not answer, and a loose stone foundation would have been inordinately and almost incalculably expensive, it was proposed to construct the road on the undisturbed surface of the soil, with an underlayer of hurdles, to diffuse the pressure and prevent sinking. It was further intended, that this road should have been protected from the encroachments of the sea by putting the reclaiming bunds into a state of efficiency.

Performances of First
Assistant Captain
Jacob: New Terminus to Mail Road on
Hog Island.

9. The mode of construction just described would doubtless have been much less costly than the one Captain Jacob had originally estimated for, under the supposition that he could cut trenches in the soil and build masonry retaining walls for the support of the road-way, but as it was impossible, in the absence of any data, to calculate the cost with any approximation to accuracy, the estimate was left unaltered.

Ditto.

10. Manifold and undeniable as would have been the advantages of this new line, which would have placed an always accessible terminus some 12 miles nearer Bombay than the present inconvenient and unapproachable one, its probable cost was yet so great, that with the prospect of a connexion between the Presidency and the Deccan at some future day by means of a railroad, the Government declined sanctioning it, and Mr. Secretary Escombe, in his letter to the Military Board of the 4th June last, No. 1,552, stated that certain arrangements with the Bombay Steam Navigation Company, which Government had under consideration, for the conveyance of the mail to Panwell, would obviate, if carried out, any further necessity for the consideration of the subject of a new terminus.

Reasons for abandonment of the project of the proposed new Terminus.

11. On the completion of the duty just described, Captain Jacob undertook the survey of the Katrey Tank and its environs, in compliance with a wish expressed by the Honourable Court of Directors in their letter to the Bombay Government of the 21st May 1844, and with a view to determine on the best way of preventing a further accumulation of mud in its bed; but as I shall shortly have occasion to describe how this duty was performed in another section of my Report, I will not now dwell upon the subject.

Katrey Tank.

12. It merely remains for me to add, in allusion to Captain Jacob, that as soon as all the designs and estimates connected with the improvement of the Katrey Tank had been submitted to higher authority, the interests of Government and the urgency of the occasion rendered it advisable that that officer should be removed from the Road and Tank Department to take charge of the Jamsetjee Bund at Poonah, which till then had been under the department of the Superintending Engineer S. P. Independently of losing the services of an officer whose established reputation would be but little enhanced by any praise from me, and who possesses the rare merit of being just as hard-working as he is talented and able, Captain Jacob's removal, unavoidable as it probably was, afforded further matter of regret to myself, in consequence of its incapacitating

Captain Jacob withdrawn from the department, and appointed to superintend the Jamsetjee Bund.

Presidency of
Bombay.

the department from undertaking several projects for the extension of irrigation, which it otherwise might have done. The vacancy occasioned by his withdrawal is as yet unfilled.

Lieutenant Bruce's
performances :
Wangoolie new line.
Lieutenant Bruce
remanded to his Re-
giment.

13. Lieutenant Bruce, at the date of my last Report, was engaged as therein mentioned, in preparing designs and estimates for a proposed new line of road between Poonah and Wangoolie; but these documents, instead of being ready for transmission to the Military Board by the month of October, as I had anticipated, and as they undoubtedly ought to have been, were not received from Lieutenant Bruce till the 12th of January following. The estimate for 8½ miles of bridged and finished road, which was minutely worked out and tolerably accurate, amounted, after correction, to 88,986 rupees, and the designs for all the works required on the line were very creditably done. The delay, however, which had occurred in their preparation was unsatisfactorily accounted for by Lieutenant Bruce, and he was consequently remanded to his regiment by Government on the 19th of May last, since which date, the department has been without a First Assistant.

Jehoor Ghaut.

14. Before leaving the department, however, Lieutenant Bruce contrived to make a survey of the Jehoor Ghaut, on the much traversed road between Nuggur and Arungabad, which had been represented to be in a dangerous state, and a serious impediment to cart traffic. A sketch survey remarkably well drawn, and accompanied by a report, was accordingly despatched to the Military Board's Office on the 25th of February last; and had Lieutenant Bruce but shown as much alacrity in the previous performances of his duty as he did on this occasion, it is possible that he might have escaped the censure of the Military Board and the displeasure of Government.

Performances of
Second Assistants.

15. In recounting the performances of the Second Assistants, it may be as well to adhere to the practice introduced by Major Peat, and hitherto observed by me, of classing them under distinct headings, in connexion with the lines of road respectively under their charge, but for the sake of perspicuity, and also with the view of showing the greater importance that has been attached of late to works for the extension of irrigation, and for supplying water to towns and villages, that part of my Report which relates to tanks, bunds and wells, will appear under a separate head.

I. The Agra Road.

Between Colsette
Bunder and Thul
Ghaut; State and
expenditure,
9,070 rupees.

16. Lieutenant Scott still remains in charge of that portion of the line which lies between Colsette Bunder and the Thul Ghaut, and the expenditure during the past year has been 9,070 rupees. The state of the road appears to me to have been much improved since my inspection of the previous year, most of it was really good, and considering the irrigation of the ground between Kurdee and Kussara, the immense traffic on the road, and the rough treatment it experiences at the hands of cart drivers, it might afford matter for surprise how a moorum surface lasts so well.

Unfair treatment of
road.

17. When the opium traffic is at its height, strings of unwieldy and greatly overloaded carts may be seen descending the steep dips below the ghaut, their wheels locked, and acting like ploughs on the surface of the road, and as if they were not sufficient to destroy it, trunks of trees are frequently attached to the rear of the carts, and with men seated thereon, are trailed after them as drags or make-weights. Such treatment as this is surely sufficient to damage the best of roads; that it should injure a moorum road need not to be explained.

Proposed new line
between Kussara
and Kurdee.
Rs. 1,33,391.

18. The survey of Lieutenant North's proposed new line of road, between Kurdee and Kussara, was sent in to the Military Board on the 22d October last, and the probable cost, roughly estimated by that officer at 1,33,391 rupees, was sanctioned by the Supreme Government, as communicated in Mr. Secretary Escombe's letter of the 18th March last, No. 712. The new line only deviates from the old one where the dips are at present too steep for traffic, and no slope is to exceed 1 in 19.

Proposed means of
carrying it on.

19. The preparation of the several designs for the works required on the new line, as well as the actual commencement of the road itself, have been temporarily postponed, till arrangements could be made for rendering an officer available for the

the duty. At the date of receiving the intimating of sanction, Lieutenant Scott was too much occupied with other work to admit of my recommending him for the performance of this important duty; but on the opening of the season, I am of opinion that he might be advantageously employed thereon, the more especially as the proposed new line is conveniently situated for the purpose, and as the experience which that officer has now had in the duties of the Road and Tank Department will prove of some service in the performance of this.

Presidency of
Bombay.

20. The portion of the new road at the bottom of the Thul Ghaut, which, in my last Report, was stated to have been commenced in the month of December 1845, was completed by Lieutenant Chapman on the 27th of December last, when, in conjunction with the portion previously finished, it was opened to the public, and has since been in constant use. The expenditure on the entire completed piece of road, which is in length a mile and a half, amounted to 70,256 rupees.

Thul Ghaut new
Road.
Expenditure.

21. The portion of road which was first completed was formed with an inward slope, the outer edge having been made a foot higher than the inner, and the surface a plane instead of a curve. The road at the bottom of the ghaut has been constructed with the usual slight convexity of surface, and will not only, therefore, be much easier for draft, but will also, I think, be more evenly used throughout its entire breadth than the other, and will consequently suffer less from the heavy traffic that passes over it.

Ditto.

22. On the completion of the lower portion, the encampment of labourers, with storehouse and workshop, were removed with all expedition to the top of the ghaut, the cuttings on which were commenced in the month of January, and carried on with as much celerity as the paucity of labourers in that neighbourhood would admit of. Up to the 30th April last, 4,200 running feet of side-cutting had been completed to the full width of road-way, and 1,157 feet completed to average widths of 10, 12, and 18 feet respectively.

Ditto.

23. The estimates for the completion of the road over the ghaut were despatched from this office, after examination and amendment, in the month of September last, the total amount being 1,48,391 rupees, which was sanctioned by Government on the 12th of the following month. The parapet wall which has been built along the edge of certain portions of the road-way already completed, and which was described in the 18th para. of my Report for 1845-46, having been considered unnecessarily expensive by the Military Board, a more simple style of construction has been provided for in the estimate, viz. dry rubble.

Ghaut. Estimate
and Plans.

Ra. 1,48,391.

24. The road from the top of the Thul Ghaut to Nassick is in much the same state as it was last year, slightly improved in some places, a little fallen off in others; but from Nassick to Chandore, a very decided change for the better was observable at the date of my last visit, and it would have been difficult to find a half-mile in any portion of its length that could have been justly characterized as in bad, or even in indifferent order. Considering the state that I found it in on my first inspection, this improvement is very creditable to the officer in charge. The expenditure on the whole during the past year, from the top of the Thul Ghaut to the bottom of the Chandore Ghaut, has amounted to 12,936 rupees.

Road between Thul
Ghaut and Nassick,
and between Nassick
and Chandore. State
and Expenditure.

Ra. 12,936.

25. The ferry boat on the Kadwa River at Kokengaon has been converted into a flying bridge, by the addition of standards and ropes; ramps have also been cut through the banks for landing-places, and approaches from the main road have been constructed; the whole at a cost of 565 rupees.

Flying bridge at
Kokengaon.

Ra. 565.

26. A bridge of 60 feet span has been designed by Lieutenant Chapman, for the Pharasherry River at Pimpulgaom, where the post is occasionally delayed as much as eight hours, and an estimate has been laid before the Military Board, but as some modification in the appeared desirable with a view to diminish the cost, a month or two will probably elapse before the proposed work can receive the sanction of Government. The small rivers at Wozur and Argam require also to be bridged, as recommended in my Report of last year, and the requisite plans and estimates are under preparation by Lieutenant Cowper of the Engineers, who has been attached to this department for the purpose of estimating

Proposed bridge at
Pimpulgaom,
Lieutenant Cowper,
of the Engineers,
appointed to the
Department, and
engaged in estimat-
ing for other im-
provements required
on the line.

190 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

mating for these and other improvements between Egutpoora and Chandore, which the Postmaster-general has, in a late report to Government, represented to be advisable.

II. Mail Road.

Below the Bore
Ghaut ;
Above ditto.
Expenditure.
Ra. 5,973.
Ra. 15,640.

27. Captain Pruett and Lieutenant Cowper still retain charge of the portions below and above the ghaut respectively; the expenditure or repairs under the former having amounted to 5,973 rupees, and under the latter to 15,640 rupees. The three years' contract with Venkuttish Nairain for the repairs of the Mail Road under Lieutenant Cowper having terminated on the 30th of April last, fresh tenders were invited for the performance of the repairs for the ensuing season, and the lowest tender having come from Nunderam Soonderje, a man of character and substance, has been approved of and accepted.

Panwell Bunder.

28. The raising of the Panwell Bunder, as well as the construction of masonry revetments to protect it from the tide, have been carried on during the past season, and are now completed at a contract cost of 5,725 rupees; but I regret to say that the contractor, Govind-bin Hurry has given a deal of trouble by frequent attempts to introduce bad work, and that it has been necessary to resort to the most stringent remedies the terms of the agreement allowed of, in order to prevent his succeeding in these fraudulent practices.

Completion of New
Akoordie line, sanc-
tioned by Honour-
able Court.
Ra. 29,426.

29. The sum required for bridging and metalling the new Akoordie line, amounting in the aggregate to 28,426 rupees, were sanctioned by the Court of Directors under date the 25th November last, and the works are now in progress by contract under the orders of Lieutenant Cowper. The entire cost of this piece of road, which is eight miles and a half in length, will, on completion, have amounted to 46,858 rupees or 5,512 rupees per mile, which may be accounted a rather moderate rate than otherwise for a metalled and perfect road in the Deccan, considering that the country is almost always either undulating and intersected by numerous watercourses, or else composed of black soil, where the foundations of a road are an unavoidably expensive item.

Ra. 46,858.
Ra. 5,512.

Probable date of
completion, and
saving in annual
expenditure for
repairs.

30. The contractor is not bound to finish the work before the 31st July 1848, but as it is an object of importance to have the new line open by the commencement of the monsoon, every exertion is being made, and will continue to be made, to prevent any work remaining on hand after the beginning of June. As the Ounde and Panwell and Bhojapoor lines will be abandoned on the completion of the Akoordee Road, the saving in road repairs will amount to no less than 4,800 rupees per annum.

Ra. 4,800.

Junction Line with
Seroor Road by
Holkar's Bridge.

31. A short line of junction between the Dapoorie and the Holkar Bridges was at the same time sanctioned by the Honourable Court, at an estimated cost of 7,827 rupees; but as it appeared likely that a contractor might be found to do the work for a smaller amount, tenders were invited, and the lowest, amounting to 6,350 rupees, has been accepted; this short piece of road is intended to perfect the communication between Bombay and Nuggur, when the Bhojapoor line shall have been abandoned, but it is believed that during the fair season, the greater portion of the traffic between those places will proceed by Poonah and Kurradee.

Culverts and drains
required between
Poonah and Kun-
dalla.

32. The plans and estimates which were alluded to in my last Report as being under preparation by Lieutenant Cowper, for a number of small bridges and drains required on the Mail Road between the western extremity of the Akoordie new road and Khundalla, were despatched to the Military Board's Office on the 31st of May last, the aggregate of the estimate amounting to 31,224 rupees, and the number of works provided for being 53. A few of the streams for which culverts or drains of several waterways have been designed, are from four to two feet deep in the monsoon, and form an occasional obstruction to the post, but the generality are small, and are chiefly to be objected to as being injurious to the road.

Widening the road
through Kypke.

33. Plans and estimates prepared by the same officer have also been sent in for widening that part of the Mail Road which lies between Dapoorie Bridge and the point of junction with the Seroor Road, and the maximum width of which is at present only 17 feet; these estimates were originally called for by Major Peat,

who

who foresaw the necessity that would exist for making this portion of road of a convenient width, as soon as the completion of the Akoordie Road should have thrown it open to all the traffic between Bombay and Poonah. The length to be widened is 2 miles and 581 yards, and the estimated cost of making it uniformly 25 feet broad, inclusive of the cost of drains, amounts to 10,567 rupees.

Presidency of
Bombay.

III. Road between Poonah and Nuggur.

34. Mr. Scott is still in charge of this line of road, and the expenditure on repairs during the past year has amounted to 8,223 rupees. On the whole it may be said to have been generally improved by the trouble that was bestowed on it last monsoon, and in some places, especially near Soopa where the moorum is of first-rate quality, it is equal in smoothness of surface and almost in hardness to the best parts of the Mail Road.

State of the road,
and expenditure.

35. The two bridges of stone and choonam masonry, which in my last Report were stated to have been sanctioned by Government for the nullahs at Kondapoor and Wasudwadee, the one at a contract cost of 6,995 rupees, and the other at a contract cost of 4,305 rupees, were commenced in the month of October last, under the orders of Mr. Scott. The progress of both works was very satisfactory up to the month of May last, when an unseasonable and totally unexpected fall of rain caused a sudden rise in the nullah at Kondapoor, which produced a slight sinking in the mud centrings, and thus caused the arches of the bridge, then being turned, to show cracks between their haunches and the skewbacks of the pier. No alternative presented itself but to pull down the damaged arches and the incorrect centrings, and as the monsoon was at hand, to postpone further operations till the re-opening of the season; of course the contractor was in nowise to blame, as the accident was one over which he had no control, and which could not have been foreseen. The nullah at Wasudwadee, though distant only three miles from Koudapoor, was neither flooded nor in any way affected by the fall of rain alluded to, and the progress of the bridge advanced therefore without interruption.

Two new Stone
Bridges: failure
of mud centring.

36. The retaining walls of the eastern approach of the Shikrapoor Bridge, which are constructed of dry stone, squared and coursed, and which adjoining the abutments are no less than 25 feet in height, began to bulge and give way in the latter end of 1845. A portion which has actually tumbled down was rebuilt by Mr. Scott in the month of July of last year, at an outlay of 300 rupees, but a much larger expenditure will be requisite before the security of the entire approach can be ensured. The bridge was built in the year 1842-43, under the orders of Lieutenant Hart, of the Engineers, and the fault of construction in the retaining walls appears to be in want of bearing in the facing stones and in the looseness of the backing.

Shikrapoor Bridge.

37. Having very attentively examined the bed of the Seena River when last at Nuggur, it appeared to me that if piles could be forced to penetrate the hard stratum below the gravel of which the bed consists, to the depth of a couple of feet or so, the style of bridge best suited to the locality, and incomparably the cheapest, would be a wooden one, and the Military Board have sanctioned an experiment being made to ascertain this point. Though styled a river, and in point of breadth almost deserving of the name, being 333 feet across, the extreme height of its banks does not exceed four feet, and as the layer of gravel which forms its bed is 12 or 13 feet in depth, a masonry bridge with foundations springing from the rocky stratum would be enormously expensive, considering the ordinary shallowness and insignificance of the stream. Were the river freshes confined indeed within its proper channel, it might be almost doubted whether a bridge of any sort would be absolutely required; but flooded as the banks occasionally are to a considerable distance, the stream is at times impassable.

Seena River; best
way of bridging it.

38. The wire ropes which were substituted last monsoon in lieu of the usual hempen hawsers for the flying bridges of Koregaon and Poonah, are likely to prove far more economical than the latter, and with the improved species of traverser which has been introduced instead of the ordinary swinging blocks, the passage

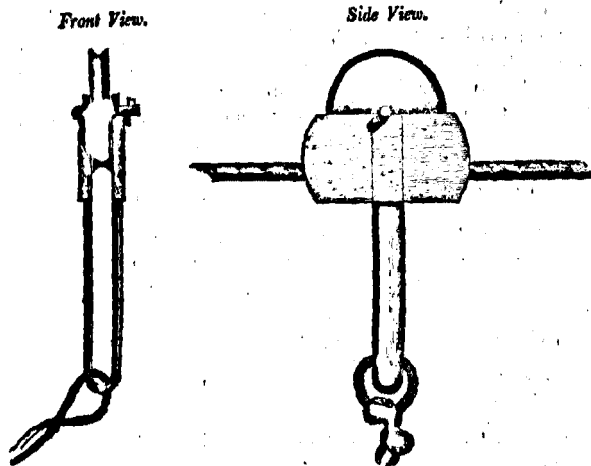
Wire ropes for
flying bridges; their
efficiency.

Presidency of
Bombay.

of each raft across the river is reported by the boatmen in charge of the flying bridges to be effected with much greater celerity than formerly. The only fault or failure in the wire rope that has yet been discovered, is its liability to oxidation, but this may possibly be remedied by an annual coating of tar.

Substitute for swing-
ing block.

39. The new traverser just alluded to, the efficiency of which was stated in my last year's Report to be then under trial, has these advantages over the old block: First, that it is but very slightly worn away during a season by the friction of the rope, instead of being rendered useless, as the block was, in the course of a month. Secondly, that it can never be top-heavy, as the blocks frequently were, and that it therefore traverses more freely. Thirdly, that it is shipped and unshipped simply by the removal and replacing of the pin of the sheave, while the fixing or unfixing of a block necessitated the unfastening and refastening of the rope itself; and fourthly, that it costs seven rupees less in the construction. As it is not likely, however, that the mere detailing of its advantages will convey a correct idea of this simple contrivance, a sketch is subjoined, which will obviate any necessity for further description. The sheaves or rollers, it may be observed, are case-hardened exteriorly, and the loops or shanks are of wrought iron.



Proposed new line
between Poonah and
Wargoolie.

40. The new line between Poonah and Wargoolie *via* Kurradee I have already alluded to, in mentioning Lieutenant Bruce's performances; but as it is not improbable that at some future day this may be the only established line of communication towards Nuggur, I may here take the opportunity of stating that the construction of a bridge across the Moota Moola at Kurradee, having been deemed by yourself of greater primary importance than the completion of a road without the bridge, the Military Board have directed the subject to be taken into consideration.

Removal of Poonah
Flying Bridge to
Kurradee.

41. The flying bridge which plied opposite the town, and which became useless on the completion of the Poonah Bridge, has been removed to Kurradee, where it is now being established at a contract cost of 1,931 rupees. The chief causes of this work being so expensive are, first, the extensive repairs required by the two boats and other wood-works of the raft, and secondly, the great amount of rock-cutting which was found to be requisite at the new site, in the formation of ramps.

IV. Road between Poonah and Neera Bridge.

State and expendi-
ture.
Bapdeo Ghaut.

42. This road is still under charge of Mr. Scott, and has been repaired during the past season at a cost of 2,646 rupees, which has been laid out with great advantage, and considerably improved its condition. The Bapdeo Ghaut will always be a formidable obstacle to traffic, which is not, however, so important on this line as to render the construction of a new ghaut advisable.

Huts for Dawk
Runners.

43. On the requisition of the Postmaster of the Deccan, an estimate has been prepared and submitted, amounting to 539 rupees, for the erection of huts at
five

five stages between Poonah and Jeejorie for the use of the dawk runners on this line.

Presidency of
Bombay.

V. *Road between Nagotna and Mahaleshwur.*

44. This road has been repaired by contract under Captain Pruen, at an expense of 5,025 rupees, and is in fair order, and but little damaged by Mr. Baretta's phaetons having been re-established between Mhao and Nagotna.

State and expenditure.

45. The only works which have been performed on this line during the past season are of a trifling nature, one being a munda ceiling to the traveller's bungalow at Indapoor, at a cost of 101 rupees, and the other the removal, by blasting, of certain rocks which impeded the navigation of the Nagotna River, at a cost of 36 rupees.

Ceiling to Bungalow at Indapoor; removal of rocks in Nagotna River.

VI. *Cross Roads in the Poonah Collectorate.*

46. The roads which are declared under this head, and which are in length 54½ miles, have been repaired during the past season at an aggregate cost of 4,348 rupees. The portion of roads which connects the Dapoorie Bridge with the Bhojapoor Road, which is 2 m. 5 f. 180 yds. in length, and which has heretofore been repaired as part of the Mail Road at a cost per mile of 303½ rupees, will revert to the former use as part of the Narraingaum Road, on the completion of the Akoordie new line, and will be repaired, like the rest of that road, with moorum instead of metal, at an annual expense of 98 rupees per mile.

Expenditure. Portion of road now used as mail-road will revert to its former use of cross-road.

VII. *Cross Roads in the Nuggur Collectorate.*

47. The repairs to these roads, which still remain under charge of Mr. Scott, have been made during the past season at a cost of 737 rupees, and their state remains the same as at the date of my last Report.

VIII. *Cross Roads in the Nassick Sub-Collectorate.*

48. The outlay on these roads for the past season amounts to 1,639 rupees, and they are in tolerable order.

State and expenditure.

49. A bridge over a large nullah on the road between Nassick and Sinnur, and about a mile distant from the former place, was partially swept away by a heavy flood in the month of June last year, and was repaired at a cost of 297 rupees, and the Nassurdy Causeway was also slightly injured on the same occasion. No damage would, in my opinion, have been sustained by either of those works had their style of construction been as good as it ought to have been.

Injury to a bridge from last monsoon flood.

IX. *Cross Roads in the Tannah Collectorate.*

50. The aggregate expenditure on these roads for the past season amounts to 3,522 rupees. The Collector of Continental Customs and Excise, under date the 29th August last, suggested the advisability of widening and raising certain portions of the road between Khopoolie and Dhurm Tur, and a report has been received from Captain Pruen on the subject which is now under consideration.

Expenditure; proposed improvement.

51. The Collector of Customs, at the same time, recommended the construction of branch roads to the salt-works at Wansee and Oomarde, which are situated, the former at three miles and the latter at one mile from the main road, but it appeared to Captain Pruen, after an examination of the country, that the work would be more extensive than the occasion called for, and that it would be sufficient to bridge two salt-water creeks, which, after the middle of the month of November, are the only impediments that exist to traffic. Plans and estimates for these works are consequently in course of preparation.

Two salt-water Creeks proposed to be bridged near Penn.

X. *Cross Roads in the Rutnagherry Collectorate.*

52. The roads in the above collectorate have been repaired during the past season, at a cost of 1,169 rupees, and are represented to be in good order.

XI. Roads in Salsette.

53. These roads are still under Lieutenant Mungavin, and have been repaired during the past season at a cost of 1,731 rupees. Though a trifle better than they were, they have not been improved to the extent that I anticipated at the date of my last Report, and I was informed by Lieutenant Mungavin, during last rains, that the iron rollers, which have been found so effective elsewhere, had but little effect on the Salsette Roads. The only way in which I can account for this is, under the supposition that the roads have been so deteriorated for some years past, by the admixture of bad moorum and earth with the metal, that it is now impossible to get a thin layer of the latter material to form a compact surface.

54. The new line of road between Cooria and the 20th milestone *vid* Bhandoop, which was stated in my last Report to have been sanctioned by the Government of India, and about to be undertaken by a subsidiary gaol, was not commenced till the 16th December last, in consequence of the delay that occurred in supplying guards, by which means six weeks of the working season were irretrievably lost. When once commenced, however, the work proceeded with rapidity, and up to the end of April last, a length of nearly four miles had been completed, inclusive of bridges and cross-drains, with the exception of the parapets.

55. In the month of February last, when some progress had been already made, a representation which had been addressed to Government by Framjee Cowasjee, Esq. was received in this office, to the effect that the value of his estate of Poway would be very much deteriorated by the abandonment of the old, and the construction of the new road, the former having passed through the estate, while the latter would merely skirt it; and it was further attempted to be shown that a shorter and a better line than the Bhandoop one might be carried through another part of Poway, with mutual advantage to the public and the proprietor.

56. In consequence of this representation, instructions were received by the Military Board from Government, to cause Framjee Cowasjee's new line to be surveyed and levelled, but as this duty had already been performed by Captain Ash, when engaged on the Vehar Khird survey, whose field-books were in my office, nothing was easier than to plot the survey and lay down the longitudinal section on paper with accuracy; this was accordingly done, and in company with a detailed report, which a careful inspection of the ground had enabled me to prepare, with survey and section, were submitted to the Military Board in the month of March, the whole plainly proving that Captain Crawford's Bhandoop line was, in all the essential characteristics of a good road, superior to the Poway one; it was better watered, better wooded, shorter, and more level, and the Government in consequence decided that it should be carried out as originally contemplated; but, with the view of preventing any injury to Framjee Cowasjee's estate, instructions were subsequently issued by Government that, on the completion of the new line, a branch road should be constructed connecting it with Poway, and the necessary sketch is now under preparation by Lieutenant Mungavin.

57. It was originally intended, and instructions were given to that effect by the Military Board, that the accounts connected with the cost of the subsidiary gaol should be so carefully kept, that the relative expense of convict and free labour in the construction of roads in this country should be satisfactorily determined; this object, I need hardly say, has been most carefully kept in view, but I am inclined to believe that the result of the experiment will be less favourable to the employment of convicts than it would have been had no delays been permitted to occur, and this much I think is clear, that a subsidiary gaol would be employed to much greater comparative advantage on a line of work that could be completed in one season, than on an undertaking of greater magnitude, where more than one season would be required, for the contingent expenses incurred on account of guards and establishment during the monsoon, when there is no equivalent in the shape of work, must make a material addition to the debit side of the gaol account.

58. The proposed new bridge at Earla Parla, which was stated in my last Report to have been then estimated for, was commenced by contract under the orders

orders of Lieutenant Mungavin in the month of February last, and progressed fairly and satisfactorily till the beginning of June, when the self-same cause which proved so injurious to the centrings and arches of the bridge at Koudapoor on the Seroor Road, had a similar effect on the work at Erla Paria; a heavy and unlooked-for fall of rain caused one of the centrings to sink, and the arch to crack, so that I have been obliged to direct Lieutenant Mungavin to see that the contractor re-constructs on a correct centring.

Presidency of
Bombay.

59. In both cases the centrings were of mud and rubble, a style of construction which is in so far preferable to wood, that it is much cheaper and more expeditiously carried on, but, as will have been seen by the instances now brought to notice, it is not to be relied on in wet weather, and becomes decidedly dangerous as the rains approach; mud centrings ought never, therefore, to be used, except in cases where there is a certain prospect of the arches being completed, and the mortar set before the usual period of the first monsoon showers.

XII. Poonah and Sholapoor Roads.

60. The piece of metalled road leading out of the town of Poonah, in the direction of Sholapoor, is 2 m. 3 f. 200 yds. in length, and has been repaired by Mr. Scott during the past season, at a cost of 631 rupees; that part of it which is beyond the camp having been but recently completed, needed but very little remetalling, and there the average cost per mile appears somewhat small, but during the current year it will more nearly approximate to the usual charge for other metalled roads under this department.

61. That portion of the Poonah and Sholapoor Road which is now under construction between Patus and Indapoor, a distance of 44 miles and 6 furlongs, has been expeditiously carried on since the date of my last Report, by Mr. Sub-Conductor Armitstead. On the 30th April of last year, 9 miles and 6 furlongs had been trenched and raised with moorum; on the 30th April of the present year, 43 miles and 5 furlongs had been trenched and raised, 13 miles cross-drained, 17 miles curbed, and 7 miles completely finished. On the portion cross-drained, 1 small bridge, 3 culverts, and 66 drains of sorts, had been constructed. The entire expenditure had amounted to 1,42,284 rupees, out of which sum 1,23,208 rupees had gone solely on labour, and its trifling proportion of superintendence.

62. An estimate for the completion of the road and all the works required thereon, accompanied by appropriate and well executed designs, was received from Mr. Armitstead in February last, and forwarded to the Military Board on the 16th of that month. It provided for all work that remained to be performed on the 1st day of the present year, and amounted to 1,31,643 rupees, so that as the expenditure up to the close of last year had amounted to 1,22,985 rupees, the total probable cost for the entire piece of road between Patus and Indapoor will be 2,54,628 rupees, or 5,690 rupees per mile.

63. After visiting Indapoor in November last, and carefully examining the works in progress, I was enabled to submit a very satisfactory account of Mr. Armitstead's proceedings to the Military Board. Such deviations as had been made from the old track appeared to me judicious, and the work of every description was excellent. The masonry of the culverts and drains is composed of hammer-dressed or rough-cut stone and choonam, and the workmanship is inferior to none that I have seen in this Presidency. The such* stones are of an almost uniform size, and of the best basalt, varying not more than from 10" x 10" x 18" to 9" x 9" x 15", and should any objection be made, either to these or to the masonry, on the score of their being too good or too expensive, I have only to mention that, good as they are, the curb-stones only cost 3½ rupees per 100 running feet, and that, excellent as the masonry is, a culvert of three arches, each of five feet span, is completed for the moderate sum of 647 rupees.

* Orig. Qu. sunk?

64. This road, as I mentioned in my last Report, was undertaken for the sake of affording employment to a distressed population, and as those who sought relief were either cultivators out of employ, or the Mhars of the surrounding villages, unmixed with builders—artificers, it was of course necessary, with the view of turning their physical strength to the best account, to set them

Presidency of
Bombay.

XI. Roads in Salsette.

53. These roads are still under Lieutenant Mungavin, and have been repaired during the past season at a cost of 1,731 rupees. Though a trifle better than they were, they have not been improved to the extent that I anticipated at the date of my last Report, and I was informed by Lieutenant Mungavin, during last rains, that the iron rollers, which have been found so effective elsewhere, had but little effect on the Salsette Roads. The only way in which I can account for this is, under the supposition that the roads have been so deteriorated for some years past, by the admixture of bad moorum and earth with the metal, that it is now impossible to get a thin layer of the latter material to form a compact surface.

54. The new line of road between Coorla and the 20th milestone *vid* Bhandoop, which was stated in my last Report to have been sanctioned by the Government of India, and about to be undertaken by a subsidiary gaol, was not commenced till the 16th December last, in consequence of the delay that occurred in supplying guards, by which means six weeks of the working season were irretrievably lost. When once commenced, however, the work proceeded with rapidity, and up to the end of April last, a length of nearly four miles had been completed, inclusive of bridges and cross-drains, with the exception of the parapets.

55. In the month of February last, when some progress had been already made, a representation which had been addressed to Government by Framjee Cowasjee, Esq. was received in this office, to the effect that the value of his estate of Poway would be very much deteriorated by the abandonment of the old, and the construction of the new road, the former having passed through the estate, while the latter would merely skirt it; and it was further attempted to be shown that a shorter and a better line than the Bhandoop one might be carried through another part of Poway, with mutual advantage to the public and the proprietor.

56. In consequence of this representation, instructions were received by the Military Board from Government, to cause Framjee Cowasjee's new line to be surveyed and levelled, but as this duty had already been performed by Captain Ash, when engaged on the Vehar Khird survey, whose field-books were in my office, nothing was easier than to plot the survey and lay down the longitudinal section on paper with accuracy; this was accordingly done, and in company with a detailed report, which a careful inspection of the ground had enabled me to prepare, with survey and section, were submitted to the Military Board in the month of March, the whole plainly proving that Captain Crawford's Bhandoop line was, in all the essential characteristics of a good road, superior to the Poway one; it was better watered, better wooded, shorter, and more level, and the Government in consequence decided that it should be carried out as originally contemplated; but, with the view of preventing any injury to Framjee Cowasjee's estate, instructions were subsequently issued by Government that, on the completion of the new line, a branch road should be constructed connecting it with Poway, and the necessary sketch is now under preparation by Lieutenant Mungavin.

57. It was originally intended, and instructions were given to that effect by the Military Board, that the accounts connected with the cost of the subsidiary gaol should be so carefully kept, that the relative expense of convict and free labour in the construction of roads in this country should be satisfactorily determined; this object, I need hardly say, has been most carefully kept in view, but I am inclined to believe that the result of the experiment will be less favourable to the employment of convicts than it would have been had no delays been permitted to occur, and this much I think is clear, that a subsidiary gaol would be employed to much greater comparative advantage on a line of work that could be completed in one season, than on an undertaking of greater magnitude, where more than one season would be required, for the contingent expenses incurred on account of guards and establishment during the monsoon, when there is no equivalent in the shape of work, must make a material addition to the debit side of the gaol account.

58. The proposed new bridge at Earla Parla, which was stated in my last Report to have been then estimated for, was commenced by contract under the orders

orders of Lieutenant Mungavin in the month of February last, and progressed airily and satisfactorily till the beginning of June, when the self-same cause which proved so injurious to the centrings and arches of the bridge at Kondapoor on the Seroor Road, had a similar effect on the work at Erla Parla; a heavy and unlooked-for fall of rain caused one of the centrings to sink, and the arch to rack, so that I have been obliged to direct Lieutenant Mungavin to see that the contractor re-constructs on a correct centring.

Presidency of
Bombay.

59. In both cases the centrings were of mud and rubble, a style of construction which is in so far preferable to wood, that it is much cheaper and more expeditiously carried on, but, as will have been seen by the instances now brought to notice, it is not to be relied on in wet weather, and becomes decidedly dangerous as the rains approach; mud centrings ought never, therefore, to be used, except in cases where there is a certain prospect of the arches being completed, and the mortar set before the usual period of the first monsoon showers.

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196 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

to work on what required the least teaching, *i.e.* the trenching and raising of the road-way.

65. Thus it is, that the entire raising of 44 miles was almost completed before a single bridge or drain had been commenced, but under other circumstances, where choice should be the guide and not necessity, the system which you have before now advocated is the one that would be followed, and the passage of such rivers and streams as were calculated to impede traffic would be the first step to be accomplished in opening a new line of communication. The Military Board, indeed, guided by the same views, have already instructed me to send in rough estimates of the cost of bridging the remainder of the Sholapoor Road.

XIII. Nagpoor Dawk Line.

66. Captain Dennis still retains charge of the line of works between Nugga and the Wurda River, and the expenditure during the past season in repairing and renewing old works amounted to 10,306 rupees.

67. Delays on this line appear now to be of rare occurrence instead of great frequency, as was the case some few years back, and it may be safely inferred, therefore, that wide and unstable as many of the bridges and other constructions are, they are yet moderately efficient so long as they last.

68. A sample of the rope-suspension bridge, which it was proposed at the date of my last Report to substitute for flying bridges over the large nullahs on this line, was completed in the month of July of last year by Captain Dennis, who reported favourably of its utility and suitability for the dawk runners or foot-passengers, but he at the same time gave it as his opinion, that great difficulty would be experienced in crossing the horses, who would naturally take alarm at the oscillating motion of the footway. This opinion was undoubtedly well-founded, for the bridges were only designed with the view to afford a safe and speedy passage to the men themselves, for which the flying bridges had been so ill adapted.

69. As it did not appear impossible, however, to make such improvements in the construction and substantiality of bridges of this description as would admit of horses crossing over without difficulty or fear, an experiment is about to be tried with wire-ropes and a firm flooring, protected on either side by a light railing.

70. The ferry across the Godavery at Toka has been transferred to the charge of Captain Dennis from that of Mr. Scott, as proposed in my Report of last year, and on the recommendation of the former officer is about to be converted into a flying bridge, for which the raft which was constructed by this department last season will answer the purpose very well. As no flying bridges exist on this side of India of so great a span as this will be, the standards will require to be of unusual height and strength, and the rope it is intended shall be of wire $3\frac{1}{2}$ " in circumference, which is equal in strength to an 8 $\frac{1}{2}$ " hempen hawser.

XIV. Works of the Regular Lines of Road.

71. The Poonah Bridge, which was commenced on a design of Major Peat's in the month of November 1844, was completed by contract under Lieutenant Cooper's orders in December last, at a total cost of 28,212 rupees, out of which the inhabitants of the town bore 10,382 rupees. To this outlay has subsequently been added the sum of 1,352 rupees, being the calculated amount of expense the contractor was put to in pulling down and removing the centring, and the consequent amount of compensation adjudged by Government. The entire cost of the bridge, therefore, from first to last, has amounted to 29,564 rupees, and no one can deny that it is extremely moderate.

72. The partial reconstruction and improvement of the Gokhurwa Bridge, near Bassein, which was stated in my last Report to have been then estimated for, and sanctioned by Government, at a cost of 5,702 rupees, has also been carried on during the past season, and must ere this have been completed, but numerous circumstances have combined to render an excess upon the estimate unavoidable.

unavoidable. In addition to the fact of building materials having turned out to be much dearer in that neighbourhood than was originally calculated on, it was found, on dismantling the bridge, that the timbers were in such a state as to preclude the possibility of their being used to a tenth of the extent that was allowed for; and as a still further cause of increased expenditure, the progress of the work was much retarded by the tides, by which, at the springs, the piers and abutments were covered for several days. A supplementary estimate, therefore, became unavoidable, and Government have accordingly sanctioned an additional sum of 976 rupees.

73. Lieutenant Scott has also constructed a flight of steps to the jetty at Callian, and repaired the Mamlutdar's Cutcherry at the same place, the former at a cost of 43 rupees, and the latter at a cost of 228 rupees; and the same officer has likewise furnished the extensive repairs which were required to the Kusseybee Bunder, and which, as stated in my last Report, had been postponed on account of the rains, the total expense having amounted to 1,782 rupees.

74. Lieutenant Mungavin completed the boat intended for the ferry at Oomergaom, at a cost of 571 rupees, and despatched it to that place in the month of January last.

75. An estimate for a Mamlutdar's Cutcherry at Oarum, in Carrinja, was sanctioned by Government, under date the 30th April last, for 1,367 rupees, and will be commenced by contract under the orders of Captain Pruen, on the opening of the season.

76. Estimates, accompanied by plans, were submitted to the Military Board in the months of October and February last, for an Assistant Collector's Cutcherry at Kelwa Mahira, and for a Bungalow for one of the uncovenanted Assistants of the Collector of Continental Customs and Excise at Bassein, the former amounting to 2,914 rupees, and the latter to 5,400 rupees, but nothing has been communicated in regard to their sanction.

XV. *Military Buildings.*

77. The repairs to the military buildings at Tannah have been completed by Lieutenant Mungavin for 117 rupees, and the same officer has constructed four new pendalls, and improved two old ones, for the sum of 3,470 rupees, a saving of 212 rupees having been effected on the estimate for the repairs, and a saving of 779 rupees on the estimate for the new pendalls; the former in consequence of the reduction of work caused by the removal of the temporary pendalls, and the latter in consequence of the employment of convict labour.

78. Lieutenant Mungavin is also now engaged in building a new Detachment Hospital at Tannah, 56½ feet in length by 18½ feet in breadth, with dispense rooms and out-offices, the estimates for which, amounting to 4,340 rupees, were sanctioned by Government under date the 12th March last.

79. An estimate, prepared by Lieutenant Mungavin, amounting to 2,138 rupees, and accompanied by a plan, was submitted to the Military Board in the month of May last, for two new pendalls for the use of the detachment of Ghaut Light Infantry stationed at Tanna, but no intimation of sanction has yet been received in this office.

80. The regimental buildings which were stated to be in progress at Nassick at the date of my last Report, were completed, under the orders of Lieutenant Chapman, in the month of September last. The estimated and sanctioned amount was 3,366 rupees, but through the extreme carelessness and negligence of Sub-Conductor Viges, to whom the superintendence of the work had been entrusted by Lieutenant Chapman, while himself otherwise engaged, this sum was exceeded by a very large amount. From Lieutenant Chapman's explanation of the business, it appeared that the estimate itself was deficient to the extent of 421 rupees; but, independently of all the legitimate causes which could be assigned for an excess upon the sanctioned amount, Lieutenant Chapman discovered, on investigating the case, that there was an additional sum of 1,150 rupees expended, for which Mr. Viges was totally unable to account.

81. That the sub-conductor did not appropriate the whole of this money to his own use, was very clear, as certain sums were traceable into the possession

Presidency of
Bombay.

of some of the native subordinates, who absconded; that he took even a portion of it has not been proved, and may be doubted, but that the loss was entirely owing to the most gross negligence, enhanced by indulging in habits of intemperance, was unfortunately but too evident.

82. This, however, was not Mr. Viges' only breach of duty. He abstracted from the bag entrusted to his charge for the payment of people employed on road repairs, the sum of 230 rupees, with which he liquidated a private debt. The fault was freely acknowledged, and it is possible that Mr. Viges might have intended to replace the money as soon as he was able; but it was perfectly clear that a man who could be guilty of such neglect of duty and dishonesty was unfit for any situation of trust under Government. He was, therefore, removed from this department, and remanded to his corps as a second corporal.

83. Some additions to the buildings alluded to were sanctioned by Government in the month of January last, at a probable cost of 591 rupees, and are now progressing towards completion.

XVI. Tanks, Bunds and Wells.

84. Though the energies of the Road and Tank Department have been directed to the accomplishment of more important undertakings than had ever previously engaged the attention of any branch of the Public Works Department under this Presidency, still it has furnished cause for complaint, and has been a source of regret to myself, that, comparatively speaking, but little has been effected towards the extension of irrigation throughout the country by the means of tanks, bunds and wells.

85. To remedy this deficiency, the most strenuous efforts have been latterly made, but owing to the numerous difficulties which have been encountered, and the many conflicting interests which often have to be reconciled before a work can be undertaken, less progress has been made than could have been wished; though, on perusal of the following Report, I think it must be admitted, that, as far as the Road and Tank Department is concerned, matters are in fair train towards effectual and speedy amendment.

86. Before entering into particulars, however, I would request permission to say a word or two on the subject generally; and, first, in regard to the policy and advantage of putting into an efficient state such of the old works which are to be found scattered throughout the country, as may now only need a few repairs to render them as productive to the revenue of the existing Government as they were to former times. Of those works, the most deserving of attention are the bund and bundaras, by means of which the land on either bank of many rivers and rivulets was fertilized and rendered productive throughout the greater part of the year. To say what amount of profit would be yielded by the repair of each, would of course require the knowledge and experience of a Government Revenue officer, but as far as rendering them efficient may be concerned, numerous are the instances in which a trifling expenditure, and a very small amount of engineering skill would suffice to secure the desired result; and surely, unless my judgment is greatly at fault, it would be but a common act of prudence to incur a small outlay in perfecting those ancient works, whose strength and substantiality have resisted the floods of possibly a century, and whose utility has been proved beyond a doubt, before we make attempts at constructing most costly and expensive new ones; attempts, moreover, which, like others of recent date, might chance to prove abortive, despite the amount of science and talent which would doubtless be brought into requisition.

87. With views such as these, it was my anxious wish to have had some 50 bunds in the Nassick Collectorate put into a state of efficiency, and as the Collector and the Superintendent of the Revenue Survey were both agreed as to the advisability of the measure I proposed to the Military Board, under date the 11th August 1846, that a First Assistant of a department should be employed in reporting on and estimating for the whole. This duty would, in consequence, have been performed by Captain Jacob long ere this, but for his untimely removal from the department to superintend the reconstruction of the damaged portion of the

the Jamsetjee Bund at Poonah, and as no other officer's services have been available for the work, it still remains in abeyance.

Presidency of
Bombay.

88. Another remark, which ought to precede my report on the subject of Works for Irrigation, is, that easy as it may appear at first sight, to discover places where bunds might be constructed with effect, there are two points to be considered and made to agree, before anything definite can be attempted; for not only ought the locality selected to be free from all engineering difficulties, and to afford every facility for the construction of the proposed work; but it ought also to be so peculiarly situated as to render remuneration from increase of revenue a moral certainty. Many are the places where the eye of an engineer might detect desirable sites for drains and bunds, but few there are in comparison where the Revenue Officer could see any prospect of a profitable return to Government.

89. The most expensive project which has been contemplated during the past year in connexion with the subjects of an increased supply of water is, that which has already been briefly alluded to in the 11th para. of this Report, viz. the clearing out and improvement of the Katrey Tank. The attention of this department has for some years past been directed to the advisability of removing the earth which has been gradually accumulating for the last half century in the bed of the tank; and a proposition was made by Lieutenant Hart, while a Second Assistant in the department, to make an opening in the bund, through which the mud, after having been stirred up by labourers, might be forcibly carried by the rush of water in the rains. This suggestion was fortunately objected to by the Honourable Court of Directors, in their letter to Government of the 21st May 1844, and directions were given that a very careful survey might be made of the nullah which supplies the tank, with the view of devising some remedy for the prevention of further accumulation in its bed. A most accurate survey was accordingly made by Captain Jacob, the place was carefully examined by both of us on more than one occasion, and the means of effecting the desired object were fully discussed, the result of which was, that an estimate was prepared, and sent in to the Military Board on the 26th December last, accompanied by a survey and sections for the excavation and removal of a mass of earth, whose solid contents amounted to 2,900,000 cubic feet, and for the re-opening of a channel, and repair of a bund which had been originally constructed with the intention of carrying off all earthy matter, and preventing any deposit in the tank, but which had fallen into complete neglect and disuse. The probable cost of these several improvements amounted to 4,765 rupees, and the additional quantity of water which Captain Jacob calculated would be available for the inhabitants of Poonah amounted to a '30 days' supply.

90. Another project of some importance which has engaged the attention of this department, is that which is alluded to in the 4th para. of the Superintending Engineer's Report for 1844-45, and which at that period was affording some employment in estimating and designing to the Executive Engineer of Nuggur, I mean the proposed aqueduct at Teola for the supply of the town with water; it appears that an estimate, amounting to 29,972 rupees had been prepared by the Executive Engineer, under date the 9th February 1846; but that the project had been temporarily abandoned, in consequence of the inhabitants of the town evincing a disinclination to pay the amount of subscription originally agreed on by them. At the recommendation of the Revenue Commissioner, however, the project was revived by this department, and it was intended that Captain Jacob should have been deputed to examine the locality, and prepare fresh estimates, if the proposed means of supply appeared likely to prove sufficient; but Captain Jacob's employment on the special duty already alluded to prevented this arrangement, and I contrived, therefore, during my tour of inspection, to visit Yeola, and examine the place myself.

91. The complaint regarding the scarcity of water, I found to be but too well founded. The wells in the town and its immediate vicinity, which are the only available sources of supply, though numerous, are for the most part of little use, and many of them even in the month of January were perfectly dry. The Pamulla Well, from which it was proposed to supply the town, and which is about half a mile distant from the walls, is the only favourable exception that

Presidency of
Bombay.

could be pointed out, and as it is fortunately fed by a very strong spring, it yields a moderate supply to a great proportion of the township during the hot weather. The depth of water at the time of my visit was 11 feet, and the rate of supply, on being carefully tested, was found to amount to 2,800 gallons per hour. This, though of course insufficient for all the inhabitants, would have yet been enough to fill some three or four reservoirs, and with a Persian wheel to raise the water, and masonry pipes to convey it to the town, the expense, I think, would have been very moderate compared to what the Executive Engineer of Nuggur had reckoned it at. The chief inhabitants, however, with whom I held some conversation on the subject, though evidently extremely anxious to avail themselves of any liberality the Government might be pleased to extend towards them, manifested a very great and extraordinary reluctance to bear any portion of the expense of thus adding to their own comforts; and as it appeared to me to be advisable, before estimating for the work, to ascertain from the proper quarter to what extent this disinclination might extend, a reference was made to the Collector of Nuggur, under date the 23d February last, which to this day remains unreplyed to; nothing further, therefore, has been done.

92. Various projects have been under consideration for increasing the supply of water on the Thull Ghaut Road, and some, I hope, ere this will be sufficiently matured to be laid before Government and approved of. Without entering into particulars, I may mention that estimates are either in progress for proposed new works or improvement at Kussara, Kurdee and Kullumgaom, or else that the necessary preliminary inquiries are being made, with a view to the preparation of those documents with sufficient accuracy to be submitted to superior authority.

93. The work proposed at the last-mentioned place is a new bund, which I think might be constructed at a very trifling outlay, and with a certainty of success. The original one was built by this department in 1837, and appears to me to have been faultily designed, loosely constructed, and injudiciously placed, so that its failure so shortly afterwards is easily accounted for. Though 14 feet in height, its thickness at the base is only five and a half feet, and though intended to stem a stream of some force, as well as to resist the pressure of a column of water of the height just stated, the masonry is of rubble and choonam, and that not of the best quality. As to the site, I am unable, except by a sketch, to convey a correct idea of its inferiority to another which might have been selected, and I therefore add the subjoined rough outline, showing the position of the proposed new bund, as well as that of the old, together with their relative dimensions and construction.

94. At the requisition of the Collector of Tanna, an estimate by Lieutenant Scott was sent in on the 1st May last, amounting to 2,325 rupees, for clearing out and adding a bund and escape-channel to the tank at Colsette, which the Collector stated would not only benefit the inhabitants of that village, but the travellers generally who frequented that great line of road. The villagers, themselves offered to contribute the sum of 251 rupees in cash and manual labour. A report and sketch have also been received from the same officer, and are now under consideration, for improving in a similar manner the tank at Kulwah, opposite Tannah.

95. The best means of improving the Waddala Tank at Panwell, from which the inhabitants draw so large a portion of their supply of water, has also afforded matter for consideration and office labour. It appears that during a flood, which occurred in 1844, the earthen embankment by which the water is retained, together with the masonry retaining-wall on the inner side, were partially but extensively injured, and that the breach so made was promptly repaired by an individual of the name of Sookul Sing, to the extent that is of renewing the embankment, but the retaining-wall was not rebuilt, and a proposition was made by the Acting Collector of Tannah to remedy the defect. On an inspection of the place, however, the standing portion of the retaining-wall appeared to me to be so deficient in foundation and strength, that it afforded no protection or support to the embankment, and that it would be therefore

therefore useless renewing the breached portion on the same plan as the old wall. It was clear, moreover, that the embankment itself was amply strong enough to retain the water as long as it was not overflowed, and I proposed, therefore, to make escape-channels to give egress to the surplus water after it should have reached the level of the top of the retaining-wall. The Military Board having approved of this suggestion, an estimate has been called for, and is under preparation by Captain Pruen.

96. On the recommendation of the Judicial Commissioners for Goozrat and the Concan, an attempt was made in the month of May, of last year, to clear out a large tank in Tannah, which affords the chief supply of water to that town, and which had become choked up to a great extent with mud and weeds. As it was found to be a too expensive work to be done by free labour, I suggested that all the convicts who were then available from the Tannah gaol might be employed on it, and this proposition having been approved of by Government, Mr. Mungavin took out 250 prisoners on the 22d May, and commenced work; he had made, however, but four days' progress when the convicts were withdrawn by order of the Acting Session Judge, in consequence of a recommendation to that effect from the Civil Surgeon, and this exceedingly useful work was thus abandoned.

97. The clearing out of the Chowdar Tank at Mhar, which was stated in last year's Report to have been postponed in consequence of the prevalence of cholera, has been this year satisfactorily completed by contract. The accepted tender amounted to 6,047 rupees, but as the mud in the bed of the tank was found after the water was drawn off to be but four and a half feet in depth instead of five and a half, as had been originally calculated on and estimated for, a corresponding deduction has been made from that sum, so that there is an unexpended balance of 1,614 rupees. This balance it is proposed to lay out in repairing certain portions of the retaining-wall, which are in a dilapidated state.

98. The sluices which it was proposed to make in the bund across the Kurra at the village of Kullud, as mentioned in my Report for 1844-45, have been completed by Mr. Scott during the past season, at a cost of 637 rupees, the expense having been defrayed partly by Mahadeo Rao Nilkunt Poorundurry, Jagheerdar, and partly by the villagers.

99. A new well, with cut stone retaining-wall and stone parapet, is under construction by Lieutenant Chapman at Egutpooree, near the top of the Thull Ghaut, at an estimated cost of 751 rupees; and as the site is well chosen, there is every prospect of its affording such an abundant supply of water, that, together with the excellent well which now exists, it will prevent any further complaints of scarcity at this constantly frequented halting-place. A well is also being cleared out and improved by Mr. Scott, at Shicrapore, on the Seroor Road, at an estimated cost of 176 rupees.

XVII. *Building and Building Materials.*

100. In my Report of last year, I ventured to offer a few remarks on the bad policy and false economy of resorting too generally to what is usually denominated "cheap work" on lines of communication intended to be permanent, and I was in hopes that the examples therein cited of the comparative cost and durability of good work and "cheap work" might have the effect of bearing out my opinions.

101. As it is possible I may have been misunderstood, however, when I stated that "the better a work is constructed, the cheaper it will eventually prove," I now beg to explain, that I never intended the word "costlier" to be used synonymously with the word "better," and it was very far from my purpose to advocate the construction of ornamental or highly-finished work; I merely wished to make it appear, that when the best of all known building materials abounded, it was a great mistake not to take advantage of it; in other words, that where stone was to be had on the spot for the mere cost of quarrying, as it is in almost all parts of the Deccan, it was a pity to use wood, which has to be

Presidency of
Bombay.

bought at an enormous expense from the Calicut or Dhaug forests; still greater pity to resort to rubble-work, which though cheaper at the outset than cut stone, possesses not a tenth of its durability.

102. The style of work whose general adoption on permanent lines of communication in the Deccan I respectfully contend for, is anything but a costly one; in fact, it is not more expensive than those which I condemned. A good bridge of roughly-cut or hammer-dressed stone, chisel-edged at the joints, would not cost more than a bridge of rubble and choonam abutments and piers, and teak-wood superstructure; it would be, beyond all comparison, more lasting, and it would not require annual pointing and dammering, and other repairs, to prevent decay and dilapidation, as the other most assuredly would. With the material here adverted to, abundant as it everywhere is in the Deccan, and easily prepared, I think I may venture to reassert, without fear of misapprehension, that the better a work is constructed, "the cheaper it will eventually prove."

103. Viewed in the light I intend, the rule might be made applicable to the products of all countries. In Goozerat, for instance, where stone does not exist, and where brick and choonam are the most easily procurable of all building materials, and with a little trouble are generally to be had of good quality, I would construct all bridges, where a good foundation was to be had, of masonry so composed, and to carry out the rule I have laid down, I would invariably insist upon the work being of the best description, firmly believing that it would eventually prove the cheapest.

104. Of the sad impolicy of "cheap work," the Report I have now the honour to submit furnishes additional proof: the failure in 1840 of the bund at Kullumgaom and its prototype at Kurroond, and the present failure of the approaches of the Shicrapore Bridge and the small bridge near Nassick, are either solely or in part attributable to the fact of a very inferior description of work having contented the designer or the builder; and to these instances I might add that of the parapet walls, of a second bridge on the Mail Road between the Sungum and Kirkee, which are in so dilapidated a state, that a heavy shower of rain would probably wash them away. Other works there are of greater magnitude, which might be adduced as examples of the fault I complain of, but at present it comes not within my province to notice them.

XVIII. *Department and Establishments.*

105. Several changes have taken place amongst the European overseers. Mr. Sub-Conductor Viges was remanded to his corps in December last, for the extreme negligence and untrustworthiness which he had manifested in the case of the regimental buildings at Nassick, as explained in the 81st para. of this Report, and Corporal Acting Sub-Assistant Overseer Goldfrey was transferred to the Executive Engineer's Office at Poonah in November, in order that he might be instructed in his duties.

106. Serjeant Assistant-Overseer Brock was transferred from Lieutenant Mungavin's office to that of Lieutenant Chapman in April 1846, and Corporal Sub-Assistant Overseer Tudor was also placed under the latter officer, for employment on the Thul Ghaut, in January of the present year. Corporal Sub-Assistant Overseer Mungavin rejoined the department, after a temporary absence at Aden of 18 months, in August of last year. Gunner Morgan, of the Horse Artillery, was admitted into the department, and joined in October following as an Acting Sub-Assistant Overseer; and Serjeant Assistant-Overseer Roberts was also transferred to the department, and placed under Captain Pruen's orders in March last. In consequence of these changes, the number of European Overseers now at the disposal of the Department exceeds by one the number available at the date of my last Report.

107. By the promotions in the Public Work Department, which were published in Government General Orders of the 15th of February last, Serjeant Overseer Armitstead rose to the rank of Sub-Conductor, and Serjeants Levien and Brock, from Assistant Overseer to that of Overseer. On the conduct of the former, no further commendation need now be bestowed, as it was solely on account

Presidency
Bombay.

account of his exemplary behaviour and superior qualifications that he was selected by the Military Board to fill the responsible situation in which he is at present placed, and to hold the rank he now does; Serjeant Levien is also well worthy of his promotion, and his steady conduct and high attainments as a draughtsman give him claims to the favourable notice of his superiors. Of the rest of the European Overseers, Serjeants Taylor and Angas have most distinguished themselves, by uniform excellence of behaviour and great attention to their duties, and Serjeant Brock is also favourably spoken of by Lieutenant Chapman.

108. The only Overseer whose conduct has been complained of is Serjeant Allyman, whose unfortunate addiction to intemperance has at last compelled Captain Pruen to solicit his removal, and his loss will be the less felt, as his acquirements are of so ordinary a kind as to be barely useful, except in superintending road repairs, and such like work.

109. The only changes which have been made among the Assistant Surveyors and Builders since the date of my last Report, are the departure of Hurbajee Rowjee to Aden, and the re-appointment of Govind Moreshwar to the department, and the conduct of all the others has given satisfaction to the several officers under whom they are placed. Venaik Bhicajee, as usual, has entitled himself to great praise for his invariable willingness and diligence, as well as for his qualifications; and Ragoba Hajee has also maintained his previous good character.

110. That all of the Assistants have been diligently employed, either in carrying on sanctioned works, or in estimating for proposed ones, will be fully credited, I trust, after a perusal of the foregoing account, and an inspection of the appended lists of estimates which have been submitted for consideration and sanction. And having now concluded my Report of the proceedings of the department for the past official year, I am contented to hope that the satisfaction which Government were pleased to express at its performances of the preceding year may be augmented in proportion to the increase of work which has been herein detailed.

I have, &c.

(signed) H. Berthon, Captain,
Supt. Roads and Tanks.

Poonah, 4 August 1847.

STATEMENT of EXPENDITURE in the Construction and Repair of Public Works in the ROAD and TANK DEPARTMENT, from the 1st of May 1846 to the 30th of April 1847.

NAMES OF WORKS.	AMOUNT.	TOTAL.
Works connected with the Communication of the Country:		
Constructing a Bridge in the City of Poonah	2,518	
Overseers superintending ditto	183 13 2	
Annual repairs to Mail Road, Poonah to Khopoolie, for the Official year, 1846-46	8,782 14 10	
Annual repairs to Cross Roads, ditto, 1846-46	235 10 0	
Annual repairs to Bridges and Drains, Mail Road, ditto 1846-46	740	
Special repairs to Moossee Flying Bridge	738 3 6	
Annual repairs to Poonah and Moossee Flying Bridges, 1846-47	378	
Annual repairs to Mail Road, Poonah to Khopoolie, 1846-47	8,946 9 13	
Annual repairs to Cross Roads, ditto, 1846-47	3,935	
Annual repairs to Fair-weather Roads, 1846-47	155	
Annual repairs to Bridges and Drains, Mail Road, 1846-47	826	
Annual repairs to Bridges and Drains, Cross Roads, 1846-47	118	
Annual repairs to Bridges and Drains, Mail Road, 1846-47	498 10 8	
Special repairs to Bridges and Drains, Cross Roads, 1846-47	220	
Rebuilding Approaches and Barapet Walls of a Bridge on the Mail Road near the Sungam	532 1 11	
Minor Works	221 12 0	
Building Stone Coping to Barapet Wall of Poonah Bridge		
Approaches	680	
Repairing Fords, Poonah Collectorate	12 18 4	
	622	

204 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

NAMES OF WORKS.	AMOUNT.			TOTAL.
	Rs.	a.	p.	
Constructing Stone Foundation to piece of Road connecting Kailee Bungalow with Mail Road	68	-	9	
Annual repairs to Main Road, Poonah to Seroor, for 1846-47	4,880	15	6	
Annual repairs to Bridges and Drains on ditto, 1846-47	424	8	4	
Annual repairs to Main Road, Poonah to Neera Bridge, 1846-47	2,648	9	8	
Annual repairs to Bridges and Drains on ditto, 1846-47	448	14	-	
Annual repairs to Sholapoor Road, 1846-47	631	11	4	
Annual repairs to Bridges and Drains on ditto, 1846-47	20	1	3	
Annual repairs to Cross Roads, 1846-47	413	11	8	
Annual repairs to Bridges and Drains on ditto, 1846-47	72	0	7	
Annual repairs to Flying Bridges at Seroor and Koregaum, 1846-47	700	-	-	
Annual repairs to cleared Tracks, 1846-47	263	8	8	
Annual repairs to Bridges and Drains on ditto, 1846-47	48	7	2	
Repairing approach of Shicrapore Bridge	300	-	4	
Minor Works	151	5	11	
Making four Brass sheaved blocks for Flying Bridges	110	-	-	
Building Bridge over a Nullah, at Wundwadee	1,720	-	-	
Ditto - - over - ditto - at Kondapoor	2,940	-	-	
Constructing a new Road between Palus and Indapoor	1,25,721	8	-	
Annual repairs to Main Road, Seroor to Nuggur, 1846-47	3,382	9	10	
Annual repairs to Bridges and Drains, ditto, 1846-47	447	13	-	
Annual repairs to Cross Roads, 1846-47	737	2	10	
Annual repairs to Bridges and Drains, 1846-47	73	12	2	
Minor Works	24	2	2	
Annual repairs to Works on Nuggore Dak Line	5,841	3	4	
Special repairs to ditto - ditto	1,733	7	7	
Erection of New Works - ditto	1,680	5	2	
Maintenance of Ferryman and Haulers, ditto	3,002	1	1	
Taking Charge of Stores - ditto	240	-	-	
Annual repairs to Main Road, from Thull to Chandore Ghaut, 1846-47	12,936	2	7	
Annual repairs to Bridges and Drains, 1846-47	178	15	11	
Annual repairs to Cross Roads, Nassiok Sub-Collectorate	1,639	18	5	
Annual repairs to Bridges and Drains, - ditto	83	0	7	
Annual repairs to Ferry Boats and Flying Bridges	182	14	7	
Special repairs to Main Road	23	14	10	
Converting Kadoo Ferry Boat into a Flying Bridge	54	15	7	
Repairing a Bridge on Sunier Cross Road	298	15	5	
Minor Works				
Pulling down and stacking frame-work of the Undwell Bridge	85	0	2	
Completing lower and experimental portions of Road on the Thull Ghaut	16,691	11	0	
Ditto - - upper portion	6,702	-	11	
Special repairs to Main Road, Colsetta Ferry to Thul Ghaut	89	-	7	
Annual repairs to ditto - ditto, 1846-47	9,070	10	4	
Repairing Bridge at Goklurva	5,805	9	11	
Minor Works	18	12	-	
Constructing Steps to Jetty at Callian	48	3	6	
Repairs to Bridge at Busein	102	14	5	
Annual repairs to roads in Bhowndy, 1846-47	134	6	8	
Special repairs to Kusseyes Bunder (called erroneously in last year's Report, owing to a mistake of the copyist, "Callian Pier")	1,006	7	6	
Conveying four guns from Tannah to Kusseyes Bunder	21	-	-	
Repairing Road from Anieh to Chenboar	115	4	5	
Building a Boat for Oomerpaom Ferry	421	10	1	
Breaking down and Rebuilding Wing Walls of Mullar Bridge	404	7	-	
Constructing four Roller-frames	120	-	-	
Annual repairs to Main Road, Sion and Colsetta, 1846-47	5,042	15	9	
Annual repairs to ditto - Bandora to Ghorabunder, 1846-47	5,695	-	-	
Annual repairs to ditto - Trombay to Sion, 1846-47	993	7	-	
Special ditto to ditto, between Tannah and Pereseh	51	-	2	
Minor Works	48	4	5	
Annual repairs to Road from Chemboar to Mhoul	163	-	-	
Special repairs to Sankes Bridge and Vehar Bhand	18	5	2	
Removing Guns from the Ramps of the Tannah Causeway, and substituting Mooring Rings	153	11	6	
Erecting a Bridge at Erle Parlee	1,500	-	-	
Constructing new Road from Coorla to Bhandoop, by Convict labour	7,500	-	-	
Providing metal for the Mail Road from Panwell to Khoopoolia, out of the sanction for 1846-46	148	15	7	
Annual repairs to Nugotna and Mahableshwar Road, 1845-46	3,025	-	-	

Presidency of
Bombay.

NAMES OF WORKS.	AMOUNT.			TOTAL.		
	Rs.	a.	p.	Rs.	a.	p.
Repairing Platform of Panwell Bunder - - - - -	4,343	8	8			
Annual repairs to Mail Road, 1846-47 - - - - -	5,973	7	1			
Annual repairs to Bridges and Drains, 1846-47 - - - - -	91	10	8			
Annual repairs to Nagotna and Mahableshwar Road, 1846-47 - - - - -	4,070	-	-			
Annual repairs to Cross Road, Tannah Collectorate, 1846-47 - - - - -	3,357	13	2			
Constructing a piece of Road leading into the Town of Chiplow - - - - -	1,439	-	-			
Annual repairs to Cross Roads, Southern Concan, 1846-47 - - - - -	1,169	1	8			
				2,92,367	5	5
TANKS, WELLS and BUNDS:						
Deepening Well at Wursoolie - - - - -	16	4	4			
Building Coping of Cut Stone to two Wells in the Khundalla Tank - - - - -	551	9	-			
Opening Sluice Gates in the Dhum at Kullud - - - - -	637	15	10			
Opening Sluice Gates of Kutrass Tank - - - - -	6	-	-			
Closing ditto - - - ditto - - - - -	47	-	-			
Repairs to Wells, Nassick Sub-Collectorate - - - - -	34	7	11			
Deepening and enlarging Well at Kussara - - - - -	221	13	10			
Improving the Tank at ditto - - - - -	109	15	7			
Clearing Tank in the Town of Tannah - - - - -	9	5	6			
Clearing out Chowdar Tank at Mhar - - - - -	4,355	-	-			
				5,989	7	-
BUILDINGS:						
Annual and special repairs to Travellers' Bungalows and Furniture, for 1846-47 - - - - -	4,145	12	3			
Building a Post-office at Khundalla - - - - -	286	-	-			
Supplying Plank Weather Frames to Karlee and Murgaoim Bungalows and Outhouses - - - - -	113	4	5			
Building a Privy at Veera Bridge Bungalow - - - - -	171	-	-			
Repairs to Roof of Seroor Bungalow - - - - -	37	3	2			
Repairs to ditto of Chandore Bungalow Outhouses - - - - -	20	14	-			
Erecting Military Buildings at Nassick - - - - -	3,852	4	8			
Certain additions to ditto - - - ditto - - - - -	497	7	10			
Annual repairs to Store Room at Bhowndy - - - - -	9	2	9			
Annual repairs to Military Buildings, ditto - - - - -	6	9	-			
Special repairs to Tannah Church - - - - -	9	11	10			
Whitewashing Hospital at Bhowndy - - - - -	34	5	6			
Annual repairs to Buildings in Customs Department at Tannah - - - - -	165	4	1			
Special repairs to ditto - - - ditto - - - - -	10	4	-			
Constructing a Gate and repairing Enclosure Walls of Mam-luddar's Cutcherry at Cullian - - - - -	258	3	1			
Annual repairs to Civil and Detachment Hospital at Tanna - - - - -	90	15	3			
Annual repairs to Store Room, ditto - - - - -	42	-	-			
Weather Screens for Entrances to Tannah Church - - - - -	93	7	-			
Special repairs to Office of Collector of Customs, Tanna - - - - -	40	7	3			
Annual repairs to permanent and temporary Pendalls - - - - -	117	9	6			
Erecting four new and improving two old ditto - - - - -	3,470	7	8			
Constructing three Sentry Boxes - - - - -	24	15	8			
Erecting a new Detachment Hospital - - - - -	1,500	-	-			
Constructing a new Bungalow at Par - - - - -	1,250	-	-			
Furniture for ditto - - - - -	90	-	-			
Numda Ceiling to Indapore Bungalow - - - - -	101	11	11			
				16,439	-	10
GRAND TOTAL - - - Three Lacs, Fourteen Thousand Seven Hundred and Ninety-five, Thirteen Annas and Three Pies - - -				3,14,795	13	3

BOMBAY.

STATEMENT of EXPENDITURE incurred under the Presidency of Bombay on WORKS of IRRIGATION, and in the Construction of ROADS and BRIDGES, for the Ten Years, from 1836-37 to 1845-46, inclusive.

ROADS and BRIDGES.

Defrayed from the late County and Assessment Funds, and the present Municipal Fund.												
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.	
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Charges for repairs to Old Roads	71,072 7 9	73,658 9 4	70,910 1 9	63,658 6 8	63,684 - 11	72,381 11 2	63,321 6 4	61,982 6 5	85,412 1 11	64,867 2 -	6,91,128 6 3	
Charges for constructing New Roads	31,353 3 3	47,180 15 8	62,651 15 9	45,457 12 3	33,548 6 2	17,674 14 4	7,507 - 3	31,069 6 1	51,637 - -	53,543 - 7	3,81,673 10 4	
Charges for repairs to Old Bridges	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	1 9 4	1 9 4	
Charges for constructing New Bridges	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	
TOTAL - - Rs.	1,02,425 11 -	1,21,069 9 -	1,33,762 1 6	1,09,116 2 11	97,212 7 1	90,056 9 6	70,628 6 7	93,051 12 6	1,37,699 1 11	1,18,411 11 11	10,72,303 9 11	
Defrayed from the Honourable Company's Treasury.											TOTAL	
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.	from all Sources.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for repairs to Old Roads	61,791 - 1	1,12,926 10 10	1,02,264 15 11	1,05,749 1 3	1,19,096 1 7	1,22,704 10 -	1,33,994 9 11	1,55,018 13 -	1,68,039 12 1	2,15,033 14 10	13,16,619 9 6	20,07,747 15 9
Charges for constructing New Roads	58,558 15 11	85,523 - 9	55,849 7 2	58,197 9 9	67,045 11 6	39,592 1 4	28,442 1 1	1,09,622 3 5	94,191 8 10	45,851 3 11	6,62,871 15 11	10,44,545 10 8
Charges for repairs to Old Bridges	4,578 6 1	4,370 6 1	11,877 18 -	9,427 9 7	8,379 9 4	8,776 15 4	2,265 1 7	3,459 6 10	3,164 6 1	3,888 8 11	60,697 8 10	60,699 2 2
Charges for constructing New Bridges	967 12 -	2,353 14 7	9,889 10 3	22,637 2 5	62,042 12 4	77,106 10 3	26,112 9 6	13,712 13 6	3,476 1 -	21,867 11 11	3,33,975 14 4	2,33,975 14 4
TOTAL - - Rs.	1,25,905 2 1	2,08,673 13 3	1,79,881 12 4	1,96,011 7 -	2,76,563 1 11	2,48,180 5 4	1,84,816 6 3	2,81,811 10 10	2,68,871 12 -	2,86,441 7 7	22,74,155 - 7	33,46,958 10 6

TANKS, &c., and WORKS of IRRIGATION.

Incurred on the Bombay Island, in the Construction, Repairing, and Maintenance of Tanks for Purposes other than Irrigation, and defrayed from the late County and Assessment Fund, and the present Municipal Fund.											
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c.	—	—	—	—	—	—	—	—	—	—	—
Charges for repairing and maintaining ditto	2,287 12 9	10,312 4 3	5,882 13 5	7,232 4 9	1,189 3 10	577 3 -	971 4 -	969 11 6	4,598 13 -	4,972 1 9	38,993 8 8
TOTAL - - Rs.	2,287 12 9	10,312 4 3	5,882 13 5	7,232 4 9	1,189 3 10	577 3 -	971 4 -	969 11 6	4,598 13 -	4,972 1 9	38,993 8 8

Incurred under the Bombay Presidency, in the Construction, Repairing, and Maintenance of Tanks, Wells, Canals, Bundaraha, &c., for Irrigation.											
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c.	14,396 10 11	11,367 2 5	14,533 14 2	12,208 5 8	21,833 14 5	9,698 14 4	3,193 11 3	3,088 4 -	2,283 7 3	679 6 9	93,283 11 3
Charges for repairing and maintaining ditto	23,636 9 2	26,241 15 2	26,801 9 7	54,669 3 -	17,640 3 7	30,434 9 9	29,507 11 7	9,877 - 5	33,859 4 8	30,096 9 2	2,92,794 12 4
TOTAL - - Rs.	38,032 4 1	47,609 1 10	41,335 7 -	66,907 8 8	39,474 2 -	40,133 3 1	32,701 6 10	12,965 4 5	36,142 11 11	30,775 15 11	3,86,078 7 7

	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.	TOTAL from all Sources.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c.	4,324 3 11	13,995 - 7	8,291 12 8	11,422 2 2	6,516 5 10	13,497 9 1	5,364 4 11	7,408 8 11	16,619 2 2	22,479 6 6	1,14,120 9 3	2,07,404 4 6
Charges for repairing and maintaining ditto	8,904 13 7	14,103 2 7	14,686 5 6	6,122 15 1	7,903 1 10	16,060 9 8	5,077 14 9	7,897 5 6	11,833 - 9	14,006 6 7	1,06,615 11 10	4,38,404 - 5
TOTAL - - Rs.	17,429 1 6	28,098 3 2	22,977 2 2	17,545 1 9	14,421 7 3	29,557 2 9	10,442 3 8	15,305 14 5	28,452 2 11	36,485 13 1	2,20,736 5 1	6,45,808 4 11

Rs. a. p.

ROADS and BRIDGES; Total from all Sources - - - - - 33,46,968 10 6

TANKS, &c., and WORKS of IRRIGATION; Total from all Sources - - - - - 6,45,808 4 11

GRAND TOTAL - - - - - Rs. 39,92,766 15 5

TEN YEARS, AND THOSE NOW IN PROGRESS.

B O M B A Y.

STATEMENT of EXPENDITURE incurred under the Presidency of Bombay on WORKS of IRRIGATION, and in the Construction of ROADS and BRIDGES, for the Ten Years, from 1836-37 to 1845-46, inclusive.

R O A D S and B R I D G E S.

PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

	Defrayed from the late County and Assessment Funds, and the present Municipal Fund.										
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for repairs to Old Roads - - - -	71,072 7 9	73,858 9 4	70,910 1 9	63,658 6 8	63,664 - 11	72,361 11 2	63,321 6 4	61,982 6 5	85,412 1 11	64,867 2 -	6,91,128 6 3
Charges for constructing New Roads - - - -	31,353 3 3	47,160 15 8	62,851 15 8	45,467 12 3	33,548 6 2	17,674 14 4	7,307 - 3	31,069 6 1	51,687 - -	53,543 - 7	3,81,673 10 4
Charges for repairs to Old Bridges - - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	1 9 4	1 9 4
Charges for constructing New Bridges - - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
TOTAL - - - -	1,02,425 11 -	1,21,089 9 -	1,33,762 1 6	1,09,116 2 11	97,212 7 1	90,056 9 6	70,628 6 7	93,051 12 6	1,37,699 1 11	1,18,411 11 11	10,72,803 9 11

	Defrayed from the Honourable Company's Treasury.											TOTAL
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.	from all Sources.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for repairs to Old Roads - - - -	61,791 - 1	1,12,926 10 10	1,02,264 16 11	1,05,749 1 3	1,19,096 1 7	1,22,704 10 -	1,33,994 9 11	1,55,018 13 -	1,58,039 12 4	2,15,039 14 10	13,16,619 9 6	20,07,747 15 9
Charges for constructing New Roads - - - -	58,556 15 11	65,523 - 9	55,849 7 2	58,197 9 9	67,045 11 8	39,592 1 4	28,442 1 1	1,09,622 3 6	94,191 8 10	45,851 3 11	6,62,921 15 11	10,44,545 10 3
Charges for repairs to Old Bridges - - - -	4,579 6 1	4,870 8 1	11,877 16 -	9,427 8 7	8,379 8 4	8,776 15 4	2,265 1 7	3,458 6 10	3,164 6 1	3,888 8 11	60,687 8 10	60,689 2 2
Charges for constructing New Bridges - - - -	967 12 -	2,353 14 7	9,889 10 3	22,637 2 5	62,042 12 4	77,106 10 8	20,112 9 8	13,712 13 6	3,476 1 -	21,667 11 11	2,33,975 14 4	2,33,975 14 4
TOTAL - - - -	1,25,003 2 1	2,05,673 13 3	1,79,881 14 4	1,96,011 7 -	2,76,563 1 11	2,48,180 5 4	1,84,816 6 3	2,81,811 10 10	2,88,871 12 -	2,86,441 7 7	22,74,155 - 7	33,46,958 10 6

TANKS, &c., and WORKS OF IRRIGATION

Incurred on the Bombay Island, in the Construction, Repairing, and Maintenance of Tanks for Purposes other than Irrigation, and defrayed from the late County and Assessment Fund, and the present Municipal Fund.											
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c. - - -	-	-	-	-	-	-	-	-	-	-	-
Charges for repairing and maintaining ditto - - -	2,287 12 9	10,312 4 3	5,882 13 5	7,232 4 9	1,189 3 10	577 3 -	971 4 -	969 11 6	4,598 13 -	4,972 1 9	38,993 8 3
TOTAL - - Rs.	2,287 12 9	10,312 4 3	5,882 13 5	7,232 4 9	1,189 3 10	577 3 -	971 4 -	969 11 6	4,598 13 -	4,972 1 9	38,993 8 3

Incurred under the Bombay Presidency, in the Construction, Repairing, and Maintenance of Tanks, Wells, Canals, Bundaraha, &c., for Irrigation.											
	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c. - - -	14,386 10 11	11,367 2 5	14,533 14 3	12,208 5 8	21,633 14 5	9,698 14 4	8,193 11 8	3,098 4 -	2,283 7 3	679 6 9	93,283 11 3
Charges for repairing and maintaining ditto - - -	23,636 9 2	36,241 15 5	28,801 9 7	54,699 3 -	17,640 3 7	30,434 9 9	29,507 11 7	9,877 - 5	33,559 4 8	30,096 9 2	2,92,784 12 4
TOTAL - - Rs.	38,023 4 1	47,609 1 10	41,335 7 -	66,907 8 8	39,274 2 -	40,133 8 1	32,701 6 10	12,965 4 5	36,142 11 11	30,776 15 11	3,86,078 7 7

	1836-37.	1837-38.	1838-39.	1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	TOTAL.	TOTAL from all Sources.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Charges for constructing Tanks, Wells, Canals, Bundaraha, &c. - - -	8,534 3 11	13,996 - 7	8,291 12 8	11,422 2 8	6,518 5 10	13,497 9 1	5,364 4 11	7,408 8 11	16,619 2 2	22,479 6 6	1,14,120 9 3	2,07,404 4 6
Charges for repairing and maintaining ditto - - -	8,904 13 7	14,103 2 7	14,686 5 6	6,122 15 1	7,903 1 10	16,080 9 8	5,077 14 9	7,897 5 6	11,832 - 9	14,006 6 7	1,06,615 11 10	4,38,404 - 5
TOTAL - - Rs.	17,429 1 6	28,099 3 3	22,978 2 2	17,545 1 9	14,421 7 8	29,578 2 9	10,442 3 6	15,306 14 5	28,452 2 11	36,485 13 1	2,20,736 5 1	6,45,808 4 11

ROADS and BRIDGES; Total from all Sources - - - - - Rs. a. p. 33,46,968 10 6
TANKS, &c., and WORKS of IRRIGATION; Total from all Sources - - - - - 6,45,808 4 11

GRAND TOTAL - - - Rs. 39,92,766 15 6

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CC 4

TEN YEARS, AND THOSE NOW IN PROGRESS.

208 PUBLIC WORKS COMPLETED IN INDIA IN THE LAST

Presidency of
Bombay.

SUMMARY of EXPENDITURE incurred under the several PRESIDENCIES,
as follows; viz.

PRESIDENCY.	DESCRIPTION.	AMOUNT.		
		Rs.	a.	p.
BENGAL - - - -	-- on Works, Salaries, Establishments, &c., in the Civil Department of Public Works within the ten (10) years from season 1839-40 to season 1848-49 inclusive, from the Military Board Office Bill Books - - - -	2,23,65,343	15	1
FORT ST. GEORGE - -	-- on Repair and Construction of Works of Irrigation, and on Roads, Bridges and Ghauts for the ten (10) years from 1838 to 1847 inclusive - - - -	82,51,187	-	2
BOMBAY - - - -	-- on Works of Irrigation, and on the Construction of Roads and Bridges for the ten (10) years from 1836-37 to 1845-46 inclusive - - - -	39,02,766	14	5
		Rs.	3,46,09,297	14 8

Thus, while the works particularized as above appear to have cost Rs. 3,46,09,297. 14. 8. in the aggregate, that sum cannot be considered as the total amount expended by Government for works of public utility; the outlay incurred in the improvement of roads, &c., under the control of Local Committees, out of funds derived from ferries and other sources placed at their disposal for that purpose, not being included, nor the value of convict labour employed on Public Works. The years subsequent to those referred to in the above statement, will likewise show a much higher rate of expenditure; the Court of Directors having made large grants for several important Public Works, the principal of which are the following; viz.

At Bengal, a special grant of 97 lacs of rupees (nearly 1,000,000 l.) for the completion of the Ganges Canal.

In the Punjab, an annual outlay of 5,00,000 rupees (50,000 l.) for canals and roads, besides a special grant of 50,00,000 rupees (500,000 l.) for the construction of canals of irrigation and navigation in the Baree Doab.

At Madras, an additional grant of between 4,00,000 and 5,00,000 rupees (40,000 l. and 50,000 l.) for the Godavery Anicut, and of 15,00,000 rupees (150,000 l.) for works on the Kistna River.

At Bombay, a grant of 3,09,610 rupees (30,961 l.) for the construction of the Mole and Road at Kurrachee.

Plans for completing the road under construction on the Phoonda Ghaut, and also for providing a supply of water to Bombay, both which schemes involve a very large amount of expenditure, are under the consideration of the Court of Directors, who await the receipt of further surveys and revised estimates, before giving their final sanction thereto. The recent correspondence respecting these works is given in an Appendix.

East India House,
26 July 1851.

R A I L W A Y S.

BENGAL.**EAST INDIA RAILWAY.**

A RAILWAY is in course of construction in Bengal, which is to form part of a Line of Railway from Calcutta towards the Upper Provinces of India. The execution of it is undertaken by a Company on terms specified in a contract which has been entered into by them with the East India Company, who provide all the land required for the Railway, and guarantee 5 per cent. interest for 99 years, on the capital of 1,000,000*l.*; this amount is to be paid into the East India Company's Treasury by August 1852, and drawn out from thence as required.

The contract bears date the 17th August 1849. The works were commenced in India in September 1850, and it is expected that the section now being proceeded with, will be completed in the year 1853. The question of extending the Line towards the North Western Provinces, is now under consideration.

BOMBAY.**EAST INDIA PENINSULAR RAILWAY.**

A RAILWAY is being constructed in this Presidency, which commences at Bombay and proceeds towards the Ghauts by way of Callian. The execution of this Line is also committed to a Company, on the same terms as those granted to the East India Railway Company. Under an existing contract, a capital of 500,000*l.* has to be raised by the Railway Company, and under a clause of the deed of contract, this may be hereafter increased to 1,000,000*l.* The question of this increase is now under consideration. The first section is intended to terminate near to Callian, a distance of 40 miles. Directions have been given for making surveys, in order to enable the authorities to determine what direction the second Section Line, shall take, and what shall be its proposed termination.

The whole outlay already sanctioned for the purposes of Railways in India is 2,000,000*l.*; this is independently of the cost of land, which is borne entirely by the East India Company.

Appendix.

APPENDIX.

GANGES CANAL.

REVENUE DEPARTMENT, 7 July (No. 9) 1847.

Our Governor-General of India in Council.

Para 1. We have received a letter from our Governor-general in the Home Department, dated at Simla the 20th April (No. 5) 1847, in which his Lordship solicits our sanction to the immediate prosecution of the works on the Ganges Canal on an extensive scale, and to the assignment of 20, or even 30 lacs of rupees per annum to that object.

2. In our despatch of the 1st September (No. 12) 1841, we gave our sanction to the plan as it was then proposed, the estimated cost being 60 lacs, and the expected net return 2,50,000 rupees; since that time, we have on several occasions, and particularly in our despatches of the 20th November (No. 12) 1844, and 1 July (No. 8) 1846, expressed our sense of the importance of the undertaking, and our hopes that means would be placed at the disposal of the Superintendent for its rigorous prosecution.

3. The Governor-general has submitted to us the Report of the Committee which was appointed to ascertain by actual inspection the effect of canal irrigation on the health of the people. The Committee have satisfied themselves that the Delhi and Doob Canals have had some influence in producing disease in the tracts of country through which they pass; they consider, however, that such an effect is much less likely to follow the construction of the Ganges Canal, from the nature and elevation of the country through which it will be conducted, which will generally admit of an efficient system of drainage, and from attention having been given in laying out the line to points which were not so well understood when the others were projected; although there may be portions of the canal on which it may be found impracticable to adopt efficient measures for preventing the development of miasmatic disease, they are of opinion that on others an improvement rather than a deterioration of the general salubrity, may follow the introduction of canal irrigation; on the whole, therefore, we do not think that considerations having reference to the public health are of sufficient weight to overbalance the acknowledged advantage of an abundant and never-failing supply of water for agricultural purposes.

4. The Governor-general further seems to apprehend, that the navigation of the Ganges below Allahabad will for three or four months in the year be greatly impeded, if not altogether stopped, in consequence of the obstruction of so large a quantity of water at the canal head at Kunkhul, near Hurdwar. This point has from the first received the consideration which its importance demands; the Committee, consisting of Captains Abbott, Cautley and Baker, who were appointed in 1842 to examine the project for the Ganges Canal, reported that in their opinion, "the navigation of the river would not be injured below Cawnpore; between that point and Ghurmookhsir Ghaut, the navigation for the larger classes of river craft will probably be impaired, if not altogether stopped; therefore, (they add) it appears to the Committee to be absolutely necessary that the main line of canal from Kunkhul to Cawnpore should be rendered completely efficient for navigation." In his subsequent detailed Report, Captain Cautley examines this question at considerable length, and after showing the effects produced on the Jumna River by the abstraction of the whole of its water to feed the Delhi and Doob Canals, comes to the conclusion, that "no interruption will arise to the navigation of the Ganges as high up as Futtehghurh,* even supposing that the whole body of the river, as it leaves the hills, is taken away for the supply of the Ganges Canal." With these high professional opinions before us, we are not disposed to attach much weight to the apprehension that the navigation of the Ganges will be impeded below its junction with the Jumna at Allahabad.

near Furruckabad.

5. Before you authorise any increased outlay on the work, we desire that the following points may receive your careful consideration:

First. The practicability of completing the canal for the sum, and within the period named.

Secondly. The extent to which the canal should be made subservient to purposes of navigation.

6. The Governor-general estimates the cost of the canal at one million sterling, and the annual return at 145,000 l. or 14½ per cent. This differs from Major Cautley's estimate, who gives 93,39,746 rupees for the cost of the line to which he gives the preference, and 10,34,555 rupees as the probable net return.

7. There appears to be no doubt of the practicability of the scheme, in the minds of those persons who have been consulted on the subject; Major Cautley's plans and estimates have been printed, and have consequently been open to professional criticism; the only great engineering difficulty seems to be the aqueduct over the Solani River, the cost of which is estimated at 15,80,784 rupees, and which the Governor-general states cannot be completed under five years, and will probably require six or seven; and as the success of the whole undertaking is entirely dependent on the satisfactory completion of this work, we think it desirable

desirable that the plans and estimates should be subjected to further scrutiny, and that some competent officer (if possible one not previously connected with the work), should be deputed to the spot for that purpose.

8. Major Cautley's original plan was for a canal of irrigation, adapted, as far as could be done consistently with its efficiency in that respect, for navigation also; in 1844, the Government determined, that the Canal should be constructed with a view to navigation in the first instance, and that irrigation should be made a secondary object. We altogether disapprove of this project; and we are satisfied that its employment as a navigable canal should in any case be made altogether subordinate to its use as a means of irrigation; the advantage of possessing a good line of water communication through the centre of the Doab is undoubted, more especially if the navigation of the Ganges above Cawnpore should be rendered impracticable from the abstraction of its water. On the other hand, the efficiency of the Canal for purposes of irrigation may possibly be impaired by specially adapting it to purposes of navigation; the expense of its construction will certainly be very much increased; the injury occasioned to the banks by the passage of boats will probably add to the cost of the annual repairs; and it must not be left out of view, that the Canal, as a means of transit, may be hereafter superseded by the construction of a railway. These considerations must be borne in mind in determining on the expediency of adapting the Canal to purposes of navigation; and we would desire you to consider whether the sum which would be saved out of its cost by making it a canal of irrigation exclusively, might not be better applied in improving the ordinary means of communication through that tract of country, either by clearing the rivers of existing obstructions, by improving the roads, and eventually by the construction of a railway.

9. On the subject of the proposed augmentation to the Corps of Engineers at the three Presidencies, alluded to in para. 39 of the Governor-general's letter, we shall hereafter address you in the proper department; in the mean time, we shall take measures for supplying you with the eight additional engineer officers requested in the 38th paragraph, and we shall, at an early period, communicate with Major Cautley relative to the engagement of artisans required for the Canal works, according to the suggestion contained in the same paragraph.

We are, &c.
(signed) *H. St. George Tucker,*
J. L. Lushington,
&c. &c.

London, 7 July 1847.

PUNJAB WORKS.

FOREIGN DEPARTMENT, Simla, 30 July (No. 35) 1849.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

I HAVE the honour to transmit to you the accompanying copy of correspondence* with the Board of Administration at Lahore, relative to the adoption of measures for the development of the resources of the Punjab. I have to request your sanction to an annual expenditure of five lacs, which I have undertaken to grant for the construction of Public Works in that country.

2. You will observe that I have directed the commencement of operations for the formation of canals, but until your sanction is received, they will not be carried on to any great extent, as the season will prevent any active measures involving large outlay.

3. I need not expatiate on the advantages, political, social and fiscal, which I expect will be derived from offering an inducement to the people to occupy themselves in agricultural pursuits; they are fully dwelt upon in the Board's letter, and readily acknowledged in my reply.

Simla, 30 July 1849.

I have, &c.
(signed) *Dalhousie.*

REVENUE DEPARTMENT, 5 December (No. 11) 1849.

Our Governor-General of India in Council.

Para. 1. WE now reply to the Governor-general's Foreign letter, dated 30 July (No. 35) 1849.

2. The measures proposed by the Board of Administration in Lahore for developing the resources of the Punjab by Public Works, principally the construction of a great military road between Lahore and Peshawur, and the enlargement and extension of the Huallee Canal of irrigation, appear to promise highly advantageous results.

3. We gladly give our sanction, as requested by the Governor-general, to the annual outlay of five lacs of rupees (5,00,000 rupees) for these and similar purposes.

4. It

* From the Secretary to the Board of Administration, Lahore, dated 28 May 1849 No. 24, to the Board of Administration, Lahore, 25 July, No. 1,284.

Appendix.

4. It is proposed to repay this expenditure from the income to be derived from the Ferry Fund, Road Fund, and Canal Rents, amounting to 2,50,000 rupees per annum, and to add to this the Excise Revenue, 2,00,000 rupees. The surplus Ferry Funds being already applicable, in our old possessions, only to purposes of local improvement, and the one per cent. Road Fund being raised with the specific object of being expended in improving the means of communication, may be properly applied in aid of this expenditure; it being understood, however, that for works undertaken out of these funds, sanction must be obtained in the same manner as for those, the cost of which is defrayed out of the ordinary revenue. We object, as a general principle, to the allotment of any branch of revenue to a particular object. We concur, therefore, with the Governor-general in not approving the appropriation of the Abkars to the specific object of being expended in improving the public works in the Punjab; and the same objection exists to a similar application of the Canal Rents, which, in fact, form a portion of the land revenue. Whatever sum may be required beyond the proceeds of the Ferry and Road Funds to meet the expenditure now sanctioned, must be taken out of the general revenue.

5. Major Napier's report on the Huslee Canal, gives a clear, interesting, and highly promising view of the extent to which it now is, and to which it may be made available for irrigation; of the present and prospective revenue; and of the grounds for expecting the cordial co-operation of the Zemindars.

6. We notice as a strong ground for giving the utmost practicable encouragement to the proposed measures of irrigation, the circumstances remarked by Major Napier, that "Surrounded by the most luxuriant cultivation, the canal villages and their inhabitants bear every appearance of comfort and ease; there is scarcely a discharged soldier to be found in them, as the cultivation affords ample occupation for the population, whilst the poor villages in the dry tracts between Lahore and Kusoor, with their small patches of cultivation, hardly wrought from wells more than 60 feet deep, were full of the discharged Khalsa."

7. The dishonesty of the native managers, whose exactions of half a rupee per begah, in addition to the Government rate of one rupee, "have grown into a rule," will, we trust, under Major Napier's prohibitory arrangements, be for the future thoroughly checked. There are also serious losses from neglect and mismanagement, which will require careful attention, especially the waste from mill-streams not returning to the canal.

8. We observe that Major Napier states the ordinary supply of water in the canal during the winter months to be about 200 cubic feet per second, which is sufficient to irrigate 70,000 begahs of land.

9. The irrigation of 70,000 begahs would yield 70,000 rupees of annual revenue. We think the realization of one rupee per begah from the full capacity of the canal may be fairly anticipated, when the mismanagement and exaction above alluded to shall have been remedied.

We are, &c.

(signed) A. Galloway,
J. Shepherd,
&c. &c.

London, 5 December 1849.

FOREIGN DEPARTMENT, Simla, 10 June (No. 15) 1850.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

In your despatch in the Revenue Department, dated the 5th December last, No. 11, your Honourable Court remark, "that for works undertaken out of the five lacs allowed for public works in the Punjab, sanction must be obtained in the same manner as for those, the cost of which is defrayed out of the ordinary revenue."

See below.

2. This circumstance having been brought to the notice of the Board, I have now the honour to transmit for your information copy of the correspondence noted in the margin,* regarding the expenditure of certain sums on account of the public works carried on under Lieutenant-colonel Napier, from the funds set apart for that purpose.

I have, &c.

Simla, 10 June 1850.

(signed) Dalhousie.

REVENUE DEPARTMENT, 25 April (No. 5) 1851.

Our Governor-General of India in Council.

See below.

Para. 1. THE letters and paragraphs noted in the margin,† report the progress made in the execution of public works in the Punjab, which appears generally to be satisfactory.

2. In

* From Secretary to Board, dated 27 May, No. 265; to Board, dated 6 June, No. 810.

† Governor-general's Foreign Letter, dated 20 December (No. 57) 1849, para. 1; Foreign Letter, dated 17 August (No. 23) 1850, para. 88; Governor-general's Foreign Letter, dated 10 June (No. 15) 1850; Governor-general's Foreign Letter, dated 13 August (No. 26) 1850; Governor-general's Foreign Letter, dated 7 December (No. 46) 1850.

2. In the last of the letters under reply, the Governor-general has submitted for our favourable consideration, a plan for the construction of canals of irrigation and navigation in the Baree Doab. The main line will leave the Ravee some miles below the Fort of Shahpore; and, after throwing out two branches, one at Tibberes below Deenanuggur, and the other at Buttala, will again fall into the Ravee, 60 miles above Mooltan, apparently extending from north to south, about 450 miles; it is anticipated that the work will be completed in four, or at most in five years.

3. The total estimated cost of the work is 50 lacs of rupees, while the expected returns in the shape of water-rent, water-mills, and other sources of revenue, after deducting the expense of establishment and repair, exceed 12 lacs of rupees per annum.

4. We observe that this important work is to be executed under the immediate superintendence of the Civil Engineer of the Punjab, Lieutenant-colonel Napier, and the Governor-general has placed at his disposal three lacs of rupees to enable him to commence operations.

5. We have already, in our despatch of the 5th December (No. 11) 1849, shown the importance which we attach to the extension and improvement of public works in the Punjab, and concurring entirely in the view taken by the Governor-general, of the advantages, social, political, and financial, likely to result from the construction of the canal in question, we readily give our cordial assent to the undertaking, in the full confidence that the utmost care will be exercised in selecting officers competent in every respect for designing and carrying into execution with efficiency, and a due regard to economy, a work involving so large an expenditure of the public money. You will, of course, transmit to us periodical reports of the progress of the work, and we shall be glad to receive a copy of the survey of this main line of the canal as soon as it is prepared.

We are, &c.
(signed) J. Shepherd,
J. W. Hogg,
&c. &c.

London, 25 April 1851.

GODAVERY ANNICUT.

REVENUE DEPARTMENT, 18 July (No. 6) 1849.

Our Governor in Council at Fort St. George.

Para. 1. WE now reply to your letters of the dates noted in the margin,* on the subject of the operations in progress for constructing an Annicut across the Godavery River. See below.

2. We have also received from the Government of India the communications referred to in the margin,† on the same subject. See below.

3. In obedience to the orders contained in the concluding paragraph of our despatch of the 20th September (No. 15) 1848, you appointed Captain Buckle, Brevet Captains Bell and Orr, and Mr. Forbes, Sub-collector of Rajahmundry, a Committee to examine and report on the actual condition of the Godavery works, and the plans proposed by Major Cotton to be pursued for completing them.

4. The report of the Committee, who appear to have performed this duty in a most satisfactory manner, was forwarded to you on the 13th January last.

5. We gather from this report, that the main causes of the large excess of the expenditure over the estimate were: firstly, the disproportionate amount of outlay on what is termed the "Plant," consisting of the machinery, steam-tugs, railroads, &c., provided for the preparation and transportation to the works of the materials required for the construction of the Annicut; and secondly, the great inadequacy of the original estimate in regard both to the rates and the quantity of the materials themselves. With respect to the rates, as deduced from actual expenditure, the Committee observe, "If the total supposed cost of the masonry and loose stone, 4,26,868 rupees, be added to its appropriate plant, 2,00,000 rupees, and the total, 6,26,868 rupees, be divided by the number of 328,825 cubic yards, the rate per cubic yard for masonry and loose stone together will be Rs. 1. 14. 0. per cubic yard including a large proportion of cut stone. The Committee are of opinion, that the above-mentioned rates are singularly low; and that were each of them increased 50 per cent. the Annicut might, even then, be pronounced one of the cheapest works ever constructed, if its immense length and its situation, with the endless difficulties arising therefrom, were duly considered."

6. Considering the opinion of the Committee, that the rates at which the work has been actually performed, although greatly in excess of those estimated, are singularly low, we cannot acquit Major Cotton of blame, in having submitted an estimate for your sanction in which the rates were assumed at an amount at which it is clearly impossible that the work could have been performed; and we are surprised that such an error should have escaped the notice of the Chief Engineer and Secretary to the Board of Revenue in the Department

* Godavery Annicut.—Letter, dated 14 January (No. 12) 1848, paras. 16 to 18; Letter, dated 12 September (No. 86) 1848; Letter, dated 20 November (No. 83) 1848, paras. 5 and 14; Letter, dated 13 February (No. 6) 1849.

† Public Letter, dated 10 December (No. 51) 1847, paras. 16 to 18; Public Letter, dated 3 March (No. 7) 1849.

Appendix.

Department of Public Works, whose peculiar duty it is to satisfy themselves, not only that the works which they recommend to Government are properly designed, but that the expenditure is estimated with as near an approach to accuracy as may be possible. The want of care exhibited in this instance must greatly tend to diminish our confidence in the correctness of future estimates.

7. In respect to the plans of the works, the Committee report that "with regard to the most important point, the section of the Annicut, after a most minute consideration of the subject, they are satisfied that the work may be carried forward with safety and success, upon the section hitherto followed, with some improvements recommended by Captain Orr." And they conclude their report, by observing that, "reviewing their inspections and investigations, they are constrained to record their very high opinion of the science, practical ability, and indefatigable labours of Major Cotton, displayed in the great work under report. It is scarcely possible to place that officer's qualifications as an engineer of hydraulic works higher than they stood before; but the Godavery Annicut is a new and splendid illustration of the powers of mind and self-devotion, from the exercise of which the country has already so largely benefited."

8. The total amount expended on the Annicut up to the end of November 1848, was 5,03,703 rupees; and, according to the Committee's estimate, a further sum of 4,07,506 rupees will be required to complete the work, making an aggregate expenditure of 9,11,209 rupees, or 4,35,639 rupees in excess of the sum originally sanctioned for that purpose.

9. Under these circumstances, and in pursuance of the instructions contained in the 8th paragraph of our despatch of the 20th September (No. 15) 1848, you have resolved to authorize the work being proceeded with; you state that you are still sanguine that the advantages to be gained by the Godavery Annicut have not been overrated; and you refer to the opinion expressed by the Committee already quoted, that even at its greatly augmented cost the Annicut will still be a cheaply constructed work.

10. However much we regret the imperfect nature of the information which was submitted to us when our sanction to the undertaking was originally solicited, it is obvious that the whole of the large expenditure already incurred must be entirely lost, unless the works are carried to completion; and the sooner the country begins to derive the expected benefit from the work, the earlier will you receive some compensation for the outlay in the shape of an increased revenue. We observe that the Committee state, that "the Annicut will, it is expected, be effective for a large supply of water this season, and will next year be in all probability at its full height."

11. We accordingly approve and sanction the course of proceeding which you have adopted, but we would at the same time call your attention to the absolute necessity of requiring from the Board of Revenue in the Department of Public Works, a strict adherence to the instructions communicated to them in para. 10, of your minutes of consultation of the 13th February 1849, with the view of ensuring, as far as possible, a successful issue to the undertaking.

12. We also approve of your having granted to Captain Orr, for the period during which he may be engaged in superintending the construction of the Annicut, the full allowances of a Civil Engineer.

We are, &c.

(signed) A. Galloway.
J. Shepherd

London, 18 July 1849.

KISTNAH ANNICUT.

REVENUE DEPARTMENT, 8 January (No. 1) 1851.

Our Governor in Council at Fort St. George.

See below.

Para. 1. The letters and paragraphs referred to in the margin,* relate to a plan for the construction of an Annicut across the river Kistnah, for the purpose of irrigating portions of the Guntoor and Masulipatam districts, which you have submitted for our sanction.

2. This project has been at various times under the consideration of Government since the year 1792, and although circumstances have hitherto prevented its being carried into effect, its feasibility and the great advantages which it would confer on the before-mentioned districts seem never to have been doubted. One of the principal considerations which deterred the Government from carrying the plan into execution was, probably, that both Guntoor and Masulipatam had been permanently settled, and there would have been difficulty in arranging with the zemindars for the reimbursement of the necessarily large outlay. That obstacle is, however, now removed, the whole of Guntoor, and a considerable part of Masulipatam, having reverted to the possession of Government.

3. The present scheme is founded on a report by Captain Lake, the Civil Engineer of the division, dated the 2d July 1847. It had been examined and approved by Major A. Cotton, whose

* Kistnah Annicut.—Letter, dated 20 November (No. 83) 1848, paras. 15 and 16; Letter, dated 20 July (No. 37) 1849; Letter from the Government of India, dated 18 August (No. 10) 1849.

whose experience in such works in Tanjore is very extensive, and who was at the time engaged in superintending the construction of the annicut across the Godavery River.

4. The plans and estimates were submitted to your Government by the Board of Revenue in the Department of Public Works, with a strong expression of opinion in favour of the undertaking. Considering, however, that so important a work should not be commenced without the most rigid scrutiny, you appointed Major A. Cotton, Captain Buckle, Captain Bell, and the Collectors of Masulipatam and Guntoor, a committee for that purpose, directing them to assemble at the site of the proposed Annicut, and there to examine carefully the plans and estimates, both of expenditure and return, and report fully their opinion of them, of the feasibility of the project generally, and of the eligibility of the proposed site, or the advantages over it of any other they might consider preferable.

5. The Report of the Committee is dated the 26th January 1849, and was submitted to you on the 30th April 1849. After having made a most careful examination into the whole question, the Committee close their Report with the following paragraphs:

" 58. In conclusion, the Committee desire to record their conviction of the very great importance of the proposed work, and of its early sanction. That it would, in all human probability, avert the possibility of a destructive famine in this region, seems an argument of the greatest possible weight, independent of profitable expectations, which are themselves most promising. Again, its early sanction is important to meet the expectations of the ryots, and the contingency of drought, and to hasten the profitable returns; in addition to which, the sooner the valuable experience acquired at the Godavery is brought to bear upon the Kistnah project, the more effective it will be.

" 54. The loss of revenue by the famine of 1832, 1833, is estimated at least at one crore, the loss of property at a far greater amount; of life, at 200,000, or 300,000, and of cattle at 200,000 (at the lowest) in Guntoor alone, besides the ruin of 70,000 houses. These facts will, the Committee believe, bespeak more effectively than the most laboured arguments, the favourable attention of the Honourable Court of Directors to the project now submitted, as one of indispensable and urgent necessity. The famine of the Northern Circars in 1833, and that of the North Western Provinces of India at a later period, prove, with irresistible force, that irrigation in this country is properly a question not of profit but of existence. " The amount of the revised estimate is Rs. 7,49,165. 4. 2."

6. The question has again been carefully considered by your Government, and you have satisfied yourselves that, adding to the estimate of 7½ lacs given by the Committee for the Annicut alone, the sum of eight lacs as the probable amount required for " Detail Irrigation Works and Embankments," the total cost of the work when complete, will not exceed 15½ lacs. The Committee estimate " the advantages of the work from the two districts" (by which terms, however, they mean the increase of revenue to be gained by the Government alone, without including the benefits to be derived by the ryots), when the Annicut and auxiliary works shall have been brought into full operation, at 7,32,059 rupees per annum, or 48 per cent. on the capital expended, according to the above estimate. Without going the full length of the Committee's expectations, you state that you feel assured that " a permanent increase of revenue will be gained from extended and improved cultivation, which will not be short of 30 per cent. at the least."

7. " The projected work," you observe, " thus promises on the lowest estimate to be a highly profitable one, by creating additional revenue, and it will be still more so probably, by saving the public finances, and the inhabitants, from a recurrence of the enormous losses caused by the dearths which have afflicted the districts of Masulipatam and Guntoor."

8. You accordingly resolved to transmit all the papers to the Government of India, with your earnest recommendation in favour of the project. That authority, in addressing us on the subject, state, that the contemplated work has their entire approval, and submit their strong recommendation that the plan proposed by the Committee should meet with our favourable consideration.

9. The project has thus been submitted to the examination of those whose scientific acquirements, general experience, and local knowledge, render them the most competent to form an opinion as to its merits, and has received the strongest recommendation from those authorities under whose consideration it has passed. We have carefully examined the papers submitted to us, and have satisfied ourselves that every possible means have been adopted to obtain the fullest assurance of the practicability of the proposed undertaking, and that the greatest care has been taken to prevent future disappointment in respect to the estimates, both of cost and returns. Under these circumstances, and concurring fully in the observation of Sir Henry Pottinger, that, independently of the undoubted benefit which must in due time accrue to the State by a great increase of revenue, it is " a positive duty which the British Government owes to the inhabitants of the districts which the Annicut is meant to fertilize, to adopt a measure, which, under God's blessing, will for ever avert the horrors of famine, under which they have before so deplorably suffered," we readily give our cordial sanction to the undertaking, and trust that matters will be so arranged, that the establishment employed on the Godavery Annicut may not be broken up and dispersed, but may be made fully available for the works on the Kistnah.

We are, &c.
(signed) *John Shepherd,*
J. W. Hogg,
&c. &c.

London, 8 January 1851.

Appendix.

MOLE and ROAD at KURRACHEE.

PUBLIC DEPARTMENT, 13 February (No. 6) 1850.

Our Governor in Council at Bombay.

See below.

Para. 1. THE letters noted in the margin* refer to two public works at Kurrachee :

- 1st. A Mole from the Town to Kemara Point, a distance of about two miles.
- 2d. A Road from the Camp to the Mole, also a distance of about two miles.

2. The whole was begun in 1844, without estimate or regular sanction; after 23,736 rupees had been expended, sanction was asked for 51,894 rupees, which, as it was in addition to the amount already expended, should have been stated as 75,632 rupees.

3. Sanction was afterwards asked for 1,43,098 rupees, for the completion of the work to Kemara. No orders were passed by the Government of India, but the question was referred to your Government, which on the 31st July 1848, submitted an estimate for the total cost of the work, amounting to 2,75,250 rupees, not including any charge for metalling the road-way.

4. Of this sum, 1,44,739 rupees had been already expended; sanction was requested for the outlay of the remainder, 1,30,711 rupees, with an intimation from the Superintending Engineer, that this sum could not be relied on as being all that would be required; as, "from the liability of the work to be influenced by causes which could not be foreseen, it was most difficult, if not impossible, to arrive at anything like a correct conclusion with regard to the probable expenditure."

5. The Government of India could not undertake, on the very scanty information before them, to sanction, on their own responsibility, the completion of the work; but were willing to authorize you to do so on your responsibility, if you should think fit to report to them your decision to that effect, rather than postpone the completion of a work which promises great public advantage.

6. You have not thought fit to take this responsibility on yourselves, and the question is referred for our decision.

7. The scantiness of information is remarked by you as well as by the Government of India; but this information, such as it was, has not been transmitted to us. For what was intended to be done, what has been done, and what remains to be done, the proceedings refer to plans which have not been transmitted; we desire that they may be transmitted without delay.

8. At the same time we request that you will furnish us with information on the following points—

As the Mole will pass entirely over swamps and sands covered at high water, what measures have been taken to ascertain the character of the subsoil, with reference to the probable stability of the foundation?

As the Mole has been carried in a solid mass across the Chinny Creek, instead of by a bridge, as was first proposed, what effect will be produced in regard to access to the town by means of boats at high water; or will the completion of the Mole render access by water no longer important?

As the completion of the Mole will exclude the sea from a great expanse of swamp to the south-eastward of the Mole, with the exception of the narrow channel which is now the mouth of the Chinny Creek, what will be the probable effect of the completion of the Mole on the swamp, on the mouth of the creek, and on the health of the town?

As the sea at high-water will press wholly on the north-west side of the Mole, and will beat heavily against it, what measures have been taken to predetermine the slope and solidity necessary to resist these actions?

9. On the receipt of the plans and information required, we shall lose no time in communicating to you our decision.

10. The proceedings respecting the Road from the Camp to the Mole, also refer to plans, without which the proposed measure is not intelligible. We desire that these plans also may be transmitted without delay.

11. We cannot forward this despatch without an expression of our extreme displeasure at a work of this magnitude and importance having been commenced without our previous sanction, and still more at the very loose and unsatisfactory manner in which it has been allowed to proceed to the point it has now reached.

12. However necessary and important this work may have appeared to be, nothing can excuse the commencement of such an undertaking without the most minute and careful surveys, conducted by persons capable of making estimates, which should at all events approximate to the expense, and of ascertaining how far the proposed operations were practicable. Instead of this, the estimates already amount to nearly six times the sum originally stated; and it appears quite uncertain to what further extent the outlay may reach.

13. We

* Public Works.—Mole and Road at Kurrachee; Public Letters, 9 May (No. 46) 1849; 6 August (No. 74) 1849.

13. We are aware that the blame of commencing this work without authority does not attach to your government; but we have not thought it right to pass over so glaring an instance of unauthorized expenditure without remark.

Appendix.

We are, &c.

London, 13 February 1850.

(signed) *A. Galloway,*
J. Shepherd,
&c. &c.

No. 74, of 1850, GENERAL DEPARTMENT.

To the Honourable the Court of Directors for the Affairs of the Honourable East India Company, London.

Honourable Sirs,

We herewith forward copy of a letter from the Military Board, together with the sketches therein referred to, containing the information called for in your Honourable Court's despatch, No. 6, dated the 13th February 1850, regarding the Mole at Kurrachee.

2. With reference to the 7th paragraph of your despatch, we beg to explain that with the exception of two rough sketches* (which would seem to have been overlooked, but which are now sent), copy of every paper on record relating to the Mole and Road from the Camp, was forwarded with our despatches of the 4th May and 6th August of last year.

* 1. Sketch of Mole.
2. Longitudinal section of the M

We have, &c.

Bombay Castle, 31 August 1850.

(signed) *J. P. Willoughby.*
D. A. Blane.

PUBLIC DEPARTMENT, 5 March (No. 4) 1851.

MOLE and ROAD at KURRACHEE.

Our Governor in Council at Bombay.

Para. 1. We reply to your letter dated 31st August 1850, No. 74, transmitting the plans and information required in our despatch of the 13th February 1850, No. 6, respecting the Mole and Road at Kurrachee.

2. The answer to our question respecting the subsoil and foundation is satisfactory.

3. The answer respecting access to the town by boats at high-water is not sufficiently explicit; we understand it to be, that the present access by the creek would be closed, but the beach would be available; it is evident, however, that the beach being dry for a great distance at low-water (the extreme rise of tide being only 9½ feet), will afford an inadequate substitute for the creek, which, according to the chart, has always high-water below the lowest tide, and consequently gives, on the line of its channel, a depth at high-water of more than the rise of tide.

4. The answer respecting the probable effect on the mouth of the Chinney Creek, and on the health of the town, are very much open to question; the Executive Engineer is of opinion that the narrow channel, which is now the mouth of the Chinney Creek, will become considerably deeper and wider. The Superintending Surgeon says that, "even if the quantity of water now flowing over the swamps should be diminished, the surface covered by the tide would only be the smaller, while the uncovered part would get baked and hardened by the sun, and in fact become like a great part of the low ground surrounding Kurrachee, which evidently has at one time been covered by the sea; it would therefore be no more a source of malaria, than the similar ground in the immediate neighbourhood of it now is; I say 'no more' because whatever malaria does exist at and near Kurrachee, must be evolved from the low muddy sandy beach along the coast; but we can only come to the conclusion, that malaria would not under the above circumstances be generated in any great additional quantity, so as materially to affect the health of the town or neighbourhood."

5. It appears to us from an inspection of the chart, that the action of the waves, under the prevalence of southerly winds, has thrown up a long line of low sand-hills through which the scouring action of the Chinney stream has maintained an opening; but when the stream ceases, the most probable result, according to the analogy of similar cases, will be that the waves will throw up a continuation of the same sandy barrier, and perhaps close the opening.

6. The answer respecting the slope of the Mole is satisfactory.

7. The Road from the Camp to the Mole is evidently a work of which the accomplishment is desirable.

8. With these observations, we authorize the completion of these works, provided you shall

Appendix.

shall be satisfied that the estimates* submitted for that purpose will not be materially exceeded, and that the officer in charge is fully competent to superintend and complete the works in the most efficient manner. To these conditions of our acquiescence we particularly direct your attention. For the sake of the economy as well as the stability of such a work, it is of great importance that it should be entrusted to a superintendence in which you have entire confidence. Rather than that it should be under doubtful management, it would be worth while that the late Major Peat's suggestion should be adopted, who observed that "it would be highly advisable to employ an Engineer Officer upon this work alone;" an able officer so deputed might first satisfy himself that the estimates you have had before you will not be materially exceeded, a conclusion at which we cannot but think that an officer of experience and sound judgment may arrive with more certainty than has hitherto been attained. If the excess of expenditure is likely to be very large, we desire that you refer for our previous consideration the question of the continuance of the work.

9. With respect to the explanation in the 2d para. of your letter under reply, we have to observe that several plans, without which the proceedings were unintelligible, were referred to in the papers transmitted with your former letters, in relation both to the Road and the Mole, and that not one of them was among the documents received by us; this may have arisen from official oversight at your Presidency, but in future it is desirable that every plan, chart, map, drawing or diagram transmitted with your letters, should be distinctly specified in the list of packet.

10. As the Military Board, in reporting the answers above noticed on the 29th June 1850, stated the urgency of the sanction being received by September, it is to be regretted that your letter, transmitting their report, was delayed till the 31st August.

We are, &c.
(signed) John Shepherd,
J. W. Hogg,
&c. &c.

* London, 5 March 1851.

PHOONDA GHAT ROAD.

PUBLIC DEPARTMENT, 21 August (No. 27) 1850.

Our Governor in Council at Bombay.

See below.

Para. 1. We have had under our consideration your letters noted in the margin,† respecting a projected line of communication between the sea-port of Vizadroog and the country to the east of the ghauts, by the line of the Phoonda-Ghaut.

2. You have, with the concurrence of the Government of India, requested our sanction to the expenditure requisite for the effectual accomplishment of these works; and, pending the receipt of this sanction, you have permitted Captain Del Hoste to complete part of the work he was engaged in, on an amended estimate, for reasons which you have fully detailed; we approve of these proceedings, and we observe with satisfaction the increase of traffic in the year succeeding the partial improvement of the Ghaut.

3. There cannot be a question that the proposed works are of great public importance, nor that its full and successful accomplishment would be well worthy of a considerable outlay; great pains have been evidently taken to select the best port on the western coast, and the most practicable Ghaut for the connecting road into the eastern country.

4. The estimate originally submitted for our approval, but which appears to be capable of considerable

* In the former proceedings the expense of the Mole was computed as follows :	Rs.
Expended to 31 August 1848	1,52,833
Estimate for completion, given as probable, but not conclusive, with the following remark from the Superintending Engineer	1,22,417
	2,75,250
Estimate for metalling the road-way (20 feet wide)	20,000
	2,95,250

The expense of the Road from the Camp to the Mole was first estimated at 16,360 rupees, but it was subsequently stated that it would be probably completed for 2,000 rupees less, leaving

14,360

† From the liability of this work to be influenced by causes which cannot be foreseen, it is most difficult, if not impossible, to arrive at anything like a correct conclusion with regard to the probable expenditure, which can be depended upon, especially with reference to the part not yet commenced, which is the most troublesome portion of the whole line.

† Public Works: Road over the Phoonda Ghaut:—Indian Letter, dated 2 September (No. 45) 1848; Foreign Letter, dated 7 August (No. 15) 1849, p. 44; Bombay Letter, dated 14 September (No. 75) 1849; Bombay Letter, dated 12 May (No. 49) 1849; Bombay Letter, dated 17 October (No. 87) 1849; Bombay Letter, dated 3 November (No. 91) 1849; Bombay Letter, dated 23 February (No. 16) 1850.

considerable modification, is for four-and-a-half lacs of rupees,* but we cannot consider the proposal as having yet been brought before us in a form sufficiently definitive for our final sanction. In your last received letter, dated 28th February 1850, you informed us, that in consequence of doubts expressed by the Military Board and the Chief Engineer (in which however you do not concur), of the efficiency of Captain Del Hoste to carry out the works which he has originated, you have directed the Military Board to instruct the Superintending Engineer of the Southern Provinces to proceed to the Phoonda Ghaut, for the purpose of surveying and reporting on the state of the work accomplished, and the plans of the work proposed.

5. We trust that no time will be lost in transmitting this report to us, with all necessary plans and estimates, and with a distinct statement of the amount of expenditure to which you may then think proper to request our sanction.

We are, &c.
(signed) John Shepherd,
J. W. Hogg,
&c. &c.

London, 21 August 1850.

EXTRACT Political Letter from Bombay, dated 15 February (No. 17) 1851.

5. In continuation of our despatch as mentioned in the margin,† we beg to forward in Collection (No. 4), copies of reports from Mr. Anderson and from Captain Del Hoste, of the further proceedings of the latter officer in the construction of roads from the town of Kolhapoor to the Phonda Ghat, and from Dajeeppoor to Belgaum, and in other portions of the Kolhapoor territory. See below.

6. The proceedings which form collections Nos. 5 and 6 relate to the contemplated construction of a road from the town of Nepanes to the Phonda Ghat, and of one down to Parpolee Ghat, to be effected under the superintendence of Captain Phayre, Assistant Quartermaster-general, Southern Division of the army, who (in conformity with the resolution in the General Department) has been appointed in succession to Captain Del Hoste to the duty of completing the Phonda Ghat, and roads connected therewith.

SUPPLY of WATER to BOMBAY.

PUBLIC DEPARTMENT, 12 January (No. 1) 1848:

Our Governor in Council at Bombay.

Para. 1. Your letters now under notice,‡ report the temporary measures you adopted in anticipation of a failure of water at Bombay at the end of the hot season of 1846, and the steps taken for the permanent prevention of that evil.

2. The proceedings authorized by you to prevent the mis-appropriation of the water in the public tanks and wells, and to secure as far as possible new sources of supply, have our entire approval.

3. With the second and more difficult object of providing a permanent remedy, you deputed Captain Goodfellow to the Island of Salsette, to report whether supplies of water could be procured from that Island for the town of Bombay.

4. His

	Rs.	a.	p.
* Road from Wagatun to Kolapore, a distance of about 69 miles	71,815	5	2
Bridges on this line	86,420	-	-
Road branching off from Phuralla, and running as far as Yenkermandu, in the direction of Belgaum, a distance of about 48 miles	63,877	4	3
Bridges on this line	1,21,795	-	-
Cost of the Ghaut	45,673	9	3
Travellers' Bungalows	18,000	-	-
Dhurmsallas	9,000	-	-
Works at Wagatun, the starting point on the Vesiodroog River, about 12 miles from its entrance	20,507	-	-
	4,48,978	2	8
Contingencies	4,489	12	6
TOTAL	Rs. 4,51,447	16	2

Some changes of detail have been made in the plans since the estimate was formed.

† Political Despatch, dated 31 August (No. 67) 1849, para. 29; Political Despatch, dated 16 December (No. 130) 1849, paras. 1 and 2.

‡ Supply of Water to Bombay.—Letter, dated 29 January (No. 7) 1846, para. 42; Letter, dated 28 Jan. (No. 9) 1846, entire; Letter, dated 13 April (No. 42) 1846, para. 39; From Government of India, 6 March (No. 8) 1847.

Appendix.

4. His report was submitted to your Government, and we regret that the information it contained was so vague and unsatisfactory, as to leave the question much as it stood before the inquiry was commenced.

5. You, therefore, called on the Military Board to give an opinion whether further investigation should take place on the island of Salsette, or whether it would be advisable to test the practicability of a plan suggested by the Chief Engineer, for collecting water in reservoirs in different parts of the island of Bombay.

6. Your Secretary's letter of the 12th February last to the Government of India, informs us of the result of this reference.

7. The plan proposed by the Military Board is, the construction of a reservoir, with feeding tanks, &c. immediately below Malabar Hill, the cost of which is estimated at 3,00,040 rupees, exclusive of the cost of 1,008 pieces of iron pipe to be procured from England, and the amount that it may be necessary to pay to parties who may be entitled to compensation.

8. We regret that we are under the necessity of referring back this proposition to you for further information, before we pronounce a decision upon it.

9. The object which you have in view is stated by your Secretary to be, "to secure for the use of the population," of the island of Bombay, "an adequate supply of wholesome water at all seasons of the year."

10. The plan proposed by your Military Board professes to provide a supply of rain-water sufficient for one-fourth of the population of the island, for two months only, upon which a sum of between three and four lacs of rupees is to be expended, besides an annual charge of some amount for the working of a steam-engine, which is not included in the estimates. We are not satisfied that such an undertaking will accomplish the object you have in view, and if other reservoirs are required, it will neither prove effectual nor economical. The other projects which were before you appear designed to supply all parts of the island, the northern as well as the southern, with wholesome water, but upon these no sufficient information is communicated. The plan of the Chief Engineer, is not particularly explained, and no estimate of its cost is submitted. With this we desire to be furnished, unless the proposition has been abandoned as altogether too expensive.

11. A proposition by Captain Crawford, for obtaining water from Salsette, is indeed transmitted, but that officer's report having been hastily prepared, and at the commencement of the rains, did not contain all the needful information, nor could he frame an accurate estimate. The approximate estimate submitted rather exceeded five lacs of rupees.

12. Captain Crawford also referred to a plan for drawing a supply of water from the hills between Koorles and Tanna, which seems distinct from that of bringing it from a nullah near Vehor. A plan, moreover, has been suggested by the clerk to the court of petty sessions, for forming a reservoir on a part of Salsette called the "Neat's Tongue."

13. We desire that you will direct an accurate investigation of these several schemes as soon as practicable, and that you will transmit to us, at the earliest opportunity, the fuller information which we require, in order that as little time as possible may be lost in providing in the most economical manner consistent with efficiency, for an adequate supply of wholesome water to the large population of Bombay and its vicinity.

We are, &c.

(signed) *H. St. George Tucker,*
J. L. Lushington,
&c. &c.

London, 12 January 1848.

PUBLIC DEPARTMENT, 12 May (No. 48) 1848.

To the Honourable the Court of Directors for the Affairs of the Honourable
East India Company, London.

Honourable Sirs,

We have the honour to acknowledge the receipt of your Honourable Court's despatch in the Public Department, dated the 12th January, No. 1, of 1848, calling for further and more detailed information upon the various schemes which have been proposed for providing a supply of water sufficient for the wants, at all seasons of the year, of the inhabitants of Bombay.

1848: V. 4, 221 to
4, 234.
1849: V. 2, 244 to
2, 253; V. 2, 277 to
2, 278 A.; V. 1, 376
to 1, 376 D.; V. 2, 368,
2, 368, A.

2. In reply, we beg to forward to your Honourable Court, an extract from our proceedings recorded under the dates noted in the margin, amongst which will be found a minute by the Chief Engineer, dated the 26th December last, submitted to Government by the Military Board in answer to a call made upon them for the additional information required by your Honourable Court.

3. To this minute is appended copy of a report, not previously furnished to Government, which was drawn up in March 1846, by the late Captain T. M. B. Turner, descriptive of the reservoir with feeding tanks, which in their letter of the 20th April 1846 the Military Board proposed should be constructed at the foot of Malabar Hill.

4. The additional information now furnished by the Military Board, although it supplies some details which were not previously laid before your Honourable Court, is still defective, inasmuch

inasmuch as it is unaccompanied by an estimate of the probable entire cost of the proposed scheme.

5. Such an estimate cannot be framed with any degree of accuracy, until it is ascertained whether Government will have to purchase the site of the proposed reservoir and of the feeding tanks, and if so, at what cost. Lieutenant-colonel Jervis seems, indeed, to anticipate that the liberality and public spirit of individuals will render the expense of this portion of the scheme very trifling. But we doubt whether much aid will be forthcoming from this source. We are apprehensive, that unless a site can be reserved under the general arrangements for the settlement of the long-pending disputes relative to the resumption of Foras Lands, we shall have to purchase the ground, and that the purchase-money will constitute a considerable item in the estimate of the expense.

6. The possibility of our being able to reserve a site without payment, will be ascertained in the Revenue Department, where all proceedings connected with the Foras Lands have been conducted, and we have in the meantime called upon the Military Board to determine what the ground would cost, in the event of our having eventually to purchase it. On this point we will, hereafter, address your Honourable Court.

7. Pending a decision on the above scheme, and with reference to the 5th para. of your Honourable Court's despatch under reply, Lieutenant-colonel Jervis suggested the experiment of constructing on a small scale a reservoir, with diverging tunnels, on the esplanade. Into these he believed that the water lodged in the red sandstone would filter, and so fill the reservoir. The cost of this experiment would have amounted to 8,450 rupees, but we declined to sanction this outlay without the previous consent of your Honourable Court.

8. At the Chief Engineer's suggestion, we have since sanctioned the experiment on a much smaller scale; two channels will be cut into the sandstone formation of the esplanade, each 300 feet in length, and a couple of the existing wells will serve as reservoirs. The cost of this experiment, 3,241 rupees, will be defrayed from a balance in hand of the Esplanade Fund.* Should it succeed, we presume that the necessity for the larger and more expensive experiment alluded to in the preceding para. will be obviated.

9. We do not consider it necessary to trouble your Honourable Court with any comments upon the other plans alluded to in your Honourable Court's despatch, as we conceive that Lieutenant-colonel Jervis has satisfactorily disposed of them in his minute now transmitted.

10. Accompanying this despatch are Returns showing the depth of water in the public tanks on the island up to the 15th ultimo. We regret to observe, that the water appears to be getting so low as to threaten a scarcity, and its attendant distress. We have directed the police to adopt every precaution for preventing a needless expenditure.

11. We have just given authority through the Board of Conservancy to have the silt and sediment removed from all the tanks and wells on the island, which may dry up sufficiently to admit of their being so cleaned out during the present hot season.

We have, &c.
(signed) J. P. Willoughby,
D. A. Blane.

Bombay Castle, 12 May 1849.

PUBLIC DEPARTMENT, 15 November (No. 98) 1850.

To the Honourable the Court of Directors for the Affairs of the Honourable East India Company, London.

Honourable Sirs,

We regret to state, that the fall of rain during the past monsoon has been so scanty as to give rise to serious apprehensions that great distress will be experienced by the large population of this island, from a scarcity of drinking water during the ensuing hot season.

2. To show that these apprehensions are not groundless, we subjoin a statement of the total quantity of rain which has annually fallen up to the 1st October during the past five years.

	Inches.	Cents.
In 1845 - - - - -	54	73
1846 - - - - -	87	49
1847 - - - - -	67	31
1848 - - - - -	73	42
1849 - - - - -	118	88
1850 - - - - -	47	78

3. We have issued orders for all practicable precautions being immediately resorted to for the purpose of husbanding the supply of water collected in the different tanks and wells on the island, and have instructed the Senior Magistrate of Police, should he at any time consider

1850; V. 7,881 to
7,984; V. 8,036 to
8,048; V. 8,213,
8,214; V. 8,296 to
8,300.

* This is formed of fees levied on cattle which graze on the esplanade, and from dyers, for the privilege of using the ground to dry their cloths, &c.; the fund is under the control of the Chief Engineer, who expends it at his discretion in improving the esplanade, and submits for our information an annual account of the receipts and expenditure.

Appendix

* Vide despatch from this Government, No. 8, of 18 June 1845.

consider it necessary to have recourse to the measures adopted* in the hot season of 1846, to provide water for the public, independently of the supplies in the public tanks and wells, immediately to report the necessity to Government in view to their adoption.

4. At the present juncture our attention has again been turned to the several projects which have already been laid before your Honourable Court, for making some permanent provision against the great scarcity of drinking water, which is invariably experienced in Bombay when the fall of rain during the monsoon does not reach the average supply.

5. Of these plans it appears to us (and your Honourable Court would seem to be of the same opinion) that the one which was submitted by Captain Crawford, of the Engineers, for obtaining a supply of water from the island of Salsette, is the most promising, and merits more attention than it has yet received.

6. It will be recollected, that Captain Crawford proposed to dam up at its mouth a stream which runs into the sea at Coorla in Salsette (and which drains 18 square miles of country) and to construct a reservoir on the adjacent hill, more than 80 feet above the level of the sea, into which the water should be pumped by means of a steam-engine to be thence conducted into the principal tanks at Bombay by a main of 14-inch pipe. The immediate expenditure necessary to carry this proposal into effect was roughly estimated at 5,20,030 rupees, besides an annual charge for working (exclusive of repairs) of 46,464 rupees.

7. Captain Crawford has again addressed Government in favour of this scheme, with this important modification, however, that he now proposes to ascend the stream to the height of 80 feet above the level of the sea, and there construct a dam and reservoir, from which the water would be carried first to the reservoir on the hill at Coorla, and thence by similar means to another reservoir on some convenient site in Bombay, from whence it might be distributed by smaller pipes to the principal tanks on the island. Captain Crawford states that this plan is capable of gradual extensions hereafter, to the degree of supplying, if required, every private dwelling-house in the island with a sufficient supply of water throughout the year.

8. A serious objection to Captain Crawford's present proposal, although it may be in other respects feasible, is its enormous expense; instead of the principal main being constructed of 14-inch pipe, he now recommends that a pipe of at least 24 inches in diameter be employed, and this he estimates would cost about 6,180 *l.* per mile. The cost of the iron pipe alone, exclusive of the expense of laying it down, would therefore, according to his calculation, be 98,560 *l.*

9. But, on the other hand, the present modification has this advantage in a pecuniary point of view over the original plan, that there will be no necessity for the large annual outlay, estimated at 46,464 rupees, which would have to be incurred in working the steam-engine for pumping up the water, if the dam were to be constructed at Coorla.

10. It will be seen that Captain Crawford, in estimating the cost of his plan, makes no pretensions to accuracy. As a preliminary step, therefore, to a correct appreciation of the merits of the scheme, we have, on the recommendation of the Chief Engineer, appointed Lieutenant De Lisle, of the Engineers, to the duty of preparing the necessary surveys, and framing an estimate of the cost. On receiving Lieutenant De Lisle's report we shall immediately address your Honourable Court on the subject.

11. Colonel Jervis having again advocated the experiment suggested by him last year for obtaining water from the esplanade, noticed in para. 7 of our despatch to your Honourable Court, No. 48, dated the 12th May 1849, we have sanctioned its being carried out on the extended scale originally proposed, and at the estimated cost of 8,450 rupees. If this plan for obtaining drinking water prove successful, much of the anxiety in respect of the future supply of water will be relieved, and the necessity for more extensive measures may perhaps be obviated.

12. For further details of our proceedings, we would particularly solicit your Honourable Court's attention to our Right honourable President's Minute, dated the 14th ultimo, and to our Secretary's Memorandum annexed to it, both of which accompany this despatch.

We have, &c.

(signed) J. P. Willoughby.
D. A. Blane.

Bombay Castle, 15 November 1850.

(True copies.)

East India House,
26 July 1851.

T. L. Peacock,
Examiner of India Correspondence.