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MADRAS RECORD OFFICE.**Government of Madras.***Public Works* **DEPARTMENT.**

G.O. No. 3663	Press
3614-3663	Mis.
Dated 17-11-18.66.	

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
17th November 1866.*

No. 364. Read the following Circular from the Government of India, Public Works Department, (Civil Works—Miscellaneous,) to the Secretary to Government of Madras, Public Works Department, dated Simla, 18th October 1866, No. 92:—

Progress Report of Public Works in India for 1864-65.

Ordered, that

Commissioners
Burmah.
Governor, Straits Settlements.
Commissioners of Mysore and Coorg.
Resident at Hyderabad.
Agents, Governor General, for Central India and Rajpootana.

Governor.
Administrations noted on the
margin.

(Signed) C. H. DICKENS, Lieut.-Colonel, R. A.,
Secy. to the Govt. of India.

No. 365. ORDER THEREON, 17th November 1866, No. 3,663.

CIVIL WORKS, No. 74.

Ordered to be recorded.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

Exd. S. T. Augustin.

2

*ANNUAL PROGRESS REPORT of Public Works in
India for the year 1864-65.*

MILITARY WORK

MAHARAS.

The Library and Reading-rooms have been completed, and the auxiliary buildings for the Artillery were still in progress. Expenditure Rs. 36,000.

BELLARY.

Alterations to the Sea-face batteries have been made, and some conversions in the casemates have been effected. The expenditure was Rs. 14,000. One block of family quarters has been completed, and two blocks were in progress, the expenditure being Rs. 46,000. A second set of mills at the Powder Factory has been completed, the expenditure for the year amounting to Rs. 8,000. The Horse Artillery Lines at St. Thomas' Mount were adapted to afford accommodation for two batteries, on which Rs. 72,000 was spent.

FORT ST. GEORGE.

Six ranges of barracks have been completed, and two others nearly so, and some subsidiary buildings nearly completed. The expenditure for the year was Rs. 83,000. The Ulsoor Water Project did not make much progress, and only Rs. 19,000 was spent on it.

BANGALORE.

Part of married quarters for 26 families have been completed, and the remainder were in rapid progress. The expenditure for the year amounted to Rs. 13,000. Progress was made in the construction of a Racquet Court for the Artillery. Expenditure Rs. 5,500. The Grand Magazine was completed, the expenditure for the year being Rs. 17,000.

TRICHINOPOLY.

The expenditure on the Lawrence Asylum was Rs. 84,000. Although the main buildings were not commenced, yet the workshops have been built, a 4-horse-power engine set up, together with sawing and planing machines. Servants' houses have been constructed. Twenty-five lakhs of bricks have been made, and a 4-horse-power engine set up for the lime works.

COIMBATORE.

Additions to the Infantry barracks at Cannanore have cost Rs. 56,000. They consist of a Regimental School, Recreation-room, Sergeants' Mess-house, Staff Sergeant's and married quarters, some complete, while others were in a progressive state.

MALABAR.

BOMBAY.

The Harbour Defences were still under construction during the year, and 12½ lakhs of Rupees were expended. The Oyster Rock battery, commenced in 1863-64, was in a forward state, and may be expected to be finished and armed in 1867, as

BOMBAY.

B

MILITARY WORKS.

far as essentials are concerned. The Middle Ground battery was commenced, and 300,000 cubic yards of stone thrown into the shoal on which the work stands, and exhibiting an area at low-water of somewhat more than 3 acres. But this quantity is the *total* amount of stone thrown in since the commencement of the work. The Cross Island, Colaba Point, and Butcher's Island batteries were all completed, and the first two named armed. The demolition of the eastern and western ramparts had been completed.

ADEN.

In Aden, about Rs. 26,060 have been spent on the Isthmus Defences, chiefly on revetting the ramparts with stone, and constructing two shell rooms. One upper-storied barrack with its subsidiary buildings, and one four storied barrack have been completed, and made available for occupation. Another of the latter kind was ready for roofing, and the remaining two were uncommenced. On these buildings the expenditure has been Rs. 96,000. Several other minor buildings have been completed, or were in process of construction, including some quarters for married men, on all of which Rs. 91,000 have been spent.

MATHERAN.

At Matheran, quarters for three sick Officers have been almost completed. The work would have been completed earlier, but for a deficiency of water on the hill, and the pressure on the labour market.

MOUNT ABOO.

Barrack accommodation at Mount Aboo was in a very forward state. Only three out of 16 barracks remained to be completed, and they were almost ready for use. The subsidiary buildings were to be pushed forward. Expenditure Rs. 99,000.

DEESA.

The Artillery stables, on which Rs. 10,000 were spent during the year, were nearly completed.

POONA.

The two upper-storied barracks at Wanowri commenced in 1863-64, but were making no rapid progress. The family quarters are finished and occupied. The steam bakery was completed, and is a highly remunerative work. A range, consisting of 20 quarters for married Sappers and Miners at Poona, was almost finished, and has been made over for occupation. On the above works, the expenditure was Rs. 67,000.

KIRKEE.

Nine Artillery barracks have been completed; the new Powder Works were well in hand, and were to be finished in a twelve-month; 161 iron stables from England (costing Rs. 16,000) for the Artillery have been erected; 3 blocks of Cavalry stables, affording accommodation for 490 horses, have been finished at Ahmednuggur; on all of which Rs. 2,32,000 have been expended.

AHMEDNUGGUR.

POORUNDHUR.

Here the two new barracks were in a forward state.

SATTARA.

Quarters for 24 married families have been completed. Expenditure Rs. 28,000.

BELGAUM.

Stables and subsidiary rooms have been completed. The Library for European troops is also finished. Expenditure on the above works, Rs. 28,000.

SINDH.

Stables for the Royal Artillery at Hyderabad and Kurra-chee were constructed, costing Rs. 27,000.

BENGAL.

No works of any importance have been carried out here. Some small buildings have been constructed, and some alterations have been effected in existing buildings.

MILITARY WORKS.

NORTH WESTERN PROVINCES.

Rupees 2,25,000 have been expended on preliminary operations. A large quantity of materials for the new Cantonments has been collected, and a tramway from the Government brick-fields to the site of barracks has been three-fourths completed.

Materials are being collected. Expenditure during the year, Rs. 29,000.

The renewal of the portion of the Agra Fort wall, which fell down in 1863, has been completed; the cost being Rs. 23,000. The new double-storied Artillery barrack was nearly completed; the expenditure for the year being Rs. 17,000. Materials for the construction of a three-storied Infantry barrack were in process of collection. Some additions to the Artillery Family barracks, and repairs and improvements in the drainage of the Artillery and Infantry Lines, led to an expenditure of Rs. 17,000.

The construction of a Blacksmith's forge for the Cavalry Lines, and new privies for the Artillery and Cavalry Lines (all complete) led to an expenditure of Rs. 11,500. The conversion of some Artillery Depot buildings into married quarters (two-thirds complete) cost Rs. 21,000.

The main work here was the substitution of stone flags for bricks in the floorings of 10 barracks at a cost of Rs. 11,000. The completion of a plunge-bath, and some other works, brought up the expenditure to Rs. 24,000.

Two temporary barracks were erected at a total cost of Rs. 31,000. Rupees 18,000 were spent on re-roofing a barrack that had been burnt down. Medical Subordinates' quarters, and a Horse Hospital, were completed at a cost of Rs. 6,500.

Staff and Commissariat Sergeants' quarters were completed, together with some other less important works of a small character. A Ball Court for European troops was in progress.

A barrack for 12 married men was constructed, costing Rs. 14,000. Two workshops were constructed, and some buildings re-roofed at a cost of Rs. 11,000.

PUNJAB.

Very little progress has been made in the construction of the Fort glacis. Some drainage improvements have been carried out. Two new barracks have been completed.

The Arsenal fortifications were completed, and likewise a set of Officers' quarters commenced in 1863-64.

Some subsidiary buildings have been completed. Some Officers' quarters have been commenced.

Improvements have been made in the fortifications.

Some Artillery and Cavalry workshops have been completed. Progress has been made in the re-modelling of the barracks.

The two new barracks were very nearly completed, together with some subsidiary buildings.

Two new double-storied barracks with out-offices were complete.

A Sanatorium was formed here, distant 14 miles from Murree, for the accommodation of 100 single men and 50 families.

The Ghoorka barracks in progress last year were completed, and the Peshawur Mountain Train Lines were in progress.

ALLAHABAD.

NOWGONG.

AGRA.

MEERUT.

BAREILLY.

BENARES.

CAWNPOOR.

GWALIOR.

DELHI.

FEROZPOOR.

LAHORE.

MURDAN.

KOHAT.

UMBALLA.

SUBATHOO.

DHURMSALLA.

NUNDKOTE.

ABBOTTABAD.

CAMPBELLPOOR.
DERA GHAZI KHAN.

Two barracks and subsidiary buildings have been constructed, and a Warrant Officer's bungalow commenced.

The Native Infantry Lines commenced last year here were all but completed.

At the stations named in the margin, some minor works

Dugshai.
Kussowli.
Jullundur.
Rawul Pindie.
Sydun Bowli.

Peshawur.
Bunnoo.
Mooltan.
Simla.
Umritsur.

Sealkote.
Attock.
Nowshera.
Dera Ismail
Khan.

have been carried on.
They call for no detailed
account.

ODDH.

LUCKNOW.

The demolition of the Residency entrenchments has been carried out, and improvements in the roads and drainage of the Cantonments effected. A Female hospital with out-offices, and married barracks with out-offices, were commenced and completed during the year on an expenditure of Rs. 53,000. Other married barracks, affording accommodation for 40 families, were in progress, the expenditure being Rs. 55,000. A Native Infantry hospital was commenced and completed, costing Rs. 10,000. An Ice-machine house was commenced. Besides the foregoing, other works were carried out, such as plunge-baths and wash-houses, &c., not demanding special notice here.

FYZABAD.

Some Cantonment improvements were carried out. One plunge-bath was completed, and two others in progress. The expenditure during the year being Rs. 6,000. A Native Infantry hospital was also in progress. Expenditure Rs. 3,000.

SEETAPOOR.

Drainage and road improvements were carried out in the Cantonments. Ball-courts, skittle-alleys, baths, and some minor buildings were commenced, and an experimental vermin-boiler was completed and found satisfactory.

CENTRAL PROVINCES.

SAUGOR.

The Military works here were of a temporary character, consequent on the likelihood of another site being selected for the station. The expenditure during the year has been Rs. 20,000, spread over the construction of some family quarters and repairs.

JUBBULPOOR.

A range of family quarters was complete, and another half so. The European Infantry hospital has been materially improved. One range of Royal Artillery workshops was completed.

KAMPTEE.

On family quarters for European Troops, Rs. 63,000 were expended. Some repairs and alterations to different buildings have been carried out.

CHINDWARRA.
MOHTOOR.

These places are proposed sanatoria. In the latter, quarters for Officers and men are progressing; the expenditure for the year being Rs. 19,000.

SIRONCHA.

Officers' quarters here have been completed, and the Native Infantry Lines were nearly so. The yearly expenditure was Rs. 15,000.

BRITISH BURMAH.

RANGOON.

Three new Native Infantry barracks have been completed, and two others well in hand. The expenditure was Rs. 53,000. Improvements in continuation of those initiated in 1863-64, were carried out in the Cantonments.

Two Royal Artillery barracks have been completed, and 4 Infantry barracks are in progress. Some minor buildings have been completed, or were in progress. Two barracks for Native Sappers, with an hospital, and quarters for European Non-Commissioned Officers, and an hospital for European Infantry, have been completed.

THATETMYO.

Three quarters for Subalterns were in progress. At Chatham and Viper Islands, small barracks have been constructed.

PORT BLAIR

STRAITS SETTLEMENTS.

The Admiralty Coal Wharves were nearly completed. Sheds capable of holding 8,000 tons of coal, and a Timber Wharf, 100 feet in length, were constructed. A Timber Pile Wharf has been erected in the river. No works, purely Military, of any importance, were carried out.

SINGAPOOR.

HYDERABAD.

The blasting of rocks necessary for the buildings still continues. Improvements in the Cantonment drains and roads were being carried out. On all the above, the expenditure has been Rs. 16,500. Two blocks of family quarters for 24 families of Infantry were completed, and two were in progress. Family quarters, 48 in number, for the Artillery Brigade, were making good progress. Expenditure was Rs. 88,000. Upwards of Rs. 21,000 have been spent on the school-house, approaching completion, and on the Teachers' quarters, which were complete. On the Half-Company barracks Rs. 58,000 have been spent, and the buildings were all in progress. The Officers' Mess-house, on which the expenditure was Rs. 17,500, were finished, and some Officers' quarters were approaching completion. On them the expenditure was Rs. 41,000. Besides the foregoing, there was an expenditure of about Rs. 61,000 on subsidiary buildings and minor works. The former include plunge-baths, harness-rooms, cook-houses, privies, ball-courts, and other buildings.

TRIMULGHERRY.

MYSORE.

The expenditure on the new Cantonment was Rs. 19,000. The Sepoy Lines were three-fourths completed, and the Officers' huts quite so. The hospital and some other buildings were also finished.

MYSORE.

CENTRAL INDIA.

Two double-storied barracks have been completed, together with 68 married quarters, and the subsidiary out-offices. Rupees 45,000 were spent during the year. A double-storied European hospital were under progress, on which the outlay has been Rs. 82,000. Works of minor importance have also been carried out.

MHOW.

RAJPOOTANA.

Twelve barracks are completed and occupied, and four were in progress. The expenditure was Rs. 1,25,000.

NUSSEERABAD.
NEEMUCH.

Some alterations and additions have been made to the Artillery barracks.

CIVIL WORKS.

MADRAS.

BUILDINGS.

GANJAM.

VIZAGAPATAM.

GODAVERY.

SALEM.

COIMBATORE.

CUDDAPAH.

KURNOOL.

BELLARY.

PRESIDENCY.

A Church was in progress at Berhampoor, for which Rs. 3,500 have been raised by private subscription.

The Jail was still in progress, but accommodation for 80 prisoners was provided. Expenditure Rs. 10,000.

On the Central Jail at Rajahmundry, about Rs. 69,000 have been spent, and the building was still in progress.

The Jail here was being increased by the addition of an upper-story. The work was not far from completion. Rupees 23,000 were expended.

Rupees 76,000 were spent on this Jail—a Central one. Much work remained towards completion.

A Sub-Collector's Cutcherry was completed, and in occupation at Madanapilly, and a Taluq Cutcherry at Pullampote was rapidly approaching completion.

Here a Deputy Collector's Cutcherry was completed at Paipally.

Two Cutcheries were in progress, of which one was completed during the year, and the other was nearly so. Their sites are at Hospite.

The new Stamp Office was being carried out by contract, and was expected to be ready by July 1865. Rupees 23,000 were spent. The additional storage room (incomplete) at the Salt "Cotours" led to an expenditure of Rs. 27,000. The Deputy Collector's Cutcherry at the same place is complete.

The expenditure on the General Hospital was Rs. 56,000. A portion was complete for use, and the whole building was nearly ready. Flower gardens have been laid out on the south side. The general store and workshop rooms for the Public Works Department were rapidly approaching completion, and cost during the year Rs. 55,000. The Taluq Cutcherry at Madranticum was complete, with the exception of the plastering.

The progress of the Court-house at Cuddalore would have been greater had the supply of timber not failed. Rupees 26,000 were spent on it, and September 1865 may see the work completed.

During the year, the old Fort Jail was converted into a Lunatic Asylum.

BOMBAY.

BUILDINGS.

Cutcheries are in progress in the Districts as per margin. The expenditure was Rs. 23,000.

Sawergaum.
Belgaum.
Carwar.

NORTHERN CONCAN.

CANARA.

PRESIDENCY.

A Custom House at Karanja, and two Post Offices at Rotundee and Kurjut, were being built.

A Post Office was finished at Carwar.

Two-thirds of the Leper Hospital, the gift of the Hon'ble Rustomjee Jamsetjee Jeejeebhoy, was completed. The sum expended was Rs. 46,000.

The Executive Engineer, Presidency, thus describes the work:—

"The main building consists of two large wards (27½' x 19') and two small wards (24' x 19½'), with open corridors 11 feet in width in the front and rear, and 10 feet in width at

the ends; in the two front angles of the corridors, there are two bath-rooms (12' x 12'), and in the rear angles two necessities of similar size, including passages partitioned off. There is also a carriage porch covering 32' x 20' with three open archways on clustered columns, similar to the arches of the corridors, and a carriage archway of similar construction, affording a clear way of 10 feet in width between the plinths of the bases. The architecture of the building is early English of the second period, and its construction is of irregular coursed Breccia rubble, with calcareous limestone dressings. The roofs over rooms are open timber frame-work of a pitch of 45° and 60°, covered in with ¾" tongued and grooved planking and corrugated iron ornamented with cast-iron galvanized crestings, with wrought-iron bannerets and finials painted maroon with points oil-gilded; the flat roofs over corridors and porch consist of thin slabs of limestone with concrete and Portland cement over teak joists."

The David Sassoon Hospital was to be completed during 1865-66, the bulk of the masonry being complete. The expenditure was Rs. 81,000. This is a handsome cut-stone building, designed in the early English Gothic style, to contain 200 patients. Rupees 50,000 are contributed towards its erection, and one lakh for its endowment by the late Mr. David Sassoon. The walls of the building have been built to within six feet of the roof, and it was to be completed during the ensuing official year. The Poorundhur Church was nearly complete. St. Paul's Church was progressing, the walls being 12 feet above ground. On these two buildings the outlay was Rs. 22,000. The Deccan College was 8 feet above the ground, and the site of the Engineering College was cleared, and materials have been collected.

The additions to the Mint sanctioned in 1859 were completed, the expenditure for the year being Rs. 32,000.

The Cantonment Church was in progress, but on a design different to that on which the work was commenced 8 years ago.

BENGAL.

Civil Buildings.—Court-houses at the stations, as per margin, were in progress. Collectors' Cutcheries were also being constructed at stations Nos. 3, 4, and 5, and also at Kooshtea.

Sites for three of the eight Central Jails had been fixed upon at Deegah, Hazareebaugh, and Midnapoor.

Fair progress was made in the Central Penitentiary for 100 Europeans at Hazareebaugh, the expenditure being Rs. 84,500.

A new Jail Hospital was commenced at Jessore.

The alterations and additions to the Calcutta Jail commenced in 1862-63 were nearly complete. Some improvements have been carried out in Government House. The new Copper Mint works were completed, the expenditure during the year being Rs. 88,500 and Rs. 2,24,000, respectively, and good progress made with the new Post and Telegraph Offices. The masonry of the new High Court was up to flooring level; expenditure Rs. 1,19,846.

Cachar.
Purneah.
Gya.

Cuttack.
Arrah.

Churches have been under construction at the stations named in the margin.

The foundations of the new College at Berhampoor were completed.

BUILDINGS.

POONA.

BOMBAY.

BELGAUM.

BUILDINGS.

COURT-HOUSES.
CUTCHERIES.

CENTRAL JAILS.

HAZAREEBAUGH.

JESSORE.

CALCUTTA.

CHURCHES.

BERHAMPOOR.

NORTH WESTERN PROVINCES.

BUILDINGS.

ALLAHABAD.

On the new Public Offices an expenditure of Rs. 1,08,000 has been incurred. One block was about 16 feet above ground, but the other was not in such a forward state, operations having been delayed by the uncertainty regarding the alterations necessary to adapt the building for the sitting of the High Court composed of seven Judges. Four barracks were completed in the Central Jail, thus completing the entire number of 8, as well as 3 manufacturing sheds, &c. Expenditure Rs. 23,500. The new Presbyterian Church was completed.

CAWNPUR.

The plinth of the Memorial Church was finished. In order to keep within the revised estimate (Rs. 1,51,131) some alterations have been made in the design, notably that of the substitution of plastered brick for stone facings in the interior. Expenditure Rs. 5,000 only out of a Budget allotment of Rs. 20,000.

POLICE BUILDINGS.

Only about a quarter of the allotment (1½ lakh) was expended on Police buildings in the North Western Provinces generally from the difficulty of obtaining contractors and qualified artizans.

BAREILLY.

The main gate and a group of buildings in the Bareilly Central Jail have been completed. Expenditure Rs. 26,857.

AGRA.

Eight barracks were brought to completion in the Agra Central Jail, also the new hospital, and 360 feet of the enclosure wall. Expenditure Rs. 17,000.

BENARES.

In the Benares Jail progress was going on. The west main wall was almost completed, and the foundations of the south and east walls dug. Two barracks in a forward state. Foundations of partition walls of west block were dug. The expenditure was Rs. 33,000.

GHAZEEPOOR.

A Godown was constructed at a cost of Rs. 30,000.

FUTTEHGURH.

The Memorial Cross here was completed.

JHANSI.

A Tablet in the Memorial was erected at Jhansi.

Besides the foregoing, a great number of Tehsilees and Cutcheries were in progress in various Districts.

PUNJAB.

Churches have been completed at the stations as per margin. Small Churches were being constructed.*

Tehseels, Treasuries, and Thannahs were being constructed in various stations. Dispensaries were being built or improved. Schools were under construction, 71 village schools being built or in progress. Improvements were being made in Jails and Cutcheries.

The Punjab Government reported as follows regarding the Institute building:—

"Rapid progress has been made in the new Institute building at Delhi; the work done this year has, however, comprised much of the more tedious and difficult portions. The external plastering of the two wings and upper-story of the main portion, and the internal plastering of one wing, and the main double-storied portion having been completed, with their flooring, doors, windows, fittings, and the vaulting of the museum of 30 feet span. The Corinthian cornice of the main building, and the roofing of the Durbar Hall corridors have been completed. The houses in front of the Chandnee

BUILDINGS.

CHURCHES.

Kangra.
Madhopoor.
Mooltan.
Nowshera.

*Attock.
Shahpoor.
Rajanpoor.
Montgomery.

DELHI.

CIVIL WORKS.

Chowk have been cleared away. It will probably be necessary to add upper-stories to both wings of this building to provide the required accommodation for the Educational Department."

The block of city buildings, comprising museum, town-hall, school, &c., at Umritsur, was well advanced, and good progress has been made in the erection of the clock tower. An ornamental balustrade from the entrance of the Rambagh to the central building in the garden has been constructed. The three last works are from local funds.

STRAITS SETTLEMENT.

The Chief Engineer reported as follows regarding the Church at Singapore:—

"The Saint Andrew's Church spire has, I am glad to report, been successfully completed. This handsome building has occupied 8½ years in construction; the foundation stone having been laid in 1856. It provides seats for 520 persons. The total cost has been (including the value of convict labour) about £ 10,000. The whole building and furniture have been constructed by the convicts, and certainly is a very creditable work. Photographic views have lately been submitted to the Secretary of State for India, and to the Government of India. Handsome iron gates were purchased for the four entrances to the compound, but not in time to have them erected."

Rapees 33,000 were allotted to the new Court-House, estimated to cost Rs. 75,000. It was not commenced till late in the year, revised plans and estimate having been called for by the Government of India. The foundations proved heavier work than was anticipated, owing to the unevenness of the substratum. Trials were made previously and hard soil found at 8 to 10 feet deep, but towards the river this soil unexpectedly shelved to 16 and 18 feet necessitating piling or carrying down to the full depth. The latter plan was adopted for all the main walls. It appears the river formerly (30 years ago) traversed the site which was reclaimed.

CENTRAL PROVINCES.

Bhundara.
Nagpoor.
Khundwah.

Chindwarra.
Raipoor.

Churches are under construction at stations as per margin.

A Deputy Commissioner's Court House has been completed during the year at Bhundara. Expenditure up to date Rs. 31,412. Sanctioned amount Rs. 30,752.

At Seroncha a Court House for the Deputy Commissioner has been finished at a cost of Rs. 14,979. A Jail was in course of construction. It was expected to be completed about the end of 1865. The expenditure has been Rs. 16,437.

At Nagpoor a large Central Jail has been commenced; of this, one barrack was finished, and two wards of two other barracks were completed; three wells have been sunk; a boundary wall has been built, and materials to a large extent collected. The expenditure has been Rs. 53,607.

Some materials for the construction of a Central Jail at Jubbulpoor have been collected.

Some materials for Jails at Mundlah and Hoshungabad have been collected.

At Wurda a Jail was building, the foundations of which were in hand. Expenditure is Rs. 855. The amount sanctioned was Rs. 22,000.

A Court House for the Deputy Commissioner at Raepoor was nearly finished. Expenditure during the year Rs. 5, Sanctioned amount Rs. 29,949.

BUILDINGS.

UMRITSUR.

BUILDINGS.

SINGAPOOR.

BUILDINGS.

CHURCHES.

BHUNDARA.

SERONCHA.

NAGPOOR.

JUBBULPOOR.

MUNDLAH.
HOSHUNGABAD.

WURDA.

RAEPOOR.

BRITISH BURMAH.

BUILDINGS.

RANGOON.

The new Custom-house and Bonded Ware-house at Rangoon has progressed fairly, three-fifths of the work being completed. The expenditure during the year amounted to Rs. 80,890, making the total outlay from its commencement Rs. 1,23,466.

Good progress was made with the block of Public Offices at Rangoon, the second story being nearly completed and roofed in. The approximate outlay for the year was Rs. 80,428, giving a total expenditure up to the end of 1864-65 of about Rs. 2,13,087.

Trinity Church at Rangoon completed, with the exception of internal fittings and a couple of crosses for the roof. The cost up to the end of the year amounted to Rs. 57,000.

The large new ward and Deputy Jailor's quarters nearly completed the previous year were finished, together with the necessary out-offices. Two new wards with out-offices, viz., one for European Sailors, and the other for male debtors, were constructed, and a ward for prisoners under trial was within two months of completion; new night privies were added to all the wards, the rice cleaning shed enlarged, sentry turrets constructed, and other minor improvements carried out. The expenditure during the year amounted to about Rs. 50,681, and the total outlay to the end of the year Rs. 75,636.

The new Court-house at Mergui, as originally sanctioned, was finished, and a similar building at Tavoy was within a month or so of completion at an outlay of Rs. 28,113.

At Thayetmyo and Tounghoo also, good progress was made in the Jails; the enclosure walls were completed, and the wards and pucca wells put in hand. The outlay at Thayetmyo was Rs. 32,221, and at Tounghoo, Rs. 32,180. A brick wall was built round the Jail work yard at Maulmain at a cost of about Rs. 8,000; and a new Lock-up for Shoaygheen was nearly ready for roofing in.

The following is the report of the Chief Engineer *in extenso* on the works at the Penal Settlement at the Andaman Islands:—

"At Port Blair considerable progress has been made, notwithstanding an insufficiency of Convict labour and the unfortunate loss of a ship-load of materials despatched from Maulmain.

"On Ross Island, the following buildings have been entirely completed within the past year, or so nearly so, as to have been made over for occupation:—

"Christian Convict barrack on sanctioned design.

"Two Convinct barracks do. do.

"Four do. do. one half longer than ditto.

"Six cook-houses for the above.

"European Civil Hospital.

"Iron Ware-house for the Commissariat Department.

"The above-mentioned six barracks are equivalent in accommodation to the eight originally proposed for this Island. The following buildings have also been put in hand:—

"Four Overseers' houses with out-offices.

"Corrugated iron grain godown.

"Two semi-permanent latrines.

"The jetty has progressed as labour was available for the purpose, and various minor works have been executed, such as wells, palisading, out-offices, &c.

MERGUI.
TAVOY.THAYETMYO.
TOUNGHOO.

MAULMAIN.

PENAL
SETTLEMENT.

BUILDINGS.

"On Chatham Island, the following have been completed, or handed over for occupation:—

"Convict hospital, commenced by the late Superintendent.

"One corrugated iron barrack.

"Two iron-framed barracks.

"Three wells sunk, and other minor works executed.

"On Viper Island are completed—

"One corrugated iron barrack.

"Two iron-framed barracks.

"One Overseer's house with out-offices, commenced by the late Superintendent;

and the following are in a forward state:—

"One iron-framed barrack.

"Two Overseers' houses with out-offices.

"At Aberdeen—

"One iron-framed Convict barrack, completed.

"One " " " well advanced.

"One Overseer's house with out-offices commenced.

"At Mount Harriet—

"One iron-framed Convict barrack, under construction.

"One Overseer's house with out-offices under construction.

"At Haddo—

"One iron-framed Convict barrack, completed.

"One " " " under construction.

"One Overseer's house with out-offices under construction.

"Bricks, lime, and soorkee, have been manufactured at various stations.

"The difficulties that have retarded the progress of the works are—

"1st.—The want of labour for preparation of sites and carriage of materials.

"2nd.—The small out-turn obtained from convict labour, owing to absence of any system of task-work.

"3rd.—A strike among the Chinese artificers, and the departure of many of them for Calcutta after the late cyclone.

"4th.—The loss of the ship *Maulmain* and the difficulty of obtaining other freight.

"5th.—Sickness among the elephants employed in forest operations; and

"Lastly.—The great scarcity of fresh water during the dry season.

"Notwithstanding these drawbacks, 1,600 convicts have been comfortably housed during the past year, and accommodation for 400 more will be ready by the commencement of the south-west monsoon. The expenditure on account of convict barracks has amounted to Rs. 1,56,578."

OUDH.

The Central Jail at Lucknow. Expenditure Rs. 24,000.

In the Progress Report of 1863-64, a list of buildings was appended, being works in progress, or not yet commenced, which were required to complete the Jail. Good progress was made on these during the year, and the following were the works still wanting to render the Jail quite complete, viz. a

BUILDINGS.

LUCKNOW.

CIVIL WORKS.

BUILDINGS.

FYZABAD.

SEETAPOOR.

portion of compound and enclosure walls; two printing-shops, the foundations and plinth of one of which had been executed; a tank for 2nd Circle Wells; painting wood-work of Inspection tower; some tiling and plastering to solitary cells; Carpenters and Blacksmiths' shops; wells for paper manufactory, and a Medicine room.

The Divisional Jail at Fyzabad was entirely completed. The expenditure during the year being Rs. 31,500.

The expenditure on the Divisional Jail at Seetapoor was Rs. 65,500. Of the several works enumerated in last year's report as still required to complete the building, which alone were carried out during the year except the following, viz., a portion of Lunatic wards, cells, and Dead-house, new Carpenters' shop, enclosure, portion of one partition wall, and of guard in front of Jail.

HYDERABAD.

BUILDINGS.

AKOLA.

OOMRAWUTTEE.

Two Civil Hospitals were undertaken at Akola and Oomrawuttee, at an estimated cost of Rs. 25,266; the expenditure being Rs. 18,282. These are charitable institutions, but as they are required for the Police, the Hyderabad Contingent, and the servants of Government, one-third of the cost was borne by the general revenues. The masonry of the buildings was completed.

The only other building of importance in progress, was the Jail at Akola for 500 prisoners. The amount of the estimate being Rs. 1,49,404, and the expenditure being Rs. 43,000.

"The four large barracks each consisting of four wards 50 x 18, four cook-rooms, three work-sheds, four latrines, one hospital godown, one hospital cook-room nearly completed. The foundations and plinths of two hospitals, 62 cells, and central tower, completed. Four hundred and seventy-two prisoners accommodated in the Jail. As soon as the few remaining buildings are completed, the inner walls of the polygon will be built. The well being dug at the Jail has proved a great success. Work done on contract by Balaram, Motteeram, and Chunbusappa, contractors. Last year's progress, one barrack nearly built, and two privies built, and two cook-rooms nearly ready for roof."

MYSORE.

BUILDINGS.

BANGALORE.

The most important work under this head was the construction of new Public Offices of Government at Bangalore. The Budget grant was Rs. 1,20,000, and the expenditure Rs. 91,931, the work having been commenced on contract in October. The lower-story of the building, of stone-in-chunam, was nearly completed; and timber for the roof, &c., was ready on the spot.

The Central Jail was enlarged at a cost of Rs. 33,000.

Agricultural.

MADRAS.

AGRICULTURAL.

GODAVERY.

On the Vizeisweram, Muddoor and Rally branches, the raising of the Godavery Anicut and the construction of an additional apron has been completed. On the Dowlaishweram branch, the crown of the Anicut has been faced with cut-stone (4 yards in width) throughout a length of 1,300 yards, and nearly all the additional stone apron has been packed in. The expenditure during the year amounted to Rs. 68,401.

CIVIL WORKS.

AGRICULTURAL.

The expenditure on the Ellore High Level Canal from Perikeed to Nundamoor *via* Dendaloor, amounted only to Rs. 24,829, the work being checked by sickness among the workmen.

The grant for improvements to the Akeed Canal having been small, very little progress was made, the sum spent amounting only to Rs. 11,824.

The Locks and Calingulabs in the Mundapetta Canal were completed, with the exception of a part of the stone revetment of the Pasalapoody Lock and a little earthwork, the expenditure being Rs. 11,989.

The channel from Peddavudlapudi to Nizampatam was opened out to its full length, but some small works remained to be completed. It was expected the whole would be finished in 1865-66.

KISTNA.

Rupees 29,897 have been expended on widening the channel from Wallabapooram to tide water, and in completing some branch channels.

The channel from Pullairu near Weyoor, to the Canal basin at Masulipatam, has been completed at a total cost of Rs. 2,64,149; the amount expended during the year being, however only Rs. 900.

The enlargement of head of channel from Seetanagram to Duggeralla has made but little progress, owing to scarcity of labour. Expenditure, Rs. 21,583.

The widening of the lower portion of the Pullairu channel has progressed favourably, with an expenditure of Rs. 26,943, and some of the minor works connected with it have been finished.

The continuation of the Cummamoor channel from Inkole to Chinna Gangam has been carried on with an expenditure of Rs. 33,113. The embankments for ten miles have been made in a substantial manner; seven and a quarter miles of channel have been dug to full section, and two and a half miles to full width with a depth of one yard; two and a half miles of channel previously made have been enlarged, and an escape at the terminus of the channel has been constructed.

The eastern embankment of the Kistna from Yanamala-cudum to Mopedavy has also been improved and strengthened.

The works necessary for improving the Edur Kodur branch of Juffer Sahib's channel, and in making a new cut from it to Survapully channel have been nearly completed.

NELLORE.

Several tanks connected with the Palar project have been restored and improved.

MADRAS DISTRICT.

The Palar Anicut has been raised from 5 to 7 feet in height at a cost of Rs. 7,700, and the work has proved most serviceable. Rs. 8,130 has been spent excavating a channel to supply the Chuckramelloor and twelve other tanks on the south side of the Palar river, and Rs. 14,000 have also been very usefully spent in cutting a channel about 12 miles long to utilize the waters of the overflow from the Mahindravady tank.

NORTH ARCOT.

The channel from Lalpet to Surpentangle has been completed at a total cost of Rs. 19,300, and is expected to prove highly remunerative. The Cheyaur Anicut has been raised, and the channel and subsidiary works widened. Expenditure, Rs. 9,589.

Rupees 19,348 have been expended in repairing the damages done to the Trivady, Vanamadavy, and Trivandipuram Anicuts, by the extraordinary floods of October 1864.

SOUTH ARCOT.

CIVIL WORKS.

AGRICULTURAL.

TANJORE.

Satisfactory progress has been made in re-building the fallen portions of the south branch of the Lower Coleroon Anicut. Expenditure, Rs. 19,743.

The following repairs require special mention :—

Expenditure.

	Rs.
GODAVERY DISTRICT.—Godavery Anicut ...	26,931
Rough stone revetment and groynes for the protection of the river bank of eastern Delta ...	17,958
Dredging the Coconada harbour ...	19,652
KISTNA DISTRICT.—Kistna Anicut ...	13,011
Masulipatam Canal and Branches ...	52,710
Ellore Canal and do. ...	9,756
Ryve's do. do. ...	3,499
Pullairn do. do. ...	12,640
Nizampatam do. do. ...	14,102
Western Bank Channel ...	3,381
Commamoor Channel ...	6,754
BELLARY.—Toongabuddra Channels ..	14,743
MADRAS DISTRICT.—Deepening the Northern and Southern Canals ..	22,071
TANJORE.—Re-constructing wing-walls of the South Raja Voikal Surplus Sluice of the Lower Coleroon Anicut ..	6,149

BOMBAY.

Rupees 1,16,178 have been expended during the year on the Sukkur and Shadadpoor Canal. The earth-work in the deepest portion, (the first 12 miles) has been progressed with.

Mitrow Canal has been opened out to the 74th mile, and water admitted to the 70th mile. The opened portion has been widened, and some subsidiary works have been completed.

Thurr Canal has been excavated at half its size as far as the Oomercote branch, which has been completed; a considerable amount of work has been done on the other half. The head-works and weir have been completed.

There has been some delay in carrying out the cuts in the bed of the Narra owing to a reduction of the grant, but a cut 30 feet wide would, it was expected, be made through all the obstructions in time to admit water for the kurreef crop.

The Foolalee improvements have been proceeded with, and some extensive improvements have been carried out in the Canals of the Hyderabad Collectorate.

Rupees 3,000 were sanctioned in April for deepening the Mallao Tank at Oomereith from the grant made by Government for famine works in the Collectorate. Owing to work being commenced so late in the year, only Rs. 888 has been spent.

The improvements of the tank at Koregaum in the Barsee Talooka, commenced after the rains of 1864, has been vigorously carried on. Out of a grant of Rs. 11,821, the expenditure has amounted to Rs. 8,022.

Over 5 miles of the Mudduck Canal has been completed, and the water used for irrigation. Expenditure, Rs. 7,992.

The progress made in these works has not been so rapid as expected, owing to the system of advances to contractors having been prohibited.

AGRICULTURAL.

SUKKUR AND SHADAD-
POOR CANAL.

MITROW CANAL.

THURR CANAL.

NARRA.

FOOLALEE IMPROVE-
MENTS.HYDERABAD COLLEC-
TORATE.
KAIRA.

SHOLAPOOR.

DHARWAR.

KHANDEISH COLLEC-
TORATE.

CIVIL WORKS.

The masonry weir across the Girna, 1550 feet in length, and the head-works of the two canals have been completed, with the exception of the gates and lifting apparatus for the latter. The left bank canal has had its earth-works nearly completed for 10 miles, and the masonry aqueducts, 8 in number, have been so far completed, that they were to be ready for the admission of the water in September.

	Rs.
Allotment for the year 1864-65 ...	1,25,000
Expenditure ...	67,889

The progress of the Panjur works has been delayed from a similar cause as the Girna works; they were, however, expected to be finished by the end of June. The expenditure, during the year, has been Rs. 26,704.

During the present year, the weir in connection with the Kristna works, 2,000 feet long and 20 feet high, has been raised to 14 feet above low-water level, or within 6 feet of its full height. The wing walls have been brought up to an average of 24 feet, and had only 10 feet to be added to them. The canal has been excavated for a distance of 8 miles, and of the aqueducts, 7 in number, one is complete, and the others have been advanced as far as they can be, till the monsoon floods have passed off, when the arching and finishing were to be undertaken. The progress made with the works has been satisfactory. Expenditure during the year, Rs. 1,23,837.

The Rewaree project has been completed. Although the irrigating channel is only 4 miles in length, the work is a valuable one, as its source of supply is a perennial stream which never fails. Rs. 17,901 have been expended during the year.

A small project on the Kadwah has been nearly completed. Rupees 6,505 have been expended in restoring the Kasoor-dee Tank, but want of funds caused a stoppage of work.

BENGAL.

Rupees 1,21,936 have been expended during the year in Bengal, of which Rs. 99,290 was spent on the Hidgellee Sea embankment.

The work on the latter was impeded, not only from the difficulty of obtaining labour and the breaking out of cholera among the imported labourers, but also by the unusually heavy rains and high winds experienced.

In the South-Eastern Circle some repairs were done to the embankments along the Hooghly, which were destroyed or injured by the Cyclone of October.

NORTH WESTERN PROVINCES.

The works on the Ganges Canal being of such great importance, the Report of the Chief Engineer of Irrigation Works is given almost *in extenso*.

The termination of the rains in 1864 disclosed that the main stream of the Ganges had deserted its usual course, and had taken to the left bank of the river, throwing up a deposit of silt 600 feet in width, and from 2 to 5 in depth, in front of the mouths of the canal supply-channels. This had to be cut through, and it added to the ordinary difficulties of getting in the canal supply. The rapid at bund No. 2 having cut back about 100 feet, also endangered the future prospects of the supply. The remedial measures taken will be described further on.

Prior to the commencement of the rainy season, Captain Forbes had made breaches in the head bunds, in order to direct

AGRICULTURAL.

SATTARA COLLEC-
TORATE.AHMEDNUGGER COL-
LECTORATE.
POONA COLLECTORATE.HIDGELLESE SEA
DYKE.SOUTH-EASTERN
CIRCLE.AGRICULTURAL.
GANGES CANAL.

NORTHERN DIVISION.

AGRICULTURAL. the set of the stream towards those points; and he also removed part of an old bund of 1857-58, which threatened a deposit of silt near the mouth of supply-channel No. 1; but in spite of his care and foresight, the river shifted its course as described.

In September, *i. e.*, as soon as the climate would permit, 500 coolies were set to work vigorously at the heads; but the season proved unhealthy, and as many as 230 men out of this number, were prostrated with fever at one time. Captain Forbes, however, assisted by Sergeant M'Arthur, overcame all difficulties, and a full supply was turned down the canal on the 16th October. In consequence of a slight accident, the supply fell for a few days, but this was speedily remedied, and the canal has since been retained at its full volume without intermission.

Of the four head bunds, the Hurdwar bund was commenced in the middle of September, and completed by the end of the same month. It was constructed of boulder and shingle, of which about 63,311 cubic feet were expended, and was protected by 6,530 superficial feet of matting. Its length was 1,170 feet, and its height averaged 6 feet. It cost Rs. 588.

Beemgoda bund No. 1 was completed by the middle of October, simultaneously with the supply-channels at the heads, in which 2,90,200 cubic feet of excavation through shingle and boulders was carried on in water, and cost Rs. 2,227. The bund was 1,200 feet in length; its average height being 11, and width 14 feet. It consisted of 103 large triangular crib boxes filled with 259,200 cubic feet of boulders, protected with 18,000 superficial feet of matting; 17,595 cubic feet of excavation was also executed in removing the remains of the old bund of 1857-58 already alluded to. All this had hardly been done when a breach, 120 feet in length, occurred, through which the river rushed with the velocity of a mill-race, with a depth of from 12 to 16 feet of water. This was closed within 10 days, but with considerable difficulty. The total cost of the bund, including the repairs, amounted to Rs. 7,152.

The second, or No. 2 Beemgoda bund, was completed in November at a cost of Rs. 1,083, its length being 1,300 feet, with a depth of 5, and mean width of 12 feet; it was composed of 34 smaller triangular crib boxes filled with 78,400 cubic feet of boulders, and protected by 18,700 superficial feet of matting.

The last, or Neeldhara bund, was completed early in December, at a cost of Rs. 412, and consisted of 39,000 cubic feet of boulder work, faced with 7,200 superficial feet of matting.

The total cost of the head bunds was Rs. 11,462, or Rs. 1,721 in excess of the estimate. This excess was caused principally by the extra work in repairing the breach before described, and partly by the materials expended being charged at a higher rate than that estimated.

To guard against the further cutting back of the rapid below No. 2 bund, referred to in paragraph 1, a rapid, 300 feet wide and 60 feet in length, was thrown across the bed of the river, 400 feet below the bund; the crest of the rapid was half a foot below the river bed, and a fall was given over it of $2\frac{1}{2}$ feet, distributed in steps, each half a foot in depth. Three cuts, each 50 feet in width, were also made through the silt deposit on the right bank, the whole being completed at an expense of Rs. 9,600. The estimated cost was Rs. 10,307. The total quantity of work executed consisted of 1,43,991 cubic feet of shingle and boulder excavation in water, and 2,00,825 cubic feet of boulders filled into 213 crib boxes, which were firmly fastened together by 447 kurrees.

AGRICULTURAL. The rapid was scarcely complete when, on the 5th March, a very high flood passed down the Ganges, sweeping away the whole of the bunds. The rapid, however, was so near completion that it suffered no damage, and not only prevented any cutting away of the river's bed, but facilitated the repairs that became necessary to the bunds; 57 large crib boxes had to be repaired and filled in with 236,224 cubic feet of boulders, and 384 trees were cut down and fastened along the steep bank of the river, to prevent further erosion. These repairs cost Rs. 4,410.

Before the rains set in, a bund in the River Ganges had been thrown up for the protection of the town of Kunkhul, and it has been found to answer its purpose, the main stream of the Ganges having taken to a new channel made for it at some distance from the town, and a hole 22 feet in depth, below the garden of Lalla Balmokund, having completely silted up. When the river rose, however, this bund, which had to stand the full force of the floods, was much damaged, and had to be repaired at a cost of Rs. 2,940; the work done was the fixing 67 crib boxes on the bund, and the replacing 94,600 cubic feet of boulders which had been carried away.

Two bridges of boats were made across the branch of the Ganges which supplies the canal, during the Hurdwar fair, for the convenience of the crowds of bathers going to, and returning from, the sacred ghât. The sum of Rs. 954 was spent on them.

This completes the works in the River Ganges, of which, $4\frac{1}{2}$ miles come within the charge of the Executive Engineer, Northern Division. The following is a description of the works executed in the canal, from the regulating bridge at Myapoor to Jowlee ($50\frac{1}{4}$ miles), where this Division terminates.

The gates and tackle of the dam and regulator at Myapoor have been maintained in an efficient state; 4 new dam gates were made, 92 dam planks sawn up and fitted, and several old gates and chains thoroughly repaired. Considerable expense was incurred in caulking the gates, and stopping all leakage during the canal closures in July and September. Four hundred and seventy-one cubic feet Hurdwar stone were packed into a deep hole below the dam flooring, and 2,062 cubic feet were dressed preparatory to being placed on the piers of the dam. The amount spent during the year on the dam and regulator was Rs. 6,254.

The ogees of the Ranipoor fall had been much damaged, owing apparently to the sleepers for holding up the water having been placed too close to the crest of the fall. These sleepers were removed, and a masonry wall was built across the bays, at a distance of 6 feet from the crest; the work, consisting of 4,681 cubic feet of masonry, was protected by 3,662 superficial feet planking. A temporary bund, containing 14,840 cubic feet earth-work, had also to be thrown up. The whole cost Rs. 2,872, against an estimate of Rs. 2,352.

At the Ranipoor protective bunds, 95,825 cubic feet earth-work were executed, and 1,040 fascines were used in protecting the face of one of the principal bunds, at a cost of Rs. 229. At the Ranipoor locks a sum of Rs. 549 was spent in replacing two gates and four sluices, and in keeping the other gates, windlasses, &c., in order.

A sum of Rs. 941 was spent in the clearance of silt from the Kunkhul mill-channel, and on two temporary bunds, which were constructed during the closure across the bed of the canal, to intercept the passage of leakage water through the regulator to the works under repair below. Two hundred and eighty-seven thousand, seven hundred and five cubic feet earth-work and

AGRICULTURAL. silt clearance were executed; 49 small cribs were placed in bunds, protected by 2,510 superficial feet matting.

At Bahadurabad fall No. 2, the masonry was repaired, the frame-work of sleepers renewed in 4 bays, and 24,392 cubic feet of boulders thrown into a deep hole below the crib-work. At No. 3 the brick-work of the ogees was repaired. On the former, Rs. 1,423 were spent, and Rs. 233 on the latter. At the Bahadurabad locks Nos. 2 and 3, the wood-work was repainted, drums and gates were repaired, and the sluices renewed, at a cost respectively of Rs. 273 and 375.

The Bahadurabad Navigable Channel was cleared of 1,100,248 cubic feet of silt, and its banks of jungle for $5\frac{3}{4}$ miles. The amount sanctioned was Rs. 3,333; the work cost Rs. 2,404. A clearance was likewise effected at the Bahadurabad mill-channel of 224,520 cubic feet of silt from its bed, and of jungle from its banks, $1\frac{1}{4}$ miles long. The expenditure incurred was Rs. 664, against an estimate of Rs. 736.

A sum of Rs. 134 was expended on the Puttree fall and super-passage in petty repairs to the masonry. No expenditure was incurred on the protective bunds at the Puttree. At the locks, the relieving arch over one of the drum sluices had given way, and was re-built at a cost of Rs. 778.

An amount of Rs. 865 was sanctioned for the re-construction of bunds and water-courses in the Jowalapoor Pergunnah, for the irrigation of certain villages from the Puttree Nuddee. The works were completed for Rs. 707. Two lakhs, twenty thousand, eight hundred and eleven cubic feet earth-work was executed. A revenue of Rs. 2,500 has been derived from these works during the current year; but as the damming up of the water in the river tends to raise the level of the springs in the adjacent lands, by which considerable injury is done to villages lying near the Puttree, the bunds will not be made in future.

At Dhunnoree much work has had to be done, consequent on the injuries sustained by the works in 1863. On the right of the canal, the Rutmoo had deserted its course, and impinging on the canal embankment, had burst through one of the bunds and approached the inlet dam in a tortuous direction. A project was submitted and sanctioned for straightening the course of the river, estimated to cost Rs. 5,560, against which the sum of Rs. 1,194 was spent in 1863-64. In May and June a further sum of Rs. 1,579 was spent; 9,47,163 cubic feet of earth-work having been executed, and 87 sixteen-feet piles driven in the formation of bunds. But early in July heavy floods came down the Rutmoo, injuring the new works which were not quite finished, and the repairs which had then to be carried out led to an expenditure of Rs. 3,813, and to an excess over estimate of Rs. 1,026. The work done during the monsoon was 11,76,918 cubic feet earth-work in cuts and bunds, 264 sixteen-feet piles were driven, 389 trees were fastened to banks, which were further protected by 10,705 superficial feet of grass matting.

The same flood that caused such mischief on the right of the canal, also broke the three retaining weirs below the outlet dam. Rs. 17,587 were sanctioned for the repairs, which were executed for Rs. 11,473, and consisted of 3,83,770 cubic feet excavation, 359 twenty-feet piles driven, 764 crib boxes placed, and 1,47,979 cubic feet of heavy material filled in. (In 1862-63 and 1864, Rs. 10,060 and Rs. 5,890 had also been set apart for these works, and the expenditure then incurred, Rs. 16,940, was somewhat in excess of the sanctioned allotments.) In addition to the above, Rs. 5,262 were laid out in repairs to the old weirs below the dam; 45,237 cubic feet earth-work were executed, 18

AGRICULTURAL. piles driven, 48 crib boxes placed, and 68,953 cubic feet of heavy material filled in. These weirs have acted beneficially; the Rutmoo now approaches the dam in a direct course, and the hole (13 feet deep) below the outlet dam has completely silted up.

The effect of widening the waterway of the Rutmoo below the Dhunnoree dam was so marked, that a project, amounting to Rs. 30,131, for increasing the waterway still further by the prolongation of the three retaining weirs has been received, and it is expected the work which is in progress will preclude the necessity of constructing a masonry fall below the Dhunnoree dam, the cost of which would amount to $1\frac{1}{2}$ lakhs of Rupees at least. The two main weirs had been lengthened to their full extent, and the third, or smaller weir, was well in hand. The amount spent up to 1st May 1865 was Rs. 12,257. The following work has been done:—622,981 cubic feet excavation, 1,177 twenty-feet piles driven, 287 crib boxes placed, and 1,02,149 cubic feet boulders filled in.

The Dhunnoree dam and regulator, together with the gates, have been kept in an efficient state for Rs. 1,465. On an average, three gates had to be repaired after each flood; and one new gate was made up to replace a broken one.

The bunds on the up-stream side of the inlet dam have been put into a thorough state of repair, at a cost of Rs. 1,019. The work done consists of 192,212 cubic feet of excavation, and 239 sixteen-feet piles driven.

A sum of Rs. 1,322 was spent under the head of "Original Works" on the earthen embankment of the Solanee aqueduct; the work was stopped to admit of urgently required repairs being carried out on the Dhunnoree and Solanee bunds. The left embankment, however, is nearly complete. The following was done in 1864-65:—237,659 cubic feet earth-work, and 600 lineal feet of tramway laid.

An allotment of Rs. 2,322 was sanctioned for the clearance of silt and weeds from the drainage channels below the Solanee aqueduct. Rupees 2,368 were spent, and 1,010,380 cubic feet silt, &c., excavated.

A sum of Rs. 6,793 has been spent this year in straightening the course of the River Solanee. 2,810,520 cubic feet excavation have been done, 604 sixteen-feet piles have been driven, 5 cribs placed, and 372 trees cut down and staked on banks.

An expenditure of Rs. 840 has been incurred against an estimate amounting to Rs. 5,408, for directing the course of the Solanee straight on to the aqueduct. The work will be completed before the rains. 669,000 cubic feet of earth-work have been executed.

On the Imlee nuddee bunds, a sum of Rs. 642 has been spent in repairs; 220,842 cubic feet excavation have been done, and 90 piles have been driven.

The following table shows the height of water on the Roorkee gauge for the past three years, and the dates on which the Ganges Canal was closed and re-opened during the year 1864-65:—

MONTHS.	1862-63.	1863-64.	1864-65.	REMARKS.
May	5'87	6'63	7'01	The water was shut off at Myapoor on the 24th July 1864, and the canal was re-opened on the 27th August. It was again closed on 8th September, to admit of the Jowlee fall being repaired, and re-opened on the 18th idem.
June	6'51	6'58	6'90	
July	6'25	5'05	5'79	
August	5'37	4'43	6'07	
September	5'21	5'87	4'97	The average for March is low, as the canal supply was purposely kept down, in order that repairs to the Sullawa lock might be effected.
October	4'59	6'14	5'88	
November	3'12	6'56	6'74	
December	4'23	6'01	7'17	
January	5'24	7'18	6'92	
February	6'14	6'77	6'63	
March	6'91	6'88	6'01	
April	6'84	6'96	6'79	
Averages	5'52	6'33	6'36	

CIVIL WORKS.

A deep hole, which formerly existed below the crib work at the Asufnuggur fall, had cut back to the foot of the piles, which leant forward, and led to a settlement of a considerable portion of the crib work. The necessary repairs, which were estimated at Rs. 6,710, were completed during the canal closure for Rs. 4,141, under the supervision of Mr. J. Kelly, Executive Engineer, Hurdwar Quarries, who kindly offered to take charge of the works; 213 twenty-five-foot piles were driven; 24,608 cubic feet boulders, &c. filled in crib work, and 144 trees cut down, weighted and thrown into the deep hole. The masonry of the falls was also repaired.

A sum of Rs. 27,060 was granted for making crib-work weirs below the falls at Asufnuggur, Mymoodpoor and Jowlee and the Dimat bridge. These works were intended to check, in some measure, the great erosive action of the water on the bed of the canal at these places. They have all been completed. The expenditure at the Asufnuggur, Mymoodpoor and Jowlee falls amounted respectively to Rs. 3,806, 7,558 and 4,220, and at the Dimat bridge to Rs. 3,936; the aggregate was Rs. 19,570. The following work was done:—

WORK.	PILES DRIVEN.	CRIBS LAID.	BULLAH AND TORS USED IN TIES.	BOULDERS FILLED IN.	TREES WEIGHT- ED AND THROWN INTO HOLES.
Asufnuggur Falls...	No. 53	No. 74	No. 479	C. F. 34,400	No. 449
Mymoodpoor Falls...	58	86	455	19,546	100
Jowlee Falls...	224	57	437	26,000	150
Dimat Bridge...	60	33	392	18,000	729
Total	419	250	1,703	97,946	

On the closure of the canal, the hole below the Belra bridge was found to be 26½ feet deep: in front of the centre bay, it had cut back to the protective line of piles and crib-work on the down-stream side of the flooring. An estimate for repairing the crib-work, and placing the bridge in safety, by throwing in boulders, &c., so as to form a long sloping talus, was submitted and passed for Rs. 4,950; the work was completed for Rs. 2,844. It had the effect of silting up the deep hole (10 feet) in ten days, and the bridge may now be considered out of immediate danger; 77 piles were driven, 19 crib-boxes laid, 32,631 cubic feet boulders thrown in, and 358 trees sunk in holes.

The flooring of the chambers of the Jowlee Fall was much damaged, and had to be repaired with Delhi stone; Rs. 16,795 were spent against the sanctioned sum of Rs. 25,201; 10,617 cubic feet Delhi stone were used, and the stones were fastened together by 1,557 iron clamps.

There are altogether 388 miles of rajbuhās in this division, and the work on them has been almost entirely confined to clearances of silt, strengthening banks, and the like. 12,235,198 cubic feet of earth-work and silt clearance have been effected; 253 miles kept free of jungle; and petty repairs executed, at a total cost of Rs. 23,480. The heaviest silt clearances have been made from the right and left main rajbuhās, and the Jugjeetpoor, Liburheree, Mahmoodpoor, Busserah and Tausi-poor rajbuhās.

Among new rajbuha works, 5 miles of banks of the Liburheree rajbuha have been raised to their full height, and the foundations of the aqueduct to carry the Sidhowlee rajbuha over the Seela nuddee have been laid. On the former, 807,841 cubic feet earth-work, costing Rs. 1,088 have been executed, and on the latter 1,06,267 cubic feet earth-work, and 4,000 cubic feet masonry.

CIVIL WORKS.

A sum of Rs. 4,551 was sanctioned for making certain cuts to divert the course of the River Solanee in the khadir of the Ganges; they were completed for Rs. 4,392, under the supervision of Lieutenant Marinden, and have answered their purpose admirably, as the effect produced by them in silting up two jheels was beyond all expectation; 2,855,642 cubic feet of excavation have been done.

With reference to the heavy outlay on the "Repairs" of this division, it is necessary to explain that the Ganges Canal was not closed for repairs in 1863-64. This, of course, increased the work that had to be carried out in 1864-65; and the year's expenses were still further augmented by the extensive repairs, which the serious injuries from floods sustained by the protective works on the Rutmoo and Solanee rivers rendered imperative.

On the main canal the alterations to the Nidhowlee and Meerut Division. Wulleepore chowkees have been carried out; the expenditure during the year amounted to Rs. 900.

The heaviest outlay under "Original Works" was in the construction of new rajbuha chowkees, for which a sum of Rs. 20,000 was set apart in 1864-65. Rs. 19,984 were spent. The masonry of 20 chowkees has been completed, but all the doors and windows had not been put up. The principal items of work executed were 51,269 cubic feet pukka masonry 17,010 superficial feet roofing, and 67,039 cubic feet earth-work.

The other works carried out in this division consist of remodelling defective lines of irrigation, and constructing minor distributing channels. Of the former, 22 miles have been remodelled, and of the latter 26 have been completed. The progress for the year will show best in a tabular form, and is given below:—

NAME OF WORK.	Amount allotted.	Amount spent.	WORK EXECUTED.		DESCRIPTION OF WORKS.
			Masonry.	Earth work.	
<i>Remodelling.</i>	Rs.	Rs.	C. F.	C. F.	
Meerut and Naoon left rajbuha ...	1,351	1,742	1,325	1,015,706	
Sohanna Bunera rajbuha head ...	286	286	830	100,718	1 new head built.
Urrowlee right rajbuha ...	525	517	2,378	124,000	1 aqueduct and 1 bridge built.
Koosullia right rajbuha bridges...	921	942	4,900	160,000	5 new bridges, 7 feet waterway.
Jullalabad left rajbuha bridges ...	937	938	4,925	112,000	4 New bridges, 10 feet waterway.
Dasma, and part of main left rajbuhās ...	5,285	2,532	9,075	700,000	7 new bridges, 11 feet waterway.
Sohunpoor left rajbuha ..	869	836	4,100	114,648	5 new bridges, 4 feet waterway.
Ladlabas ditto ..	267	337	...	101,721	Mile-stone and wood-work.
Cheetee ditto ...	436	48	...	23,000	Milestone and wood-work.
<i>Water-courses.</i>					
Ketka left rajbuha ...	913	670	4,160	139,705	1 aqueduct and 2 bridges built.
Sekhera right rajbuha ...	3,807	4,012	11,912	1,297,170	1 head and regulator and 13 bridges built.
Bhownee right rajbuha ...	853	1,066	2,730	72,000	3 bridges built.
Phoorlut right rajbuha ..	2,008	2,902	11,888	601,934	1 head, 4 bridges, and 5 syphons built.
TOTAL	18,458	16,828	58,223	4,562,602	

CIVIL WORKS.

AGRICULTURAL.

Under the head of "Special Repairs" some heavy work was carried out during the closure of the canal in August and September, at a total cost of Rs. 17,606. The principal items of work are here given. The further reclamation of the large loop at the 52nd mile of the canal, just below Jowlee, was effected at a cost of Rs. 433; 183,000 cubic feet earth-work were executed, and 1,600 fascines used. At the Chitowra and Sullawa falls, the floorings, which were extensively damaged, especially at Sullawa, were put into a state of repair; also the ogees, wing-walls, abutments, piers, &c. At Chitowra 2,000 cubic feet of concrete, and 2,000 of Delhistone, were expended, and at Sullawa about 2,670 cubic feet of the latter. A weir was thrown across the bed of the canal at the Sullawa falls, composed of crib-work and block kunkur, piles, trees, refuse of brick-kilns, &c., forming a mass of about 75,000 cubic feet of materials. The repairs at Chitowra cost Rs. 4,968, and at Sullawa Rs. 8,280. Petty repairs were also executed at the Bhola, Dasna and Pulra falls, costing Rs. 550, 830, and 800 respectively.

Considerable erosion had taken place below the Wulipoor bridge, which carries the Grand Trunk Road across the canal. In the immediate vicinity of the work, extensive subsidence of the canal channel had previously been observed; but nothing more than temporary expedients, such as sinking trees, &c. could be resorted to with a running stream; the opportunity of the closure was taken to complete the job more effectually by constructing a weir of crates filled with earth and sand bags, and held together by piles; its cubical contents were 33,792 feet, and cost Rs. 1,030. It has proved successful. At five other bridges, where cutting was observed, stakes have been driven and block kunkur thrown in; 3,573 stakes and 5,400 cubic feet of kunkur have been used, and Rs. 400 spent. Petty repairs were also carried out at the different locks, costing Rs. 315.

The aqueduct on the main right rajbaha over the Boolund-shuhur branch, is almost ready. Rs. 319 have been spent on it this year. New down-stream walls (masonry 3,489 cubic feet) have been added to the aqueducts on the main right rajbaha at Nugla and Rudanah, at an expense of Rs. 659. A sum of Rs. 5,949 was sanctioned for piling the Sullawa and Bhola lock channels; Rs. 1,000 have been laid out in driving 2,500 tors and stakes; the balance will not be spent, as these channels will in all probability be abandoned when the canal is remodelled.

The Budget grant for current repairs was Rs. 38,000, and the expenditure for the year amounted to Rs. 41,029. For this sum, 110 miles of the main canal, and 732 miles of rajbahas, were maintained in order. Petty repairs to masonry works were executed, jungle clearances effected, and the following quantity of earth-work done:—

Clearance of silt from rajbahas	..	Cubic feet.
Scarping the inner slopes of rajbahas	..	4,554,622
Strengthening rajbaha embankments	..	4,196,335
	..	3,847,359
Total earth-work	..	12,598,316

The improvements to the Machooa 2nd class chowkee, on the main canal, for which a revised estimate, amounting to

ALLYGURH DIVISION.

CIVIL WORKS.

AGRICULTURAL.

Rs. 2,478, has been sanctioned, have been commenced; 618 cubic feet masonry, and 15,500 cubic feet earth-work, have been executed; these and other preliminary operations have brought up the expenditure for the year to Rs. 628. Eight new gates have been made for the regulator at Nanon, at a cost of Rs. 4,040 against an estimate of Rs. 5,580. The Kana Kowa bridge has been completed; 862,871 cubic feet earth-work, and 2,100 cubic feet metalling, have been executed at a cost of Rs. 1,736 against an allotment of Rs. 1,800.

Keeping the remodelling of the Ganges Canal in view, it has been deemed inadvisable to construct any new minor irrigating lines. Several rajbahas, which were in course of reconstruction, have been brought to completion; but they call for no remark, as they were fully described in the last Report. The annexed Statement shows the quantities of work executed thereon during the past year, with the allotments and expenditure against each:—

NAME OF WORK.	ALLOT-MENT.	EXPEN-DITURE.	WORK EXECUTED.			DESCRIPTION OF MASONRY WORKS BUILT.
			Masonry.	Earth-work.	Metal-ling.	
<i>Rajbahas.</i>	Rs.	Rs.	C. F.	C. F.	S. F.	
1st Class rajbaha chowkees	8,033	3,575	34,318	51,005	...	6 Chowkees.
Hurdeogunj right ..	4,485	4,339	8,539	410,040	11,010	2 Bridges, 1 siphon, 1 tail fall.
Sheka left ..	3,714	2,966	6,966	242,340	25,046	1 Head, 1 bridge, 1 siphon and 1 tail fall.
Machooa left ..	8,315	6,821	20,656	909,224	35,588	1 Head and 2 bridges.
Kooreagunj left ..	2,776	1,442	7,272	317,559	...	2 Bridges and 1 siphon
Somera left ..	2,139	1,906	...	918,000	...	1 Tail work.
Junsol left ..	6,929	4,222	7,332	2,843,979	...	1 Siphon.
Sahowlee left ..	5,421	5,237	21,813	914,342	...	2 Heads and 5 bridges.
Lodipoor right ..	6,340	6,424	20,772	1,502,044	...	1 Head, 3 bridges, 1 siphon and 2 aqueducts.
Seetapoor right ..	2,796	2,704	9,246	221,203	...	1 Head, 1 bridge, and 1 tail work.
Pilkutra right ..	12,182	12,166	25,611	4,561,982	...	2 Heads and 10 bridges.
Purka drainage line ..	1,722	1,150	5,557	216,826	...	1 Aqueduct.
Total ..	64,863	53,049	168,112	13,108,594	73,144	

Work was steadily progressing at the close of 1864-65 on the Allygurh drainage line, which was designed to drain the low marshy lands in the vicinity of the Allygurh Cantonment on the east, and to divert into the River Seyngoor a portion of the floods which, during every rainy season, pass down a succession of hollows to the west of the city of Coel. This two-fold object will be effected at comparatively trifling expense, by taking advantage of an existing drain, about four miles in length, and incorporating it in the scheme. The drainage hollows on the west of the Allygurh Fort are connected with this drain by a cut nearly three miles in length, and a prolongation of the drain is carried on so as to join the Seyngoor below the Adhawun jheel. It is expected that these measures, when carried out, will greatly ameliorate the sanitary condition of the cantonments and city. The expenditure (to be shared by the Irrigation Department and the Local Funds) amounted to Rs. 3,352. The amount sanctioned is Rs. 7,962. Four bridges have been built, and 8,391 cubic feet masonry, and 850,945 cubic feet earthwork, executed.

During the closure in August, the holes below bridges were filled in, and the bed of the canal was staked at places where dangerous cutting had taken place; cost Rs. 1,433. The

CIVIL WORKS.

canal bank in the 178th mile, nearly opposite to the Sheka jheel, was breached in 1856, and a recurrence of the accident has been constantly apprehended. The bank has now been widened and strengthened at a cost of Rs. 1,596. These two works have been carried out under "Special Repairs;" 550 cubic feet masonry and 748,433 cubic feet earth-work have been executed, and 30,211 cubic feet kunkur filled in. The Jurowlee Bridge over the right main rajbaha in the Cawnpoor-branch has been constructed, also as a "Special Repair," at an expense of Rs. 757 against an allotment of Rs. 947. Of masonry, 5,300 cubic feet have been carried out, and 39,278 cubic feet of earth-work.

The Budget grant for "Current Repairs" was Rs. 25,000, against which an expenditure of Rs. 30,953 has been incurred. The repairs to canal banks, masonry works, &c, were of the usual nature.

Within the last two years, the canal supply in the Allygurrh Division has fallen from an average of 5' 4 to 3' 5, and the utmost exertions have to be made to keep the irrigating lines free from silt, especially above Nanoon. Advantage was taken of the lowness of the supply before the *rubbee* waterings commenced, to effect a thorough clearance of all the rajbahas, and 7,534,166 cubic feet of silt were then taken out of them. To this may be attributed the large increase in the irrigation returns of the past *rubbee*. The prevalence of "Oosur" throughout the Districts in this Division necessitated very extensive repairs to the banks of many of the irrigating lines which, in places, were almost entirely renewed.

The wharf-wall at the Dunnahar Bridge has been completed. Considerable difficulty was experienced in laying the foundations, which were carried 8 feet below the bed level; they were to have rested on wells, but solid foundations, on account of their stability, were substituted. Owing to the constant supply since January, much trouble and work were entailed in preserving the earthen coffer-dam. The sides of the excavations also fell in from time to time, and added to the difficulties of the work; 20,445 cubic feet masonry, 4,262 superficial feet plaster, 6,775 running feet staking, and 394,125 cubic feet earth-work, have been executed, and Rs. 4,295 spent against an allotment of Rs. 4,701.

On rajbahas, of which 47 $\frac{1}{4}$ miles have been opened out during the year, the following work has been done:—On the *Nugurria*, left, 3 bridges and 3 siphons have been built; 6,328 cubic feet masonry, 3,477 superficial feet plaster, and 87,370 cubic feet earth-work. A diversion, 5 $\frac{3}{4}$ miles in length, has also been made on this rajbaha from the 20th to the 25th mile, entailing 2,002,488 cubic feet of excavation, and the construction of 4 bridges and one siphon, on which 12,582 cubic feet masonry have been executed; earth-work 137,829 cubic feet. On the *Mirzapoor*, left, a siphon at Roopoor has been completed, containing 2,293 cubic feet masonry, and 1,501 superficial feet plaster; earth-work 4,800 cubic feet. The extra channel for the *Aima rajbaha* has been completed; excavation 276,300 cubic feet, and the junction work also, containing 2,587 cubic feet masonry, and 1,500 superficial feet plaster; earth-work, 63,556 cubic feet.

In the Tirrooa left rajbaha, which is 28 miles in length, 5,973,324 cubic feet excavation have been carried out. The masonry works consist of a new head, 19 bridges, 4 aqueducts and two siphons. An escape has also been excavated, having a fall at its tail. The quantity of work executed has been

CAWNPOR DIVISION.

CIVIL WORKS.

116,372 cubic feet masonry, 28,874 superficial feet plaster, 9,146 superficial feet pointing, and 420,106 cubic feet earth-work.

On the Kunsowa right rajbaha, mile-pillars have been put up, and a syphon constructed; 6,915 cubic feet masonry, 3,162 superficial feet plaster, and 13,525 cubic feet earth-work; 101,500 cubic feet excavation have been carried out on an escape, and 219,262 cubic feet in three drainage lines. The Sheolee Branch, 13 $\frac{1}{2}$ miles in length, has been excavated; 1,577,439 cubic feet of work, 13 bridges and a fall have been built, and milestones put on this branch; 9,616 cubic feet masonry, 9,833 superficial feet plaster, and 118,949 cubic feet earth-work. A syphon was also constructed by the Railway Engineers at the point where the rajbaha crosses the East Indian Railway near Blowpoor, at a cost of Rs. 869.

About 8 miles of the Kullianpoor left rajbaha have been widened three feet, in order that the supply lower down might be raised. It is from the tail of this line that the water is taken off for the supply of the Cawnpoor Memorial Garden; 689,014 cubic feet excavation have been done.

Under the head of "Special Repairs" the only work undertaken has been the repair to No. 1 over-fall on the Tirria escape. This work has given way on several occasions, and has always been a source of anxiety. An estimate for Rs. 2,478 was sanctioned in 1864-65 for putting the work in order, and an outlay of Rs. 2,456 has been incurred. The work executed consist of 10,725 cubic feet masonry, 2,550 superficial feet plaster, 1,457 running feet staking, and 36,000 cubic feet earth-work.

An expenditure of Rs. 26,606 has been incurred against the allotment of Rs. 28,500 for "current repairs." The works on 123 miles of canal, and 395 of rajbahas, have been maintained in a state of efficiency.

Work has been concentrated on the Gangsee, Bansuck, KTAWAH DIVISION. Phupoond and Boradana rajbahas, which remained incomplete at the end of last year. The following is an abstract of the amounts allotted and spent, and of the works executed on these irrigating lines:—

NAME OF WORK.	ALLOTMENT.	EXPENDITURE.	WORK EXECUTED.				DESCRIPTION OF WORKS BUILT.
			Masonry.	Plaster.	Earth-work.	Silt clearance.	
	Rs.	Rs.	C. F.	C. F.	C. F.	C. F.	
Gangsee left rajbaha ...	6,000	12,803	35,835	24,920	12,74,833	31,48,520	3 bridges and 4 syphons.
Bansuck left rajbaha ...	17,000	16,923	64,859	55,717	9,19,513	9,98,376	2 bridges and 6 syphons & 2 chowkees, 1st class.
Phupoond minor rajbaha	3,000	3,000	6,043	2,121	11,38,206	...	1 bridge and 4 syphons.
Boradana minor rajbaha	3,000	3,300	5,190	856	13,74,002	...	1 bridge and 1 syphon.
Total ...	29,000	36,026	1,11,927	83,614	47,06,644	41,46,896	

The works on the Gangsee and Bansuck left rajbahas have, with the exception of chowkees, been brought to completion. On each of these lines three second class chowkees have yet to be built, and an additional first-class chowkee, which was well advanced on the Bansuck rajbaha, remains to be completed. The earth-work on the two minor lines of irrigation has also been completed, but the head and regulator and two village bridges require to be constructed on the Phupoond rajbaha, and an aqueduct, one head and 7 syphons on the Boradana.

AGRICULTURAL.

A sum of Rs. 25,000 was set apart for remodelling the main right rajbuha in the Etawah division, but Rs. 1,000 only have been spent. 230 miles of levelling for new projects, including the rectification of the main right rajbuha, were carried out, and 50 miles of old channels were re-levelled. A survey was also made of the "oosur" lands lying between the main canal and the Seyngoor Nuddee for a distance of 37 miles, over a tract of country about 100 square miles in extent. The map compiled from this survey will be of great service in laying out future irrigation lines in this neighbourhood.

There were only two miles of new rajbuhas over which water passed this year, but about 10 miles of new Government gools were opened for irrigation.

The road along the canal bank was re-sloped and dressed for a distance of 104 miles, viz., from the commencement of the division to the 154th mile. This was done under "Repairs." The works of the division were maintained in order, and silt clearances effected, the amount spent was Rs. 28,004 against an assignment of Rs. 25,500.

FUTTEHGURH BRANCH.

The bunds which had been left across this branch for cross communication in the latter 20 miles of its course have been removed, and the excavation of the channel is now complete up to the 83rd mile; 470,750 cubic feet earth have been excavated, and 1,90,300 cubic feet used in dressing bank and roadway approaches; cost Rs. 1,346. The boundary ditch has also been completed: 619,760 cubic feet excavation have been carried out at an expense of Rs. 841.

The Narsina, Chirora and Dharaura bridges have been completed; the foundations of the Bagsur bridge laid; and the superstructures of those at Bharkar and Amchora carried up to the springing line of arches. Work on the latter two has been temporarily suspended, as arrangements for navigation will probably be made both on the Futtehghurh and Boolundshur branches; and it is better to delay progress for a time, than to complete works which would have to be altered in order that navigation might take place.

There are five sets of falls still to be built in this division; they have not been commenced owing to difference of opinion concerning the design. The works, however, are not emergent, as water is not admitted into that portion of the channel in which they are situated; nor is it required, as the supply which passes into the portion of the channel already excavated is fully utilized, and the rajbuha system due to it has been completed.

The head of the Shahjehanpoor escape at the 40th mile has been completed, and the drum valves fixed; the total expenditure being Rs. 2,041.

At the Jutwarra bridge, a temporary regulator has been constructed by building up piers on the bridge flooring, so as to obtain a scour through the heads of the Jansut and right main rajbuhas, and immediately above, which rapidly became clogged with silt. Formerly, one of the arches of the bridge had been entirely closed, and across the other two, bars of masonry, 4 feet high, had been constructed, on which piers were built, leaving four openings of 8 feet each for the regulation of the supply by means of sleepers. The result of this permanent obstruction was the rapid accumulation of silt, which has been remedied by lowering the openings to the level of the canal bed.

AGRICULTURAL.

The Kethor rajbuha has been completed to its 24th mile, 4 miles of channel having been excavated this year; 20 bridges, 1 fall and a chowkee (commenced last year) have been built on this rajbuha, as also 5 bridges on other irrigating lines. In the compound of the Salarpoor chowkee, on the Jansut rajbuha, a masonry well, 37 feet in depth, was sunk, at an estimated cost of Rs. 357, to supply the want of drinking water which was much felt. The banks of the Parichutgurh and Wair rajbuhas have been strengthened and raised in places, and the outer slopes increased. Of gools, or minor rajbuhas, 39 $\frac{3}{4}$ miles have been lined out and completed (raising the total to 159 miles) and 40 bridges and syphons built thereon.

Under the head of "Special Repairs," an extensive clearance of silt from the upper portion of the branch was effected at an estimated cost of Rs. 11,182. These periodical clearances are necessitated by the supply in the branch being below that allotted to it, on account of its incomplete condition, and the water, to obtain a command of level, has to be held up at the different bridges. The result is a great check to the velocity of the current, and a consequent deposit of silt.

Under "Current Repairs," the canal banks (especially in the upper 30 miles, where the soil is light and sandy,) and the masonry works have been kept in order. Much, however, remains to be done to the lower section of the branch before it can be considered efficient; but as water has not been admitted into it, the disrepair into which the bed and banks have fallen is not of immediate consequence. On rajbuhas, silt clearances have formed the principal items of expense, particularly on the left main and Parichutgurh rajbuha, where the work has been most extensive, averaging about one-half of the entire quantity executed under this head during the year.

On the main branch, three permanent bridges have been erected. The supply in the branch was maintained by temporary cuts round the works while they were in progress. The fourth and last bridge in this part of the canal yet remains to be built. On the right sub-branch, four bridges have been constructed, and these complete the line as far as the first set of falls. No locks are attached to the falls; and as the channel below them is only 16 feet in width, no provision for navigation has been made beyond this point. On the Kotescape, the excavation and the masonry works, except the terminal falls, have been completed. The expenditure on all these works amounts to Rs. 34,358.

As this branch was brought into work before its completion, and before the full supply provided for it could be utilized, a small bank was thrown up along the main channel, in order that the waterway might be reduced to a section corresponding with the discharge required for the works that were completed. It was supposed that, by thus confining the limited supply of water, instead of allowing it to meander in a wide bed, where it would lose its velocity, the deposit of silt and growth of weeds, which have proved so troublesome on the Futtehghurh branch, might be checked; but the bank did not answer its purpose and was removed. On the right sub-branch, the left bank, as far as the 17th mile, has been cut down to the level of the berm or tow-path, as both were inconveniently narrow; the road-way has thereby been considerably improved. In small channels like the present, it is difficult to find sufficient earth for banks without outside excavations, which are to be avoided as much as possible. The outlay on the foregoing was charged to "Repairs"

BOOLUNDSHUR
BRANCH.

CIVIL WORKS.

AGRICULTURAL.

The appended abstracts show the allotments for the Ganges Canal under "*Works*" and "*Repairs*," the expenditure incurred, and the most important items of works executed during the year 1864-65.

GANGES CANAL.		ALLOTMENTS.	EXPENDITURE.	QUANTITIES OF WORK DONE (MAIN ITEMS.)					DESCRIPTION OF MASONRY WORKS BUILT, &c.
		Rs.	Rs.	C. F.	C. F.	Masonry.	Plaster.	Metal-ling.	
Northern Division	{ Canal works	...	...	...	...	...	...	...	Altering Nidhowlee and Wulleepoor chowkees. 20 chowkees, 2 aqueducts, 3 heads, 44 bridges, and 5 syphons. 8 new gates, Nancon Regulator; and four bridges on Allygurh drain-are line. 6 chowkees, 3 aqueducts, 8 heads, 27 bridges, 5 syphons, and four junction works. Wharf wall at Dunnabar Bridge completed. 4 aqueducts, 1 head, 39 bridges, 9 syphons, two falls, and one junction work.
	{ Rajbuhas	*15,000	...	...	...	...	...	...	
Meerut Division	{ Canal works	1,400	900	...	...	...	...	...	
	{ Rajbuhas	89,234	36,812	4,629,641	109,492	...	...	2,100	
Allygurh Division	{ Canal works	10,771	9,756	1,729,316	10,511	...	...	...	2 chowkees, 7 bridges, and 15 syphons. 3 bridges completed and three in progress. Shahjehanpore escape head completed. 1 chowkee, 25 bridges, and one fall, with 40 masonry works on gools; 1 well sunk. 3 bridges on main branch, and 4 on right sub-branch. Masonry works, Kot escape. 4 heads, 34 bridges, (3 with falls), one syphon, and two tail falls.
	{ Rajbuhas	*73,886	53,049	13,198,594	168,112	...	...	73,144	
Cawnpore Division	{ Canal works	4,701	4,295	894,125	20,445	4,262	...	...	
	{ Rajbuhas	43,431	40,820	11,585,455	156,693	57,393	...	4,368	
Etawah Division	{ Canal works	...	...	...	...	...	...	...	2 chowkees, 7 bridges, and 15 syphons. 3 bridges completed and three in progress. Shahjehanpore escape head completed. 1 chowkee, 25 bridges, and one fall, with 40 masonry works on gools; 1 well sunk. 3 bridges on main branch, and 4 on right sub-branch. Masonry works, Kot escape. 4 heads, 34 bridges, (3 with falls), one syphon, and two tail falls.
	{ Rajbuhas	*54,000	37,026	8,853,540	111,927	83,614	...	5,416	
Fatehgarh Branch	{ Canal works	20,000	12,410	1,343,610	45,178	...	...	960	
	{ Rajbuhas	*30,000	29,211	7,814,927	67,722	24,980	...	27,760	
Boolundshuhar Branch	{ Canal works	*48,058	34,358	2,269,286	190,263	68,718	...	3,290	2 chowkees, 7 bridges, and 15 syphons. 3 bridges completed and three in progress. Shahjehanpore escape head completed. 1 chowkee, 25 bridges, and one fall, with 40 masonry works on gools; 1 well sunk. 3 bridges on main branch, and 4 on right sub-branch. Masonry works, Kot escape. 4 heads, 34 bridges, (3 with falls), one syphon, and two tail falls.
	{ Rajbuhas	21,380	20,624	6,144,232	76,315	33,598	...	...	
Total	{ Canal works	...	...	...	...	...	...	...	
	{ Rajbuhas	...	...	...	...	...	...	...	
	Grand Total	...	...	...	...	...	...	...	...

* Portions of these allotments subsequently relinquished.

* Portions of these allotments subsequently relinquished.

AGRICULTURAL.

GANGES CANALS.		ALLOTMENTS.		EXPENDITURE.	QUANTITIES OF WORK DONE (MAIN ITEMS).						
		Rs.	Rs.		Earth-work.	Silt clearance.	Masonry.	Plaster.	Metalling.	Staking.	Filling in heavy material.
					C. F.	C. F.	C. F.	S. F.	S. F.	R. F.	C. F.
Northern Division	{ Current Special	87,000 50,000									
		...	...								
Meerut Division	{ Current Special	38,000 2,000	41,029 19,644		80,43,694 3,78,300	45,54,622	7,055	1,725	...	15,241	1,49,162
		...	...								
Allagurh Division	{ Current Special	25,000 2,000	30,953 8,786		50,93,529 8,23,711	94,85,057	140	...	15,935	...	4,482
		...	...								
Cawnpore Division	{ Current Special	28,500 2,000	26,606 2,416		31,67,203 36,000	75,91,538	8,074	9,999	4,260	26,438	3,410
		...	...								
Etawah Division	{ Current Special	24,500 1,000	27,004 1,000		75,33,240 6,67,405	86,27,407	1,191	2,358	...	1,457	...
		...	...								
Fatehpur Branch	{ Current Special	21,900 2,000	20,248 14,314		35,61,957 1,03,000	12,57,376 56,14,322	2,125 1,925	385	5,500	...	...
		...	...								
Boolundshahr Branch	{ Current Special	5,000 1,000	10,906 8,236		23,68,012 55,62,067	38,33,254	...	...	...	...	5,800
		...	...								...
Total	{ Current Special	2,29,900 60,000									...
		...	...								...
Grand Total		2,89,900									...

GANGE'S CANAL.—REPAIRS.

Abstract of allotments, expenditure, and description of work executed during the year 1884-85.

AGRICULTURAL.

PLANTATION.

The expenditure for the year amounted to Rs. 18,024 against an allotment of Rs. 19,175. The following statement shows, under four heads, the number of trees growing within canal bounds in the various divisions of the Ganges Canals, as also the number on the banks of rajbuhas:—

GANGES CANAL DIVISIONS.	NUMBER OF TREES GROWING WITHIN CANAL BOUNDS.				NUMBER OF TREES ON RAJBURHA BANKS.	TOTAL NUMBER OF TREES.
	Canal bank (right).	Canal bank (left).	Separate plantations.	Nurseries (Seedlings).		
Northern	13,550	47,735	22,594	47,845		
Meerut	1,62,553	2,05,685	32,506	1,06,433		
Allypurb	94,391	80,117	13,005	17,546		
Cawnpoor	69,557	88,360	6,120	23,637		
Etawah	33,831	27,935	2,895	4,337		
Futtehghurh	16,760	36,676	2,759	70,295		
Boolundshuhur	38,296	1,22,241	761	1,876		
Total	4,28,938	6,08,749	80,640	2,71,519		

NAVIGATION.

The boating and rafting operations were both very slack during the *khureef fussil*, or for the first six months of the official year, owing to the protracted closure of the canal for repairs. This led to a diminution of revenue, which altogether amounted to Rs. 9,921 against Rs. 12,143 of the previous year's *khureef*. During the second *fussil*, however, the canal was steadily running, and under each of the recognized heads of account, the returns were larger than in the corresponding *rubbee* for 1863-64, the aggregate being Rs. 31,326 against Rs. 16,535. The results for the year are given in the following Table, which shows a net increase over last year's income of Rs. 12,569:—

YEARS.	RATE ON GOVERNMENT BOATS.	RATE ON PRIVATE BOATS.	TRANSIT DUTY ON RAFTING.	PROFIT ON RAFTING OPERATION.	TOTAL.
1863-64	Rs. 3,583	Rs. 10,530	Rs. 11,877	Rs. 2,688	Rs. 28,678
1864-65	2,024	10,145	20,361	6,717	41,247
Increase, 1864-65	...	...	8,484	6,029	14,513
Decrease, 1864-65	1,559	385	...	...	1,944
Net increase					12,569

EASTERN JUMNA CANAL.

A total expenditure of Rs. 86,058 was incurred on the Eastern Jumna Canal during the year. The works comprised an iron syphon tube 105 feet in length, and 3 feet internal diameter, laid under the bed of the Dumala, in order to pass the supply of the Ghoona rajbuha; a tube 3 feet in diameter, fixed across a ravine near Kulseea, for passage of supply in the Nugla rajbuha, and a number of minor works of improvement and repair.

DOON CANALS.

A reservoir tank in a ravine near the village of Dokra, as an additional supply to the Beejapoor Canal, has been nearly completed at a cost of Rs. 8,036. No other works of importance were executed.

ROHILKUND CANALS.

126. The original works consisted of the excavation of the Kylas Canal, which was stopped, pending drainage operations proposed; and two bridges and a culvert on

the Bygool Canal, which have been finished. The amount allotted for the Kylas Canal was Rs. 20,000; but owing to the stoppage of the work, Rs. 5,595 only have been spent on 2,237,973 cubic feet of excavation. The bridges and culverts on the Bygool Canal, containing altogether 7,640 cubic feet of brick-work, cost Rs. 1,032.

PUNJAB.

The principal work done on this canal during the year was the construction of rajbuhas or main distributing channels.

These were approaching completion on the open portions of the canal.

The tail of the Sirkeeian rajbuha was completed, and an additional head half finished.

The remodelling of the Husler Channel to adapt it for navigation, progressed rapidly.

The excavation of the Majheeta rajbuha, 25 miles in length, has been completed. Of the masonry works, 27 out of an aggregate of 31 are finished.

The Shalimar rajbuha has been bridged throughout.

The Chevinda feeder was projected and completed in six months, and the Kohallie lock was finished with the exception of the wood-work.

The Raiwind rajbuha, 20.05 miles in length, was completed and opened out during the year. The Basurky rajbuha was progressing rapidly, about three-fourths being finished, and it was intended to open a portion of it as far as the Vaigul escape for the next *rubbee*. The excavation of the channel of the Nag rajbuha was approaching completion.

About 2 miles of the Upper Sohag, which were remaining from last year, have been completed, and of the continuation to the Para Nullah, the whole of the main channel, 28.14 miles in length, has been finished and embankments made, of which 12 miles have been excavated during the current year. The Bupperwal rajbuha, 7 miles in length, has also been completed. A channel, 800 feet in length, was made near Kullair to cut off one of the most tortuous loops of the Sohag.

The work on this canal consisted chiefly in connecting portions of the canal completed in previous years; about 10 miles of canal were cleared and finished.

The Khanwah Canal and its rajbuhas were thoroughly cleared of silt. The banks of a portion of the main channel, and of the north rajbuha, were raised and strengthened.

Eleven masonry outlets were built during the year, completing the number of the third set sanctioned.

The first 7 miles of the Sohag Canal were cleared from silt, and the revetment at mouth renewed.

A bridge over the Bhawulwah Canal, on the Mooltan and Bhawulpoor Road, and one over the Wulli Mahomed Canal, were commenced during the year. The expenditure will be defrayed from local funds.

The usual silt clearance of all the canals was completed by the time the rivers had risen sufficiently high to supply them.

Owing to the encroachments of the river last year, a considerable portion of the head of this canal was cut away, and the channel so silted up, that, in August last, the Lugari Chief excavated a temporary mouth; but this failing to give

AGRICULTURAL.

SUTLEJ AND CHENAB INUNDATION CANALS. UPPER SOHAG.

KUTORA CANAL.

KHANWAH CANAL.

LOWER SUTLEJ AND CHENAB CANALS.

INDUS CANALS. MANKA.

AGRICULTURAL.

SHORIA.

the required supply, a second new head was excavated at a cost of Rs. 4,008. The length of channel is 3,883 feet, width 35 feet, and average depth 9.39 feet.

A portion of the head of this canal, also, was cut away, and the channel so much silted up, that it failed just when water was most wanted. A new head has been excavated, length 7,040 feet, width 25 feet, and an average depth of 7.25 feet, at a cost of Rs. 3,968.

ANNUAL SILT CLEARANCES.

The annual silt clearance of the Indus Canals, in the Dera Gaze Khan District, was effected almost entirely by free labour, at a cost of Rs. 77,197. The Dhoondie Canal, and the tail of the Manka Canal, were cleared out on the old system, half the cost being defrayed by Government, and the other moiety by the Zemindars.

WESTERN JUMNA CANAL. NEW CHANNEL.

The new channel between Indree and Boodha Khara has been completed. No. 1 Rapid was complete, with the exception of some piling at the tail. The lower portion of the floor was laid with great difficulty, owing to the constant ingress of water. Of No. 2 Rapid, the whole of the block foundations were sunk to the full depth; the pier and abutments of the bridge built up, as well as a portion of the revetment on each side. Bunds have been made round the site of No. 3 Rapid, and a drainage channel excavated; but, owing to the great quantity of water, nothing further has been done. Two small drain-bridges have been built; bricks have been collected at the sites of some of the inlets, and a few neemchucks made.

HEAD-WORKS.

The crib revetment at the Tajawalla head was commenced in May, and finished in July 1864; it was completely successful in preventing any further erosion of the bank of the escape.

DELHI CANAL. DRAINAGE—CHOTA THANNA JHEEL.

A large area of land between a "cut-off" lately made, and an old loop of the canal here, has long been known as one of the worst swamps on the Delhi Canal.

With the view of silting it up, the whole stream of the canal was this year turned into it, and rows of stakes driven across at intervals to serve as silt traps.

The result so far has been most satisfactory.

About one-third of the whole swamp has been silted up. A small portion was brought under cultivation during the last rubbee, which it was expected would be considerably increased in the ensuing khurreef.

KOWALLIE DRAIN.

Has been thoroughly cleared out, and the jheels, which last year were covered with two and three feet of water, owing to obstructions in the drain channel, have been completely dry and have borne luxuriant wheat crops.

BOWANAH ESCAPE.

The new cut from the Grand Trunk Road to the Jumna has greatly relieved the drainage of the khadir lands. The foundations of the Booraie Bridge have been commenced, but the interruptions from passage of escape water have been so constant that little progress has been made.

JOOAH JHEEL.

Advantage was taken of the canal being closed in May to cut off a loop opposite the Jooah Chowkee, with the view of diminishing the percolation into the large jheel. This has proved very successful.

TANKS.

DELHI AND GOORGAON IRRIGATION WORKS. NUZUFCHUR JHEEL ESCAPE DRAIN.

Of the escape, 15 miles from the tail upwards have been cleared out, and of the embanked portion beyond the village of Bussye nearly 12 miles have been re-made.

Most of the bunds have been repaired and cleared of jungle during the year.

BUNDS.

About 7 miles in length of the Kotillah jheel catch-water embankment have been repaired, and the escape drain partially cleared of silt.

AGRICULTURAL.

About 6 miles of the drainage cut from the Chundanee Jheel have been cleared, and the banks repaired.

DRAINAGE.

The drainage works for the Kanawan jheel were carried on at intervals during the year, but their progress was very much retarded by the heavy rains of February.

KANAWAN CHUMB.

The occurrence of a heavy flood on the night of the 3rd August 1864, which, breaching the banks of the Dourana Lungana Canal, inundated the Civil lines and neighbourhood of the Fort of Mooltan, and seriously threatened the Cantonment, has rendered necessary the construction of an embankment of sufficient strength to resist future inundations. But as this embankment could not have been completed in time for the next rains, it was proposed to widen the channel of the Dourana Lungana Canal sufficiently to allow of its acting as an escape, at the same time strengthening its right bank to serve as an embankment.

DYKES. MOOLTAN BUNDS.

This proposal was sanctioned, and the work was completed, with the exception of a small portion of the clearance at the head where it is in high ground.

The Shah Jumal Bund, reported completed the previous year, was breached for a considerable length by the floods of the succeeding rainy season, owing to irregular settlement.

BUND AT SHAH JUMAL.

It has been raised and strengthened; work was commenced in April and about two-thirds completed by the close of the month. It was expected to be finished before the rains.

The inundations of last rains nearly breached this bund again. A supplementary bund was added 14,644 feet in length, of an average height of 7 feet, with a top width of 6 feet.

BRITISH BURMAH.

An embankment and three sluice bridges have been constructed at Akyab.

AGRICULTURAL.

AKYAB

MYANOUNG DISTRICT.

The embankments in the Myanounng district, Projects Nos. 2, 4 and 5, which were nearly completed the previous year, have been finished off, and two sluices constructed. Two wooden shoots and two pucca sluices were in progress. Nearly Rs. 12,000 have been expended in keeping the various embankments in proper repair, and about Rs. 5,500 in planting trees and providing piling, wattle and fascine protection for the flank embankment where required.

In the Amherst district at Oongolong, an extensive old bund has been repaired and renewed, and a pucca sluice for irrigation put in hand.

AMHERST DISTRICT.

STRAITS SETTLEMENTS.

The drainage of the Northern Province has been extended, and the Tumboos drainage works now drain a considerable area of country.

AGRICULTURAL.

PENANG.

Although no heavy expenditure has occurred, a great deal was done in a small way near the Sea-coast, and several small canals cut and old streams re-opened.

MALACCA.

HYDERABAD.

This work has been completed with an expenditure, during the year, of Rs. 2,300, but will be of no use until the distributive channels are made for supplying water to the fields. This matter was said to rest with the villagers and Civil Authorities; meanwhile the water was running to waste.

AGRICULTURAL.

WAGOLEE ANICUT.

MYSORE.

Two anicuts have been completed across the Shimsha River, and the Mulloorpudna tank supply channel has been improved at an aggregate outlay of Rs. 11,488. Two anicuts, two channels, and one aqueduct were undertaken. Total expenditure Rs. 6,266.

The Muddoor anicut has been safely completed. Expenditure during the year Rs. 11,374.

Two anicuts were under construction, the outlay amounting to Rs. 4,548, and the sluices of the Great Soolikerry Tank were partly restored.

COMMUNICATIONS.

MADRAS.

The earth-work of 21 miles of the road from Mojaḡḡda to Sunkerakole, with masonry work to the top of Kalingia Ghāt, was completed. Gravel has been spread for six miles, and the side slopes turfed for a distance of nine miles.

Rupees 22,500 have been expended on the Aska and Ganjam Road. The earth-work of the entire length (30 miles), and the bridges on five miles, have been completed.

Rupees 3,299 from Income Tax Funds were spent on the Aska and Russelcondah Road during the year on the construction of six timber platform bridges, three tunnels, three road dams, and the completion of $7\frac{1}{2}$ miles of earth-work, and three other timber bridges not finished.

On the road from Bullipudra to Kurcholy, the earth-work of eight miles and three tunnels have been completed.

The work on the Vizagapatam and Kassipoor Road comprised twenty-nine tunnels, eighteen sluices, and three road dams built; six bridges, two tunnels, and two road dams under construction, and a large quantity of earth-work, metalling and gravelling at various places between the 3rd and 21st miles, completed. The expenditure amounted to Rs. 23,897.

Twelve miles of earth-work, nine miles of metalling with gravel, and thirty-five bridges have been completed on the road from Vizianagram to Chepurpilly, at an expenditure of Rs. 18,714.

On the road from Vizianagram to Jeypoor, Rs. 13,246, from the amount (Rs. 50,000) contributed by the Rajah of Vizianagram, have been expended.

The two abutments of an iron girder bridge at Coconada have been built.

Ten miles of Trunk Road No. 6, from Seetanagarum to Guntoor, have been completed and opened for traffic.

The foundations of a bridge across the Commamoor Channel have been laid, and the piers and abutments were in progress.

The Sultanagram Bridge on the Masulipatam and Hyderabad Road, which was destroyed by the late cyclone, has been re-built to within 18 inches of the springing of the arches.

Rupees 31,000 have been spent on Trunk Road No. 6 in completing about $1\frac{1}{2}$ miles of embankment across the Moosanoor Valley, and in generally improving the road.

Fourteen and a half miles of the Nellore and Dorenal Road have been completed; twenty-two miles of side drains have been excavated, and two tunnels built.

COMMUNICATIONS.

CUDDAPAH.

In May 1864, Rs. 15,000 were allotted for expenditure on roads in the Kadiri Taluq, in order to afford relief to its inhabitants who continued to suffer great distress consequent on the total failure of the monsoon of 1863. This amount was judiciously laid out in the formation of eighty miles of road, the whole of which is now practicable for carts.

On Trunk Road No. 11, the Soodamalla and Ethalcherroo bridges (4 arches, 36 feet span), another bridge of 12 feet span and six tunnels, have been completed during the year.

One Railway feeder from the Madras and Cuddapah Road to the Cuddoor Railway Station, has been completed, and two others, one from Rajampett to the Rajampett Railway Station, and another from the Madras Road at Nundalore to the Nundalore Railway Station, were in progress.

On the road from Cuddapah to the Nellore frontier, the work executed during the year was as follows:—

2 bridges completed.
3,255 cubic yards earth-work sectioned
4,768 running yards metalled.
6,995 do. gravel spread.
5,281 cubic yards do. dug.
460 parabs of metal collected.

The total expenditure up to 30th April 1865 has been Rs. 26,850.

On the road from Cuddapah to Nundial, work has been retarded by the great demand for the works of the Madras Irrigation and Canal Company; Rs. 18,845 have, however, been spent during the year.

Rupees 33,770 have been expended on the road from Cuddapah to Bellary. A number of tunnels have been built, and work has made considerable progress.

The Nundy Kanawa Ghāt was nearly completed, and on the road from Kurnool to Bellary five bridges have been finished.

The Elephant Gate Bridge has been widened at a cost of Rs. 7,280, provided from the Income Tax Funds. The work has proved a great boon to the public.

The road from Mylapoor to Conatoor has been nearly completed. Expenditure during the year, Rs. 12,465.

A useful Railway feeder from Satgur to the Mailputty Railway Station has been completed and opened for traffic, and another from Arcot to Arnee has progressed satisfactorily.

Of the bridge over the Guddilum River at Cuddalore, six arches out of ten carried away by floods, have been re-built.

Two bridges, each of three arches of 30 feet span, have been built, one on the Salem and Cuddalore Road, and the other on Trunk Road No. 5, near Darampury and a bridge of nine arches of 30 feet span near Attur on the first mentioned road was near completion.

Two Railway feeders, one from Negapatam to Nagore, and the other from Keevalore to the station of that name, have been nearly completed.

The excavations throughout the entire lengths of the canal from the Vedarniem Salt Pans to the Adapaur River and of the junction canal from Negapatam to Teroopoondy have been completed, and good progress has been made in the construction of the masonry works of the latter.

CUDDAPAH AND
KURNOOL.CUDDAPAH AND
BELLARY.

KURNOOL.

PRESIDENCY.

MADRAS DISTRICT.

NORTH ARCOT.

SOUTH ARCOT.

SALEM.

TANJORE.

COMMUNICATIONS.

COIMBATORE.

Rupees 40,781 have been expended on the new Coonoor Ghât during the year. The total length of the Ghât is 16½ miles, and the state of the work was as follows:—

6 miles opened to a width of	18 feet.
5 ditto ditto	12 "
4½ ditto as a bridle path.	
1 mile untouched.	

MALABAR.

The new Tambracherry Ghât has progressed favourably. The abutments of the Stony River Bridge, and one of the abutments of the Parjery Bridge, have been completed, and of the actual ascent, 4 miles is now used by carts. Rupees 34,553 have been expended.

The masonry of the Kulpatty Bridge has been completed, ready for the girders. The expenditure has been Rs. 24,735.

SOUTH CANARA.

Rupees 26,016 have been expended during the year in bridging the road below the Charmady Ghât; each of the 4 bridges in progress had the piers and abutments completed, and considerable progress made in the upper works.

Progress has been made on five bridges below the Munzerabad Ghât, at an expenditure of Rs. 9,419.

MADURA.

Three platform bridges on the road from Teroomungalum to the Coimbatore boundary have been completed, several others were in progress, and the worst portions of the road have been placed in good repair.

The foundations of the abutments and piers of the Shunmooganuddee Bridge have been laid, and materials collected for the superstructure, at an expense, during the year, of Rs. 11,336.

TINNEVELLY.

Eleven miles of the road from Palamcottah to Tuticorin have been completed during the year. Expenditure Rs. 21,594. The restoration of the Sattur Bridge has been successfully completed, so that the impediment to traffic hitherto caused by the River Sattur no longer exists.

BOMBAY.

COMMUNICATIONS.

AHMEDNUGGER.

The construction of the Seroor and Pargaum Road was still incomplete, owing to a misunderstanding with the Contractor. Rupees 37,008 from Local Funds has been expended on the road, which measures 16 miles, 7 furlongs and 166 yards.

NASSICK.

The road over Sindeh Pulset Ghât, between Sinnur and Nassick, has been completed with bridges, drains, and metal.

During the year, 5½ miles of the road from Yeola to Munmar Railway Station, with four bridges, and some culverts and drains, have been completed at an expenditure of Rs. 15,767.

The Mandoor and Kolhar Road, 30 miles in length, has been nearly completed.

SHOLAPOOR.

The tramway from Barsee to Barsee Road Station, 21 miles long, has been completed as much as is advisable, until a definite arrangement has been arrived at, whether it is to be used as a tramway or ordinary road. Rupees 30,887 have been expended on it during the year.

POONA DISTRICT.

The road from Mera Bridge, *via* Soopa and Kheergaum to Seeroor, in length about 56 miles, has been finished.

The road from Poona *via* Katruz Ghât to Sherwul on Poona to Madras line of road has, progressed rapidly, and has been opened for light traffic. Its length is about 26½ miles, and 6 miles have been entirely finished. The Ghât portion, 3½ miles, including a tunnel, 880 feet in length, has been completed

with the exception of the parapets, and a small portion of cut-ting near the tunnel entrance which were also to be built. The remainder of the road was finished, excepting one bridge and parapet wall to some of the others. Expenditure during the year Rs. 1,55,000.

The bridge over the Neera River at Sherwul, on the road from Sherwul to Sattara on Poona to Madras line of road, has been finished at an expenditure during the year of Rs. 16,415, and other works have been executed, the expenditure amounting to Rs. 1,36,727. The road is now complete from Sherwul to Sattara.

On the road from Sattara to Warna River, Madras line, three large bridges and a number of small bridges and drains have been completed. Rupees 69,243 have been spent on the road during the year.

The masonry of two abutments, one abutment pier and two piers of the bridge over the Quoina river on the Sattara-Belgaum Road, has been raised nearly to springing line, but the foundations of the other piers will be delayed from the underlying rock being 30 feet below summer water-level of the river.

The bridge over the Ghutpurba river at Sootgutee, has been completed and opened for traffic.

A bridge over the Hurrunkashee river has been arched over.

The Yedgunga Bridge has been opened for traffic, and the bridge over the Doodgunga river will soon be open for traffic, the arches having been turned.

The Yarrus and Bunkapoor Road has been widened and improved, and in some places nearly re-made.

Satisfactory progress has been made on the Bunkapoor and Hurryhur Road with the aid of a European Contractor. The whole of the earth-work of all the line was complete, also the masonry of all the large bridges, except that over the Wurda, and the smaller drains over about 20 miles of roads which were in progress. The expenditure has been Rs. 1,34,038. The Hooblee and Annigherry Road still remained incomplete from want of funds, but Rs. 28,300 were spent on it during the year.

On the Annigherry and Guddug Road the Soal Nullah Bridge has been completed to the road level, the piers and abutments of three other bridges brought up to springing level, and some minor works finished.

On the Koombaree Ghât Road the work consisted in metalling the Ghât 9 miles in length, and finishing parapet and retaining walls.

The road from Koombaree Ghât to Chiploon has progressed satisfactorily. Six bridges have been completed to level of roadway, and only drains and culverts remain to be built, and 21 lakhs of cubic feet of filling have been executed at the Gowalcote Wharf, and the wharf-wall brought to full height, except in a few places where the foundations were insecure, the expenditure during the year has been Rs. 43,261.

Only a few gaps remain unbridged on the road from Mhar to the foot of the Wurranda Ghât.

Rupees 80,730 were laid out on the road from Belgaum to the west coast of Vingorla, in completing bridges and drains already commenced with a view to opening the line as soon as possible.

COMMUNICATIONS.

CANARA.

The approach to Carwar *via* the Arbye Ghât has progressed satisfactorily. The Carwar and Aorsa Ghâts have been taken out to full width, and a number of unbridged streams have been rendered passable, the expenditure amounting to Rs. 1,25,000.

POONA DISTRICT.

SHOLAPOOR.

One bridge was completed, and three others in progress.

Difficulties being experienced in sinking the foundations of the Seena Bridge on Barsee tram-road, the work has not progressed as satisfactorily as might have been desired. Rupees 68,990 were, however, spent during the year.

Four bridges on the Dharwar and Goa Road were approaching completion.

BOMBAY.

Rupees 4,24,891 have been expended in completing, as far as practicable at present, the roads on the esplanade and along the western front of the town.

NORTHERN CONCAN.

The embankments, cuttings and bridges of the road from Dhurumther to Kurjut have been nearly completed.

KHANDEISH.

Twenty-three miles of the road from Dhoolia to Challisgaum have been completed with banking, on which, with masonry work and ballasting, Rs. 1,19,289 have been spent during the year.

The road over the Kondaibaree Ghât has been nearly completed.

AHMEDABAD.

On the Ahmedabad and Gogo Road the expenditure was Rs. 3,03,899. Of three iron-girder bridges, with piers of screw-piles, one was completed, and the other two were nearly finished. Ten masonry bridges were constructed, and a large quantity of earth-work and metalling was completed.

KHANDEISH.

The road from Munmar to Malligaum has been completed.

NORTHERN CONCAN.

The entire road from Wassind to Kalhair, 22 miles, is now completely metalled with an expenditure during the year of Rs. 45,453.

The road from Parsick to Panwell is now open for 7 miles.

The earth-work on the road from Alibaugh to Poinar has been nearly finished. On the plain only 2 miles of embankment, and on the Ghât Road over the Karlee Khind, only two heavy rock cuttings remain to complete. The masonry work was progressing. Expenditure Rs. 42,310.

Rupees 45,359 have been spent on the Oorun and Panwell Road, chiefly on the bridge near Dapoolie, and on the road between Belpada and Oorun, the latter being nearly finished.

The embankment of the Nagotun and Dhurumtur Road was complete, with the exception of a few small gaps. Rupees 47,394 were spent on this work during the year.

The road from Alibaugh to Mandwa and Rewas progressed favourably, 5 miles of embankments being completed.

SURAT AND BROACH.

The whole of the earth-work of the Oolpur and Rândeir Road has been completed, and culverts and drains were in progress, and the road from Oolpar to Saylu was in a similar condition.

On the road from Unklesur to Hansote, the earth-work of that portion from Unklesur Railway Station to Sujode has been completed, and the remainder nearly so, while masonry works were in progress.

The whole of the earth-work on the Jumboosur and Amode Roads has been nearly completed, and most of the masonry works were constructed.

Rupees 97,494 have been spent on the Surkej and Veerun-
gaum Road in completing the earth-work, and in constructing some of the masonry works. COMMUNICATIONS.
AHMEDABAD.

The road from Neriad to Kupperwunj has progressed satisfactorily, nearly all the earthwork and masonry being complete. KAIRA.

The large bridge over the Ungharee nullah, on the Annund and Oomerith Road, was in progress.

On the road from Dohud to Godra, the earth-work was nearly finished; from Kakria to Godra, several culverts have been constructed, and two large masonry bridges were in progress, the expenditure during the year being Rs. 45,663.

An iron-girder bridge of nine 30 feet spans, with planked road-way, over the Chota Bhogawa near Pheydra, has been nearly completed.

The sum of Rs. 37,653 has been expended in bridging the roads from Hyderabad to Roree, and Hyderabad to Oomercote. SINDH.

Rupees 22,342 have been spent at Sukkur in excavating rocks. No advantage had as yet been derived from the work, as it was necessary to keep up an embankment that work might proceed during the inundation. RIVER IMPROVEMENTS.

BENGAL.

The Ganges and Darjeeling Road (136 miles) is now open throughout, with only one unbridged river, the Mahanuddy, and the first 30 miles has been metalled. COMMUNICATIONS.
GANGES AND DARJEELING.

Nineteen and a half miles of the Darjeeling Hill cart-road have been opened, and the old road from Silligoree to Kursiong has been repaired. DARJEELING HILL
CART ROAD.

The Pheelkhana and Ameerpeerah Road, and its continuation, the Jeeagunge and Bhugwangolah Road, have been completed. PHEELKHANA AND
AMEERPEERAH.

The bridge over the Pooranee Nullah, on the Bhaugulpoor and Sooree Road, has been increased by five more openings of 20 feet span each, to afford a passage for the spill-flood of the Chundun River which was changing its course. The metalling and earth-work were progressing. BHAUGULPOOR AND
SOOREE.

A considerable quantity of metalling and earth-work has been completed on the Patna Branch Road; 40 old bridges have been widened and improved; and the foundations of a bridge of 3 arches over the Jumna nearly all secured. PATNA BRANCH.

Metal was laid on 30 miles of the Churparun and Chuttra Road, and a bridge of 3 spans built over the Heeroo Nuddee. The earth-work and bridging of the Cuttack Trunk Road progressed satisfactorily, and 28 miles of road were metalled. CHURPARUN AND
CHUTTRA.

The earth-work of the Cuttack and Pattamoondée Road, from the 16th to the 24th mile, has been finished, and the rest of the road improved. CUTTACK AND PATTAMOONDEE.

On the Cuttack and Sonepoor Road, work has been delayed owing to want and dearness of food, and prevalence of cholera. Eleven miles of the road were however finished. CUTTACK AND SONEPOOR.

Thirty miles of the Assam Trunk Road have been nearly completed, but in the Upper Assam Division, scarcity of labour has somewhat impeded the work. ASSAM TRUNK ROAD.

The line between Gowhatty and Shillong has been opened to a width of 10 feet, and timber bridges placed over every stream. Of the descent towards Sylhet, about 20 miles have been opened as a mule track, and timber bridges built. GOWHATTY AND SHILLONG.

COMMUNICATIONS.

CALCUTTA AND
JESSORE.
Dacca and
CHITTAGONG.
HILL TRACTS OF CHIT-
TAGONG.

GRAND TRUNK ROAD.

About $5\frac{1}{2}$ miles of the Calcutta and Jessore Road were metalled.

Eight miles of the Dacca and Chittagong Road were metalled.

A road from Russalong to Golabaria, in the hill tracts of Chittagong, was commenced in order to open communication between the Police out-posts stationed in those hills.

On the Grand Trunk Road, the foundations of the east abutment of the Morhur Bridge, and of Piers Nos. 1, 2, and 3, will very probably be secured by end of this season. The span-drills of the 10 western arches have been nearly completed. On the Booryah Bridge, 3 more arches have been in progress, but work has been held back in order to get the Morhur Bridge open for traffic as soon as possible. The masonry bridge over the Koodra River at Koormabad has not yet been completed. The works on the Burrakur Bridge have progressed slowly, and their state is reported on by the Superintending Engineer as follows:—"The foundation blocks of Piers Nos. 6, 7, and 8, which were damaged by the floods of 1862, have not yet been entirely rectified. The south block of Pier No. 6 is now down to a depth of 44 feet, and may be deemed secure. The sinking of the north block has been delayed, owing to some obstruction at the bottom; but it is down to 32 feet****. The south block of Pier No. 7 has sunk evenly to 24 feet. The north block was continued early in the season, but failed, and has now to be removed****. The blocks of No. 8 Pier have not had any thing done to them since they were upset in 1862. The north block is tilted, and during a great part of the past season, efforts were made for the purpose of straightening it, but it has not moved an inch****. The blocks of No. 9 Pier were upset, it is believed, in 1861. The foundations appear to have been lately secured, and the superstructure has been in progress for some time. The rest of the bridge is nearly complete."

The arching of two larger bridges, which remain to be constructed on the Hazareebaugh and Burhee Road, has been put in hand.

The Cylinder Screw-pile Bridge over the Sowrah River at Purneah, on the Ganges and Darjeeling Road, was completed and opened for traffic; and the four injured bays of the old timber bridge over the Mahanuddy at Silligooree have been renewed.

NORTH-WEST PROVINCES.

Extensive repairs have been done to the Agra and Bombay Road. Gradients have been improved, and the line of the road altered in some cases. The piers and abutments of the new bridge over the Kharee Nuddee, about which some anxiety was felt, owing to a scour around and between the wells, have been made secure. A large number of new bridges have been constructed.

The Loondihara Ridge Tunnel, on the Roorkee and Dehra Road, has been commenced. This work was expected to give considerable trouble as the soil is so loose, absorbing a vast quantity of water in the rains, and the dip of the strata is steep.

The progress of the part of the road-way through the Mohun Pass has been delayed, both by the unfavourable weather, and the withdrawal of the Sappers for duty with the Bhootan Force, a considerable number of bridges being however completed, or nearly so, and a large quantity of earthwork finished.

COMMUNICATIONS.

AGRA AND BOMBAY.

ROORKEE AND DEHRA.

COMMUNICATIONS.

ROHILKUND TRUNK
ROAD.

Nearly Rs. 2,40,000 have been expended on the Rohilkund Trunk Road. A larger expenditure would have been incurred, but for the unfavourable season, and the general failure of brick-kilns fired by the Contractor. About $9\frac{1}{2}$ miles have been completed and opened out, the remainder progressing rapidly, with the exception of masonry works.

On the Great Deccan Road, the Hurrye Bridge of 3 arches of 50 feet span each, with the exception of one pier, which was only half finished, had been completed up to 10 feet above springing, arches being semi-circular. The Lall-gunge Bridge was completed, and Seetee Bridge was in progress. Altogether, 7 bridges have been opened for traffic on the Great Deccan Road during the year.

Twenty miles of the Sohagee Pass Road, next Allahabad, have been completely metalled and bridged, and the remaining $6\frac{1}{2}$ miles bridged.

The Pandoo Bridge, on the Cawnpoor and Jhansie Road, has been nearly completed. On the whole road, except 9 miles, the lower coat of metal was laid down, and the road was expected to be opened completely for wheel traffic by the ensuing rains. The portion lying within the Cantonment of Jhansie was completed during the year.

The Duttea Section of the Gwalior and Jhansie Road is now open for traffic during the dry season, the work having been done by the Duttea Durbar under Public Works Department supervision. The larger bridges excepted, all the culverts in this section were completed, and the large bridges over the Leerow and Suffupahar Nullahs were opened, the piers of the bridges over the Oopsa and Sultupoor Nullahs were built, and arching had commenced.

The road from Ramnuggur to Kyrna was made to an average width of about 8 feet for nearly 23 miles, and some small bridges were put up.

The cart road from Haldwanee to Nyne Tal was completed up to the barracks, and required but little more to fit it for traffic.

The piers and abutments of the bridge over the Hindun River were complete, and the girders were on their way from England.

An iron suspension bridge over the Jumna River at Kalsee was in progress. A stone-bridge over the Sirsee nuddee, on the Banda and Saugor Road, was approaching completion. An iron-girder bridge over the Kahlee Nullah has been completed. All but 5 miles of the bund from Bareilly to Nynee Tal *via* Buheree has been completed.

Nine miles of metalling, and two bridges, have been completed on the road from Goruckpoor to Burhulgunge on the Gogra.

The earth-work of the Dabeeapoor Road in the Etawah District has been completed, and a considerable quantity of metal consolidated, and the arching of the Chichowlee Bridge over the Seyngoor Nuddee was progressing rapidly.

The Etah portion of the Etah and Shekoabad Road was approaching completion.

The Allahabad and Fyzabad Road was completed with the exception of $1\frac{1}{2}$ miles at the Allahabad end, which was stopped in consequence of a proposed change to suit the new Cantonment at Allahabad.

About $3\frac{1}{2}$ miles of Bandhals have been erected in the Ganges for the improvement of the channel.

GREAT DECCAN ROAD.

CAWNPOR AND JHAN-
SIE.

GWALIOR AND JHANSIE.

RAMNUGGUR AND
KYRNA.

HALDWANEE AND NYNEE
TAL.

HINDUN BRIDGE.

KALSEE BRIDGE,
BANDA AND SAUGOR.

KAHLEE BRIDGE.
BAREILLY AND NYNEE
TAL.

GORUCKPOOR TO BUR-
HULGUNGE.

ETAWAH DISTRICT.

ALLAHABAD AND FYZA-
BAD.

RIVER WORKS.

COMMUNICATIONS.

PUNJAB.

DELHI AND BAHADURGURH.

The Delhi and Bahadurgurh Road has been partially metalled.

GRAND TRUNK ROAD.

Progress was made in the construction of the bridges on the Grand Trunk Road near Umballa.

Six arches of the Ghuggur Bridge were turned, and the bridge was progressing satisfactorily. One abutment arch and 5 of the main arches of the Markunda Bridge were in progress.

The piers of the Mootasoottee Bridge have been brought up to the springing of the arches, and the 5 flood arches on each side have been turned. The foundations of the Tangree Bridge were in progress.

LAHORE AND RAVEE RIVER.

On the Trunk Road between Lahore and the Ravee River, a large bridge of 120 feet water-way has been completed. On the Trunk Road from Lahore to Peshawur, a large quantity of metalling has been done. The Dheena Bridge of 10 spans of 40 feet each has been completed to springing line. Nearly half the foundations of the large bridge over the Sohan River near Rawul Pindee have been finished, and one abutment and 5 piers approached springing level. The bridge over the Bukralla Nullah has been opened.

LAHORE AND PESHAWUR.

Eleven miles of the road from Kalka to Simla have been opened out to the full width of 24 feet.

KALKA AND SIMLA.

SIMLA.

Beyond Simla, 26 miles of additional new road have been constructed, giving a completed road-way 151 miles beyond Simla. The Wangtoo Bridge across the Sutlej was completed and opened for traffic.

DUKOOLA AND KHYROOLA.

The branch line from Dukoola, the termination of the Jullundur and Hoshiarpur Road, to Khyroola on the Grand Trunk Road, has been metalled.

UMRITSUR AND DHURMSALA.

A laminated arch bridge of 75 feet span over the Guj River, on the Umritsur and Dhurmsala Road, has been completed.

UMRITSUR AND PATHANKOTE.

Most of the culverts on the Umritsur and Pathankote Road, 68½ miles long, have been completed, the foundations of a bridge over the Chukkee Nullah, and nearly the whole of the metalling were finished.

RAWUL PINDEE AND MURREE.

Part of the Rawul Pindee and Murree Road has been widened, and some of the gradients improved.

HADJEESHAH TO CAMPBELLPOOR.

A branch road from the Trunk Road at Hadjeeshah to Campbellpoor has been completed.

ATTOCK AND MUKKAD.

Five miles of the sandy portions of the Attock and Mukkad Road have been metalled.

RAWUL PINDEE AND KOOSHIALGURH.

About 19 miles of the Rawul Pindee and Kooshialgurh Road have been completed, and bridges were in progress.

MURREE AND ABBOTTABAD.

Eight miles of the road between Murree and Abbottabad were opened out during the hot season by a body of European soldiers.

SALT RANGE.

In the Salt Range, 92 miles of road, and 22 miles of paths, have been opened out.

FEROZPOOR.

Several roads at Ferozepoor were metalled.

MOOLTAN.

The earth-work of a metalled road from the Heerun Gate of Mooltan to the Railway Station was completed, and a large bridge in construction, and several other roads at Mooltan were in progress.

COMMUNICATIONS.

Throughout the different districts, the communications were generally improved, and a large number of masonry works executed, and frontier communications were extended and improved. Accommodation for travellers was also provided, and water-supply increased.

RIVER WORKS.

The navigation of the Indus from Attock to Kooshialgurh has been improved by the blasting of rocks, and tow-paths along the banks have been formed.

OUDH.

All the earth-work and drain bridges of the Gondah and Byramghat Road have been completed. The two large bridges over the Kurrai and Mundah Nullahs were in progress.

GONDAH AND BYRAMGHAT.

The Fyzabad and Gondah Road from the Tehree River to Gondah was completely finished, and the remainder was in progress.

FYZABAD AND GONDAH.

The whole of the earth-work on the Lucknow and Seeta-poor Road was completed, all the drain bridges were finished, and the Gond bridge was in progress, the two abutments and one pier being completed to springing line. Two coats of metal have been put down on the first 22 miles, and one coat on two-thirds of the remaining miles.

LUCKNOW AND SEETA-POOR.

The Fyzabad and Allahabad Road was completed, with the exception of the large bridges required at the Kurrowee, Kunnesta, Biswee and Tonse Nullahs. The two latter were in progress.

FYZABAD AND ALLAHABAD.

A raised and bridged, but unmetalled, road between Lucknow and Sultanpoor was completed.

LUCKNOW AND SULTAN-POOR.

Several new roads not requiring special mention were opened out throughout the districts.

Several dangerous trees and sunken rocks have been removed from the bed of the River Gogra, but little progress was made owing to the work being commenced late in the season. It appeared that very little was required to make the river navigable for steamers as far as Byramghat.

RIVER WORKS.

CENTRAL PROVINCES.

Bridging on the Northern Road (which extends from Mirzapoor to Nagpoor) has progressed favourably.

NORTHERN ROAD.

A bridge over the Kutney River, of 5 arches, each of 45 feet span, was carried up to an average height of 30 feet. The arching of a bridge over the Tonse River, of 5 spans of 50 feet each, has been finished; the Shere River Bridge (5 arches of 50 feet span) has been built up to springing; two arches have been turned, and a third was in progress. The Goodra Stream Bridge, of 3 arches of 50 feet span, was up to springing level, and one arch turned, and the Bigna Bridge (5 arches of 50 feet) was in a similar state of progress. Nothing more has been done to the masonry bridge, which was commenced over the Kanhan, but was injured by the rains of 1864-65. A revised project instead of the original design of 12 arches of 50 feet span, was to be submitted.

A large number of smaller bridges were either completed or in progress.

The Korai Ghat—a pass from the low plains of Nagpoor to the elevated table-land of Seonee, the steepest gradient on which was only 1 in 30, was commenced.

During the past year, on the Southern Road between Nagpoor and Chanda, a distance of 97 miles, 55 miles have been metalled, metalling has been stacked for 8 miles, and seven and

SOUTHERN ROAD.

COMMUNICATIONS. a half ordinary road bridges have been built. To finish this road, $6\frac{1}{2}$ miles of metalling required to be laid, and 4 small bridges and 3 large ones have to be built.

A branch road, 6 miles in length from Boree to Assolah, on the Bombay Road, has been completed.

JAM AND DEOLEE.

On the road from Jam *via* Hingunghât (the great cotton mart of the district) to Deolee, 31 miles in length, metalling for a distance of 19 miles has been laid down; several culverts completed, while others were in progress, and several bungalows for travellers were completed.

EASTERN ROAD.

Of the Eastern Road from Nagpoor to Bagh Nuddee, 91 miles in length, $52\frac{1}{2}$ miles have been finished in respect to metalling, and several culverts have been built. To finish this section of the road, 29 culverts and three large bridges remain to be built, and 20 miles have not been surveyed.

On the remainder of the road from Bagh Nuddee to Sumbulpoor, 248 miles in length, very little work has been done.

NORTH WESTERN ROAD.

Of the North-Western Road from Kamptee to Chindwarra, 76 miles, the earth-work of 23 miles has been completed, the remainder being a well-metalled road.

BRITISH BURMAH.

COMMUNICATIONS.

YEH ROAD.

On the Yeh Road, the earth-work with improved gradients has been completed to the 31st mile-post from Maulmain, and 12 miles of metalling laid down; seven brick culverts and seven timber bridges completed, while 16 other timber bridges were in progress. Expenditure Rs. 70,000.

RANGOON AND PROME.

On the Maubee Section of the Rangoon and Prome Road, Rs. 84,948 were expended, making a total outlay up to date of Rs. 1,40,991. Two Inspection Bungalows have been built. All excessive gradients reduced to 3 in 100; the timber bridges are all completed, as well as most of the brick culverts and about five-eighths of the metalling stacked at road-side. On the Prome and Pongday Section, $8\frac{1}{2}$ miles were metalled, leaving only about 4 miles to be completed; five bridges and two culverts were constructed; only the largest nullahs remained unbridged, and on the Meaday Section, two bridges and ninety-four culverts were built, leaving only two or three large nullahs to be provided for; four miles were metalled after raising well above flood-level. The expenditure on bridging in these two sections aggregated Rs. 57,200, and on metalling Rs. 19,500.

PINE KYUN CREEK.

The Pyne Kyun Creek works have been vigorously carried forward, under many difficulties arising from land springs and the irruption of the River Sittang. The expenditure during the past season has been Rs. 1,80,000, and the total outlay will probably amount to Rs. 3,00,000 for the entire cost of the work. The cutting of this canal has, in addition to the results expected from it, drained a very large tract of marshy inundated country, and will thereby be the means of bringing into cultivation for rice crops about 100,000 acres of most productive land hitherto lying waste, and which may be expected to yield in due time an additional annual revenue to the State of about Rs. 1,00,000. Villages are springing up all along the banks of this new creek, and the land on either side is rapidly being brought under cultivation.

PEYBENG CREEK AND BASSEIN.

A navigable canal to connect the Peybeng Creek with the Bassein River at Bassein, was being excavated, and has been well advanced.

RANGOON.

A travellers' bungalow with out-offices has been completed at Rangoon from Local Funds at a cost of Rs. 13,500.

STRAITS SETTLEMENTS.

COMMUNICATIONS.

A road, 7 miles long, to the east of the Island (Tampinis Road), was widened and improved.

The A B C or Ordnance Bridge over the Singapore river, consisting of 3 spans (*viz.*, one of 45, and two of 35 feet), and connecting Fort Canning with the Arsenal and Commissariat stores, was completed on contract.

SINGAPOOR.

Four permanent bridges were constructed in lieu of old ones built temporary of jungle-wood. Another small portion of road was made near town, half the expense or \$ 1,200 = Rs. 2,640, being subscribed by the land-holders in the neighbourhood.

About 8 miles of roads were opened, but much was done towards improving the roads generally throughout the district. Sixteen bridges of sizes were erected to replace old temporary ones. The communications generally throughout the district were greatly improved.

PENANG.

Fifty-five miles of bridle paths were opened out, and free communications can now be easily and expeditiously obtained with all parts of the district.

MALACCA.

Five new bridges and 24 tunnels were constructed in various parts of the district. More attention has also been shown to the material placed on the roads, and most of the main roads are now metalled with good iron stone.

HYDERABAD.

Some new roads at Akola were in progress. The expenditure being Rs. 14,913.

COMMUNICATIONS.

The road from Budneira to Moresee, $38\frac{1}{2}$ miles in length, has progressed satisfactorily. Seven miles have been completed and opened for traffic. The expenditure during the year has been Rs. 96,988.

AKOLA.
BUDNEIRA AND MORE-
SEE.

The earth-work of the road from Akola to Akote, 31 miles, has been completed, and the metalling and masonry were in progress. Expenditure Rs. 31,655.

AKOLA AND AKOTE.

The road from Ellichpoor to Oomrawutee, 31 miles, has been progressed with; an expenditure of Rs. 1,17,425 having been incurred. All the earth-work and nearly all the masonry has been completed.

ELlichPOOR AND
OOMRAWUTEE.

The earth-work and metalling of the Karinja and Moor-toozaipoor Road, 20 miles, have been nearly completed, and only a few culverts and a bridge remain to be built. The expenditure during the year was Rs. 43,635.

KARINJA AND MOOR-
TOOZAPOOR.

The road from Akola to Mallaigaon, 37 miles, has been opened for fair-weather traffic. Only one small bridge and a few drains remain to be completed; Rs. 31,399 were expended during the year.

AKOLA AND MALLAI-
GAON.

All the earth-work, metalling, and bridging of the Khamgaon and Nandoora Road, 12 miles, with the exception of three bridges, have been completed at an expenditure during the year of Rs. 41,588.

KHAMGAON AND
NANDOORA.

Rupees 60,469 were spent on the road from Aurungabad to Nandgaon, 40 miles, of which 17 miles have been opened as a first class road, and the remainder was in progress.

AURUNGABAD AND
NANDGAON.

Two travellers' bungalows at Budneira and Akola.

BUDNEIRA AND AKOLA.

COMMUNICATIONS.

COORG.

The only roads dealt with were the Mercara-Codlipett and Veerajunderpett-Fraserpett Roads; the former being opened wholly for wheel traffic, and the latter being unfinished. Several bridges also were built on the several lines of roads running through the district.

MYSORE.

COMMUNICATIONS.

BANGALORE

Several roads, including a Railway feeder from Ooscottah to Kadgoody, were in progress, and nearly completed at a total outlay of Rs. 50,945.

NORTH ASHTAGRAM.

The expenditure on the different roads in this division during the year was Rs. 1,12,371.

SOUTH ASHTAGRAM.

Portions of several roads were metalled and otherwise improved at a cost of Rs. 30,671.

CHITTELEDROOG.

Rupees 36,541 were expended on the improvement of the Bangalore-Shemogah Road.

NUGGUR.

Several roads with four bridges were partly constructed.

HURRIHUR BRIDGE.

Six piers and one abutment of the Hurrihur Bridge across the Toongabudra River were completed. Expenditure Rs. 28,533.

CENTRAL INDIA.

COMMUNICATIONS.

AGRA AND BOMBAY ROAD.

The part of the Agra and Bombay Road, north of Indore, has been embanked and metalled throughout, and the masonry works were well advanced.

The Shajapoor Bridge (seven arches of 30 feet each) has been completed, and the Ubbapoor and Punwaree bridges were well advanced.

On the southern part of the road at Gojree, a bridge of 14 spans of 40 feet each, has been in progress, and was well advanced to springing line.

INDORE TO SIMROLE.

This road has been widened and re-made, and a bridge over the Kannar Nuddee nearly finished.

SIMROLE TO BULWARRA.

The Simrole and Bhare Ghâts were well advanced; the expenditure during the year being Rs. 82,583, and a bridge of five arches of 43 feet over the River Choaral was progressing satisfactorily.

DHAR AND NURBUDDA.

On this road, moorum has been spread over 14 miles, and 5 miles have been opened, and the Anund Row Bridge (5 arches of 40 feet span each) has been opened for traffic by His Highness the Rajah of Dhar. Several other masonry works have been completed.

NUGDA BRIDGE.

This bridge, over which the Mhow and Nusseerabad Road will be taken in crossing the Chumble Nuddee, will consist of 5 arches of 45 feet span. The foundations only have been completed.

COMMUNICATIONS.

RAJPOOTANA.

MHOW-NUSSEERABAD AND AJMERE ROAD. JEYPOOR AND AGRA ROAD.

This work has been commenced, but little progress has as yet been made.

A number of bridges and culverts, and a considerable quantity of earth-work and metalling have been completed, the expense being borne by the Jeypoor Rajah.

ODEYPOOR AND NEEMUCH ROAD.

The expense of this road was also borne by the Durbar. Four bridges, a number of drains, two travellers' bungalows, and a considerable quantity of embankment and metalling were completed.

MISCELLANEOUS WORKS.

MISCELLANEOUS.

LIGHTHOUSES.

BURMAH.

This Lighthouse is completed, and the light was shown on the night of 23rd April 1865.

The building work is completed, and as the light and light-apparatus had arrived, it was expected that the light would very shortly be displayed.

The progress in this work has not been so great as could have been desired, but this was owing in a great measure to the difficulties which had to be contended with. The houses for the Light-keepers were in progress, and it was expected that the foundation for the Tower would be got in by the end of May 1865.

ALGUADA REEF.

DOUBLE ISLAND.

COCOS.

RAILWAYS.

MADRAS.

RAILWAY.

The North-West line was opened as far as Reddipully, 79½ miles from Arconum Junction, and by the end of April the rails were laid in continuation to within 7 miles of Cuddapah. This section of the line was expected to be opened in September following.

The Bangalore Branch, 84½ miles in length, was opened on the 1st August 1864, and, together with the South-West line, was maintained in efficient working order. Numerous additions have been made to the station works which were still incomplete.

The Engineers of the Great Southern of India Railway were employed in maintaining the line between Negapatam and Trichinopoly, and in carrying on the construction of the Erode Extension, to join the Madras South-West line, 88½ miles long, 64 of which have been in progress.

BOMBAY.

Considerable progress was made on the North-East branch line of the Great Indian Peninsula Railway. On the Nagpoor branch, a further length of 32½ miles, from Mulkapoor to Sheogaum, was opened for traffic, and the Thull Ghât has also been completed, thus making altogether 596 miles opened for traffic at the close of the year.

By the opening of the Thull Ghât, through communication was established between Bombay and Sheogaum, in Nagpoor, a distance of 339 miles.

The traffic on the Bhore Ghât was carried on without interruption during the monsoon; no landslip of importance occurring.

The laying of the second line of rails between Callian and Wassind was in progress.

The earth-work nearly finished; 60 per cent. of ballasting done, and the permanent-way laid up to the 54th mile.

The Taptee Viaduct was completed with the exception of a small portion of the planking. Masonry works up to 106 miles, with two exceptions, completed, and the remainder in an advanced state. Stations well advanced.

Twenty-five miles of permanent-way laid, and 173 yards of the Bagra Tunnel completed out of a total length of 297 yards.

HURDAH TO SOHAGPOOR.

RAILWAYS.

RAILWAYS.

And the foregoing Table may be abstracted as follows:—

STATE OF PROGRESS.	MADRAS.	BOMBAY AND CENTRAL PROVINCES.	BENGAL.	N. W. P. AND CENTRAL PROVINCES	PUNJAB AND N. W. P.	TOTAL.
Miles open	650	999½	719½	549	253	3,171½
Miles under construction	179½	527½	...	225	304	1,235½
Miles uncommenced	177	158½	...	3	..	338½
Total	1,006½	1,685½	719½	777	557	4,745½

NOTE.

For the usual Statement of expenditure during the year, See P. W.
Circular No. 28 of 1866.

ANNUAL PROGRESS REPORT of Public Works in India for the year 1864-65.

W 4582/18

Calcutta:
PUBLIC WORKS DEPARTMENT PRESS,
1866.

Proc. 17 Nov. 1866 Lib. 34

Miscellaneous.

SIMLA, OCTOBER 18, 1866.

Progress Report of Public Works in India for 1864-65.

Governments of Madras, Bombay, Bengal, North
Western Provinces, and Punjab.
Chief Commissioners of Central Provinces, Oudh and
British Burmah.
Governor, Straits Settlements.
Commissioners of Mysore and Coorg.
Resident at Hyderabad.
Agents, Governor General, for Central India and Raj-
pootana.

ORDER.—Ordered, that
copies of the above Report be
forwarded to the Local Govern-
ments and Administrations
noted on the margin.

(Signed) C. H. DICKENS, *Lieut.-Col., R. A.,*
Secy. to the Govt. of India.

William McLeary C. E.,
Offg. Asst. Secy. to the Govt. of India.

*Copy to Govt. of
Madras. W.D.*

1798 Dec 18
G. & J. P. Norton
1798 Dec 18

GOVERNMENT OF INDIA.

Public Works Department.

CIVIL WORKS.

Decy. 28. 1778

No. 92 PUBLIC WORKS.

LA, October 18, 1866.

12. Power of

Spencer George
17th Nov 1866

Report of Public Works in India

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1871
J. H. Currier
1871-17
J. H. Currier
1871-17