

1912.

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

REPORT

OF THE

DEPARTMENT OF PUBLIC WORKS,

FOR THE

YEAR ENDED 30 JUNE, 1912.

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1912.

NEW SOUTH WALES.

THE DEPARTMENT OF PUBLIC WORKS.

(ANNUAL REPORT, 1911-12.)

THE DIRECTOR-GENERAL FOR PUBLIC WORKS TO THE HONORABLE ARTHUR
HILL GRIFFITH, M.L.A., MINISTER FOR PUBLIC WORKS.

Department of Public Works,
Sydney, 28th November, 1912.

Sir,

I have the honor to submit the following report, together with statements from the Heads of Branches, showing the work carried out by the Department during the twelve months which ended 30th June, 1912.

The total expenditure, as shown by the statement furnished by the Accountant, amounted to £4,152,548 13s. 9d. This sum includes £295,405 11s. 6d. provided by and expended on behalf of other State Departments, and £112,876 13s. 3d. for the Commonwealth Government. £3,774,781 4s. 1d. was disbursed directly through the officers of the Department, whilst the balance, £377,767 9s. 8d., was issued for expenditure to Shire and Municipal Councils. The total amount represents an increase of £1,050,264 1s. 2d. on last year's outlay.

FINANCIAL.

The approximate cost of administration, design, and supervision is shown to have been £248,766 19s. 5d., which is equivalent to 5.99 per cent. of the total expenditure. As the average cost for similar services taken over a period of the nine preceding years was 7.2 per cent., the cost for the year under review may be regarded as satisfactory.

Exclusive of the cost of administration, etc., as given above, the expenditure carried out by the several branches was as follows:—

	£	s.	d.
Railways and Tramways	1,118,904	9	11
Public Buildings (State and Commonwealth) ...	724,283	17	11
Irrigation... ..	508,651	3	7
Harbours and Water Supply	457,628	15	6
Water Conservation and Drainage	341,941	1	1
Local Government (incidental to)	338,620	1	3
Roads, Bridges, and Ferries (other than under Shire or Municipal control)	141,250	3	10

Further payments amounting to £6,951 1s. 10d. were made in connection with the Darling Harbour and Rocks resumptions, bringing the total expenditure under that head at 30th June to £4,844,562 17s. 4d.

Excluding the above, the acquisition of private property necessitated by the carrying out of other public works involved payments during the year totalling £305,217 9s.; £251,782 5s. 1d. was on account of the Burrenjack Storage and Murrumbidgee Irrigation project; and that sum, added to previous payments, brings the total outlay for resumptions in connection with that scheme to £294,555 0s. 4d.

Resumptions for railways and tramways absorbed £21,737 1s. 10d., and £13,945 11s. 4d. was paid for land required in connection with public buildings.

The number of officers employed on the Permanent Staff at close of the year was 791, their annual salary being £190,363.

In addition to these, however, the amount of work requiring attention during the year made a considerable increase in the Temporary Staff unavoidable, and at 30th June 1,130 temporary officers, whose aggregate salary amounted to £193,457, were also employed.

Cost of equipment and travelling amounted to £37,450 13s., and postage, telegram, and telephone charges to £3,879 1s. 9d.

As indicating the extent to which the day-labour principle has been adopted, it may be noted that the wages of daily-rate men amounted to £1,027,271 19s. 1d., as compared with £399,930 for the preceding year.

Notwithstanding this, however, the number of contracts let was 1,524, with a total value of £1,519,052 5s. 10d. Of that total, Railways and Tramways absorbed £465,879 14s.; Public Buildings, £395,911 19s. 9d.; Conservation and Supply of Water, £330,880 15s. 9d.; and Sewerage, £136,986 18s. 7d. At close of the year there was still an outstanding liability on these contracts of £463,219 7s. 4d.

RAILWAYS AND TRAMWAYS.

As shown in the preceding Financial Statement, expenditure under the above heading amounted to £1,118,904 9s. 11d., of which £923,331 19s. 1d. was for railways. £184,423 8s. 6d. for tramways, and the bulk of the balance, £11,149 2s. 4d., was expended on behalf of the Chief Commissioner.

Six new lines of railway were put in hand during the year, together with further sections on the North Coast and Moree-Mungindi lines, work on which was commenced in previous years. The total length of line under construction at 30th June was 702 miles 45 chains, of which 79 miles 6 chains were completed and made available for traffic.

The Lockhart to Clear Hills extension, the first section of which, from Lockhart to Lake Cullivel, was opened for traffic in December, 1910, was continued, and a further length of about 8 miles, extending to Urana, was completed and handed over to the Railway Commissioners, in December, 1911, making the total length opened since this extension was commenced in June, 1909, 37 miles. Work on the remaining length, 32 miles 6½ chains, is well in hand.

Steady progress was made on the Moree-Mungindi line, and the second section, which commences at Garah, was put in hand in October, 1911, the total expenditure to 30th June, 1912, being £129,799.

The extensions from Forbes to Stockinbingal, and from Parkes to Peak Hill, which were commenced during the early part of 1912, will, in addition to opening up first-class agricultural country well adapted for the maintenance of a closely settled population, also complete a direct cross-country connection between the existing Western and Southern railway systems.

The route connecting Wagga Wagga and Tumbarumba passes through country much of which is at present held in large areas, and it is expected that the completion of the line will be closely followed by the subdivision of most, if not all, of these holdings, whilst the rich grass country beyond Tumbarumba will be made more readily accessible to the western pastoralist when drought in the Riverina necessitates removal of stock.

The extensive Pilliga scrub country, which consists of first-class land, suitable for wheat-growing and mixed farming, will be tapped at its southern extremity by the extension from Dunedoo to Coonabarabran. This line enters the valley of the Castlereagh at about 20 miles from Dunedoo, the present terminus, and thence follows closely along the course of the river for about 48 miles to Coonabarabran. The country passed through is at present sparsely populated, but has a good rainfall and includes large areas suitable for agriculture and mixed farming, and the opening of the line will no doubt result in greatly increased settlement and production.

The first section, terminating at Nimmitabel, of the extension from Cooma to Bombala, for which a contract was let in April, 1910, was opened in April, 1912. Owing to an alteration in route the permanent survey of the second section, to Bombala, is not yet complete.

Two additional sections of the North Coast line were commenced, making the total length completed or in hand at 30th June, about $226\frac{1}{2}$ miles, of which about $35\frac{3}{4}$, extending from West Maitland to Dingadee, have been completed and opened.

The sections so far undertaken extend in a continuous length to Wauchope, on the Hastings River, $163\frac{1}{4}$ miles from West Maitland, after which breaks occur between Wauchope and Macksville, and between Coff's Harbour and Glenreagh.

The commencement of the section Macksville to Coff's Harbour may, perhaps, be regarded as the first step in the direction of decentralisation, and when combined with the contemplated extensive improvements at Coff's Harbour, referred to in more detail elsewhere, will be the means of providing a very large and productive district with much-needed direct deep-sea shipping facilities.

At date of this report construction is nearing completion to Taree, $115\frac{3}{4}$ miles from West Maitland. Cost, £1,668,068 3s. 11d.

In addition to the work actually in hand, authority was given during the year for the construction of four new lines, totalling 96 miles 35 chains, and estimated to cost £348,929.

Among the latter may be mentioned the connection to be made between the existing termini at Finley and Tocumwal, which will link up the railway systems of this State and Victoria, and will give the residents of Riverina more direct communication with the markets in the Southern State.

Surveys for new lines and the permanent marking of those authorised, involved 2,466 miles of exploration, $785\frac{3}{4}$ miles of traversing and detail survey, 1,386 miles 65 chains of levelling, 275 miles 25 chains of staking, and 1,030 miles of inspections.

Tramway

Tramway Construction.—The two lines under construction at the commencement of the year, viz., Military-road to Cremorne, and Wallsend to Spier's Point, were each completed and opened for traffic, and the following new works were put in hand :—

Darley-road to Little Coogee, 2 miles 47 chains. The first section,	} Electric.
1 mile 37 chains, has been completed and opened for traffic.	
Brookvale to Collaroy Beach, 3 miles 25 chains.	
Dulwich Hill to Wattle Hill, 70 chains.	
Rosebery Park to Bunnerong-road, 62 chains.	
Rozelle to Leichhardt, 57 chains.	
Leichhardt terminus to Balmain-road, 40 chains.	} Steam.
Carrington, Newcastle, 50 chains.	

In addition to the above, the following were authorised, and preliminary work, surveys, plans, etc., put in hand :—

Patton-street to Racecourse (Broken Hill), 75 chains.	Steam.
Wallsend to Racecourse, 1 mile 20 chains.	Steam.
William-street, <i>via</i> College-street, to Elizabeth-street, 43 chains.	Electric.
Petersham Railway Station to Livingstone-road, 1 mile 20 chains.	Electric.

PUBLIC BUILDINGS.

The year's expenditure on public buildings amounted to £724,283 17s. 11d., which sum includes £171,161 4s. 4d., provided by the Department of Public Instruction, and £78,952 4s. 10d. expended on behalf of the Commonwealth Government.

Among the more important of the new works undertaken during the year were the new offices for the Public Instruction Department, facing Bridge, Loftus, and Young streets. The estimated cost of the work now in hand is £65,000. This comprises the first section, covering about one half the block which will ultimately be built on. The additional accommodation to be provided by these premises is urgently needed, inasmuch as the staff of the Department is now distributed in eight different buildings, located in various parts of the city. Not all of these buildings are Government property, and a payment of between £600 and £700 a year for rent is involved.

The external walls of the new building, which will be seven stories high, will be of stone; the internal construction, of steel and reinforced concrete.

Good progress was made with the construction of the new offices for the Registrar-General, facing Hyde Park and College-street, although the work has again been delayed by dearth of stonemasons.

One wing has been completed, and was put into occupation in December, 1911.

The expenditure to 30th June was £66,283 6s. 3d., £28,984 12s. 7d. being spent during the year.

A considerable amount of work was carried out in connection with the various University buildings; Fisher Library; Medical, Agriculture, Veterinary Schools, &c., of which particulars are given on page 29.

Designs and estimates were also prepared for a new Teachers' Training College, and were submitted for consideration of the Public Works Committee.

The

The new Abattoir buildings at Homebush, for which a contract for £158,765 was let in April, 1910, are approaching completion, the expenditure to 30th June, 1912, being £156,291. The total expenditure on this undertaking, including improvements to site, roads, railway connection, &c., has been £305,501 13s. 9d.

The Commonwealth Ordnance Stores, at Darling Island, described in last year's Report, were nearing completion; and good progress was made with the new Parcels Post building, under construction at the Central Railway Station.

In addition to the above, it will be seen from the list attached to the Government Architect's Statement that a large number of buildings in country towns: schools, colleges, police stations, court-houses, post offices, hospitals, &c., were also dealt with.

The reconstruction of the "Rocks" resumed area is being pushed forward rapidly, and a terrace of seventeen dwelling-houses were completed, and further extensive business, hotel, and other premises were commenced during the year.

The ever-increasing amount of building work handled directly by the Department, and the necessity for closer personal supervision of the work of construction than could be given by the Government Architect without undue interference with the administrative work of his office, determined the Minister to appoint an executive officer to be responsible for all construction and shop work. Mr. Bruce, an officer of long service and varied experience, was accordingly placed in charge of this sub-department, but, as the appointment was not made until toward the close of the year, little more had been done at 30th June, 1912, than a general readjustment to meet the new conditions.

The Theatres and Public Halls Act and the Scaffolding and Lifts Act are administered by this branch of the Department, and the report furnished, indicates that the requirements of the former have been closely observed, and the large number of buildings and places devoted to public entertainment show marked progress in the matter of public safety and convenience, whilst the strict enforcement of the provisions of the Scaffolding and Lifts Act and Regulations, the careful supervision maintained, and the high standard of safety insisted upon, have resulted in an almost total absence of accident due to faulty or careless construction.

The number of lifts within the metropolitan area has considerably increased during the year, and now totals 1,510, of which 457 are used for the transfer of passengers. It is estimated that these lifts carry an aggregate total of 68,000,000 passengers a year.

IRRIGATION.

As work in connection with the Burrinjuck and Northern Murrumbidgee Irrigation projects advanced, the demands upon the time and energies of the Chief Engineer for Irrigation, Drainage, &c., became increasingly heavy. He had during the preceding year been appointed temporarily as executive officer and secretary to the Murrumbidgee Irrigation Trust, and, this appointment being subsequently confirmed, his designation in the Department was altered to that of Chief Engineer for Irrigation, thus relieving him of the duties, relating to water conservation, sewerage, drainage, &c. These were placed under Mr. Dare, formerly Principal Designing Engineer, and Mr. Bradfield was appointed to the position vacated by Mr. Dare.

Mr.

Mr. Wade's statement attached deals, therefore, only with the Burrenjack dam and the Murrumbidgee Irrigation works.

Progress with the former was seriously interfered with owing to heavily fissured rock being met with when opening up the foundations in the higher levels, and it became necessary to remove about 40,000 cubic yards in order to obtain solid seating for the concrete. This had the effect of suspending actual progress with the wall for about six months. When concreting could again be commenced three shifts were put on and the work carried on continuously, an average of about 1,800 cubic yards of concrete being placed in position each week, the total for the remaining six months of the year being 47,000 cubic yards.

Future progress, it is anticipated, will be more rapid, and if expectations are realised it will be possible to store a depth at the dam of about 70 feet of water in a few months.

At 30th June a total of 131,000 cubic yards of concrete had been used in the dam.

The diversion weir at Berembred was completed the preceding year, and a full description of this work has already been given. Water was turned into the main canal, and, being held up by regulators, the banks were subjected to a satisfactory test.

On the Irrigation Area further work was carried out on the main canal, distributing channels, regulators, bridges and outlets, and a large staff of workmen were also employed on the construction of buildings.

The total excavation completed to 30th June, 1912, on the canals and distributing channels amounted to 1,121,900 cubic yards, and 504 bridges, checks, drops, regulators, and syphons, in which 2,832 cubic yards of concrete were used, had been constructed in connection therewith.

Sixty-one miles of roadway had been made, together with 30 miles of drains and 41 miles of fencing.

An electric light and power station is being rapidly pushed forward, and at time of writing a butter factory, capable of treating about 40 tons of butter per week, is practically complete.

Contour surveys had been made of about 114,000 acres, and plans of 407 farms, showing these levels, had been prepared for use of the settlers when grading and preparing their land for irrigating.

Three hundred and thirty-six miles of canals and distributing channels had been permanently marked for construction, and designs for the new township "Griffith" on the Mirrool area were put in hand.

The total expenditure at 30th June was £1,272,507 18s. 9d., of which £508,651 3s. 7d. had been spent during the year.

HARBOURS AND WATER SUPPLY.

The expenditure on Harbours and Water Supply works amounted to £457,628 15s. 6d., of which £271,917 13s. 6d. was in connection with the maintenance or improvement of Harbour works and River entrances.

At the majority of the river entrances no addition has been made for some years to the incomplete breakwaters, training walls, &c., designed for the permanent improvement of the ports, and, with but three exceptions, attention has been directed to the upkeep of the existing works and the maintenance of navigable channels by dredging.

The

The exceptions referred to are Newcastle, Port Kembla, and Crookhaven.

At Newcastle, the extension of the northern breakwater, commenced in February, 1910, was completed by the addition of 91 feet, the total length being now 3,406 feet. Cost, £38,682. Details of dredging and rock excavation carried out within the harbour and entrance channel are given on pages 50-51.

At Port Kembla, the eastern breakwater, which was carried to its full length, 2,750 feet, the preceding year, was further strengthened by the addition of 21,163 tons of stone, bringing the total quantity used on the wall to 794,624 tons. The northern breakwater was extended 650 feet, making the total length 2,070 feet. A new coal loading jetty, which will have a total length of 1,220 feet, was put in hand, and 840 feet completed during the year.

At Crookhaven, the northern breakwater was extended 530 feet, and 24,980 tons of stone tipped in position, the total quantity used at 30th June, 1912, being 96,900 tons. It will be seen from the following quotation from the Chief Engineer's report that the utility of this work has already been demonstrated:—"Some acres of sand having been held back . . . which otherwise would undoubtedly have entered the harbour and been deposited on the inner crossing."

On page 48, a table is given showing the total cost of the permanent improvements at each entrance.

Reference is made in Mr. de Burgh's report to the difficulties experienced, owing principally to continuous untoward weather conditions, in maintaining navigable channels at some of the river entrances by dredging, particularly at Nambucca and the Bellinger, and, with a view to affording permanent relief to the districts dependent upon those ports, a scheme has been prepared for the development of shipping facilities at Coff's Harbour. The proposal provides for the construction of breakwaters and suitable jetties, involving an expenditure of £180,000, and is under consideration by the Public Works Committee. The North Coast Railway will skirt the water front, and the section giving the Nambucca and Bellinger districts access to the new port is already in hand.

The new bar dredge referred to in last year's report as being under construction at Fitzroy Dock, was completed at a cost of £23,987 15s. 2d., and placed in commission.

The total quantity of sand and material removed by dredging during the year amounted to 5,964,163 tons, at a cost of £142,394 7s. 9d., equivalent to 5·72d. per ton.

Water Supplies for Country Towns.—Several of the works in hand at beginning of the year were completed before 30th June. At Cooma, where the supply is derived from the Murrumbidgee river, and pumped thence $4\frac{3}{4}$ miles to a concrete service reservoir of 159,000 gallons capacity, 330 feet above river level, work was completed at a cost of £18,500.

A similar scheme for supplying the town of Dungog from the Williams river was also completed. Cost, £11,500.

At Forbes a new covered steel service reservoir, having a capacity of 735,000 gallons, was constructed, and a considerable length of additional service and reticulation mains laid.

At Moree and Wellington, timbered drives into the water-bearing drift were successful in securing increased supplies.

At

At Tamworth, where the existing supply became depleted, a temporary pumping scheme was arranged, and an ample supply of excellent water obtained from water-bearing drift near the Cockburn and Peel rivers.

At UMBERUMBERKA (Broken Hill) where work was commenced last year, delays were occasioned by floods and difficulties in obtaining suitable labour and material. An electric lighting plant has been installed, and the work is being carried on continuously night and day. Contracts have been let for the supply of 70,420 feet of 18-inch wood stave pipes and 17,950 feet of steel pipes. At 30th June 26,600 cubic yards had been excavated, and 11,000 cubic yards of concrete built in place, the year's expenditure amounting to £61,169 6s. 9d.

Work was continued for the supply of Grafton and South Grafton. Nineteen chains of tunnel have been excavated, three ventilation shafts, the deepest being 83 feet through hard rock, together with intake chamber and concrete bulkhead, &c., have been constructed, and 2 miles of 10-inch pipe received.

The estimated cost of the work, which has been described in an earlier report, is £68,500. Expenditure for the year, £6,329 2s. 10d.

Good progress was made in connection with the additional supply for June, authorised last year. The well, 16 feet in diameter, has been excavated, the drive, 63 feet long, made and timbered, and parts of the rising and gravitation mains have been laid. The work is estimated to cost £65,500. Expenditure for the year, £16,989 9s. 4d.

Work was commenced for the supply of Kempsey, water to be obtained from a well sunk into the drift on the bank of the Macleay River. Cost is estimated at £13,250.

Work at Quirindi, where the scheme includes a Kennicott water-softener, is at date of writing, practically complete. Expenditure to 30th June, 1912, £15,469.

A storage reservoir at Beargamil Creek and gravitation main were undertaken for the purpose of supplementing the existing supply at Parkes. Cost is estimated at £3,500.

A further expenditure of £34,027 15s. 8d. was made in connection with the works being carried out for supply of the towns north of Wollongong, details of the work being given on page 56.

A dam and gravitation main for supplying the Kosciusko Hotel, &c., and a rising main at Medlow were also constructed.

In addition to the above, investigation has been made in connection with projected works and schemes for further supplies, including a proposal for the construction of an auxiliary dam on the Cordeaux River with a capacity of 15,858 million gallons, for supplementing the existing storage for the city of Sydney.

WATER CONSERVATION, SEWERAGE, AND DRAINAGE.

These works, in addition to the Burrenjuck and Northern Murrumbidgee Irrigation Schemes, were formerly carried out under Mr. L. A. B. Wade, then Chief Engineer for Irrigation and Drainage, but upon his appointment as Chief Engineer for Irrigation, and Executive Officer and Secretary to the Murrumbidgee Irrigation Trust he relinquished control, and, as already explained on page 5, the branch, as re-modelled, was placed under Mr. Dare.

The

The year's expenditure for water conservation, sewerage and drainage totalled £341,941 1s. 1d., of which £87,436 0s. 5d. was in connection with water conservation and drainage.

The overshot compensation weir on the Nepean River, referred to in last year's report, was completed at a cost of £1,695.

Renewal of plant and other improvements were carried out at the irrigation areas, Hay and Wentworth, for the Department of Agriculture, cost about £4,911; and repairs, costing £1,395 4s. 11d., were effected to the George's River dam, Liverpool.

A concrete weir at Nidgery, on the Bogan, was completed at a cost of £1,105 19s. 7d., and a cutting and regulator between the Little Murray River and Little Merran Creek was put in hand, the expenditure to 30th June, 1912, amounting to £1,963 15s. 9d.; estimated cost, £3,547. At Barooga, briefly described in previous reports, a further expenditure of £6,328 0s. 1d. was made, bringing the total for this scheme, at 30th June, 1912, to £7,521 15s. 5d. This and the two preceding works are being carried out under the Water and Drainage Act, which provides for the formation of Trusts, to whom the works will be handed over on completion, and by whom cost will be repaid by easy annual instalments.

Tenders were invited in connection with the proposed improvement of the Great Ana Branch of the Darling river. Bridges and regulators were completed at a cost of £1,468, and a contract for the cutting, which extends over about 18½ miles, has been let for £5,875.

In the Western Division of the State where traffic on the main lines of communication is dependent upon artificial storage, work has been much hampered by dry weather and scarcity of labour. Five large excavated tanks, having an average storage capacity of 14,800 cubic yards, were completed, at a total cost of £5,694 16s. 11d., and seven other tanks and one well are under construction, at an estimated further cost of £9,840. Further works have been authorised.

The majority of the existing public watering-places are equipped with caretakers' cottages, pumping plants, troughing, fencing, &c., and the expenditure for maintenance and renewal of these appurtenances during the year amounted to £3,727.

Artesian Boring.—It will be seen from the summary given on page 81 that there are now 499 artesian bores in the State. In 382 of them the water rises above the surface, the total yield obtained being 110,005,904 gallons per 24 hours. In 75 the water failed to reach the surface, although in most cases an ample supply may be obtained by pumping. In the remainder water was not obtained.

Of the above total, 97 bores were provided as public watering places, 3 for purposes of furnishing country towns with water supplies, 52 were sunk to comply with the conditions attaching to Improvement Leases issued by the Department of Lands, 285 by private owners, and the remaining 62 are included in trusts, formed under the Artesian Wells Act or the Water and Drainage Act. Both these Acts provide, *inter alia*, that the gazetted cost of the work, together with interest, shall be repaid by the owners or occupiers of the properties benefited.

There are now 44 of these Trusts in operation, the total area benefited being 2,956,567 acres, while the length of the distributing drains supplying this area with water is 1,872 miles 41½ chains. The gazetted cost, which is not necessarily the actual cost, amounts to £138,162 7s. 1d., the total annual repayment of principal and interest amounting to £10,479 17s. 10d.

In addition to the above, ten new bores, together with 483 miles 66 chains of distributing channels, &c., are under construction at an estimated cost of £44,424, and four proposals, designed to serve a further area of 205,650 acres, at an estimated cost of £12,260, are in the preliminary stages.

The Department was formerly represented on these trusts by the local officer, who was a member of each trust within his "district." A rearrangement has now been made by the appointment of a "travelling trustee," who will in future be the official member of all Artesian Water Trusts. It is hoped by this alteration to secure greater uniformity of methods and economy in administration.

Investigation into the cause of the rapid corrosion of bore casing in the Coonamble district, and experiments with a view to its prevention, were continued, but without satisfactory result.

Swamp Drainage.—Eight schemes for the drainage of swampy or submerged country were in hand at the beginning of the year, and of these, six were completed, together with three other similar works undertaken during the year. These schemes embraced about 18,641 acres, and cost £19,993 9s. 8d. The total area reclaimed by work of this character at 30th June, 1912, was 67,857 acres; cost, £50,059 6s. 6d.

The drainage of a further area of 42,306 acres, at an estimated cost of £46,400, was in progress, thirteen proposals, dealing with an additional 38,779 acres, estimated to cost £33,229, were in more or less advanced stages, and 16 new proposals were under consideration. All these works are carried out under the Water and Drainage Act, which, as before stated, authorises the formation of trust districts and provides for the repayment of cost to the State.

Sewerage Construction.—The expenditure for the year in connection with sewerage construction was £254,505 0s. 8d., of which £124,754 10s. 9d. was in respect of country towns, and £129,750 9s. 11d. for metropolitan works. Chief among the latter is the Long Bay ocean outfall sewer, an extension of the Western, Southern, and Illawarra suburbs sewerage system. The main features of this work have been outlined in previous reports. Work on the first and second sections was well advanced at the end of the preceding year, and plant and material was being obtained in readiness for a commencement on the third section.

The first section, 2 miles 846 feet long, is principally tunnelling in hard rock. Driving is complete, and preparations were being made at close of the year for concreting.

The second section, 1 mile 4,140 feet in length, is in open cut through wet sand, some of which is sufficiently saturated to be removed by pumping.

Section No. 3, 2 miles 1,478 feet in length, includes an aqueduct in two sections, 2,068 feet long in all, connected by syphon under Cook's River. Two thousand four hundred feet of reinforced concrete sewer has been completed on this section, and a further length of 600 feet is well advanced. Where necessary, piles for piers of the aqueduct, which will be of reinforced concrete, have been driven, and tunnelling for the syphon commenced.

Electric current is obtained from the City Council, and is used throughout the works for operating excavating plant, pumps, hoists, air compressors, concrete mixers, lighting, &c. Expenditure to 30th June amounted to £139,023 3s. 6d., of which £101,100 11s. 2d. was made during the year.

The extension of the Canterbury main sewer, for which a contract was let last year, was completed; cost, about £7,300; and designs for the sewerage of Rookwood, Auburn, Granville, Canterbury North, Campsie, Belmore, and Bankstown have been prepared.

Work at Leura was practically completed, at a total cost of approximately £18,000.

A total length of 3 miles 2,254 feet of stormwater channel of varying dimensions was completed or in hand during the year, the estimated cost being £36,404.

Improvements, costing £1,236, were effected to the stormwater drainage at Centennial Park, and surveys were made and plans prepared for drainage of the surface water at Daceyville.

It will be seen from the particulars given in the statement attached hereto that extensive proposals are in hand for the sewerage of several of the larger country towns, among which may be mentioned Lithgow, estimated to cost £39,955, in connection with which an expenditure was made during the year of £25,391 10s. 4d., and Wagga Wagga where a contract was let in April last, but has recently been cancelled and fresh tenders invited.

Contracts were being prepared in connection with the sewerage of Bathurst, which is estimated to cost £43,144; Albury estimated to cost £3,967, and Orange estimated to cost £27,500.

Designs had also been prepared for the sewerage of Dubbo, estimated cost £38,800; Tamworth, £47,200; and West Maitland, £54,500.

SYDNEY HARBOUR BRIDGE AND CITY TRANSIT.

Consequent upon the investigations recently made by Mr. David Hay, in connection with the proposed provision of greater facilities and improved methods for dealing with the heavy and still rapidly increasing traffic of the City, a new branch has been created to deal exclusively with these proposals and the question of connection between the northern and southern shores of the Harbour.

Mr. J. J. C. Bradfield, then Principal Designing Engineer, was appointed to the position of Engineer in charge of the new branch, and date of this report, has prepared designs and estimates for the proposed Harbour bridge which have been approved and submitted for consideration of the Parliamentary Standing Committee. Preliminary work is also well in hand in connection with the first section of the proposed City Railway, in anticipation of authority to proceed with the work of construction.

ROADS, BRIDGES, FERRIES, AND PUBLIC WATERING PLACES.

Under the above heading is included works in the Western, or unincorporated Division of the State, and such others in the Eastern and Central, or incorporated Divisions, as have been proclaimed "National" under the Local Government Act, together with the construction of roads within the incorporated section designed to facilitate the settlement of Crown land.

The expenditure for the year on these works amounted to £141,891 2s. 10d., made up as follows:—

	£	s.	d.	£	s.	d.
Bridges—Construction	37,336	2	5			
Maintenance	16,668	12	8			
				54,004	15	1
Roads—Construction	46,503	3	10			
Maintenance	17,386	0	9			
				63,889	4	7
Ferries—Construction	154	2	0			
Working and Maintenance	23,201	16	2			
				23,355	18	2
Public Watering Places—Caretaking ...	641	5	0	641	5	0

With

With the exception of two contracts, the whole of the bridges in hand at beginning of the year were completed and made available for traffic. The exceptions were the truss bridge over Cockfighter Creek, at Bulga, which, at the end of the year, was within a few days of completion, and the bascule bridge over the Wakool.

Contracts were let for nine new bridges at prices ranging from £1,018 7s. 6d. for the bridge over the Lachlan at Booligal, to £2,193 for the low-level bridge over the Severn River at New's Crossing. A contract was also let at £785 for the addition of three 30-foot spans to the bridge over Stephen's Creek at Quandong on Menindie-Broken Hill Road, where the entire eastern approach had been swept away, and the channel widened 200 feet by exceptionally high floods.

Renewal of the truss bridge over the Cudgegong River at Mudgee was put in hand by day labour, and as very little timber now comes down the river on flood waters, it was decided the new bridge should be a plain beam structure. Cost will be about £1,600.

The bridge over Myall Creek, for which a contract was let in December, 1910, was completed at a cost of £7,432 4s. 9d., and that over the Cudgegong at Yamble, let in July, 1910, was completed in January, 1912; cost, £3,823. Both these replace bridges destroyed by the floods of January, 1910. Other bridges, for which contracts were let the previous year, and completed during the year under review, were:—Richmond River, at Kyogle; cost, £2,340; and Fish River, at Lerida Creek; cost, £1,485.

Renewal of the beam spans, Muswellbrook bridge, undertaken by day labour in February, 1911, were also completed, and the small bridge over Broughton Mill Creek, for which a contract was let in November, 1911, was practically completed at end of the year, and, there being no justification for its maintenance as a national work, it has since been handed over to the Council; cost, £1,024.

The contracts still in hand at end of the year were:—Bellingen River, at Bellingen; cost, including approaches, about £1,946; Macleay River, at Turner's Flat, £1,633; Lachlan River, at Whealbah, £1,203; Lachlan River, at Booligal, £1,018 7s. 6d.; and Woronora River, at Sutherland, £1,868 7s. 4d.

Renewal of the existing bridge over the Barwon at Mungindi was authorised, and a contract has been let for £2,999 3s. 6d. This bridge being on the Queensland boundary, that State will, in accordance with established practice, bear a moiety of the cost.

Among the more important repairs carried out may be mentioned the practical renewal of the lower portion of the concrete base of one of the piers of the truss bridge over the Towamba River at Sturt; cost, about £695.

Roads.—In addition to the construction and maintenance of roads in the Western Division, which cost £17,386 0s. 9d., the provision of access to Crown lands suitable, or being made available by the Department of Lands, for settlement in the Eastern Division, necessitated a considerable outlay. The total length of roads of this character opened during the year was approximately $37\frac{1}{2}$ miles, cost being £14,870, whilst in addition to work being carried out by day labour, contracts covering $31\frac{1}{2}$ miles, estimated to cost £10,688, were still in hand, and further contracts totalling 10 miles had been prepared in readiness for invitation of tenders. The total expenditure on these roads for the year was £15,793 1s. 4d.

In common with other works carried out by the Department, cost has been considerably increased by the higher wages now paid for all classes of labour.

As explained in former reports, the roads, when complete, are handed over to the shire councils, who then become responsible for their maintenance or further improvement as occasion may require.

At several of the minor ferries, which are under control of the local Council, traffic has increased to an extent which demands a more convenient and expeditious means of transit than that afforded by the present hand-worked punts; but the cost of providing and running larger punts, worked by steam or oil engine, is greater than the finances of the Councils concerned can meet. In several such instances, where it has been shown that the general through traffic is sufficient to warrant the ferry being proclaimed National under the Local Government Act, approval has been given for the necessary action to be taken.

At present there are thirteen national ferries, eleven being operated by steam and two by oil engines. Cost of maintaining and running these, together with the four small ferries in the Western Division, was £14,431 for the year.

The Public Watering Places now controlled by the Department, *i.e.*, those within the Western Division, number 208; 140 are leased at a total rental of £2,690; 27 are subsidised at a cost of £642, and the remainder are open—that is, no caretaker is in charge and stock water direct at the excavation.

LAND VALUATION.

A large proportion of the undertakings carried out, or contemplated by the Department, involve the acquisition of private property, either by purchase or resumption, and Mr. Sievers and his staff have been fully engaged in dealing with matters arising therefrom.

Notwithstanding the number and variety of claims, and the general tendency of owners to endeavour to secure something more than actual value, it is comparatively seldom that the Courts are invoked; a fact which may, I think, be taken as evidence of the equitable spirit in which the Department endeavours to deal with these matters.

In addition to the resumptions carried out for this Department, valuations, &c., have been made, and negotiations carried through for other State Departments, and, in conjunction with an officer of the Department of Lands, for the Murrumbidgee Irrigation Trust.

One hundred and ninety-eight claims, the subject of previous negotiations, were finally settled; 373 further valuations made, and 545 cases were still in hand at close of the year.

ELECTRICAL ENGINEER.

Several proposals of primary importance have been investigated during the year, most prominent among them perhaps, being the suggested utilisation of our water and coal resources in a general scheme for the development and distribution of electric light and power, over the more populated portions of the State.

Inquiry was also made as to the power available at certain streams for specific purposes of a more restricted character, and the Chief Electrical Engineer is strongly impressed with the importance of assembling more accurate and complete particulars of the water power at disposal than are at present available.

It will be seen from the details furnished in his statement that a great variety of work has been carried out, among which may be mentioned the lighting of the Coast Hospital, the Hotel Kosciuszko, the Broken Hill Water Supply works, and the work-shops at Yanco. Power plants were dealt with in connection with sewerage works at Long Bay, water supply at Leeton, abattoirs at Homebush, and the Uhr's Point sawmills.

ENGINEERING

ENGINEERING DRAWING OFFICE AND IRONWORK INSPECTION.

Consequent on the transfer of Mr. Bradfield in connection with the North Shore bridge and city transit proposals, Mr. Littlejohn was appointed as Principal Designing Engineer, and placed in charge of the Engineering Drawing Office and Ironwork Inspection.

Irrespective of preliminary designs and estimates, plans and specifications were prepared for works submitted for tender or put in hand by day labour, estimated to cost £2,018,577 15s. 3d., the percentage of office cost being given as '758.

Six inspectors were engaged on the inspection of ironwork, four of them being employed continuously at the Lithgow ironworks, inspections and tests being made of 29,221 pipes and special castings, weighing in all 3,195 tons, the aggregate length of the pipes being $44\frac{1}{2}$ miles.

SURVEY AND SURVEY DRAFTING.

The Chief Surveyor reports a large volume of work carried out, necessitating at times the employment of surveyors in private practice to avoid delay. Surveys were effected in connection with Irrigation, Drainage, Sewerage, Water Supply, Roads and Bridges, Artesian Wells, and Public Buildings. Railway and Tramway Surveys are dealt with separately, and have been referred to elsewhere.

The Drafting Room was kept fully employed in the preparation of plans for the various works proposed or in hand, and a considerable amount of work was involved in the collection and preparation of information for use of the Interstate Conference on Artesian Waters.

This branch also deals with water rights, for which 128 applications were received and 81 licenses issued.

LOCAL GOVERNMENT.

On the 31st December, 1912, the second period of three years from the commencement of Local Government will expire, and on or before that date it will be necessary to make proclamation of the prescribed triennial classification of the shires, fixing the amount of endowment they will be entitled to receive from the State during the succeeding term of three years.

The classification of each shire is determined, *inter alia*, by the relationship, the estimated revenue for the term in question, based on the actual revenue for the preceding year, bears to the necessary annual expenditure, and provision is made for the subdivision of the shires into six classes, the statutory endowment varying from not more than 10s. in the £ for first-class to not less than 40s. in the £ for sixth-class shires. Under the classification now in force, 27 shires are regarded as self-supporting, and receive no subsidy, whilst the remainder receive assistance at rates ranging from 1s. 6d. to 133s. for every £ received by way of general revenue.

These rates, it was estimated, would involve an annual payment of £290,030; but, as may be seen from the attached statement, it is likely that sum will be exceeded.

Although delays on the part of Councils in furnishing the periodical accounts are still noted, reference is made by the Officer-in-Charge to the general improvement which is gradually taking place in this respect. He also directs attention to apparent discrepancies in the valuation of shires and municipal lands, which suggest necessity for a more reliable system.

Examinations

Examinations were held during the year for town and shire clerks, auditors engineers, and overseers; and revision of the ordinances and regulations was put in hand.

The total amount paid out by the Department in connection with Local Government, including endowment, special grants, and recoupment of ferry tolls, was £365,562 13s. 8d.

STORES AND PLANT.

The transactions of this Branch, which is responsible for the purchase and issue of practically the whole of the plant and material used by the Department, again shows marked increase on those of preceding years, whilst the depôt at Pymont, where working plant of all kinds is held in stock, has been heavily taxed to meet the demands made upon it.

The number of requisitions dealt with was 26,158, representing a value of £779,778 16s. 2d. These necessitated the issue of 37,338 different "orders" on various firms and trades people.

The duty paid at Customs on imported goods amounted to £38,156 4s. 1d., as compared with £13,540 14s. 11d. the previous year.

17,190 tons of cement were distributed, being 6,906 tons in excess of the quantity used last year. All local supplies of this material were exhausted, and it became necessary to make extensive importations from New Zealand and elsewhere, in order to prevent stoppage of works in hand.

447 tests of cement and sand were made, 3,933,409 super. feet of hewn timber, 59,956 feet of piles, 134,114 sleepers, 3,292 tramway and telegraph poles, and 152,054 feet of earthenware pipes, were inspected and passed.

The State brickworks were extended during the year by the establishment of an additional plant for the manufacture of sand-lime brick, at Botany where the sand is well suited for the purpose in view. Lime will be obtained from the State lime works near Taree.

The acquisition of a metal quarry, for which negotiations had been entered into last year, was completed, and operations commenced. Improvements and additions are in contemplation to the working plant, which, while increasing the output, will, it is anticipated, effect a considerable reduction in the cost of production.

The quantity of metal supplied to the Department and various consumers during that part of the year the work has been in operation, was 54,893 tons, the return being about £2,740 in excess of expenditure.

A concession, much appreciated by contractors, was made during the year in the general conditions governing contracts with the Department. Hitherto it had been the practice to deduct 20 per cent. of the actual value of the work done by the contractor from all progress payments, until the total of such deductions equalled the amount of the security deposit, after which advances were paid in full.

The provision as to "retention money" had, therefore, the effect of doubling the security held against the contractor, and the Minister decided that the additional precaution was unnecessary, and directed that the "general conditions" be amended accordingly. Progress payments are now made to full value of the work performed.

By retirement, resignation, or death the Department has been deprived of the services of several valuable and experienced officers.

Col. W. L. Vernon, F.R.I.B.A., who for twenty-one years honourably and efficiently occupied the position of Government Architect, retired on reaching the statutory age limit. The public buildings in every part of the State bear signal testimony to the care, zeal and ability which he has displayed, and will remain as a witness to the good services he has rendered. The indirect healthy effect of those artistic structures will long, as they have done in the past, influence the style of private buildings.

Mr. J. M. Cameron, after a service in the Department extending over twenty-one years, during which time he was successively roads superintendent, district engineer, Governor of Trial Bay Prison, and finally superintendent of stores, resigned.

Mr. Buswell, assistant engineer in the Harbours and Rivers Branch, and formerly assistant to Mr. P. Allan when supervising the construction of Pymont Bridge, was removed by death; whilst Mr. Brownrigg, assistant engineer in the metropolitan district, has, by a regrettable accident, been incapacitated for many months.

From May, 1907, until October of this year, the position of Under Secretary was filled by Mr. W. J. Hanna, and the operations of the Department for the period embraced in this Report were therefore carried out under his able administration.

From my former close official and personal association with Mr. Hanna, I am glad to be in a position to state my appreciation of the very valuable services, which he has, in my opinion, rendered not only to the Department, but to the State.

For many years during the earlier part of his career in the Department, he was in sole charge of the greater portion of the Western Division, and it was entirely due to his untiring energy and resource that many of the then-urgently-necessary works of public utility in the districts about Broken Hill and Wilcannia, were, in the face of most discouraging conditions, carried to successful completion. When in later years he was appointed as Head of the Roads and Bridges Branch in this office, and subsequently, in 1907, succeeded me as Under Secretary, he brought to bear the same earnest and unflagging devotion to duty which had so conspicuously characterised his earlier work.

His connection with the Department extended over a period of thirty-three years, and I have no doubt that his intimate knowledge of all matters relating to the professional division of the service will be of peculiar value to the State in the position on the Public Service Board to which he has now been appointed.

J. DAVIS,

Director-General for Public Works.

Accounts Branch, 1911-1912.

I HAVE the honor to submit the Yearly Report covering the period from the 1st July, 1911, to the 30th June, 1912 :—

The net expenditure for the financial year under review was £4,152,548 13s. 9d. This is exclusive of the operations of the Metropolitan and Hunter District Water and Sewerage Boards. A comparative statement of the volume of business, extending over a period of eight years, is furnished in Appendix "A," and it will be observed that there has been a considerable increase in the Department's operations, the expenditure being greater than that of 1910-11 by £1,050,264 1s. 2d.

The distribution of the total expenditure amongst the various funds, classes of work and services is set forth in Appendix "B."

Appendix "C" supplies information as to the control of the expenditure :—

	£	s.	d.
By Departmental Officers	3,774,781	4	1
„ Municipalities	18,723	14	5
„ Shires	359,043	15	3
	£4,152,548	13	9

while Appendix "D" is a comparative statement of similar information for the years 1906-7 to 1911-12 inclusive.

Land Resumptions and Costs paid for during the year, apart from those of Darling Harbour and Rocks Resumptions, amounted to £305,217 9s., are summarised in Appendix "E."

CONTRACTS.

The contracts let and in progress during the year were as follows :—

Branch.	No. let.	Amount of Contracts let from 1 July, 1911, to 30 June, 1912.	No. Unfinished on 30 June, 1912.	Outstanding Balances on Unfinished Contracts on 30 June, 1912.
		£ s. d.		£ s. d.
Bridges.....	32	36,485 16 4	12	13,863 14 11
Railways and Tramways	64	465,879 14 0	38	99,635 2 4
Artesian Bores.....	41	29,788 3 9	12	9,872 10 7
Water Conservation and Supply	114	330,880 15 9	29	160,332 4 4
Sewerage	16	136,986 18 7	8	14,333 0 4
Harbours and Rivers	27	60,222 6 3	7	47,355 17 0
Public Buildings.....	362	286,890 15 10	92	74,762 2 10
School Buildings	409	109,021 3 11	76	14,021 1 2
Commonwealth	363	41,430 15 6	73	23,850 10 5
Roads	96	21,465 15 11	15	5,193 3 5
Total.	1,524	1,519,052 5 10	362	463,219 7 4

COMPARATIVE STATEMENT OF CONTRACTS.

Year.	Number of Contracts let during the year.	Amount of Contracts let during the year.	Number of Contracts unfinished on 30th June.	Outstanding Balances on Contracts on 30th June, due on completion.
		£ s. d.		£ s. d.
1903-4	2,356	350,794 5 7	370	119,870 4 9
1904-5	3,604	586,660 13 3	550	329,013 3 5
1905-6	3,878	578,655 10 5	697	399,627 12 6
1906-7	3,259	627,489 4 5	332	324,561 1 8
1907-8	1,542	1,112,875 7 8	432	667,308 11 4
1908-9	1,516	2,015,784 18 11	442	1,471,578 18 1
1909-10	2,268	1,806,988 18 8	760	1,625,250 19 0
1910-11	1,637	980,482 15 9	495	1,227,659 16 10
1911-12	1,524	1,519,052 5 10	362	463,219 7 4

WAGES.

The wages paid to daily-rate men is detailed in the comparative statement below, and is exclusive of the salaries of Officers and of Dredge Service employees :—

Year.	Number of Vouchers.	£ s. d.
1905-6.....	7,821	442,568 11 11
1906-7	7,915	306,213 10 7
1907-8	10,420	317,657 12 9
1908-9	9,911	303,761 14 9
1909-10	9,909	291,889 3 10
1910-11	11,357	399,929 18 6
1911-12	21,462	1,027,271 19 1

OPERATIONS OF THE PAYMASTER.

The amounts dealt with by the Paymaster make up the following total :—

Account.	Receipts.	Disbursements.	Dr. Balance.	Cr. Balance.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Expenditure Accounts	1,713,884 7 3	1,731,222 0 4	17,337 13 1	.....
Collection Accounts.—Revenue, Suspense, and other moneys	176,325 13 6	175,727 15 6	.....	597 18 0
Trust Accounts Deposits (1081 deposits for 1911-12)	24,808 13 5	22,629 0 11	.....	2,179 12 6
Fixed Bank Deposits, including those from 1910-11—Securities on Contracts (60 deposits for 1911-12)	129,485 6 0	69,018 0 0	.....	60,467 6 0
Total.....	2,044,504 0 2	1,998,596 16 9	17,337 13 1	63,244 16 6

Out of the total year's expenditure of £4,152,548 13s. 9d. the Paymaster disbursed £1,731,222 0s. 4d., and the payments by Treasury and other Departments aggregated £2,421,326 13s. 5d.

Owing to the extension of the day-labour system the number of bank accounts in head and local offices for payment of wages and other claims increased from 115 on the 1st July, 1911, to 169 on the 30th June, 1912.

The floating advances, granted to enable wages and other urgent claims to be promptly paid, were as follows :—

Account.	Amount of Advance.	Amount unadjusted on 30th June, 1912.
	£	£ s. d.
Revenue Advance	53,075	30,455 12 5
Loans Advance.....	170,325	121,343 5 11
Public Advance	1,500	857 19 0
Commonwealth Advance	10,000	12 13 0
£	234,900	152,669 10 4
<i>Overdraft Accounts.</i>		
Expenditure Suspense Account	29,000	28,285 13 8
Salaries Suspense Account	11,000	3,513 14 8
£	40,000	31,799 8 4

COUNTRY TOWNS WATER SUPPLY AND SEWERAGE.

During the year applications having been received for the construction of water works for the undermentioned towns, the Municipal and Shire Councils' books were examined and financial reports submitted :—

Coraki	Gosford
Dungog	Gulgong
Gloucester	Murrurundi

The books in connection with the water supplies at Gundagai and Wellington were also examined, and reports furnished in reference thereto.

An exhaustive examination was made of the Tamworth Water Supply Accounts, and in consequence of the unsatisfactory manner in which the rates were being collected, it was decided to place the management and administration of the water works in the hands of the District Works Officer at Tamworth.

At the request of the Treasury, Balranald was visited for the purpose of assisting in the preparation of a statement of the Balranald Water Supply Account, in order that the new Receiver, Mr. Hawarth, appointed by the Master in Equity, might take over the control of the account.

Parramatta was also visited for the purpose of determining the amount to be paid to the Council towards the cost of maintenance of the sewerage works.

Appended are tabulated statements—

Country Towns Water Supplies	Appendix G.
Country Towns Sewerage and Drainage	H.
Water and Drainage Trusts	I.

OFFICERS.

In the Statements referring to the cost of supervision, only those of the Dredge Service, designated "Chief Engineers and Masters," are included, as the others are not deemed to be "Officers" in the ordinary acceptance of the term; also, for the same reason, the following have been omitted :—Mechanics, maintenance men, labourers, and others employed without the specific authority of the Public Service Board.

The staff of the Department at the close of the financial years 1910-11 and 1911-12 is shown in the following comparative statement :—

Designation.	No. of Officers.		Annual Salary Charges.	
	30th June, 1911.	30th June, 1912.	30th June, 1911.	30th June, 1912.
Permanent	473	525	£ 126,348	£ 147,001
Temporary	477	1,005	98,574	177,445
Dredge Service employees, not engaged in supervision				
Permanent...	259	266	40,152	43,362
Temporary...	94	125	10,608	16,012
Total.....	353	391	50,760	59,374

The total increase for the year was :—

	No.	Amount.
Permanent	52	£20,653
Temporary	528	78,871
Dredge Service... ..	38	8,614
Total Increase	618	£108,138

The actual disbursements for salaries and wages of Officers, from Loans and Revenue and Public Works Fund Votes, or other headings of appropriations, during the financial year 1911-12, were as follows :—

<i>Permanent Staff.</i>							£	s.	d.	£	s.	d.
General...	...	...	...	...	...	...	138,605	11	7			
Dock ...	...	...	...	...	...	...	4,910	2	9			
Dredge Service	...	...	...	...	...	...	46,670	0	10			
										190,185	15	2
<i>Temporary Staff.</i>							£	s.	d.			
General ... ..	...	...	...	...	...	...	125,027	19	3			
Dock ... ..	...	...	...	...	...	...	194	12	11			
Dredge Service	...	...	...	...	...	...	16,417	12	2			
										141,640	4	4
Total ... ..	...	...	...	...	...	...				£331,825	19	6

The disbursements in connection with design, administration, and supervision may be stated as :—

	£	s.	d.	£	s.	d.
Salaries				331,825	19	6
Allowances, &c.—						
Equipment	8,031	8	5			
Other allowances, travelling expenses, hire of vehicles, and sundries	29,419	4	7			
Rents	217	16	4			
Cleaning, fuel and light, country offices	441	7	2			
Fuel and light, Head office	269	1	2			
Postage and telegrams	3,034	14	4			
Telephones	844	7	5			
				42,257	19	5
Total				£374,083	18	11

On the above, the charges for those who would be employed by Contractors, such as foremen, gangers, overseers, leading hands, time and store keepers, &c., are estimated at £125,316 19s. 6d.

	£	s.	d.	£	s.	d.
Total disbursements				374,083	18	11
Less—Salaries	115,124	9	1	125,316	19	6
Allowances, &c.	10,192	10	5			
Approximate cost of administration, design, and supervision				£248,766	19	5

This amount represents, say, 5·99 per cent. of the total expenditure for 1911-12, which was £4,152,548 13s. 9d. For the previous year the percentage was 6·59, prior to which the average for the preceding eight years was 7·28 per cent.

Statements are attached showing number of Officers, with annual salary and allowance charges, also total disbursements, as above, for the past ten years. (K. and L.)

The year's work has been most strenuous for the Accounts Branch, and the staff had to be very considerably increased with temporary officers to enable the work to be coped with. A great amount of overtime work had also to be performed.

It is with pleasure that I again bear testimony to the general efficiency of the Accounts Branch Staff, their loyalty and devotion to duty, and to the satisfactory manner in which their duties have been discharged.

THOMAS R. STEEL,
Accountant.

14th September, 1912.

Appendix A.

STATEMENT of volume of Expenditure, &c., for eight years.—

Year.	Number of Persons or Firms dealing with Department, exclusive of Officers or Wages Men.	Number of Pay Vouchers of all Descriptions.	Expenditure.													
			Loans		Revenue.		Public Works Fund.		Miscellaneous.		Special Deposits.		Other Departments.		Total.	
			£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1904-5	5,297	40,840	812,680	4 7	709,205	16 2	.....	.....	35,750	11 5	.....	.....	169,894	2 8	1,727,530	14 10
1905-6	5,244	43,831	743,943	7 10	789,449	7 11	.....	.....	11,540	13 11	33,986	7 0	117,121	15 2	1,701,041	11 10
1906-7	5,661	44,280	659,705	4 4	814,546	5 4	240,847	8 7	28,068	9 8	23,428	13 5	153,884	4 10	1,920,480	6 2
1907-8	6,585	45,009	823,049	3 7	560,002	18 8	685,091	17 7	18,588	12 9	16,400	0 6	211,189	2 2	2,314,321	15 3
1908-9	4,812	46,264	1,027,730	9 0	572,673	7 11	527,937	8 4	4,349	0 11	26,001	9 7	332,334	10 0	2,491,076	5 9
1909-10	4,105	49,041	1,377,336	6 2	638,711	6 6	431,524	1 9	19,460	7 3	12,082	18 5	312,703	8 10	2,791,868	8 11
1910-11	5,410	54,124	1,459,301	18 11	691,596	7 3	482,098	8 0	6,684	18 2	26,517	13 5	436,085	6 10	3,102,284	12 7
1911-12	6,841	76,972	2,305,912	17 5	839,031	13 4	523,700	9 4	33,586	14 10	13,101	15 4	437,215	3 6	4,152,548	13 9

Appendix B.

SUMMARY of Expenditure for Year ended 30th June, 1912.

Head of Service.	Loans.	Revenue.	Public Works Fund.	Miscellaneous.	Special Deposits.	Other Departments.	Total.	Credits.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Establishment—Salaries		110,113 13 9		211 10 11			110,325 4 8	
Railway Construction	919,215 17 11		3,836 5 6	279 15 8			923,331 19 1	
Tramway Construction	182,714 16 9		1,708 11 9				184,423 8 6	
State Public Buildings	149,789 12 9	44,892 1 8	218,595 3 8	39 6 1	199 4 7	6,583 18 3	420,099 7 0	
Roads		17,386 0 9	7,162 11 9		4,840 3 7	19,361 12 5	48,750 8 6	
Bridges		16,668 12 8	35,622 0 10		1,714 1 7		54,004 15 1	
Punts, Ferries, and Launches ..		23,201 16 2	139 8 6		14 13 6		23,355 18 2	
Public Watering Places, Artesian Bores, Water Conservation and Drainage		9,386 2 2	12,534 0 5	139 5 2	279 0 2		22,338 7 11	Loans. 23 15 0
Harbours and Rivers and Dredge Service		9,082 18 3	117,448 14 11	67 14 11	178 4 10			Loans. 1,683 18 6
Dock Establishment		145,140 0 7					271,917 13 6	
Water and Drainage Act		24,189 4 8	76,520 3 2	30,489 13 1			131,199 0 11	
Water Conservation	60,135 17 5						60,135 17 5	Loans. 204 13 10
Burrinjuck Reservoir and Irrigation Scheme								P.W.F. 153 14 7
Sewerage Construction, Country Towns	508,651 3 7						508,651 3 7	P.W.F.
Water Supplies, Country Towns Metropolitan—			2,116 16 2	112 10 0	532 7 5		171,704 6 9	
Sewerage Construction	123,700 13 10	130 11 1			5,333 4 8		129,164 9 7	Loans. 6,250 14
Water Supplies								
Hunter District—								
Sewerage Construction	64,558 14 10						65,613 9 11	
Water Supplies	1,054 15 1							
State Brickworks—								
Homebush	26,112 1 5	7,283 3 10					33,395 5 3	
Botany	17,695 9 5						17,695 9 5	
State Blue Metal Quarries—								
Port Kembla	1,374 9 1						1,374 9 1	
Klarna	22,529 16 11	15,939 18 9					38,469 15 8	
State Lime Works—								
Taree and Botany	4,981 9 8	18 12 3					5,000 1 11	
Miscellaneous Schedule		13,332 12 1		258 13 0	7 17 2		13,599 2 3	
Compensations and Gratuities ..		4,363 11 3		443 13 0			4,807 4 3	
Equipment, Travelling Allowances, &c.		43,484 12 11					43,484 12 11	
Rents, Cleaning, Departmental Contingencies, &c.		12,046 1 4					12,046 1 4	
Local Government		338,617 3 5			2 17 10		338,620 1 3	
Grants to Shires and Municipalities			18,171 2 9				18,171 2 9	
To provide for Purchase of Stores, &c.			30,000 0 0				30,000 0 0	
Royal Commissions—Inquiry—								
Public Works Department		223 0 2					223 0 2	
Iron and Steel Industry		2,080 18 3		1,544 13 0			3,625 11 3	
Darling Harbour and "Rocks" Resumption	3,963 13 9					2,987 8 1	6,951 1 10	
Claims against and work done for other Departments						295,405 11 6	295,405 11 6	
Claims against and work done for Commonwealth Government						112,876 13 3	112,876 13 3	
Total	£ 2,314,166 4 2	839,031 13 4	523,854 19 5	33,586 14 10	13,101 15 4	437,215 3 6	4,160,956 10 7	8,407 16 10

Expenditure.....	£ s. d.
Less Credits—	
Loans	£ s. d.
Public Works Fund	8,253 6 9
	154 10 1
	8,407 16 10
Net Expenditure	£ 4,152,548 13 9

Appendix C.

Appendix C.

DISTRIBUTION of 1911-12 Expenditure between Departmental Officers and Local Bodies :—

	£	s.	d.
Departmental Officers	3,774,781	4	1
Shires—	£	s.	d.
Endowment	334,268	14	5
Special Grants	7,154	14	0
Roads and Bridges	9,275	0	0
Ferries—Recoupment of Tolls, &c. ...	8,205	6	10
Water Supplies	125	0	0
Pounds... ..	15	0	0
	359,043	15	3
Municipalities—			
Endowment	2,673	10	0
Special Grants... ..	11,016	8	9
Roads and Bridges	608	0	0
Ferries—Recoupment of Tolls, &c. ...	599	9	6
Water Supplies	1,387	6	2
Sewerage	2,306	0	0
Harbours and Rivers... ..	108	0	0
Public Watering-places	25	0	0
	18,723	14	5
TOTAL	£4,152,548	13	9

Appendix D.

COMPARATIVE Statement of Expenditure by Departmental Officers, &c.

Year.	By Departmental Officers.	By Municipalities.	By Shires.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1906-7	1,695,989 19 9	81,530 0 2	142,960 6 3	1,920,480 6 2
1907-8	2,003,363 19 11	61,115 16 7	249,841 18 9	2,314,321 15 3
1908-9	2,223,700 15 2	20,303 11 7	247,071 19 0	2,491,076 5 9
1909-10	2,460,981 9 2	24,661 12 8	306,225 7 1	2,791,868 8 11
1910-11	2,747,384 19 0	27,088 16 0	327,810 17 7	3,102,284 12 7
1911-12	3,774,781 4 1	18,723 14 5	359,043 15 3	4,152,548 13 9

Appendix E.

LAND RESUMPTION AND COSTS.

DISBURSEMENTS for the year 1911-12, exclusive of the Darling Harbour and Rocks Resumptions :—

Head of Service.	Loans.	Revenue.	Public Works Fund.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Railway Construction	11,598 5 3	.....	.....	11,598 5 3
Tramway	10,138 16 7	.....	.....	10,138 16 7
Roads .....	.....	.....	108 3 0	108 3 0
Public Buildings .....	.....	78 13 8	13,866 17 8	13,945 11 4
Harbours and Rivers.....	27 5 0	25 12 2	438 6 0	491 3 2
Burrinjuck Reservoir and Northern Murrumbidgee Canals.	251,782 5 1	.....	.....	251,782 5 1
Water and Drainage Act	27 2 0	.....	.....	27 2 0
Sewerage Construction	7,477 9 8	.....	.....	7,477 9 8
Water Supplies	4,628 11 5	.....	.....	4,628 11 5
Botany Brickworks	1,020 1 6	.....	.....	1,020 1 6
State Metal Quarries, Kiama	4,000 0 0	.....	.....	4,000 0 0
Totals	290,699 16 6	104 5 10	14,413 6 8	305,217 9 0

Appendix F.

STATEMENT showing repayments during year ended 30th June, 1912, on account of previous years Revenue Votes.

Vote or Work.	Amount.
	£ s. d.
Harbours and Rivers	7 8 9
Dredge Service	1,000 3 4
Treasurer's Advance Account	140 0 0
Dock Contingencies	21 14 4
Bridges	233 7 7
Public Watering Places	63 10 4
Miscellaneous Schedule	5 18 2
Establishment Salaries	73 16 0
Public Buildings... ..	690 16 10
Punts, &c.	14 14 8
Equipment	23 1 1
Rents, Cleaning	5 0 4
Royal Commission	22 6 6
Compensations, &c.	50 0 0
Total	£2,351 17 11

Appendix G.

Appendix G.

COUNTRY TOWNS WATER SUPPLY.

STATEMENT of Gazetted Works to 30th June, 1912.

Municipality.	Date Gazetted.		Period of Repayment of Debt.	Annual Instalment.
	Amount.	Date.		
	£ s. d.			£ s. d.
Albury	41,000 0 0	31 Dec., 1894 ...	100 years ..	1,482 11 0
Armidale	40,417 13 2	1 July, 1898 ...	100 " ..	1,461 10 3
" Additional	300 0 0	7 Apl., 1909 ...	50 " ..	12 15 10
Ballina	13,605 0 0	30 Dec., 1904 ...	100 " ..	491 19 1
" Additional	4,046 12 3	9 Nov., 1910 ...	50 " ..	172 10 5
Balranald	6,000 0 0	31 Dec., 1894 ...	100 " ..	216 19 0
Bathurst	55,000 0 0	31 Dec., 1894 ...	100 " ..	1,988 16 0
" Additional	733 15 1	2 Feb., 1906 ...	100 " ..	29 18 10
Berry	4,323 0 0	13 May, 1902 ...	100 " ..	156 6 4
" Additional	56 10 8	25 Apl., 1906 ...	100 " ..	2 6 2
Blayney	10,519 15 9	19 Oct., 1904 ...	100 " ..	380 7 11
" Additional	251 0 11	7 Nov., 1906 ...	100 " ..	9 1 6
Bourke	13,436 0 0	31 Dec., 1894 ...	100 " ..	485 17 0
Bowral	872 8 10	29 Sept., 1909 ...	20 " ..	61 7 9
Casino	10,285 4 5	12 Sept., 1906 ...	100 " ..	371 18 3
" Additional	1,141 16 0	30 Sept., 1908 ...	50 " ..	48 13 7
" "	819 7 6	11 May, 1910 ...	50 " ..	34 18 8
Cobar	26,067 11 0	29 Sept., 1903 ...	100 " ..	942 12 0
" Additional	92 9 0	28 Mar., 1906 ...	100 " ..	3 15 5
Condobolin	7,039 5 8	16 Apl., 1901 ...	100 " ..	254 10 9
" Additional	685 16 11	2 Feb., 1906 ...	100 " ..	27 19 9
Coonamble	6,742 8 1	1 July, 1898 ...	100 " ..	243 15 10
" Additional	2,606 17 6	4 Apl., 1906 ...	100 " ..	106 7 7
" "	865 3 3	9 Mar., 1910 ...	50 " ..	36 17 8
Cootamundra	10,896 0 0	31 Dec., 1894 ...	100 " ..	394 0 0
" Additional	10,073 8 0	7 Nov., 1906 ...	100 " ..	364 5 1
" "	1,946 3 5	5 Apl., 1911 ...	25 " ..	118 1 8
Corowa	9,317 17 4	5 Feb., 1908 ...	50 " ..	397 5 2
" Additional	610 4 0	14 Apl., 1909 ...	50 " ..	26 0 4
" "	469 17 8	18 Aug., 1909 ...	50 " ..	20 0 8
" "	180 19 0	27 Aug., 1910 ...	50 " ..	12 14 7
Cowra	15,520 17 6	5 Jan., 1910 ...	50 " ..	661 14 0
Deniliquin	18,468 7 2	31 Dec., 1894 ...	100 " ..	667 16 0
" Additional	200 0 0	8 Nov., 1811 ...	20 " ..	14 1 5
Dubbo	15,238 3 4	30 June, 1896 ...	100 " ..	551 0 3
" Additional	6,842 7 0	29 Sept., 1911 ...	50 " ..	291 14 4
Forbes	7,958 7 2	31 Dec., 1893 ...	100 " ..	287 15 3
" Additional	12,968 11 5	23 Feb., 1906 ...	100 " ..	529 4 5
Goulburn	55,000 0 0	31 Dec., 1894 ...	100 " ..	1,988 16 0
" Additional	1,570 0 0	5 Apl., 1911 ...	50 " ..	66 19 2
Gundagai	11,000 0 0	28 Sept., 1910 ...	50 " ..	468 19 5
" Additional	278 0 0	24 Aug., 1911 ...	25 " ..	16 17 4
Gunnedah	14,881 0 0	22 July, 1909 ...	50 " ..	634 8 8
Hay	7,691 4 10	31 Dec., 1893 ...	100 " ..	278 2 2
" Additional	8,337 7 3	25 July, 1906 ...	100 " ..	301 9 7
" "	1,046 9 6	11 Dec., 1907 ...	50 " ..	44 12 4
Hillgrove	4,000 0 0	7 Nov., 1906 ...	50 " ..	170 10 9
Jerilderie	5,428 14 5	31 Dec., 1894 ...	100 " ..	196 6 3
" Additional	873 16 6	7 Mar., 1906 ...	100 " ..	35 13 2
" "	215 7 8	23 Dec., 1908 ...	25 " ..	13 1 4
Junee	42,000 0 0	14 July, 1903 ...	100 " ..	1,518 14 5
Katoomba	19,548 13 2	10 Nov., 1909 ...	50 " ..	833 8 9
" Additional	1,181 8 0	14 Sept., 1910 ...	50 " ..	50 7 4
Kiama	7,073 9 8	19 Mar., 1901 ...	100 " ..	255 15 3
Lismore	10,016 4 8	31 Dec., 1894 ...	100 " ..	362 3 6
" Additional	4,806 7 0	28 Mar., 1906 ...	100 " ..	196 2 9
" "	3,703 14 0	9 Nov., 1910 ...	50 " ..	157 18 0
Lithgow	12,749 5 11	30 June, 1896 ...	100 " ..	461 0 0
" Additional	8,026 13 10	6 Nov., 1907 ...	50 " ..	342 4 2
" "	12,734 6 6	18 Mar., 1908 ...	50 " ..	542 18 3
" "	2,221 15 8	13 July, 1910 ...	50 " ..	94 14 6
Mittagong	11,290 9 9	12 Oct., 1910 ...	50 " ..	481 7 1
" Additional	443 15 4	12 July, 1911 ...	20 " ..	31 4 6
Moama	7,600 11 0	25 Feb., 1898 ...	100 " ..	274 16 4
Moss Vale	13,000 0 0	1 July, 1898 ...	100 " ..	470 0 0
Moree	10,940 10 0	2 Dec., 1904 ...	100 " ..	395 12 2
Mudgee	17,029 13 11	3 Feb., 1903 ...	100 " ..	615 15 10
" Additional	1,477 10 7	27 July, 1910 ...	25 " ..	89 12 11
" "	1,439 15 0	13 Dec., 1911 ...	50 " ..	61 7 8
Murwillumbah	2,637 17 6	16 June, 1909 ...	Interest only	105 10 4
" Additional	517 14 0	5 Apl., 1911 ...	50 years ..	22 1 5
Nowra	12,592 15 10	30 June, 1896 ...	100 " ..	455 7 3
" Additional	666 4 0	2 Feb., 1906 ...	100 " ..	27 3 8
Nyngan	9,000 0 0	31 Dec., 1906 ...	100 " ..	325 8 9
" Additional	1,218 19 0	12 Sept., 1906 ...	100 " ..	44 1 6
Orange	32,688 0 0	31 Dec., 1894 ...	100 " ..	1,182 0 0
" Additional	7,634 9 9	20 July, 1910 ...	50 " ..	325 9 9
Parkes	13,660 8 0	27 Apl., 1894 ...	100 " ..	493 19 2
" Additional	8,339 12 0	30 June, 1906 ...	100 " ..	301 11 2
Picton	15,951 1 10	15 Feb., 1901 ...	100 " ..	576 15 10
" Additional	35 19 8	11 Apl., 1906 ...	100 " ..	1 9 4
" "	1,207 3 5	11 Apl., 1910 ...	50 " ..	51 9 4
Singleton	17,857 1 0	10 Aug., 1910 ...	50 " ..	761 6 3
" Additional	5,120 2 9	24 May, 1911 ...	50 " ..	218 5 10
Tumut	10,238 0 10	26 Aug., 1903 ...	100 " ..	370 4 2
Wagga Wagga	38,500 0 0	31 Dec., 1894 ...	100 " ..	1,392 3 0
" Additional	3,087 13 0	2 Feb., 1906 ...	100 " ..	126 0 0
Warren	3,969 3 4	21 Aug., 1900 ...	100 " ..	143 10 5
" Additional	1,850 6 8	10 June, 1908 ...	25 " ..	112 5 4
Wellington	12,061 10 10	26 Apl., 1902 ...	100 " ..	436 2 10
" Additional	371 4 7	2 Feb., 1906 ...	100 " ..	15 3 0
Wentworth	4,000 0 0	31 Dec., 1894 ...	100 " ..	144 13 0
Wilcannia	8,380 12 4	31 Dec., 1894 ...	100 " ..	303 1 2
	£ 866,791 3 6			£ 32,745 11 10

Appendix H.

COUNTRY TOWNS SEWERAGE AND DRAINAGE.

STATEMENT of Gazetted Works to 30th June, 1912.

Municipality.	Debt Gazetted.		Period of Repayment of Debt.	Annual Repayment Instalment.
	Amount.	Date.		
	£ s. d.			£ s. d.
Ballina	326 18 9	3 Jan., 1906..	25 years	19 16 9
Blayney	429 5 3	1 May, 1905...	25 "	26 0 11
Casino	3,023 4 7	17 July, 1904...	50 "	128 17 10
Coraki	1,214 6 2	15 Dec., 1909...	28 "	68 14 8
Forbes	1,623 8 8	16 July, 1904...	100 "	58 14 1
Hay	22,040 6 5	26 Sept., 1905..	100 "	796 19 6
" Additional	327 18 8	6 Oct., 1909...	100 "	11 17 2
Katoomba	17,299 2 1	11 " 1911...	60 "	693 9 11
Lismore	17,588 19 9	24 " 1906...	100 "	636 0 4
Narrandera	5,196 15 2	9 Feb., 1906...	100 "	187 18 3
" Additional	881 4 0	21 July, 1909...	28 "	49 17 7
" "	3,986 9 7	19 April, 1911...	28 "	225 12 11
Parkes	250 0 0	1 Jan., 1907...	28 "	15 0 0
Parramatta	66,010 9 4	24 Aug., 1910...	100 "	2,386 17 10
Tamworth	1,216 13 3	19 Sept., 1906...	50 "	56 12 9
	£141,415 1 8			£5,362 10 6

Appendix I.

WATER AND DRAINAGE.

THE undermentioned Trusts have been constituted in connection with the Bores, &c., constructed under the Water and Drainage Act, and the debts have been fixed and gazetted.

Name of Bore, &c.	Debt as Gazetted.		Total Annual Payment.	Amount of first Payment.	Due date.	Subsequent Payments.	How Payable.
	Amount.	Date.					
	£ s. d.		£ s. d.	£ s. d.		£ s. d.	
Algdgerie Creek Weir	742 10 0	1 Mar., 1911	57 19 4	43 9 6	1 Dec., 1910	14 9 10	Quarterly.
Alipou Swamp Drainage	770 19 8	27 Sept., 1911	45 18 0	34 8 6	16 Feb., 1912	11 9 6	"
Anna Bay Swamp Drainage	1,518 12 5	17 Jan., 1912	90 8 4	67 16 2	18 April, 1912	22 12 1	"
Baroma Bore	3,741 11 9	6 Dec., 1911	222 15 0	167 1 4	7 Aug., 1912	55 13 9	"
Big Swamp Drainage	7,797 12 8	24 Oct., 1906	469 9 2	87 19 3	1 Jan., 1907	234 14 7	Half-yearly.
Black Swamp Drainage	836 19 0	29 July, 1908	49 16 7	37 7 5	29 " 1909	12 9 2	Quarterly.
Bomuckledi Bore	2,704 2 3	2 Sept., 1908	160 19 9	120 14 10	2 Mar., 1909	40 4 11	"
Boobora "	4,515 16 9	15 June, 1910	268 17 0	201 12 9	15 Dec., 1910	67 4 3	"
Booloroo "	4,709 4 9	26 " 1912	280 7 4	210 5 6	20 Nov., 1912	70 1 10	"
Boomi "	1,120 3 2	2 Oct., 1907	339 13 8	254 15 4	2 April, 1908	84 18 5	"
" Additional	331 9 7	6 " 1909	19 14 8	14 16 0	6 " 1910	4 18 8	"
Bourbah "	1,194 7 6	23 " 1907	183 1 9	137 6 2	23 " 1908	45 15 7	"
Brundee Swamp Drainage	980 11 4	30 Dec., 1905	43 8 10	12 2 9	30 June, 1906	21 14 4	Half-yearly.
Bugilbone Bore	3,736 18 11	28 July, 1909	222 9 8	166 17 3	28 Jan., 1910	55 12 5	Quarterly.
Bullatale "	2,107 11 10	1 June, 1910	125 9 6	94 2 2	1 Dec., 1910	31 7 4	"
Bulyeroi "	1,004 1 10	15 July, 1908	202 15 7	152 1 8	15 Jan., 1909	50 13 11	"
Bunyah "	3,926 0 1	2 Aug., 1911	175 6 1	233 14 8	7 Mar., 1912	58 8 8	"
Careunga "	6,180 0 0	5 Feb., 1908	367 18 8	275 19 0	5 Aug., 1908	91 19 8	"
" Additional	55 14 0	1 Dec., 1909	3 6 4	2 9 9	1 June, 1910	0 16 7	"
Come-by-Chance Bore	3,852 8 1	18 Feb., 1906	231 18 6	86 8 4	18 Aug., 1906	115 19 3	Half-yearly.
" Additional	197 8 9	10 July, 1907	11 15 1	8 16 4	10 Jan., 1908	2 18 9	Quarterly.
Condobolin West Weir	691 14 7	22 Mar., 1910	41 3 10	30 17 11	24 Sept., 1910	10 5 11	"
Cooroobongatti Swamp Drainage	4,888 14 3	2 Nov., 1909	291 1 0	218 5 6	3 May, 1910	72 15 3	"
Coubal Bore	5,803 13 9	9 Sept., 1910	345 10 4	259 2 11	7 Mar., 1911	86 7 7	"
" Additional	708 1 3	17 May, 1911	42 3 0	31 12 4	17 Nov., 1911	10 10 9	"
Cudgell Creek Cutting	6,865 3 9	29 June, 1905	274 12 2	137 6 1	5 June, 1910	137 6 1	Half-yearly.
Curl Curl Lagoon Drainage	4,125 0 0	1 Feb., 1911	245 11 8	184 3 9	1 Aug., 1911	61 7 11	Quarterly.
Dolgelly Bore	579 11 2	28 April, 1909	328 10 1	246 7 7	28 Oct., 1909	82 2 6	"
Orildool "	4,094 5 2	2 Aug., 1911	243 15 0	182 16 4	24 Nov., 1912	60 18 9	"
Durembah Swamp Drainage	1,348 5 7	3 May, 1911	80 5 5	60 4 1	1 Aug., 1911	20 1 4	"
Euraba Bore	863 5 9	9 Oct., 1906	324 14 0	243 10 6	9 April, 1907	81 3 6	"
" Additional	132 0 0	27 Sept., 1911	7 17 3	5 17 11	27 Mar., 1912	1 19 4	"
Eurie Eurie Bore	4,907 1 0	7 Feb., 1907	293 7 8	166 11 4	7 Aug., 1907	146 13 10	Half-yearly.
" Additional	203 15 8	6 Nov., 1907	12 2 8	9 2 0	6 May, 1908	3 0 8	Quarterly.
Florida Bore	2,984 3 9	30 " 1905	179 1 0	70 5 0	31 " 1906	89 10 6	Half-yearly.
Gil Gil "	69 5 6	23 Jan., 1909	4 2 8	3 1 10	29 July, 1909	1 0 8	Quarterly.
Gurley Siding Bore	4,097 10 0	2 Aug., 1911	243 19 0	182 19 2	24 Nov., 1911	60 19 9	"
Grahamstown and Campvale Swamp Bore	14,317 14 6	14 Feb., 1912	852 8 4	639 6 2	13 Mar., 1912	213 2 1	"
Hollywood Bore	2,827 10 7	2 Sept., 1908	168 6 8	126 5 0	2 " 1909	42 1 8	"
Kiga Bore	5,638 3 1	26 " 1906	336 17 4	252 12 11	26 " 1907	84 4 4	"
" Additional	195 5 11	8 June, 1910	11 12 7	8 14 5	15 Dec., 1910	2 18 2	"
Little Broadwater Swamp Drainage	761 13 8	22 Nov., 1911	45 7 0	34 0 2	9 Feb., 1912	11 6 9	"
Lyndhurst Bore	233 19 11	30 Oct., 1906	13 18 8	10 9 0	30 April, 1907	3 9 8	"
Mercadool "	2,453 1 8	12 Sept., 1906	146 1 0	109 10 8	12 Mar., 1907	36 10 3	"
Millie "	1,122 0 0	9 " 1908	192 16 0	144 12 0	9 " 1909	48 4 0	"
Moomin "	823 6 4	12 Feb., 1908	198 0 4	148 10 3	12 Aug., 1908	49 10 1	"
" Additional	26 5 0	5 May, 1908	1 11 6	1 3 8	5 Nov., 1908	0 7 10	"
Mungyer "	3,858 16 2	24 Mar., 1909	229 14 8	172 6 0	24 Sept., 1909	57 8 8	"
Murwillumbah Swamp Drainage	1,534 18 10	18 Oct., 1911	91 7 8	68 10 9	16 Feb., 1912	22 16 11	"

Appendix I—Water and Drainage—*continued.*

Name of Bore, &c.	Debt as Gazetted.		Total Annual Payment.	Amount of first Payment.		Due date.	Subsequent Payments.	How Payable.
	Amount.	Date.						
	£ s. d.		£ s. d.	£ s. d.			£ s. d.	
Myocum Swamp Drainage.....	1,089 10 7	6 Mar., 1912	64 17 4	48 13 0	6 Sept., 1912	16 4 4	Quarterly.	
Neargo	3,812 0 0	23 May., 1907	226 19 0	170 4 3	23 Nov., 1907	56 14 9		
Nelson's Plains Drainage	150 0 5	5 Dec., 1906	18 6 7	13 14 11	5 June, 1907	4 11 8		
North Casino Swamp Drainage...	5,506 10 9	11 Jan., 1911	327 16 8	245 17 6	11 July, 1911	81 19 2		
Old Gnomery Bore	4,132 10 0	8 " 1906	246 0 8	184 10 5	8 " 1906	61 10 2		
Oreel No. 1	4,556 7 7	3 June, 1908	271 5 4	203 9 0	3 Dec., 1908	67 16 4		
" " Additional ..	300 6 0	1 Dec., 1909	17 17 8	13 8 2	1 June, 1910	4 9 5		
Oreel No. 2	5,657 17 1	27 Nov., 1907	336 16 11	252 12 8	27 May, 1908	84 4 3		
Sherwood	3,780 3 8	17 May, 1911	225 1 0	168 15 10	10 Nov., 1911	56 5 3		
Talmoi	4,837 11 4	2 Feb., 1910	288 0 1	216 0 1	2 Aug., 1910	72 0 0		
Telleraga	3,966 1 9	12 Jan., 1909	236 2 6	177 1 10	12 July, 1909	59 0 8		
Terranora Swamp Drainage	153 17 0	29 Mar., 1907	10 6 0	8 0 2	29 Nov., 1907	2 5 10		
Terrigammy, Muggabah, and Merrimagell Creeks.	343 19 10	21 April, 1909	20 9 7	15 7 2	21 Oct., 1909	5 2 5		
Three B. Bore	1,058 19 4	19 June, 1912	63 1 0	47 5 9	8 Nov., 1912	15 15 3	Half-yearly. Quarterly.	
Three Corners Bore	1,530 4 4	30 Dec., 1905	91 16 4	43 15 4	30 June, 1906	45 18 2		
Tulloona	1,283 9 0	16 Jan., 1908	296 8 2	222 6 1	16 July, 1908	74 2 1		
" " Additional...	18 0 0	8 Feb., 1911	1 1 5	0 16 1	8 Aug., 1911	0 5 4		
Tunda Bore	585 4 0	15 Mar., 1911	109 16 8	82 7 7	18 July, 1911	27 9 2		
Tuppall Creek Cutting.....	5,800 0 0	30 July, 1908	345 6 1	258 19 7	29 Jan., 1909	86 6 6		
Tycannah Bore.....	3,142 12 5	5 Aug., 1908	187 2 0	140 6 6	5 Feb., 1909	46 15 6		
Tyreel	4,444 0 0	2 Feb., 1910	264 11 7	198 8 8	2 Aug., 1910	62 2 11		
Ulmorra Swamp Drainage.....	4,345 0 0	14 Sept., 1910	258 13 8	194 0 3	14 Mar., 1911	64 13 5		
Ulumbie Bore	3,140 7 6	17 Oct., 1906	186 19 4	140 4 6	17 April, 1907	46 14 10		
" " Additional.....	207 12 8	10 Feb., 1909	12 9 2	9 6 10	6 Aug., 1909	3 2 4		
Uranbah	928 19 10	16 Jan., 1907	205 6 2	153 19 7	16 July, 1907	51 6 7		
Walgett	2,409 0 9	20 Mar., 1907	219 8 6	164 11 9	20 Sept., 1907	54 17 1		
" " Additional.....	121 0 0	2 April, 1908	7 5 1	5 8 10	8 Oct., 1908	1 16 3		
Weetalibah	3,386 9 10	22 June, 1909	201 12 4	151 4 3	30 Dec., 1909	50 8 1		
Welbondonga Bore	4,834 10 2	19 July, 1909	287 16 4	215 17 4	21 Jan., 1910	71 19 1		
" " Additional...	305 17 3	21 Dec., 1910	18 4 0	13 13 2	21 June, 1911	4 11 0		
Youendah Bore.....	759 9 5	16 Oct., 1907	189 4 4	141 18 3	16 April, 1908	47 6 1		
" " Additional.....	55 2 6	19 July, 1911	3 5 8	2 9 3	19 Jan., 1912	0 16 5		
Total.....	£ 204,821 6 1		£ 14,058 14 6					

Appendix K.

STATEMENT of Officers, Annual Salaries, and Allowances charged as at 30th June of each financial year as under :—

Financial Year.	Permanent.			Temporary.			Totals.		
	No.	Annual Charge.		No.	Annual Charge.		No.	Annual Charge.	
		Salary.	Allowance.		Salary.	Allowance.		Salary.	Allowance.
		£	£		£	£		£	£
1899-1900	972	193,635	10,900	272	48,126	167	1,244	241,761	11,067
1900-1901	976	200,145	12,655	412	70,959	1,722	1,388	271,104	14,377
1901-1902	1,010	204,536	12,858	497	84,597	2,083	1,507	289,133	14,941
1902-1903	1,015	206,986	13,011	347	61,731	1,541	1,372	268,717	14,552
1903-1904	853	176,796	11,827	107	17,316	551	960	194,112	12,378
1904-1905	784	161,569	12,690	109	16,936	21	893	178,505	12,711
1905-1906	782	161,292	11,641	156	22,801	100	938	184,003	11,742
1906-1907	738	155,880	6,822	282	45,086	1,153	1,020	200,966	7,975
1907-1908	682	143,825	7,043	417	68,308	1,546	1,099	212,133	8,589
1908-1909	672	145,505	7,590	497	79,406	2,208	1,169	224,911	9,798
1909-1910	688	150,776	6,791	508	84,461	3,030	1,196	235,237	9,821
1910-1911	732	166,500	4,830	571	109,182	4,158	1,303	275,682	8,988
1911-1912	791	190,363	5,130	1,005	193,458	4,550	1,796	383,821	9,680

Appendix L.

STATEMENT showing number of Officers, Permanent and Temporary, actually engaged on the 30th June of Financial Years 1899-1900 to 1911-12, with amount of Disbursements for Salary, Equipment, and Travelling Allowances during those years (Officers on leave prior to retirement, or lent to other Departments, not included).

Year.	Permanent.				Temporary.				Total.			
	No.	Salaries.	Equipment.	Travelling.	No.	Salaries.	Equipment.	Travelling.	No.	Salaries.	Equipment.	Travelling.
		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
1899-1900 ..	972	192,943 7 2	14,315 17 6	9,746 4 4	272	47,863 8 4	166 19 11	1,702 6 5	1,244	240,806 15 6	14,482 17 5	11,448 10 9
1900-1901 ..	976	205,738 12 9	15,510 3 0	10,584 2 5	412	61,992 8 5	1,722 1 5	2,013 0 10	1,888	267,731 1 2	17,232 4 5	12,597 3 3
1901-1902 ..	1,010	203,271 2 2	16,534 3 0	11,123 1 7	497	83,078 10 1	2,083 16 5	1,642 7 8	1,507	286,349 12 3	18,617 19 5	12,765 9 3
1902-1903 ..	1,025	207,395 3 6	16,923 19 6	11,020 3 6	347	82,076 14 7	1,541 17 5	1,717 6 5	1,372	289,471 18 1	18,465 16 11	12,746 9 11
1903-1904 ..	739	179,813 13 11	14,722 3 2	9,324 9 7	107	42,997 10 7	551 5 5	271 15 6	846	222,811 4 6	15,273 8 7	9,596 5 1
1904-1905 ..	741	158,904 19 5	12,601 12 4	7,256 7 4	109	16,685 17 11	21 3 4	242 3 2	850	175,190 17 4	12,622 15 8	7,498 10 6
1905-1906 ..	757	154,752 19 8	13,147 19 7	7,920 17 10	171	21,793 0 5	28 11 4	607 7 10	928	176,546 0 1	13,176 10 11	8,528 5 8
1906-1907 ..	694	146,359 8 3	6,388 5 2	6,350 10 2	282	34,485 11 0	320 14 9	604 17 5	976	180,844 19 3	6,708 19 11	6,955 7 7
1907-1908 ..	682	146,847 4 11	7,524 3 10	6,065 9 6	417	57,815 16 0	1,077 1 0	1,158 2 8	1,099	204,663 0 11	8,601 4 10	7,823 12 2
1908-1909 ..	672	145,867 11 3	7,656 11 10	6,702 9 10	497	72,339 1 10	1,081 12 2	1,879 19 9	1,169	218,206 13 1	8,738 4 0	8,582 9 7
1909-1910 ..	688	148,417 10 10	7,352 3 0	7,493 11 11	508	85,528 11 9	601 4 1	1,210 13 9	1,196	233,946 2 7	7,953 7 1	8,704 5 8
1910-1911 ..	732	172,902 13 11	6,241 9 5	7,833 15 9	571	80,910 6 3	2,455 12 7	3,823 0 0	1,303	253,813 0 2	8,697 2 0	11,656 15 9
1911-1912 ..	791	190,185 15 2	5,263 16 6	9,153 17 0	1,005	141,640 4 4	2,767 11 11	2,293 7 1	1,796	331,825 19 6	8,031 8 5	11,447 4 1

Railway and Tramway Construction Branch.

Report of the Chief Engineer for Railway and Tramway Construction.

Department of Public Works, N.S.W., Sydney, 25th September, 1912.

Sir,

I have the honor to report as follows on the works carried out in the Railway and Tramway Construction Branch during the year ending 30th June, 1912:—

Light Lines of Railway

are railways laid with 60-lb. rails on round-backed sleepers with earth ballast, bridge ends and station yards being ballasted with broken stone or gravel.

Lockhart to Clear Hills.—This railway begins at 351 miles 47.883 chains from Sydney and terminates at Oaklands, mileage 404 miles 31½ chains, a total length of 52 miles 63.55 chains.

The first section, 21 miles 75.117 chains, was handed over to the Railway Department on the 1st December, 1910.

On the 10th September, 1910, a tender, amounting to £53,917 10s. 4d., was accepted for the second section, beginning at 373 miles 43 chains from Sydney and terminating at Oaklands, 404 miles 31.433 chains, giving a length of 30 miles 68.433 chains, with a ruling grade of 1 in 100 both ways, and sharpest curve 20 chains radius.

Station accommodation is being provided at Cullivel, Urana, Uranagong, South Goonambil, and Oaklands, with Water supply for locomotives at Urana and Oaklands.

On the 10th January, 1911, a tender—amount £2,981—was accepted for the station buildings at Cullivel and Urana, and the railway to this place was handed over to the Railway Department on the 9th December, 1911.

On the 17th July, 1911, a tender was accepted for the station buildings for Uranagong, South Goonambil, and Oaklands; the amount is £6,998 10s.

The estimated cost of the line is £149,681. The expenditure on the first section is £67,065, and on the second section to the 30th June, 1912, £100,654; total for both sections, £167,719.

Moree to Mungindi (Section 1).—This extension, which is being carried out by day-labour, leaves the Moree station-yard at the north end at 314 miles 78.545 chains from Newcastle and terminates at 392 miles 2 chains, giving a length of 77 miles 3.455 chains.

The first section ends at Garah, 36 miles 30.455 chains from Moree at mileage 351 miles 29 chains. The ruling grade is 1 in 100 both ways, and the sharpest curve 12 chains radius.

Station accommodation is being provided at Camurra (late Boolooroo), Ashley, Wallon, and Garah.

Steel bridges have been supplied under contract at a cost of £7,125 for the crossing of the Mehi River and the Anna-branch of the Gwydir.

The station buildings will be erected by day-labour the same as the main line.

A telegraph line will be erected by contract at a cost of £14 per mile, the materials being supplied by the Government.

The construction of the line was started in February, 1911, and the expenditure to the end of the financial year is £120,201.

The estimate for the whole extension is £481,054.

Section 2.—Begins at Garah at 351 miles 29 chains from Newcastle and ends at 392 miles 2 chains, Mungindi, with a length of 40 miles 53 chains.

The construction is being carried out by day-labour, and the work was started on the 25th October, 1911.

Station accommodation will be provided at Bingerang, Bumarba, Paradise, and Mungindi.

Water for locomotives will be provided by means of excavated tanks at Garah and Mungindi.

The expenditure to the end of the financial year is £9,598, or a total for both sections of £129,799.

Forbes to Stockinbingal.—Commences at 274 miles 52.34 chains from Sydney on the Cootamundra-Temora Railway at Stockinbingal and ending at Forbes, at 362 miles 71.34 chains; length 88 miles 19 chains. The ruling grade is 1 in 82, and the minimum curve radius 20 chains.

The construction was started on the 30th January, 1912, and is being carried out by day-labour.

The estimated cost of the line is £293,928, and the expenditure to the end of the financial year 1911-12, has been £17,873 3s. 11d.

Wagga Wagga to Tumberumba.—Commences at 314 miles 50.37 chains from Sydney and the Great Southern Railway, and terminates at 391 miles at Tumberumba. Length 77 miles 30 chains, the ruling grade being 1 in 75 against the load and 1 in 60 with the load; minimum radius of curvature 12 chains.

The construction is being carried out by day-labour. Work was started 13th February, 1912.

The estimated cost of the line is £387,271, and the expenditure for the financial year £19,997 8s. 11d.

Dunedoo to Coonabarabran.—Commences at Dunedoo, 239 miles 6 chains from Sydney; is a continuation of the Wallerawang to Mudgee Railway, and ends at Coonabarabran at 316 miles 6 chains. The length is 77 miles, the ruling gradient being 1 in 75 against the load and 1 in 60 with the load, with a minimum curve radius of 12 chains.

The line is being constructed by day-labour; work was commenced 2nd April, 1912.

The estimated cost of the line is £304,235. The expenditure to the 30th June, 1912, is £19,962 4s. 2d.

Parkes to Peak Hill.—This line connects the town of Parkes on the Orange-Condobolin Railway with Peak Hill, the present terminus of the Narramine-Peak Hill Railway.

Parkes is 272 miles 10.48 chains from Sydney, and Peak Hill 341 miles 55.25 chains; the length of this connecting line is 30 miles 35.23 chains. The ruling gradient is 1 in 100 both with and against the load. The minimum curve radius is 40 chains.

The

The line is being built by day-labour; work was started on the 7th May, 1912.

The estimated cost of this railway is £113,115, and the expenditure up to the end of the financial year 1911-12 is £8,674 5s. 5d.

Muswellbrook to Merriwa.—This extension begins at 80 miles 10 chains from Newcastle, on the Northern Railway, and ends at 127 miles 10 chains; the length is 47 miles. The ruling gradient is 1 in 100 both ways, and the minimum curve radius 12 chains.

The work is being carried out by day-labour; construction was begun on the 13th June, 1912.

The estimated cost of this extension is £233,530, and the expenditure to the end of the financial year is £4,767 2s. 3d.

The length of unballasted lines under construction during the past financial year is 449 miles 71 chains, and the cost up to 30th June, 1912, is £368,791.

The estimated cost is £1,962,814.

During the financial year 1911-12, 21 miles 75 chains of railway were opened for public traffic.

Ballasted Railways.

This type of railway comprises lines fully ballasted with stone ballast, and laid with 60-lb. or 80-lb. to the yard steel rails on square sleepers, hewn or sawn.

Cooma-Bombala.—The first section, Cooma to Nimmitabel, begins at 264 miles 47·5 chains from Sydney and ends at 288 miles 73·435 chains, a length of 24 miles 25·935 chains.

The ruling grade is 1 in 50 in both directions, and the sharpest curve is 12 chains radius.

Station accommodation is provided at Rock Flat, Coonorang, and Nimmitabel; the buildings were erected under contract at a cost of £4,155.

The construction of the line has been carried out under contract, the amount of the accepted tender being £99,879 10s.

The estimated cost of this section is £151,666, and the expenditure to the 30th June, 1912, is £139,478.

This extension was opened for public traffic on the 22nd April, 1912.

Rookwood towards Bankstown.—The first section of this extension, Rookwood to Green's Park, begins at 10 miles 37 chains from Sydney, and terminates at 12 miles 37 chains. It has a length of two miles, with a ruling grade of 1 in 58, and a minimum curve radius of 12 chains.

Two stations have been provided at Berala and Regent's Park, the present terminus.

Sidings have been provided for the Pott's Hill New Reservoir, length 70 chains, and the Auburn Brickworks.

The estimated cost of this railway and branch to Pott's Hill is £31,298.

The expenditure to the 30th June, 1912, is £26,549, and is to be divided between Public Works, Metropolitan Board of Water and Sewerage, and the Auburn Brickworks.

North Coast Railway.

This railway is laid with 80-lb. to the yard silicon rails, and is fenced throughout.

First Section.—West Maitland to Dungog.—This section begins at 20 miles 23 chains from Newcastle and has a length of 32 miles 65·60 chains. The ruling grade is 1 in 80 both ways, and the minimum curve radius 15 chains, excepting in isolated instances, where topographical exigencies rendered the use of 14 chains radius a necessity. These conditions rule for the whole length of the North Coast Railway, with the exception of the curvature, which is in places 12 chains radius.

On April the 28th, 1908, a tender for the construction of the line was accepted, the amount being £298,235 15s., and contracts were let for the manufacture, supply and delivery of steel bridges, amounting to £17,299.

Station accommodation is supplied at Oakhampton, Dunmore, Paterson, Martin's Creek, Hilledale, Wallarobba, Wiragulla, and Dungog, with trucking-yards at Paterson, Wallarobba, and Dungog; the cost of buildings at these stations is £5,848 11s. 10d.

Water for locomotives is supplied at Martin's Creek and Dungog.

This section was opened for public traffic on the 14th August, 1911.

The estimated cost is £443,374, and the expenditure to the 30th June, 1912, £414,413 2s. 1d.

Section No. 2.—Dungog to Gloucester—has a length of 38 miles 68·4 chains, ending at 91 miles 77 chains from Newcastle.

On the 28th August, 1909, a tender, amounting to £377,693 11s. 8d. was accepted for the construction of the line.

On the 4th November, 1911, the Hon. the Minister for Public Works agreed to relieve the contractor of his responsibility and undertook to complete the work by day-labour.

The cost of steel bridges carried out under contract for the superstructure only is £6,399 10s.

The Monkerai Range is pierced with a double-line tunnel 847 yards in length.

Station accommodation is provided at Dingadee, Nooroo, Stroud Road, Ward's River, Craven, and Stratford, with trucking-yards at Stroud Road and Stratford.

The cost of buildings and yards for the above stations is £2,967.

On the 27th November, 1911, the part of the line to Dingadee was handed over to the Chief Commissioner for Railways.

Water for locomotives is being provided at Stroud Road.

The estimated cost of this section is £514,565, and the expenditure to the 30th June, 1912, £444,588 12s.

Third Section.—Gloucester to Taree—has a length of 44 miles 6 chains, ending at 136 miles 3 chains from Newcastle.

The construction of this section is similar to the previous sections, with the exception of 12-chain curves.

A tender for the construction of the main line was accepted on the 16th January, 1909, to the amount of £455,365 16s. 8d., but on the 6th October, 1911, the Hon. the Minister for Public Works relieved the contractors of their contract, and this is now being completed by day-labour.

Various tenders have been accepted for manufacture, supply and delivery of steel bridges, to the amount of £28,276.

Station accommodation is supplied at Gloucester, Bulliac, Bundook, Somerset, Black Flat, Charity Creek, Killawarra, Wingham, and Taree, the buildings for which have cost £13,492.

It is also intended to give station accommodation at Woolla Woolla, and a refreshment-room will be provided at Gloucester.

At Taree, an engine-shed with seven roads will be built, at a cost of £5,997.

Water for locomotive supply is provided at Gloucester, Somerset, and Taree.

The estimated cost of this section is £669,401, and the expenditure to end of financial year £627,037 9s. 10d.

Fourth Section—Taree to Wauchope—has a length of 47 miles 42 chains, ending at 183 miles 45 chains from Newcastle. The minimum curvature is 15 chains radius.

The construction of the main line is being carried out by day-labour, and was begun on the 26th January, 1911.

Steel bridges will be built over Brown's Creek, Dawson River, Pontobark Creek, Lansdowne River, Saltwater Creek, Stewart's River, Camden Haven River, and Heron's Creek, and tenders have been accepted to the amount of £14,260 16s. 6d., for the manufacture, supply, and delivery of these bridges.

Station accommodation is provided at Comboyne-road, Lansdowne, Cooperbrook, Moorlands, Stewart's River, Kendall, Heron's Creek, and Wauchope.

The estimated cost is £461,534, and the expenditure to the end of the financial year is £94,858.

Seventh Section—Macksville to Coff's Harbour—is 35 miles 26 chains long. The minimum curvature is 15 chains radius.

The construction of the line was begun on 8th March, 1912; the work is being carried out by day-labour.

Steel bridges will be built over the North and South Arms of the Bellinger River, the Nambucca River and Bonville, Boambee, and Pine Creeks. Tenders amounting to £4,523 have been accepted for the manufacture and delivery of the steel work for the three latter bridges.

There will be station accommodation at Macksville, Nambucca Heads, Urunga, Raleigh, Bonville, and Coff's Harbour.

The estimated cost of the line is £380,000, and the expenditure to the end of the financial year is £21,643.

Ninth Section—Glenreagh to South Grafton—a length of 28 miles. The sharpest curve is 15 chains radius.

The construction of this line is being done by day-labour; the work was begun on August 23rd, 1911.

There will be a steel bridge over Sherwood Creek; the contract for the manufacture and delivery of the steel work amounted to £1,950.

Station accommodation will be provided at Glenreagh, Sherwood, Lanitza, Braunstone, and South Grafton.

The estimated cost of the work is £238,916, and the expenditure to 30th June, 1912, is £65,628.

The total length of ballasted lines under construction during the financial year is 252 miles 74 chains. The estimated cost is £2,890,753, and the cost to the 30th June is £1,834,194.

Total amount expended on Railway Construction during the past financial year is £923,332.

During the financial year 1911-12, 57 miles 11 chains of ballasted Railways were opened for public traffic.

In addition to the Railway Extensions under construction authority has been given for the building of the following lines:—

Galong to Burrowa, 17 miles 38 chains; Finley to Tocumwal, 11 miles 6 chains; Tullamore to Tottenham, 33 miles 59 chains; and Barellan to Mirrool, 34 miles 12 chains. Total length, 96 miles 35 chains.

TRAMWAYS.

Military Road to Cremorne is a double-track electric tramway 1 mile 47 chains in length. The line branches off the Military-road, North Sydney, at Spofforth-street, and traverses that street to Florence-street, thence along Florence-street through private property to Murdoch-street, thence *via* Murdoch-street and Milson-road to Cremorne Point. The steepest grade is 1 in 15, and the sharpest curve 60 feet radius.

On the 27th September, 1910, a contract for the construction of the permanent-way, amounting to £21,808, was let, but was cancelled on the 5th July, 1911, owing to the slow progress made by the contractor.

The remainder of this contract, also the erection of the poles and overhead wiring, was carried out by day-labour, the whole of the works being completed, and the tramway opened for traffic, on the 13th December, 1911.

A contract for a waiting-room, with a starter's office, &c., amounting to £396, was let on the 8th November, 1911, and handed over completed on the 30th May, 1912.

Wallsend to Spier's Point is an extension branching off the Newcastle-West Wallsend steam tramway at a point 2 miles 68½ chains from Plattsburg. The route, after traversing private property, follows the main road to Lake Macquarie, passing through Argenton, crossing the Great Northern Railway at Cockle Creek railway-station by an overhead bridge, thence through Boolaroo to Lake Macquarie, being a distance of 3 miles 28 chains single track. The ruling grade is 1 in 25, and the sharpest curve 2 chains radius.

The

The construction of this extension was commenced on 1st February, 1911, the work being carried out by day-labour. The whole of the work was completed and the line handed-over for traffic on the 25th December, 1911.

Leichhardt to Balmain Electric Tramway is an extension from the Leichhardt terminus to the Balmain-road, via Norton, Augustus, Mary, and Perry streets, a distance of 40 chains double track. The ruling grade is 1 in 19·5, and the sharpest curve 70 feet radius. The whole of the works in connection with the construction of this tramway was carried out by day-labour.

On the 14th August work was commenced, and the extension was completed and handed over for traffic on the 1st May.

Darley-road to Little Coogee is an electric tramway branching off the Randwick-Coogee tramway at Darley-road, thence via Orange-street, St. Mark's road, Glebe-street, and Susan-street to the junction of Brook-street, from which point it passes through private land to Little Coogee Bay.

The length of the extension is 2 miles 47 chains double track, with balloon loop at the terminus, which is situated near the bathing-sheds at Little Coogee.

The whole of the works are being carried out by day-labour, a commencement having been made on the 16th August.

At the close of the year preparations were being made to open for traffic the first section, terminating at Carrington-road, a length of 1 mile 37 chains.

The ruling grade is 1 in 15, and the sharpest curve 80 feet radius.

Brookvale to Collaroy Beach is an electric tramway commencing at the Brookvale terminus and following the Pittwater road to Collaroy Beach, a distance of 3 miles 25 chains, single track. The steepest grade is 1 in 19, and the sharpest curve 230 feet radius. The work was commenced on the 12th September, and at the close of the year good progress had been made by day-labour.

Marrickville to Undercliffe is an electric tramway branching off the Marrickville-Dulwich Hill Tramway at Illawarra road and traverses that road to the Undercliffe Bridge, a distance of 1 mile 12 chains single track. The steepest grade is 1 in 20, and the sharpest curve 70 feet radius.

Work by day-labour was commenced on the 20th September, and at the close of the year good progress had been made.

In connection with this tramway arrangements have been made for the construction of an overhead bridge, with approaches, over the Belmore railway at Marrickville Station; this work is being carried out by day-labour in conjunction with the tramway, and good progress has been made.

Carrington Tramway, Newcastle, is a steam tramway, the rails being laid with welded joints in anticipation of the electrification of the Newcastle tramway system. This extension branches off the Wickham-Tighe's Hill tramway at Hannell-street, and traverses that street to its intersection with Cowper-street, and thence along that street to the intersection of Young-street, where it joins the track laid in 1902. The length of the track now being laid is 50 chains, single track; the ruling grade is 1 in 388, and the sharpest curve 100 feet radius.

Work was commenced on the 14th February, and at the close of the year was practically completed.

Dulwich Hill to Wattle Hill is an electric tramway extension from the Dulwich Hill terminus along the New Canterbury road, terminating at Wattle Hill, a distance of 70 chains, double track. The steepest grade is 1 in 22·9, and the sharpest curve 57·50 feet radius.

On the 4th March work by day-labour was commenced, and at the close of the year good progress had been made.

Rosebery Park Racecourse, via Gardener's-road, to Bunnerong-road is a double track electric tramway 62 chains in length; the ruling grade is 1 in 25·60, and the sharpest curve 88 feet radius. Work by day-labour was commenced on the 20th March, and at the end of the year good progress was being made.

Rozelle to Leichhardt is an extension from the Balmain and Drummoyne junction at Rozelle, connecting with the Leichhardt tramway via the Balmain-road, a distance of 57 chains, double track. The steepest grade is 1 in 19·50, and the sharpest curve 132 feet radius.

The extension is being carried out by day-labour, work having been commenced on the 1st May.

The construction of the following tramways has been authorised, the works to be carried out by day-labour; surveys are in progress and detail plans in course of preparation:—

Patton-street, South Broken Hill, to the Racecourse, steam tramway.—Length, 75 chains single track.

Goods depôts at Brookvale terminus and Fisher-street, on the Spit to Manly Tramway.

Wallsend to Wallsend Racecourse.—1 mile 20 chains, single track, steam tramway.

William-street, via College-street, to Elizabeth-street.—Electric tramway, 43 chains, double track.

Petersham Railway Station to Livingstone-road.—Electric tramway, 20 chains, double track.

The amount expended on tramway construction during the year was £184,423.

The total length of tramway, electrical and steam, opened for traffic during the year ended June, 1911, is 9 miles 76 chains, and there are under construction 13 miles.

The total expenditure on railway and tramway construction during the year amounted to £1,107,755, and the staff employed has had an exceptionally busy time.

I desire to express my appreciation of the way in which all the officers have carried out their work.

WM. HUTCHINSON,
Chief Engineer, Railway and Tramway Construction.

Government Architect's Branch.

Annual Report, 1911-12.

I HAVE the honor of submitting the report of the work of the Government Architect's Branch for the year ended 30th June, 1912. It will be seen from the following statement of expenditure that the year has been an exceedingly busy one. The certified expenditure is as follows, and, for the sake of comparison, that of the proceeding three years is also added:—

	1908-9.			1909-10.			1910-11.			1911-12.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Loans	333,520	2	1	11,354	3	8	65,604	12	8	120,283	17	4
Consolidated Revenue	9,796	6	1	33,977	1	8	36,577	12	0	44,892	1	8
Special Deposits	2,924	3	9	9,930	5	3	960	5	0	22	3	3
Treasury Advance	432	15	7	75	0	0	.....	.....	.....	.....	.....	.....
Federal Works	43,306	2	0	42,564	11	7	86,467	7	5	78,952	4	10
Other Departments ... ..	.....	.....	.....	48,894	15	3	65,789	12	1	60,837	1	9
School Buildings	107,872	7	4	140,500	14	2	150,700	8	10	171,161	4	4
Norfolk Island Administration	101	10	7	77	14	8	.....	.....	.....	.....	.....	.....
Resumed Properties	6,897	19	5	15,790	16	5	34,499	9	3	35,343	4	6
Public Works Fund	226,621	5	1	182,615	0	2	178,863	3	3	213,256	18	7
Total	£461,472	11	11	485,780	2	10	619,462	10	6	724,748	16	3

Generally.—The most important buildings which have been completed during the year are the Children's Court, New Dental Hospital, two large pavilions for Females, and Doctor's residence at the Hospital for the Insane, Morisset; extensive additions and improvements to the Coast Hospital, Little Bay, and additions to the Hospital at Waterfall. Fire Station and residential flats for Married and Single Firemen at Darlinghurst; Commonwealth Stores, Darling Island, for the Federal Government; erection of Students' Quarters, Experimental Farm, Glen Innes; additions to the Tamworth Hospital, extensive additions to the Hotel Kosciusko.

New offices for the Registrar-General.—Very good progress has been made with the erection of the Registrar-General's new offices, Chancery Square. The west wing has been completed—the Registrar-General taking possession on the 4th December, 1911. The ground floor and the basement are occupied by the Births, Deaths, and Marriages Branch and the upper floors by the Deeds Branch. The eastern and southern wings are well advanced, but the work has been greatly retarded by the lack of stonemasons and the shortage in the supply of free stone.

University Buildings.—The extension of the Fisher Library has been put in hand. The style of the architecture corresponding with the present completed portion and the construction being stone throughout. The School of Agriculture has been commenced—the foundations being ready for the superstructure. This building comprises lecture rooms, laboratories, class rooms, museum and workrooms; the architectural treatment adopted is somewhat similar to the buildings more recently erected at the University. The Union Building, which has just been completed, gives accommodation for the members of the University Union. A large hall has been provided for holding meetings, concerts, and general entertainments, also committee rooms, reading and refreshment rooms. The Veterinary Science School building has also been finished and comprises lecture room, workrooms, classrooms, dissecting room, post-mortem room, museum and rooms for professors and lecturers. This building has been constructed of brick with stone dressings and slate roof. The three last-named buildings have been designed with a free treatment of scholastic Gothic. The additions to the Medical School are nearing completion—only the finishing trades remaining to be done, and these are now well advanced.

Schools and Colleges.—During the year a large amount of work has been undertaken for the Public Instruction Department, principally consisting of re-modelling and enlarging existing schools and colleges and also the erection of new buildings on the most modern lines, and Teachers' residences.

Extensive additions have been completed at the following schools:—Albion-street, Marrickville West, Crown-street, Campsie, Granville, Botany, North Sydney, Petersham, Parramatta, and to the Technical College at Newcastle.

New school buildings have been completed at Glebe (Infants' School), Granville (Infants' School), Mumbil and Lismore (Infants' School), and Workshops at the Technical College, Granville.

Additions to the following buildings have been put in hand:—Chatswood, Leichhardt, Gordon, Waverley, Glenmore Road, Smith-street, Balmain, and new buildings have been commenced at Little Coogee, Sydney Technical College, Balmain Technical College (Building for Printing Class) and Arncliffe (Infants' School).

New Offices for the Department of Public Instruction.—The site of the new building is a portion of the block of land fronting Bridge, Loftus, Young and Bent streets. The new offices will form portion of a complete structure to occupy the whole of the site and will cover approximately one half of the block. The main frontage will be to Bridge-street.

The existing premises of the Instruction Department (part of which were erected nearly one hundred years ago) will practically remain intact until the new office buildings are completed.

The

The building now in course of construction will be seven storeys high: the façades are to be of stone and the design, although severely plain, has been treated in the Renaissance style, thus retaining architectural harmony with the adjacent Government buildings. The architectural embellishments have been confined chiefly to the main entrances and the crowning balconies and entablature to the upper floors. The internal construction will be of steel and reinforced concrete, thus providing a fire-resisting structure. Due prominence has been given to the entrances—one from Bridge-street and the other from Loftus-street. It is the intention, later on, to extend the building to the full area of the site and thus provide office accommodation for the Department of Agriculture fronting Bent-street. When the extension is completed, the whole will surround an internal court-yard providing light, ventilation and space for recreation purposes.

New Abattoirs.—The contract for the erection of the new Abattoirs is rapidly approaching completion.

Royal Prince Alfred Hospital.—The erection of extensive additions to the Nurses' Home has been commenced; these works are being carried out from plans prepared by private architects.

Royal North Shore Hospital.—Additional wing: the erection of the new wing for this hospital is being carried out from plans supplied by private architects.

Waterfall Hospital.—Doctors' Residence, Administrative Kitchen and Stores Block. These buildings comprise separate residence for Medical Superintendent, offices of administration, receiving and consulting rooms, stores and dispensary, kitchen and bakehouse, flour store, scullery and vegetable room, and also quarters for some of the kitchen staff. They are constructed of common brick rough-casted in parts, and roofed with tiles of New South Wales manufacture.

Female Ward: This ward was erected for female patients and provides accommodation for one hundred beds with general dining-room, scullery, bath and lavatories, and nurses' side rooms and stores. There are verandahs and balconies 12 feet wide all around the wards which can be used for sleeping on. This building is built of common brick and roofed with similar tiles to those on the Administrative buildings.

Hotel Kosciuszko.—Additions.—The additions to the Hotel Kosciuszko consist of New Southern Wing containing extension of dining-room, two private sitting rooms, twenty-six bedrooms, dressing room and lavatory accommodation, the principal bedrooms being provided with bathrooms. Addition to the Northern Wing, consisting of billiard room, ski and skate room, refreshment bar and store, main stair hall, ballroom and lounge. Servants' Wing, containing servants' hall, fourteen bedrooms and lavatory accommodation, and the installation of electric light and hot air heating plants and water and sewerage service throughout the building.

Schemes submitted to the Standing Committee on Public Works.—Plans have been prepared and submitted to the Parliamentary Standing Committee on Public Works for:—

	Estimated cost.
New Government Printing Office	£80,787
New Teachers' Training College	£65,475
New Office for Public Instruction Department	£65,000
New Hospital at Newcastle	£46,154

Plans are now in course of preparation for the following schemes:—

	Estimated cost.
New building for the Department of Agriculture	£71,000
Additions to Sydney Hospital	£100,000
Central Meat Market	£192,321
Export Slaughter Houses } New Abattoirs	£300,000
Freezing and Cold Storage }	
New Law Courts	£350,000

Observatory Hill Resumed Area.—A large amount of work has been carried out on the resumed Area, Observatory Hill, and George-street North. A number of old buildings have been taken down to admit of the erection of new and improved premises and the re-alignment of several of the streets. A terrace of seventeen dwelling houses has been completed in Gloucester-street, and the erection of extensive shops and business premises in George-street North has been commenced, viz., new warehouse for Messrs. Bushell & Co., shop for Messrs. Grubb & Co., new "Brooklyn Hotel," and an important business block at the corner of George and Grosvenor streets. Plans have been prepared for the erection of a number of shops in George-street, north of Grosvenor-street.

Federal Government Works.—Ordnance Stores, Darling Island.—The work of the Commonwealth Government, entrusted to this Branch, has, during the year, been of considerable extent. The lofty Ordnance Stores at Darling Island have been completed, and are intended to provide storage accommodation for Military and Postal Department. The building is constructed of brick with fireproof floors and roof, the ground floor being of Melbourne bluestone; it comprises seven floors, with two electric lifts to each, and has, in addition, facilities for handling heavy goods and the storage of cables.

Parcels Post Office, Central Railway Station.—The erection of the new building for the Parcels Post at the Central Railway Station is progressing rapidly. This building is to be used by the Parcels Branch of the Postal Department, and will consist of six storeys and basement; it comprises sorting, delivery, and receiving rooms, and is to be fitted with electric lifts and carriers for dealing with parcels and mail matter. It is being constructed of brick with stone dressings—the latter predominating—and is of fireproof construction throughout.

General Post Office.—Several extensive alterations have been carried out at the General Post Office, including the installation of three mechanical systems of ventilation, the erection of electric lift at Pitt-street end and alterations in Stamp Sales Room consequent upon extensive alterations in the storeys above.

The work carried out in this building involves a very considerable amount of supervision and care, as, besides the difficulties to be overcome in order not to interfere with the working of the staff, the alterations have been of an extensive and important character.

In

In addition to the foregoing, there have been a considerable number of works, over £200, carried out, and numerous repairs and alterations to the various post offices in the metropolitan area and throughout the State.

Plans and Insurance Proposals.—The preparation of plans and the filling in of forms and proposals for insurance in the State Treasurer's Fire Insurance Fund of all Government buildings over the value of £200 has involved a considerable amount of additional work.

Valuations of Properties resumed by the Crown.—A considerable number of valuations of buildings and properties resumed by the Crown have been prepared, including the measurement of the buildings and the preparation of plans of same.

Office Returns.—The registration of plans and papers shows the total returns for the year in both Head and Country Offices to be as follows:—

Drawings and duplicates	...	...	...	...	7,954
Specifications and duplicates...	...	...	...	...	5,011
Bills of quantities and copies	...	...	...	...	360
Contracts entered into	...	...	...	...	93
Vouchers passed	...	...	...	...	2,211
General papers registered at Head Office	...	...	...	...	26,526
General papers registered at country offices	...	...	...	...	14,698
Minor works not contracted for	...	...	...	...	2,227

District Office Returns.—The officer administering the work in the country offices reports:—

The following are particulars of expenditure in the several Districts in the Eastern and Central Divisions, showing the amounts expended during the year on Architectural Works:—

	£		£
Armidale	7,500	Kempsey	7,756
Bathurst	18,656	Lismore	14,022
Cooma	16,680	Newcastle	31,448
Cootamundra	15,504	Tamworth	15,291
Dubbo	16,566		
Goulburn	7,776		£151,199

Particulars of expenditure on account of Architectural Works in the Western Divisions:—

	£		£
Bourke	900	Wilcannia	158
Broken Hill	2,072		
Wentworth	463		£3,593

The following is a statement of the amount of travelling done by the District Works Officers:—

District.	Officer.	Miles travelled by Rail.	Miles travelled by Road
Armidale	D.W.O.	9,667	5,362
	Asst.	7,010	4,949
Bathurst	D.W.O.	11,388	423
	Asst.	11,329	2,387
Cooma	D.W.O.	798	5,418
Cootamundra	D.W.O.	17,704	5,287
Dubbo	D.W.O.	10,383	3,767
Goulburn	D.W.O.	5,109	1,869
	Asst.	3,515	2,139
Kempsey	D.W.O.	...	7,422
	Asst.	...	...
Lismore	D.W.O.	5,078	2,663
	Asst.	2,047	1,985
Newcastle	D.W.O.	2,175	2,163
	Asst.	6,173	5,989
Tamworth	D.W.O.	21,678	10,789
Bourke	D.W.O.	878	6,614
Broken Hill	D.W.O.	...	112
	Asst.	...	100
Wentworth	D.W.O.	1,167	5,182
Wilcannia	D.W.O.	...	485

The following are the details of papers registered, inspections made, estimates prepared, plans, specifications, and copies in connection with the work of the several districts:—

District.	Papers.	Inspections.	Estimates.	Plans.	Specifications.	Tenders.	Contracts.
Armidale	958	479	86	100	229	68	68
Bathurst	858	465	123	192	295	145	105
Cooma	875	214	71	176	127	38	38
Cootamundra	1,701	558	350	156	461	176	176
Dubbo	462	250	89	156	201	71	71
Goulburn	1,267	500	60	420	360	116	116
Kempsey	1,064	370	54	193	180	64	64
Lismore	887	529	390	508	282	79	79
Newcastle	3,174	1,671	197	859	289	141	141
Tamworth	2,430	796	135	142	151	120	120
Bourke	179	38	28	5	11	6	6
Broken Hill	253	54	24	10	24	24	24
Wentworth	517	30	10	3	17	15	15
Wilcannia	73	28	7	6	12	3	3
	14,698	5,992	1,624	2,926	2,639	1,066	1,027

Day Labour Works.—The workshops generally known as the "Government Architect's Workshops" have been handed over to the control of the Officer-in-charge of Government building works.

Theatres and Public Halls Act, 1908.—During the year a total of 1,182 detailed reports on plans, &c., and 143 inspections of buildings of all kinds have been made, many of which involved careful analysis from a constructional standpoint, and much alteration and amendment of plans and specifications where the comfort and safety of the public had not been sufficiently conserved.

Marked activity has existed in converting one-time temporary open-air structures into public halls by erecting roofs over same, approximately 100 of these buildings having been so dealt with, complete re-construction in a large percentage of them having been rendered necessary by increased popularity of moving pictures, and the demand for a better class of building, particularly in the suburbs, in order to cope with the city halls, which in many cases have reached a high standard of excellence. Many of the entertainment halls are now of a class not contemplated when the Act first became operative, and at intervals new regulations have been framed in order to successfully cope with unforeseen conditions.

About twenty-five high-class new buildings have been reported upon and erected during the year under review, a pronounced tendency being evident towards the erection of steel roofs, with clear spaces to obviate the necessity of columns and consequent obstruction of view of an audience.

Among proposed and newly-erected theatres and halls may be mentioned new theatre, Haymarket, adjoining the Adelphi; Crystal Palace, George-street; Hyde Park Rink, 85 feet roof span; Stanmore Theatre, 90 feet span; Manly Rink, 60 feet span; Mosman Rink, 85 feet span; Balmain Theatre, excellently appointed, and quite equal to the best city buildings; Manly, three new halls; Haberfield, School of Arts; Petersham, large hall; Coronation Hall, Woollahra; and Skating Rink, Bondi, as giving some idea of the class of building caterers for public entertainment have now to provide.

The past year has surpassed any preceding one in the importance of the work done, if not in the actual number of cases dealt with, and, as far as present indications go, there should be little diminution in the work to be done during the current year.

Scaffolding and Lifts Acts, 1911-1912.

The Officer-in-charge submits the following summary of the year's work in connection with the administration of the above Acts.

BUILDING OPERATIONS.

Scaffolding and Hand Cranes.—Under this head 1,375 notices of Intention to Erect were received during the year, as follows:—

Scaffolding	...	...	...	...	...	...	...	...	1,015
Hand Cranes	...	...	...	...	...	...	...	...	350
Total	...	...	...	...	...	...	...	...	1,375

Effective supervision has been maintained, and little difficulty has been experienced in securing conformity with the requirements of the Acts, and the directions issued by the Inspectors.

With the advent of the semi-sky-scraper building construction is, in some greater measure, fraught with increased possibility of accident. Particularly is this so in regard to steel and concrete construction, and it is gratifying to note that in most cases builders are alive to their responsibilities in the safeguarding of workmen.

It is impossible to altogether eliminate the risk of accident in connection with building operations, and the majority of those that have occurred during the year were due to carelessness or misadventure on the part of the person injured. In only one case was injury caused through collapsed scaffolding. This accident was caused by the unusual and unnecessary concentration of six men on one portion of an internal plasterers' scaffold, causing a "ledger" to break.

The following large and lofty buildings have been erected:—Australian Mutual Provident Society, Town Hall extension, Municipal Markets, several large wool stores at Pyrmont, Balmain Theatre, Hyde Buildings, Somerset House, Culwulla Chambers, Agricultural Hall, Commonwealth Parcels Office, Ordnance Stores, and three large elevated reservoirs for the Water Board, for which special gear was designed.

I regret to report that in connection with building operations ten fatalities occurred, none of which were, however, due to defective scaffolding or gear, or want of conformity with the requirements of the regulations. Sixty minor casualties were also reported.

Power and other Cranes, Hoists, and Sheer-legs.—It is gratifying to note that during the year the working of the above types of machines was unaccompanied by any loss of life, and inspections were made thereon as follows:—

Steam cranes	...	...	...	...	...	...	...	...	173
Electric cranes	...	...	...	...	...	...	...	...	324
Hand cranes (not on buildings)	...	...	...	...	...	...	...	...	975
Hydraulic cranes	...	...	...	...	...	...	...	...	3
Steam hoists	...	...	...	...	...	...	...	...	64
Electric hoists	...	...	...	...	...	...	...	...	248
Oil-engine hoists	...	...	...	...	...	...	...	...	6
Sheer-legs	...	...	...	...	...	...	...	...	61
Total inspections	...	...	...	...	...	...	...	...	1,854

Seven accidents occurred in connection with cranes and hoists under the above heading.

The number of cranes erected were:—

Steam cranes	...	...	...	...	...	...	...	3
Electric cranes	...	...	...	...	...	...	...	20
Hand cranes (not on buildings)	...	...	...	...	...	...	...	16
Steam hoists	...	...	...	...	...	...	...	15
Electric hoists	...	...	...	...	...	...	...	52
Total	...	...	...	...	...	...	...	106

A strong stand has been taken in regard to ensuring a sufficient margin of safety in regard to crane gearing and framing, and it is admitted that the standard set down in this State is higher than British manufacturers have hitherto adopted. This standard is being in all cases insisted upon, although it often brings the Branch into conflict with crane suppliers and builders of long standing. Overload tests have, in a number of cases, revealed weaknesses that have hitherto been unsuspected, but the results obtained can only tend towards increased confidence in the machines and safety for the employees.

Owing to the different types of crane gear coming within the certification clauses of the Act, it has become imperative that new regulations dealing with crane-drivers' certificates be proclaimed. These have been prepared, and it is hoped will shortly have the force of law.

Lifts.—This year's operations have established a record in respect to the erection of lifts, the total number erected being 200, of an approximate value of £120,000. For the sake of comparison, the number of lifts erected during the past five years is given:—

	1907-8.	1908-9.	1909-10.	1910-11.	1911-12.
Electric	52	75	70	114	167
Hydraulic	33	35	15	28	21
Belt-driven	9	8	4	14	12
Totals	94	118	89	156	200

Of the 200 new lifts erected, twelve represent conversion from hydraulic to electric power. Nine lifts were dismantled for various reasons, and re-erected.

The following table shows the number and types of lifts erected during the year:—

Hydraulic passenger	...	...	...	...	...	...	...	3
„ goods	...	...	...	...	...	...	...	15
„ whips	...	...	...	...	...	...	...	3
Electric passenger	...	...	...	...	...	...	...	74
„ goods	...	...	...	...	...	...	...	65
„ service	...	...	...	...	...	...	...	16
„ whips	...	...	...	...	...	...	...	12
Belt-driven goods	...	...	...	...	...	...	...	6
„ service	...	...	...	...	...	...	...	2
„ whips	...	...	...	...	...	...	...	4
Grand Total...	...	...	...	...	...	...	...	200

In detail, the lifts in commission in the Metropolitan area are:—

Type of Lifts.	Hydraulic.	Electric.	Belt-driven.
Passenger lifts.....	173	283	1
Goods „	496	207	90
Service „	24	62	8
Whips, &c.	106	28	32
Total passenger lifts	...	...	457
„ goods „	...	...	793
„ service „	...	...	94
„ whips, &c. ...	...	...	166
Grand Total ...	...	...	1,510

The inspection of lifts has been effectively maintained, and an average of 5.9 inspections per lift per year has resulted, and approximately 900 "Directions" have been served.

In the Newcastle district 84 inspections were made, and the lifts brought into full conformity with requirements, and from that district no accidents have been reported.

It is with regret that I have to report that one passenger was fatally injured, a child falling through an open door and down the lift-well of the Colonial Secretary's Department, the car at the time being away from the floor. A fatality also occurred at the Queensland Insurance Company's building; a workman inadvertently was crushed by the balance-weights of an electric lift while effecting some building repairs following upon a fire. Several very minor casualties were reported during the twelve months.

Lift Attendants' Certificates.—Certificates granted to Authorised Lift Attendants number 1,896, of which 671 were issued during the year. Two certificates were cancelled on the grounds of untrustworthiness and incompetency.

Conclusion.—When it is realised that the passenger lifts of Sydney carry on an average 500 persons per day, or approximately 68,000,000 passengers per year, it will be recognised that the lift is an

important factor in the commercial life of the city, and their regulation a matter of great public interest. The high standard of construction insisted upon, and the effective control of their use, however, results in fatalities and casualties being at a minimum.

Little distinction is made with regard to safeguards between passenger and goods lifts, and that only in so far as enclosure is concerned, in order that goods and merchandise may be handled, without unnecessary hampering, on the goods lifts.

The Scaffolding and Lifts Acts have been dealt with by the Commissioner for the Consolidation of the Statute Law, His Honor Judge Heydon, K.C., and in his covering memorandum and certificates, submitted with the Bill, he states, *inter alia* :—

“The subject of legislation in the first instance was not of very great importance, because lifts in 1902 were comparatively few in number, but by 1908 they had so greatly increased in kind, number, and use, that their regulation had become a matter of very great public concern.”

The following are some of the more important buildings either completed during the year or upon which expenditure has been entered into, the contract price being stated when carried out by contract, and the day-labour estimate when carried out by day-labour :—

Contracts.—

	£
Children's Court	9,555
Coast Hospital—Mortuary	1,011
Callan Park Hospital for Insane—Additions to Superintendent's Residence	480
Darlinghurst Reception House—Residence for Superintendent	1,735
Parliamentary Buildings—Ventilating plant	698
Parramatta Hospital for Insane—Admission block	6,245
” ” Cottage for Chief Attendant	1,049
Rydalmere Hospital for Insane—Additions and alterations	848
Completion of Penitentiary and Female Prison, Long Bay	56,325
New Offices for Registrar-General	83,977
Public Abattoirs, Homebush Bay	158,765
Morisset Hospital for Insane—Two pavilions and residence	23,333
” ” Six cottages for attendants	3,570
” ” Petrol gas plant	206
National Library—Trachyte base-course	999
Newtown Post Office—Alterations	242
General Post Office—Stanchions and girders	210
Edgecliffe Post Office—Additions	312
Petersham Post Office—Additions Telephone Exchange	320
General Post Office—Supply of letter-box fronts	485
Parramatta Post Office—New Telephone Exchange	1,480
Paddington Post Office—Additions	1,025
Gosford Post Office—New Telephone Exchange	256
William-street Post Office—Alterations	238
Waterfall Hospital—	
Erection of entrance gates	395
Wing for female patients	11,933
Administrative Block—Doctor's residence	10,359
University—	
Fittings for Veterinary School	277
Show-cases for Aldridge Collection	200
Fittings for Anatomy Department	998
Supply and fixing fittings, Medical School	3,800
Erection Union Building	6,797
Erection Veterinary School	1,637
First additions, Medical School	21,719
Fire Station, Darlinghurst	9,207
Rookwood Asylum—Erection of Matron's and Nurses' quarters	5,785
Veterinary School fittings, University	1,499
Second additions to Medical School, University	18,887
Scarborough Police Station	1,814
Dental Hospital	7,198
Show Pavilion, Botanic Gardens	1,671
Drummoyne Police Station	1,913
North Richmond Police Station	1,447
Five Dock Police Station	1,428
North Sydney Police Station—Additions	306
Schools at—	
Chatswood	4,166
Darlinghurst	2,700
Mount Hunter	645
Yerranderie	540
Woy Woy	653
Gulargambone Post Office and residence	1,549
Coonamble Post Office—Additions	719
Peak Hill Post Office—Additions	233
Dripstone Public School—Repairs to residence	487
Narromine Public School—”	1,376
Wrightville Public School—Additions	237
Mogriguy Public School—”	242

Contracts

Contracts.—

	£
Trangie Public School—Additions...	1,597
Nymagee Public School—Residence and repairs ...	292
Mullengrove Public School...	240
Burrowa Public School—Additions ...	315
Kenmore Public School—Repairs ...	1,300
Crookwell Post Office—Additions ...	300
Cunningar Public School—Residence ...	652
Muttama Public School—Additions ...	202
Wombat Police Station ...	983
Cootamundra Public School—Residence ...	934
Cucumgillica " "	456
Holy Camp Public School— " "	550
Tumut Post Office—Additions ...	409
Coolac Public School—Additions ...	215
Wallendbeen Public School—Erection ...	674
The Rock Police Station—Erection ...	1,455
Koorawatha Public School—Additions ...	389
Germanton Public School—Additions ...	286
Wagga Wagga Drill Hall—Erection ...	1,416
Wagga Wagga Experimental Farm—Students' quarters...	2,713
Springdale Public School—Erection ...	463
Koorawatha Post Office—Residence ...	1,231
Stockinbingal Public School ...	543
Brawlin Public School—Erection ...	510
Mathoura Public School—Residence ...	393
Clear Hills Public School ...	356
Berrigan Public School—Residence ...	799
Young Public School—Alterations ...	325
Lismore Public School—Infants' ...	9,785
Woodford Public School—Residence ...	776
Crystal Creek Public School—Residence ...	746
Ewingsdale Public School—New building...	354
Lismore South Police Station—New building	1,062
Tabulam Police Station—New building ...	1,344
Grafton Experimental Farm—Students' quarters	3,466
Perthville Public School—Erection ...	632
Wentworth Falls Public School—Erection ...	406
Cudgebong Public School—Erection ...	348
Garra Public School—Erection ...	439
Brown's Creek Public School—Residence ...	780
Oberon Public School—Erection ...	867
Portland Hospital—Erection ...	3,602
Wallerawang Post Office—Erection ...	1,499
Ellalong Public School—Erection ...	282
Merewether Public School—New lavatories ...	427
Boolaroo Public School—Additions ...	411
Newcastle South Public School—Sanitary improvements	472
Newcastle East—Additions ...	1,980
Redhead Public School—New building ...	312
Wollombi Public School—Additions ...	520
Tea Gardens Public School—Residence ...	488
Morpeth " " "	339
Wallsend " " Additions ...	1,461
Kurri Kurri " " Weather-sheds ...	245
Largs " " Alterations ...	257
Belmont " " " ...	567
Heddon Greta " " " ...	360
Vacy " " Repairs ...	242
Bulladelah " " Residence ...	800
Eglinford " " New building ...	249
West Maitland Technical College—Additions	2,309
West Maitland Drill Hall ...	1,900
West Maitland Lands Office—Painting ...	278
Newcastle Technical College—Additions ...	3,197
Newcastle, Nobby's—Cable trench...	272
Newcastle Hospital for Insane—Drying room ...	280
" " " Drainage ...	1,750
Newcastle Explosives Shed...	222
Newcastle Pilots' Quarters—Drainage ...	484
Newcastle Works Department—Alterations ...	651
Newcastle Pilots' Cottages—Repairs ...	284
" " " " ...	580
Nobbys' Lighthouse—Repairs ...	274
Adamstown Police Buildings ...	1,499
Nambucca Heads Police Station—Erection ...	1,235
Nabiac Police Station—Erection ...	965

Contracts

Contracts.—

	£
Woolla Woolla Public School—Erection	712
Tuncurry Caretaker's Cottage, Forestry Department	492
Coramba Public School—Erection... ..	439
Barrington Public School—Erection	441
Bellinger Heads Pilot's Residence—Improvements	428
Raleigh Public School—Improvements	317
Frederickton Public School—Additions	296
Myall Creek Composite Truss Bridge—Erection	7,215
Glen Innes Experimental Farm—Students' quarters	4,966
Tenterfield Court-house—Additions	1,884
Tingha Post Office—Erection	1,085
Delungra Public School—Residence	670
Hillgrove Public School—Residence	294
Bismuth Public School—Erection	290
Drake Public School—Erection	607
Bykhulla Public School—Residence	475
Tamworth Public School	2,273
Tamworth Hospital—Additions	3,237
Tamworth West Public School—Improvements	296
Singleton Drill Hall	1,234
Nundle Post Office	226
Baan Baa Public School—Residence	463
Murrurundi Public School—Additions	586
Murrurundi Post Office—Erection... ..	1,877
Breeza Public School—Additions	369
Carrol Public School—Improvements	306
Meermaul Public School—Additions	350
Jerry's Plains Public School—Improvements	330
Merriwa Hospital	401
Upper Meningha Public School—Residence	1,008
Walcha Post Office—New Exchange	215
Tamba Springs Public School—New school	398
Manilla Public School—Additions	310
Gunnedah Public School—Additions	1,476
Gunnedah Post Office—Repairs	383
Roughit Public School—Erection	468
Burren Junction Public School—Residence	554
Cooma Public School—Improvements to playground	270
" " " Alterations	220
" " " Playground	250
Nimitybelle Post Office—Additions	435
Bombala Public School—Residence	897
Mumbugga Public School—Removal from Meringlo	212
Toothdale Public School—New building	472
Tantawanglo Public School—Erection	914
Wolumla Public School—Erection... ..	686

Day Labour—

Abattoirs—	
Stock-yards and fencing	30,000
Tree-planting	450
Coast Hospital—	
Infectious Division steam and hot-water service	498
Laboratory, laundry, &c.	1,507
New kitchen block, &c.	3,490
Roadway	242
Darlinghurst Reception House—Additional accommodation for women	396
Gladesville Hospital for Insane—Additions	9,666
Kenmore Hospital for Insane—	
Repairs to roof... ..	382
Repairs to eaves guttering	1,300
Long Bay Penitentiary—	
Observation cell range... ..	5,700
Painting	780
Morisset Hospital for Insane—	
Attendant's cottage and fencing	680
National Library, foundations, &c.	4,000
Newcastle Hospital for Insane—Nurses' and Matron's quarters	5,200
Parramatta Hospital for Insane—	
Sanitary improvements	3,200
Fire escapes, No. 3 ward	510
Sewerage	3,990
Alterations to junior medical quarters	370
Rabbit Island—tank	383
Rydalmere Hospital for Insane—	
Renovations	400
Water service	500

Contracts

Contracts.—

	£
Coast Hospital—Painting artisans' cottages	553
Kenmore Hospital for Insane—	
Additions to staff dining-room	604
Additions to laundry	297
Long Bay Penitentiary—	
Painting walls	908
Females' Prison, shelter-shed and laundry	971
Parliament House—Ventilation	2,805
Registrar-General's New Building—Removal of old building	229
Seventeen dwellings, Gloucester-street	8,500
Johnson's Buildings, George Street North	12,190
Robinson's Buildings „ „	10,220
Brooklyn Hotel „ „	3,750
Bushell's Building „ „	10,373
Grubb's Shop and Dwelling, George Street, North	4,200
Women's Hospital—Additions	5,000
Seven shops, George-street North	23,000
Barber's shop „ „	2,600
Bergstrom's shop and On Chong's shop	6,000
Nicholas' shop	3,500
Princess-street dwellings	5,000
Bloxham Printing Works, Essex and Harrington Streets	11,000
Additions to Argyle Bond	8,000
Building for States, Export and Import, Harrington-street	18,200
Australian Museum	360
General Post Office	6,000
University—	
Painting and colouring at Chemical Laboratory	210
Renewals to piping, Medical School	400
Painting, &c., Macleay Museum	300
Erection of Agricultural School	14,000
Fisher Library extension	32,064
Benevolent Institutions—	
Repairs at Rookwood Asylum... ..	625
Repairs at Newington Asylum	250
Repairs at Liverpool Asylum	250
Quarters—	
For outdoor foremen, Newington Asylum	912
Assistant Superintendent's Quarters, Newington Asylum	1,300
Sewerage to Cottage Homes for Aged Couples, Parramatta	275
Sewerage to Macquarie-street Asylum	400
Fire Service, Newington Asylum	216
Hospitals—	
Royal Prince Alfred, nurses' quarters	22,000
Royal North Shore, ward pavilion	8,000
Coledale Hospital, erection	5,883
Lighthouses and Pilot Stations—	
Repairs under Annual Inspection, 1911	1,750
Repairs to Pilot Robert's quarters, Newcastle	351
Repairs and supply of material, Crookhaven Pilot Station... ..	221
Repairs to cottages, Newcastle	580
Repairs, Keeper's quarters, Nobbys	274
Public Offices—	
Public Instruction Department, new offices	65,000
Temporary buildings, Phillip and Bridge streets	4,300
Alterations Taxation Department	431
Renovation Hospital Depôt, Health Department	200
Erection Fire Station, Crow's Nest	5,500
Dawes Point Water Police	660
Central Police Court	1,200
Palm House, Botanic Gardens	600
Extension Boiler House, Botanic Gardens	200
Repairs, Paddington Court-house	290
Repairs Darlinghurst Court-house	220
Supreme Court, Judge's room	600
Regent Street Lock-up	230
Water Police Station, repairs	250
Woollahra Police Quarters, Jersey-road	313
Schools at—	
Australia-street, Newtown	1,250
Bondi	4,000
Leichhardt	7,400
Little Coogee	4,600
Gordon	3,700
Waverley	4,155
Glenmore-road	3,742

Day

Day Labour.—

£

Schools at—

Sydney Technical College, printing class	...	...	...	...	...	...	...	...	...	3,500
Naremburn	...	...	...	...	...	...	...	...	...	2,562
Thirroul	...	...	...	...	...	...	...	...	...	973
Randwick	...	...	...	...	...	...	...	...	...	2,871
Balmain Technical College	...	...	...	...	...	...	...	...	...	6,600
Smith-street, Balmain	...	...	...	...	...	...	...	...	...	3,550
Dulwich Hill	...	...	...	...	...	...	...	...	...	5,960
Corrimal	...	...	...	...	...	...	...	...	...	2,215
Arncliffe	...	...	...	...	...	...	...	...	...	3,598
Sydney Technical College, additions	...	...	...	...	...	...	...	...	...	7,500
Belmore	...	...	...	...	...	...	...	...	...	1,000
Bexley	...	...	...	...	...	...	...	...	...	1,356
Tempe	...	...	...	...	...	...	...	...	...	450
Croobyar	...	...	...	...	...	...	...	...	...	284
Ryde	...	...	...	...	...	...	...	...	...	675
Darlington	...	...	...	...	...	...	...	...	...	2,565
Liverpool	...	...	...	...	...	...	...	...	...	820
Banksmeadow	...	...	...	...	...	...	...	...	...	312
Wollongong	...	...	...	...	...	...	...	...	...	550
Helensburgh	...	...	...	...	...	...	...	...	...	930
Parramatta Girls' School	...	...	...	...	...	...	...	...	...	439
Narellan	..	..	..	..	..	..	..	..	..	381
Fort Street	...	...	...	...	...	...	...	...	...	560
Enmore	...	...	...	...	...	...	...	...	...	521
Sandringham	...	...	...	...	...	...	...	...	...	1,389
Albion Park	...	...	...	...	...	...	...	...	...	339
Flemington	...	...	...	...	...	...	...	...	...	2,600
Arncliffe West	...	...	...	...	...	...	...	...	...	1,100
Sydney Boys' High School	...	...	...	...	...	...	...	...	...	400
Freshwater	...	...	...	...	...	...	...	...	...	590
Gardeners' Road	...	...	...	...	...	...	...	...	...	435
Berowra	...	...	...	...	...	...	...	...	...	434
Crow's Nest	...	...	...	...	...	...	...	...	...	472
Balgownie	...	...	...	...	...	...	...	...	...	417
Glebe	...	...	...	...	...	...	...	...	...	350
Dubbo, additions	...	...	...	...	...	...	...	...	...	3,338
" residence	...	...	...	...	...	...	...	...	...	946
Mumbil, additions and repairs	...	...	...	...	...	...	...	...	...	680
Brewarrina, erection	...	...	...	...	...	...	...	...	...	625
Cook's Hill, Manual Training Rooms	...	...	...	...	...	...	...	...	...	295
" additions	...	...	...	...	...	...	...	...	...	6,673
Karuah, residence	...	...	...	...	...	...	...	...	...	448
St. Ethel's, additions	...	...	...	...	...	...	...	...	...	450
Millthorpe Public School, additions	...	...	...	...	...	...	...	...	...	600
Mudgee South Public School, erection	...	...	...	...	...	...	...	...	...	580
Hanbury, additions	...	...	...	...	...	...	...	...	...	1,232
West Maitland, additions	...	...	...	...	...	...	...	...	...	2,626
Upper Meningha, residence	...	...	...	...	...	...	...	...	...	1,008
Granville Technical College	...	...	...	...	...	...	...	...	...	2,350
Technological College, Sydney, additions	...	...	...	...	...	...	...	...	...	200
Armidale Afforestation Station, erection	...	...	...	...	...	...	...	...	...	350
Wellington Court-house	...	...	...	...	...	...	...	...	...	3,500
Goulburn Lockup, painting	...	...	...	...	...	...	...	...	...	210
Goulburn Gaol, guttering	...	...	...	...	...	...	...	...	...	304
Spring Terrace, erection	...	...	...	...	...	...	...	...	...	545
Bogan Gate Police Station, erection	...	...	...	...	...	...	...	...	...	1,750
Hotel Kosciusko, additions	...	...	...	...	...	...	...	...	...	10,061

The large amount of work which has been put upon this Branch during the year has necessitated the employment of a number of additional draftsmen. It has been found a very difficult matter to secure the services of competent men on account of the general activity of the building trades throughout the State.

On account of the rise which has taken place in the price of manufactured articles and raw material, also the rise in wages and the variations in connection with the several wages boards, it has been a matter of some considerable difficulty to estimate the cost of projected works. During the year the cost of labour and building materials has increased about 10 per cent. and 12 per cent. respectively, and in many country districts the cost is further increased, owing to the shortage of building contractors and tradesmen.

The Branch was under the control of Colonel W. L. Vernon, F.R.I.B.A., until 11th August, 1911, and from that date till 24th May, 1912, Mr E. L. Drew was in charge as Acting Principal Architect. On the latter date, I was appointed Government Architect and took over the control of the Branch.

I desire to express my appreciation of the loyal and able support which I have received from all the officers during the period I have been in charge, and for the zeal and efficiency which they have displayed in carrying out their work.

GEO. McRAE,
Government Architect.

The Director-General for Public Works.

Irrigation Branch.

The 1911-12 financial year has seen the division of the Irrigation and Drainage Branch of the Department into two branches, namely:

The Irrigation Branch and the Water Conservation and Drainage Branch.

Details of the work of the Water Conservation and Drainage Branch will be dealt with by the head of that branch, and will be found in a separate portion of the Department's report.

It is proposed to deal herein only with the Irrigation Branch.

Murrumbidgee Irrigation Scheme.

The energies of the Irrigation Branch during 1911-12 have been concentrated on the Murrumbidgee Irrigation scheme. The technical details of this scheme have been dealt with in previous reports, and there appears to be no necessity to again refer to them.

The work on this scheme may be divided into three parts, namely:

Burrinjuck Dam, which is being built below the confluence of the Goodradigbee and the Murrumbidgee Rivers, 29 miles from Goondah Siding, on the main southern line, 202 miles from Sydney.

2. *Berembed Diversion Weir*, situated at one of the narrowest portions of the Murrumbidgee River Valley, between Wagga and Narrandera, about 12 miles from Grong Grong, which is on the Hay branch railway line, 340 miles from Sydney, and

3. *Murrumbidgee Irrigation Area*, where are the irrigation farms. These farms are situated adjacent to the Hay branch railway line, at varying distances from Sydney, commencing at Yanco, 367 miles, and ending at Mirrool, 381 miles distant from the Metropolis.

Burrinjuck Dam.

Fairly satisfactory progress has been made with the Burrinjuck Dam during the twelve months ended 20th June, 1912.

The excavation for the foundation of the dam north of the diversion channel was completed up to the 1060 R.L.; some difficulty was incurred in this excavation on account of the faulty nature of the rock, necessitating the removal of some 40,000 cubic yards, which it was not considered advisable to leave under the heavy section of the wall.

Concreting was suspended for six months while the above excavation was being taken out, the quantity of concrete put in during the year amounts to 47,000 cubic yards, averaging about 1,800 cubic yards per week during the six months this work was in hand.

Plum stones of suitable shape have been difficult to obtain, and though a percentage of about 31 has been maintained, it has been with considerable difficulty.

The total concrete in the dam wall is now 131,000 cubic yards, but as there is now a much greater length to work out, and as concreting will not now have to be entirely suspended while excavation is being carried out, future progress should be much more rapid, and it is anticipated that storage to a depth of 70 feet against the dam will be possible in a few months.

In addition to 8,000 cubic yards sand stored in the immediate vicinity of the dam, some 40,000 cubic yards have been stored on Barber's Flat, about a mile and a half above dam, and about 1,080 R.L. The clearing of the first basin above the dam has been nearly completed.

A third cableway has been placed in position during the year. All the other plant has been working satisfactorily, and is in good order. A large slip occurred at the southern end of excavation in March, and three men had a marvellous escape from being killed, otherwise the accidents have been confined to small casualties.

The two-foot gauge railway from Goondah to Burrinjuck has been working satisfactorily, and produced a revenue of £2,800, which was largely augmented by the passenger traffic, the influx of visitors being on the increase.

Berembed Weir.

Berembed weir having been completed early in 1911, work on that portion of the scheme has been only that of maintenance. The weir is under a competent caretaker, who resides in a cottage adjacent thereto, and there are employed under him at the weir six maintenance men. The maintenance of 84 miles of main canal with about 13 miles of main branch canal has been incorporated with the maintenance of Berembed Weir and there are twenty men employed in keeping these canals in good working order. During the spring months of 1911 a large volume of water was turned down the main canal and held up on the various regulators, in order to subject the banks to a fairly-severe test. The results of the test were good, there being but little subsidence. The works have proved to be well up to expectations.

Irrigation Area.

Construction, Building, &c.

Construction work on the Murrumbidgee Irrigation Area during 1911-12 chiefly consisted of the continuance of the main canal, the preparation of the distributory channels with the regulators, bridges, and outlets required to put the water on to each of the irrigation farms on the Yanco Irrigation Area, and, during the latter portion of the year, the building of houses for settlers. On April 1st 1911, the day-labour system was introduced on the area and the same has continued ever since. From the 1st July, 1911, to the end of that year the number of men employed daily was approximately 300. From the 1st January to 30th June, 1912, the number of men employed gradually increased, there being over 1,200 employed on the last-mentioned date. During the latter period rapid strides were made in the works.

The

The amount of channel excavation on distributories, which has been carried out between May, 1911 and 30th June, 1912, has been 476,300 cubic yards, representing 71 miles of channels.

The total number of structures, "comprising bridges, checks, drops, outlets, regulators, and syphons constructed has been 504, in which 2,832 cubic yards of concrete have been placed. All of this work has been on the Yanco Irrigation Area.

The amount of channel excavation which has been done during the period December, 1910, to June, 1912, on the main canal has been 224,000 cubic yards; on the Mirrool branch, 165,000 cubic yards, and on the Hay branch, 256,600 cubic yards, making, with the distributory excavation before mentioned, a grand total of 1,121,900 cubic yards.

In connection with the roads, the following formation has been completed :—

Metal roads, three (3) miles; gravel roads, three (3) miles; formed roads, fifty-five (55) miles.

There has also been completed thirty (30) miles of delver drains, and forty one (41) miles of fencing.

In April, 1912, the Building Department was organised, and the work of constructing settlers' cottages, factories, &c., rapidly proceeded with.

At the commencement of 1912 a well equipped Sawmill and Joiner's shop was completed, and put into thorough working order, at a site near the railway station. This factory is capable of machine cutting framed houses for settlers at a rate equal to any modern factory of its size. The prices of the joinery turned out from the workshop compare very favourably indeed with Sydney prices. During the financial year a large amount of timber-cutting has been done on the area and depôts, erected at convenient places for the supply of fencing posts, house-blocks, &c., for the use of settlers.

A Pumping Station is in course of erection near an artificial lake, and the construction of the storage reservoir at Leeton is also being proceeded with.

The construction of an Electric Light Power Station has been commenced and is being rapidly pushed forward. It is anticipated that by December, 1912, sufficient electrical power will be available for pumping purposes, for the Butter Factory, and the electric lighting of the various residences and stores in the township. It is also contemplated that electric light will be provided to settlers' houses at a reasonable rate per unit.

The erection of a Butter Factory, built on modern lines and in accordance with the regulations set down by the Agricultural Department, has been proceeded with and is now nearing completion. This factory has been designed for a capacity of 40 tons of butter per week, and is capable of expansion without interfering with the structural details or with an economy of management in the future.

In addition to the butter factory, stores, butcher's shops, a hall for the use of workmen, residences for officers, cottages for nurserymen, &c., together with about ten other buildings, have been completed. On June 30th there were forty-three (43) other buildings in course of construction, principally consisting of houses for settlers.

To carry out these works by day-labour has necessitated the organising and equipping of a very large construction force, which is now in good working order.

Surveys.

Close contour surveys of the whole of the areas to be subdivided into irrigation farms have had to be made, and during the period under review the areas so dealt with are 40,000 acres on the Yanco area, 26,000 acres on the Gogeldrie area, and 46,000 acres on the Mirrool area. Of these areas, subdivision designs for 748 farms, comprising 25,201 acres in the Yanco area, and 448 farms, comprising 23,362 acres on the Mirrool area, have been got out, of which 640 farms (24,415 acres) in the Yanco area, and 207 farms (10,687 acres) in the Mirrool area, have been surveyed by the Department of Lands.

In addition to the above surveys, forty (40) miles of main and main branch canals, 167 miles of distributory channels, and 129 miles of drainage channels, have been permanently marked out for construction, while the subdivision design for the township of Leeton, comprising an area of 251 acres, was completed and divided into 925 allotments, of which 484, totalling an area of 125 acres, have been marked out.

Designs for four (4) village settlements on the Yanco area have also been prepared, each settlement comprising a few quarter ($\frac{1}{4}$) acre blocks for business purposes, surrounded by two (2) acre farms for workmen, and also school and other reserves.

A design for the new township of Griffith on the Mirrool area is also in hand.

In addition to the irrigation farms, a start has been made on the subdivision of the "dry areas" into "dry farms" to be worked in conjunction with the irrigation farms, some fourteen (14) of such farms, comprising 2,111 acres, having been surveyed.

A contour plan of his farm is supplied to each settler, to enable him to properly grade and lay out his land for watering, and, so far, 407 such contour plans have been completed.

Designs for all structures required for the distributory works have been prepared, and at present all the engineering design and drafting work in connection with the whole scheme is being carried out at the local headquarters at Leeton.

The detailed particulars of the survey and design work carried out during the financial year are given in the following tables :—

1. Contour Surveys.

Close contour surveys of the following areas have been completed, viz. :—

Yanco Area	...	...	...	...	...	40,000 acres.
Gogeldrie Area	...	...	...	...	...	26,000 "
Mirrool Area	...	...	...	...	...	48,000 "
Total.	...	...	...	...	...	114,000 acres.

2. *Permanent Surveys.—Main Canals.*

Murrumbidgee Northern Canal	30 miles.
Hay Branch Canal	8 "
Mirrool Creek Branch Canal	2 "
Total.	40 miles.

3. *Surveys.—Distributory Channels.*

Yanco Area	116 miles.
Mirrool Area	51 "
Total.	167 miles.

4. *Surveys.—Drainage Channels.*

Yanco Area	96 miles.
Mirrool Area	33 "
Total	129 miles.

5. *Total Length of Channel Surveys.*

Main Canals	40 miles.
Distributory Channels	167 "
Drainage Channels	129 "
Total	336 miles.

Administration and Settlement.

At the close of the financial year steps were taken by the Trust administering the Murrumbidgee Irrigation Area to allot the first subdivision of lands on the Murrumbidgee Irrigation Area.

Further particulars in regard to these, and the full details of the administration of the Murrumbidgee Irrigation Trust from its inception up to the 30th June, 1912, will be found in the Report of that body, printed separately.

The Director General.

L. A. B. WADE, M.Inst. C.E.,
Chief Engineer for Irrigation.

Harbours and Water Supply Branch.

Public Works Department, Sydney, 20 September, 1912.

I HAVE the honor to submit herewith report of the operations of the Harbours and Water Supply Branch of the Public Works Department for the year ended 30th June, 1912, and in doing so, to draw special attention to the following :—

Great difficulty is still experienced in maintaining a navigable depth of water at the small river entrances, notably at the Nambucca and Bellinger.

The necessity for improving one or other of the river entrances between the Richmond and the Macleay, or providing an artificial harbour on this stretch of coast, is becoming daily more urgent.

It has been referred to the Parliamentary Standing Committee on Public Works to report (1) on a scheme for the construction of a northern breakwater at the Clarence River, and (2) on the proposal to construct a harbour at Coff's. These inquiries should result in a definite decision as to the expenditure to be incurred in providing for the trade of that section of the coast referred to, and if permanent works are constructed at these places, the Department will be in a better position to deal with the remaining coastal ports, with the dredging fleet at its disposal.

The problem of providing an adequate water supply of the necessary purity for domestic purposes for inland towns is becoming more difficult of solution as the population of the State increases. Climatic conditions, the habits of the people, and the necessity for ample water for garden purposes, if the towns are to be improved, all tend to a large consumption, not less than fifty gallons a head per day in summer. The absence of permanently flowing rivers, and the high evaporation inland, make the storing and delivery of the requisite volume of water a costly matter, in many cases outside the financial resources of the towns. The small number of watercourses tends to settlement on or close to the banks of those which exist, with a resulting danger of pollution of the streams, while the difficulty of storing sufficient water for a town supply, in view of the high evaporation rate already referred to, is increased by the difficulty in providing against the silting of the reservoirs and the deterioration of the water therein, due to the decay of vegetable matter, or growth of algae.

As to the financial aspect of the question, due amendment of the existing Acts is under consideration with the object of providing works suitable for the growth of population, although such works may be beyond the present financial reach of the town. As to the quantity and quality of water available, it is easier to provide the former than the latter. I should be the last to advocate a low standard of purity for water which is supplied for drinking purposes; but the conditions are such that even with mechanical filtration, the difficulty and cost of supplying such a large volume of potable water is very great. It must be borne in mind that of the water, say fifty gallons a head a day, supplied for town purposes, only about three gallons a head a day is used for drinking and cooking, the remainder 94 per cent. of the water, while not actually necessary to sustain life, is used for purposes essential to health and civilisation. We are therefore in the position of being called upon to purify a hundred gallons of water up to a drinking standard, in order that the six gallons of that hundred may be suitable for drinking. I am of opinion that the solution of the difficulty lies in the separation of the drinking supply from that for general purposes, and that the time is not far distant when such separation will be found to be the only practical as well as the most economical system of supply.

In this branch of the Public Works Department important works have for many years been carried on without the intervention of a contractor, or as it is called, by day labour, and carried on successfully and economically. In the case of Port Kembla Harbour, for instance, when a heavy plant is in operation, the costs have been reduced to a figure which will compare favourably with those of any work of which I have a record. The extension of the system, coupled with the large number of works on hand, has been associated with initial difficulties. To obtain the necessary plant, and adopt the organisation of the staff, takes some little time, but I think these difficulties have now been overcome, and that the results obtained on the large works at Broken Hill, in the construction of works in connection with the South Coast districts' water supplies, and in other places, will be found satisfactory.

In pursuance of an agreement between the Premiers of the States interested, a conference of Engineers—Mr. Detheridge, representing Victoria, Mr. Graham Stewart, South Australia, and myself New South Wales—has been engaged in assembling such information as is now available in connection with the Murray waters, with a view to making such recommendations as may tend to a settlement of the important question. It is hoped a report on the subject will be submitted shortly which will be of assistance in reaching finality.

I must again record my appreciation of the work of the Officers of the Branch during the past year.

E. M. DE BURGH,
Chief Engineer for Harbours and Water Supply.

HARBOURS AND RIVERS.

Tweed River.

Harbour Works.—The works were suspended in August, 1904, and no further work has been carried out at this entrance since that date. The lengths remaining to complete the scheme of improvement as originally designed are 282 ft. of the northern and 852 ft. of the southern breakwater.

State of Entrance.—A considerable area of shoal water exists near and at the mouth of the river, through which vessels have to find their way to the ocean by a route which is subject to frequent and rapid alterations in position, and is often very intricate and tortuous for navigation.

The average depth on the bar at low water springs for the year was 5 ft. 3 in. and on the inner crossing 5 ft. 2 in., against 6 ft. 8 in. and 5 ft. 10 in. for the preceding year. The bar dredges worked on three occasions at this entrance at a cost of £1,144 16s. 6d.

Terranora

Terranora Dock.—Transactions :—

Number of Government vessels docked	...	...	...	...	...	Nil.
Tonnage	...	...	...	...	...	Nil.
Number of private vessels docked...	...	...	...	...	...	9
Tonnage	...	...	...	...	...	533
Revenue received	...	...	...	...	...	£88 16s. 3d.
Expenditure of docking private vessels	...	...	...	...	...	£12 17s. 9d.
Cost of maintenance, &c.	...	...	...	...	...	£312 8s. 1d.

Repairs and maintenance :—Repairs to the dock gates, including zinc sheathing of gates, repairs to boiler, machinery, &c., were carried out at a cost of £312 8s. 1d.

Powder Magazine, Point Danger.—The erection of a galvanized iron fence round the magazines and sundry repairs to bring them up to the requirements of the Explosives Act were carried out.

Wharves.—Repairs to the two crane wharves at Tweed Heads and to the wharf at the dock were carried out at a cost of £241 18s. 3d.

Byron Bay.

Jetty Extension.—The contract for the widening of the outer 100 feet of this jetty to 40 feet, and the extension of 150 feet by 40 feet, and the replacing of the single line of railway with a double track, together with the erection of one 10-ton and two 3-ton steam derrick cranes; also the building of a shelter shed 20 feet by 10 feet on the outer end of the jetty was completed during June. The expenditure for the year amounted to £7,076 12s. 8d.

Richmond River.

Harbour Works.—The outer end of the southern breakwater, which had sunk considerably during the very heavy seas which prevailed for the first five months of 1911, was repaired and raised to its original level; several bad places on the sea side were also repaired. About 8,000 tons of stone were obtained from the sidings on the wall and used for this purpose at a cost of £521 17s. 9d.

State of Entrance.—The average depth of water for the year at low water springs was 11½ feet on the bar and 9¼ feet on the inner crossing. During the year the bar dredges paid four visits to this entrance, at a cost of £1,941 16s. 2d.

Stone Punts.—These punts, which had been used for transfer of stone from Riley's Hill to the breakwater, were put in good order for transfer to various other works at a cost of £450 3s. 8d.

Sand Drift Prevention, South Beach.—During July the fence was raised about 2 ft. 6 in. along its whole length of 2,800 ft, and two tons of Marram and a quantity of spinifex and blady grass were planted at a cost of £139 3s. 4d.

Crane.—The dismantling of the 30-ton crane at Ridley's Hill Quarry for transmission to Port Kembla was commenced late in the financial year.

Riley's Hill Dock.—Transactions :—

Number of Government vessels docked...	...	...	...	...	7
Tonnage	...	...	...	...	1,050
Number of private vessels docked	...	...	...	...	Nil.
Tonnage	...	...	...	...	Nil.
Revenue received	...	...	...	...	Nil.
Expenditure in docking private vessels	...	...	...	...	Nil.
Cost of maintenance	...	...	...	...	£353 2 0

Repairs.—The cill of the dock, which was damaged when first used, gradually became worse and had to be repaired. This necessitated the construction of a coffer dam across the entrance. The gates were also taken out and repaired and sheathed with zinc; cost, £353 2s.

Dredges.—Sundry repairs to the various dredges on the river were carried out at the Ballina Fitting-shop at a cost of £719 12s. 1d.

Water Hyacinth, Emigrant Creek.—The whole of the water hyacinth in this creek was removed from that part of the river, extending from the head of navigation at Tintembar to 4 miles down stream, at a cost of £199 7s. 10d.

Sunken Punt.—This punt (the property of Mr. A. Fenwick) which had sunk in the river just above the entrance to the North Creek Canal, was lifted and removed to the inside of the South Breakwater at a cost of £42 11s. 7d.

Wharves.—The wharf at Ballina and that at Riley's Hill had some small repairs effected at a cost of £20 14s. 3d.

Snagging Duck Creek.—Two trees which had fallen into this creek near the cane-loading site were removed.

Plant.—The caretaking of the plant on the Richmond River, at Ballina and Riley's Hill, amounted to £202 12s. 3d. for the year.

Punts.—The Coraki and Woodburn ferry punts were overhauled at the Ballina shops at a cost of £303 2s. 3d.

Clarence

Clarence River.

Harbour Works.—No permanent work has been carried out at this entrance since August, 1902.

State of Entrance.—The average depth of water for the year at low water springs was 12 ft. 1 in. on the bar, and on the inner crossing 11 ft. 10 in. Above the crossing the river remains in fair condition. The bar dredges worked on four occasions at this entrance, at a cost of £1,660 13s. 2d.

Tug "Alexandra."—The annual overhaul of the tug's hull, engines, boiler, &c, was carried out at Ashby Dock at a cost of £122 15s. 6d. Repairs to her machinery, necessitated by the fire which took place on board, were started.

Beacons.—The beacons between Grafton and Copmanhurst were repaired, and the trees and undergrowth which obstructed a clear view of them were removed, at a cost of £23 7s. 5d. A tripod beacon of old iron rails has been placed at the entrance to North Creek.

River-bank Protection.—A small flood-gate and about three chains of drain were constructed for the purpose of keeping back the salt water from the cultivated area at the Aboriginal Station, Ul Gundahi Island, at a cost of £24 8s. 5d. In addition, about 27 chains of frontage on the main river side of the Island, in front of the principal building, was protected from erosion by a stone facing-wall, at a cost of £163 16s. 8d.

Wharves.—A wharf, to replace the old wharf used for the pilot steamer at Yamba, was erected at a cost of £130 0s. 7d. At the Harwood wharf a tripod dolphin of sheathed ironbark piles was erected at each end for the purpose of more securely mooring the longer steamers now trading there, at a cost of £146 14s. 5d.

Sand-drift Prevention at Iluka.—A quantity of Marram grass was planted on the sand dunes near the end of the training-wall on the north beach, to prevent the sand drifting over the wall into the channel, at a cost of £30 6s. 3d.

Ashby Dock.—Transactions:—

Number of Government vessels docked	11
Tonnage	811
Number of private vessels docked	4
Tonnage	249
Revenue received	£39 4s. 1d.
Expenditure on docking private vessels... ..	£18 3s. 7d.
Cost of maintenance	£77 2s. 1d.

Repairs.—Sundry repairs to this dock, and to the gates and machinery, were carried out at a cost of £77 2s. 1d.

Boat Harbour, Yamba.—A portion of this harbour was deepened to 3 feet at low water for the use of motor boats, and the stone work at the entrance was strengthened, at a cost of £65.

Plant.—The caretaking of the plant laid up on this river cost £122 6s. 2d.

Miscellaneous.—The Grafton, Ulmarra, and Harwood ferry punts, and the relieving ferry punt, were overhauled at the Ashby dock, at a cost of £512 4s. 10d.

Woolgoolga.

Jetty.—During the year some minor repairs were carried out at this jetty, and acetylene gas-light has been installed at a cost of £233. Approval was obtained to renew a number of piles and parts of the decking, and this work is now proceeding.

Coff's Harbour.

Jetty.—Repairs and maintenance to the jetty amounted to £156 for the year, and the installation of acetylene gas-light cost £244. The traffic at the jetty has greatly increased during the year, and the widening and enlarging of the jetty is a matter of considerable urgency to cope with the increased traffic.

Breakwaters.—Considerable progress with the preliminary work in connection with the establishment of a deep-sea port for ocean-going vessels has been made. The scheme is at present before the Public Works Committee for inquiry and report.

Bellinger River.

Harbour Works.—The breakwaters and training walls remain as described in Annual Report of 1905-6, page 53, no extension having since been made.

State of Entrance.—The bar throughout the year has been very shallow, mostly on the northern side of the southern training wall, and very difficult for navigation, and during April, May, and June the trouble became very acute. Though a bar dredge has been kept in the vicinity for the special purpose of giving relief at the first favourable opportunity, every attempt to improve the entrance by dredging was rendered futile by adverse weather conditions.

The average depth for the year has been 4 ft. 10 in. on the bar, and 5 ft. 10 in. on the crossing, the minimum depth being 2 ft. and 4½ ft. on the bar and inner crossing respectively. The amount expended upon dredging at the bar and crossing during the year was £881 6s. 4d.

Nambucca River.

Harbour Works.—The permanent improvement works still remain suspended, no work having been done at this entrance since October, 1903.

State of Entrance.—The direction of the entrance channel has generally been straight out, varying in width from 140 ft. to 30 ft. From May to the end of the financial year the bar was practically closed,

closed, no definite channel being discernible; consequently, much inconvenience was caused to shipping generally. In May the s.s. "Bellinger" was wrecked in attempting to cross the bar. The bar dredge detailed to improve the entrance was unable to give any relief on account of the adverse weather conditions. The expenditure amounted to £205 1s. 9d.

The average depth for the year has been 5 ft. 11 in. on the bar, and 6 ft. 3 in. on the inner crossing at low water spring tides.

Macleay River.

Harbour Works.—No extension to the improvement works at this entrance has been made during the current year, the work still standing as described in Annual Report of 1907, page 53.

The quarry and the tramline have been repaired in order to effect some necessary repairs to the south training walls; 9,109 tons of stone were placed in position at a cost of £1,432, or 36·17 pence per ton.

State of Entrance.—The navigable channel remained throughout the year in a north-easterly direction. The entrance, however, required a number of visits from the bar dredges to keep up navigation, at a cost of £3,779 14s. 7d. The depth on the bar ranged from 6 ft. to 9½ ft. The average depth on the bar has been 7 ft. 7 in., and on the crossing 8 ft. 4 in.

Hastings River.

Harbour Works.—The breakwaters and training walls remain as outlined in Annual Report of 1904, page 30, no extensions having been made since October, 1901.

State of Entrance.—The entrance channel has generally been in a north-easterly direction, the width varying from 50 to 180 feet. The bar-dredges visited the entrance on two occasions, at a cost of £581 8s. The upper portion of the river was in a fair condition throughout the year.

Camden Haven.

Harbour Works.—The work of repairing the northern breakwater started on the 9th May. A considerable amount of preliminary work had to be done before a fair start with the depositing of the stone could be made; 3,580 tons of stone have been quarried and tipped in position. Bushes were placed along the toe of the wall, and quarry refuse on top, which had a marked effect in lessening the influx of sand. The average number of men employed on the work was forty-eight. A diver was employed at the quarry wharf removing about 110 tons of loose stone dropped from the punts into the inlet.

Marram grass, imported from Port Fairy, Victoria, has been planted on the northern side of the north breakwater to check the inroad of the loose sand. The grass is doing well, and very favourable results are anticipated.

Repairs to Stone Punts.—Extensive repairs, which almost amounted to rebuilding, of three punts have been carried out at a cost of £926.

State of Entrance.—The entrance to the river remained very much in the same condition as last year. On no occasion have the services of a bar dredge been asked for, or needed, during the year, which speaks well for the work so far done in connection with the northern breakwater extension. The average depth on the bar at low water spring tides for the year was 5 ft. 1 in., and on the inner crossing 6 ft. 2 in.

Manning River.

Harbour Works.—No work has been done at this entrance since February 1904. A description of the work done to date is found in the Annual Report of 1904, pages 30 and 31. Act No. 16, 1911, authorises a further expenditure of £150,000 in the extension of 210 ft. of the northern breakwater, and the construction of 11,150 ft. of training wall and breakwater on the southern side of the entrance. As soon as the necessary funds are available, a start will be made to carry out the work of further improving this entrance.

State of Entrance.—The prevailing direction of the navigable channel throughout the year followed the northern training wall, the bar carrying from 5½ ft. to 12 ft. at low water spring tides. The services of the bar dredges were needed on five occasions at the entrance, occupying 137 working days, at a cost of £3,069 6s. 4d.

The average depth on the bar has been 8 ft. 8 in., and on the inner crossing, 7 ft. 1 in. at low water spring tides, being a very slight improvement on the previous year's average.

Cundle Dock.—Extensive repairs and additions to the buildings at the dock have been carried out; also some necessary repairs have been affected to the Caretaker's cottage.

Cape Hawke.

Harbour Works.—No extension to the training walls have been carried out at this entrance since December, 1901.

State of Entrance.—The bar remained in a good position throughout the year, with fair water, ranging from 5 ft. 3 in. to 3 ft. The Tuncurry crossing, however, was frequently very crooked and narrow, and much inconvenience was experienced by shipping in navigating the crossing, especially at neap tides. The average depth on the bar was 4 ft. 1 in., and on the crossing 6 ft. 1 in., being the same as that of the preceding twelve months.

A coal bunker has been erected on the Government wharf for the use of the dredges, at a cost of £67.

Brisbane Water.

Gosford Reclamation.—An area of about 8½ acres of low-lying land at Gosford is to be reclaimed at an estimated cost of £2,450. The work consists of a ballast wall about 2 ft. above high-water spring tides, and the filling in with dredged material behind the wall. The area thus reclaimed will form a much needed recreation reserve. The Erina Shire council are contributing £1,000 towards the cost. A start was made with the work towards the close of the year, and about £292 was expended.

Hawkesbury

Hawkesbury River.

Mangrove Creek Snagging.—Some snags were removed, and a few overhanging trees cut down in the creek during the year, at an expenditure of £18.

Cattai Creek.—The condition of this creek has also been improved by an expenditure of £16 2s. 6d. on the removal of some snags and overhanging trees.

Sydney Harbour and Port Jackson.

Bantry Bay.—Magazine Sites for Explosives.—The contract entered into with Mr. Cornwall for the excavation of sites for magazines and erection of sea-wall closed in October. the amount paid in respect of the contract being £6,571 0s. 9d. Since then the work has been carried out by day labour, excavating additional sites, and effecting further improvements. The cost during the year amounted to £4,465, and to date £9,206.

Bondi Beach.

Retaining Wall.—This work has been completed for a length of 1,248 ft. from the southern end, or to a point opposite the new dressing sheds erected by the Municipal Council of Waverley. To give access from the promenade to the beach, ramps at a gradient of 1 in 5 have been provided in preference to a combination of steps and ramp, as originally designed. The ramps answered their purpose very well until the piling of sand against the face of the wall rendered their presence practically unnecessary in the centre, and at the north end of the wall. At the southern extremity of the wall, the lower end of ramp, and part of the wall for about 12 ft. was undermined during the recent heavy storm, but the damage done was not of a serious nature, and has been repaired. A new footway to replace the unsightly and inconvenient wooden steps leading from the tramway waiting-shed has been provided, and the rail track leading towards the baths has also been made good. The expenditure on these works to the end of June amounted to £3,218, and the total since the commencement of the work to £5,443.

Botany.

Long Pier.—The work of renewing and enlarging this pier at an estimated cost of £9,755, including tramway for use of State Brickworks at Botany, was commenced during the year. Progress has not been as satisfactory as might have been wished, owing chiefly to the great difficulty in getting timber supplies forward; latterly, the weather conditions and dearth of suitable men have been contributing factors in delaying the work, while the necessity for keeping the traffic going has also retarded progress. Since starting work, it has been decided to widen the approach on the eastern side at an additional cost of £1,100, and this portion of the work is now nearing completion. Expenditure for the year amounted to £4,305.

Sea Wall and Groyne.—The sea wall near the tram-line was repaired and extended during the year at a cost of £585, including the provision of a stone groyne at the western end, extending a distance of about 500 ft. into the bay. The effect desired by the latter work has been fairly well realised, the beach having made considerably in the angle formed between the groyne and the wall. The abnormally heavy seas experienced lately have flattened out the groyne to some extent, but the wall stood the test very well.

Cook's River and Shea's Creek.

Bank Protection.—The work of extending and repairing the bank has been continued and carried on so far as funds allowed during the year, a new length of about 1,080 ft. of walling having been completed near the Sewage Farm. Drains and floodgates have had attention, 42 ft. of Monier pipe have been put in, and a few snags have been removed. The expenditure for the year amounted to £2,466.

George's River.

Tom Ugly's Point.—The wharf at this place has been extended during the year at a cost of £340.

Long Cove Canal.

A considerable length of walling on the right bank at the northern end of the canal was repaired at a cost of £455.

Homebush Bay.

State Brickworks.—The construction of about 35 chains of tram-line for the use of the State Brickworks was undertaken and completed during the year at a cost of £952.

After the earthen embankment had been carried out a considerable distance, it was decided to substitute a timber platform for 260 ft. in the immediate approach to wharf, and this portion of work was undertaken by the Sydney Harbour Trust and completed at a cost of £509 14s. 8d., including ballast at end of bank, making a total of £1,462. The wharf was also built by the Harbour Trust for the sum of £599 19s. 4d. The excavation of site for power-house in connection with the State Brickworks was also carried out at an expenditure of £895.

Callan Park.

Wharf.—Repairs amounting to £151 were carried out at this wharf.

Circular Quay.

Man o' War Steps.—The repair of wall and boat landing has been undertaken by the Sydney Harbour Trust. The work is now progressing.

Newington Asylum.

Wharf.—Some minor repairs have been carried out at a cost of £16.

Rose Bay.

A survey has been made in connection with reclaiming the mud-flats and laying out of a road, and plans have been prepared.

Wollongong.

Wharf.—Repairs to wharf damaged by s.s. "Eden" were effected at a cost of £30 9s. 6d.

Port Kembla.

Harbour Works.—The works are authorised by Act 1898 (62 Vic. No. 34), and are being carried out by day labour.

Quarry.—The output of stone from Reid's Hill Quarry and its distribution were as follows:—

	tons,	tons.
Breakwaters—Eastern	21,163	
Northern... ..	171,015	
		192,178
Roads		1,066
Embankment for Stone Crusher		10,664
Loop line to New Jetty		3,094
		<hr/>
Total Quarry Output		207,002

The length of the eastern breakwater is 2,750 ft., as authorised by the Act and reported in last year's Annual Report, page 75. 21,163 tons of stone were used to strengthen the breakwater at a cost of 28·64 pence per ton. The total amount of stone deposited to date is 794,624 tons at a cost of 37·15 pence per ton in position.

In the northern breakwater 171,015 tons of stone have been tipped, costing 28·67 pence per ton, advancing the breakwater 650 ft. during the year, the total length constructed to date being 2,070 ft. from H.W.M. The depth of water at the tiphead is 40 ft. at low water spring tides.

The rise in wages to workmen has made the cost heavier than it was previously.

New Coal Loading Jetty.—The building of the jetty for the better handling of coal, to replace the old Southern Coal Company's high-level jetty, has been commenced during the year, and 42 bays of 20 ft. each have been put in, representing 840 ft. of jetty. Turpentine piles have been used in the structure, ironbark for capwales and girders and hardwood decking. The deck level is 8 ft. above H.W.O.S.T. The total length of the jetty, when completed, will be 1,220 ft.

A circular loop line to bring coal to this jetty has been commenced. A contract has been let to Messrs Kelly & Lewis of Melbourne for the supply and erection of a belt conveyor for this jetty.

Stone Crusher.—An embankment has been formed of small stone, and plans have been prepared for the foundations of a gyratory crusher for breaking small stone from the Reid's Hill quarry for road purposes, &c.

Kiama Harbour.

Miscellaneous.—The concrete breakwater has been repaired at a cost of £29, and repairs to fenders were carried out at a cost of £53 15s. 11d.

Crookhaven River.

Harbour Works.—The construction of the northern breakwater extension was continued up to February, when work ceased. 24,980 tons of stone were deposited in place, at a cost of 47d. per ton, advancing the breakwater 530 ft. to the shelf of rocks. Total stone deposited to date, 96,900 tons, costing 46·43d. per ton. The structure has proved very useful, some acres of sand having been held back on the outer side, where there was 20 ft. of water, which otherwise would undoubtedly have entered the harbour and been deposited on the inner crossing.

State of Entrance.—Ample water has been on the bar throughout the year, the average being 9 ft. 9 in.; the inner crossing, however, gave a little trouble, the average depth at low water spring tides being only 4 ft. 2 in.

Bateman's Bay.

Harbour Works.—No permanent work for the improvement of this entrance has been carried out at this place.

State of Entrance.—The bar carried an average depth of 5 ft. 6 in. during the year, being practically the same as for the previous year.

Moruya River.

Harbour Works.—No further permanent improvements have been carried out at this entrance during the financial year.

State of Entrance.—The entrance channel remained practically in the same position throughout the year, in line with the northern breakwater, and the bar carried ample water, the average being 10 ft. 1 in., against 9 ft. 1 in. for the previous year; the inner crossing, however, still remains shallow, having only 5 ft. 3 in. at low water spring tides.

Wagonga Inlet.

State of Entrance.—The average depth on the bar during the year has been 8 ft. 4 in., and on the inner crossing 7 ft. 9 in., against 6 ft. 8 in. and 7 ft. for the preceeding twelve months.

Bermagui.

Bermagui.

Wharf Extension.—The contract for extending the existing wharf and making its tee-end 120 ft. by 30 ft. by 70 ft. further out into Horse-shoe Bay, together with a new low-level cattle crush, was completed during the year at a cost of £9,091 16s. 5d.

Tathra.

Wharf Extension.—A contract was accepted for extending the front of the wharf 15 ft. further out and making the face 120 ft. in length.

Eden.

Jetty.—A contract was let for widening the existing jetty for a length of 340 ft. by 5 ft. 3 in. on the western side, at a cost of £963. The work is almost completed.

A plant is in course of erection for lighting the jetty with acetylene gas.

Fish Shed.—A new fish shed is in course of construction.

Hydrographic Surveys.

During the year surveys have been made of Port Kembla, Port Forster, Harrington Inlet and Coff's Harbour. At the latter harbour investigations for suitable quarries have been made, a railway line surveyed to McAuley's Range, the harbour breakwaters and reclamations set out and borings taken to define rock levels over the area of harbour to be enclosed.

At the Clarence River observations were taken to ascertain the action and trend of the littoral currents off the Entrance, more particularly in reference to sand movements. At King's Bluff, Blessings and Point Solander measurements were taken and marks erected to define measured lengths on a North Magnetic course of 1 and 5 sea miles respectively, for use during speed trials of warships.

Investigation surveys have been made at Curl Curl and Narrabeen Lagoons for proposed drainage and reclamation works, and also at Homebush Bay for wharfage and reclamation in connection with the Government works at that site.

TABLE giving Expenditure on Harbour Improvements to 30th June, 1912.

River.	Date of Commencement.	Expenditure.		Total.
		Prior to Authorising Act.	Under Acts	
		£ s. d.	£ s. d.	£ s. d.
Tweed	Nov., 1891	30,685 0 0	59,148 16 1	89,833 16 1
Richmond	Latter half of 1889.	.....	439,099 7 7	439,099 7 7
Clarence	1862 and Jan., 1891.	182,830 0 0	279,443 2 7	462,273 2 7
Bellinger	June, 1892	25,985 0 0	39,835 13 8	65,820 13 8
Nambucca	Feb., 1896	5,503 0 0	27,298 14 1	32,801 14 1
Macleay	April, 1896	14,953 0 0	72,673 14 4	87,626 14 4
Trial Bay .....	.....	164,665 6 5	.....	164,665 6 5
Hastings	July, 1897	900 0 0	23,819 2 8	24,719 2 8
Camden Haven	1897	.....	.....	48,144 1 1
Manning	Dec., 1894	23,020 0 0	78,178 17 9	101,198 17 9
Cape Hawke	Aug., 1894	.....	15,774 10 11	15,774 10 11
Lake Macquarie .....	.....	92,941 8 9	.....	92,941 8 9
Port Kembla	Aug., 1901	.....	269,094 3 3	269,094 3 3
Crookhaven	Oct., 1902	25,076 7 8	.....	25,076 7 8
Bateman's Bay	June, 1900	16,624 2 5	.....	16,624 2 5
Moruya	1897	39,966 7 5	.....	39,966 7 5
Wagonga .....	.....	671 16 2	.....	671 16 2
Newcastle	Sept., 1897	.....	.....	263,256 4 7
Totals ... ..	...	623,821 8 10	1,304,366 2 11	2,239,587 17 5

DREDGE SERVICE.

The attached statements show the year's work amounts to 5,964,163 tons, costing £142,394 7s. 9d., or an average of 5.72d per ton.

This expenditure was distributed as follows:—

Tweed River.—The suction dredge "Actor" was engaged deepening the Crossing, Ugrehah Bight, and Terranora Creek. The combined grab and suction dredge "Sigma" worked in Terranora and Cobaki Broadwaters. The bar dredges "Tethys" and "Antleon" both visited the Tweed to improve bar and crossing. The total expenditure on this river was £7,128 4s. 2d.

Byron Bay.—Consequent upon the s.s. "Wollongbar" grounding near the jetty, the bar dredge "Tethys" was sent here early in June and removed 14,870 tons of sand at a cost of £243 4s. 4d.

Richmond River.—The cutter suction dredge "Dictys" completed the deepening of the river at Pimlico and Broadwater early in the year, and after a lengthy overhaul, was engaged upon reclamation work at Ballina. The ladder and suction dredge "Ulysses" deepened various shoals in North Arm, also deepened at site of Swan Bay Depot and channel, Schiebels to Newby's wharf, below Coraki. The grab dredge "Mu" worked in South Arm at Oakey Creek wharf, Carlton's Bend, Greenridge wharf, Tomki Station, and Rankin's wharf, also deepened in front of Railway wharves at Lismore. The grab dredge "Aon" operated in the North Creek Canal, and the grab, No. 52, deepened the navigable cane punt channels

channels in Emigrant, Duck, and Teven Creeks, and also operated on Broadwater Crossing approach. Both the bar dredges, "Tethys" and "Antleon," have worked the crossing. The expenditure on this river was £14,441 12s. 11d.

Clarence River.—The ladder dredge "Minos" operated at Southgate and North and South G wharves, also McKittrick's Yamba Channel and Palmer's Island Channel, and is now under repair. The suction dredge "Juno" has been solely engaged at Iluka Crossing. The bar dredges "Antleon" and "Tethys" worked the bar and crossing. The total expenditure on this river was £8,358 1s. 11d.

Coff's Harbor.—In order to ascertain what increased area could be obtained by dredging in the proposed new harbor, and to enable designs for wharves, &c., to be prepared, the dredge "Neptune" carried out certain boring operations here at a cost of £1,034 16s. 9d.

Beltinger River.—The suction dredge "Rho," after a lengthy overhaul, worked on the Upper Crossing, and in South Arm, and is at present engaged at the top entrance of Back Creek, where it diverges into North Arm. The grab dredge "Kappa" is still engaged deepening the numerous shoals in the upper part of the river. During the year the bar dredge "Antleon" assisted in the removal of wreck of "Elliston" at entrance. The total expenditure on this river was £4,727 7s. 7s.

Nambucca River.—The suction dredge "Tau" has been continuously engaged in vicinity of entrance, viz., School Point to Ellis' Wharf, and Ellis' Wharf to Davis' Slip, and also North to South Training Wall. The grab dredge "Iota," being thoroughly overhauled and repaired after foundering, was engaged at Bowraville deepening shoals, Government new wharf to Parkin's Log Wharf. Late in the year the bar dredge "Antleon" attempted to improve the bar, but owing to weather conditions no work was then done. The expenditure on this river was £4,059 2s. 3d.

Macleay River.—The grab dredge "Pion" has worked at North Coast Co.'s wharf, Government wharf, and Hennessy's wharf at Kempsey. The bar dredges "Antleon," "Tethys," and "Latona," each visited this river to improve bar and crossing. The expenditure on this river was £4,973 8s. 2d.

Port Macquarie (Wilson and Hastings Rivers).—The grab dredge "Beta" was removed from Newcastle in October, and has since deepened the channel Telegraph Point to Ballengarra. The bar dredge "Tethys" operated on bar and crossing. The expenditure on this river was £1,531 3s. 1d.

Camden Haven.—The suction dredge "Alesus" worked at Gogerly Island, Klondyke Crossing and Watson Taylor Lake. The expenditure on this river was £3,433 18s. 11d.

Manning River.—The suction dredge "Dorus" has done good work on the Harrington Crossing this year. The ladder dredge "Pluto" has worked at various places up the river, viz.: Devil's Elbow, Birds Flat, Clinch's Cutting, Singleton's Flat, Goat Island, and Newby's Flat. The bar dredges, "Antleon," "Latona," and "Tethys" have each visited this river and improved bar and crossing. The expenditure on this river was £8,717 18s. 7d.

Cape Hawke.—The suction dredge "Theta" deepened channel Devil's Rocks to Forster, opposite Porter's mill at Tuncurry, Wollamba River to Tuncurry, and also filled in the old Public Oyster Reserve at Forster. The expenditure on this river was £1,856 17s. 7d.

Broken Bay and Brisbane Water.—The new bar dredge "Latona" was sent here, "on trials," and removed 12,504 tons of sand at a cost of £1,233 14s. 10d. The sand pump "Zeta" operated in the Boat Channel, near Woy Woy Station, in Riley's Passage, and at Blackwall, the cost being £3,384 11s. 7d.

Cook's River.—The sand pump "Gamma" was occupied reclaiming St. Peters Park at Tempe, and pumped 200,352 tons of spoil at a cost of £3,982 19s. 3d.

Port Hacking.—The grab dredge "Midget" worked at Gunnamatta Bay, and at Lilli Pilli, the cost being £1,169 3s. 9d.

Shoalhaven River.—The bar dredge "Latona" while undergoing trials improved the crossing at a cost of £2,356 14s.

Wagonga River.—The sand pump "Eta," after overhaul at Cockatoo Dock, worked at Narooma Crossing and wharves, the cost being £4,353 8s. 7d.

Twofold Bay.—The dredge "Neptune" carried out a short work here, at the wharves, at a cost of £627 3s. 6d.

Bateman's Bay.—The dredge "Neptune" operated on the bar, the cost being £4,544 3s. 7d.

GENERAL.

Particulars of dredging operations in the Newcastle District are contained in the report of the Chief Engineer, Newcastle.

The bar dredge "Latona," built at Cockatoo Dockyard, has been completed, and after lengthy trials, during which a number of adjustments were found necessary, is now in fairly satisfactory working condition.

At Cockatoo Dockyard the dredge, "Groper," is being provided with a new iron hull, and undergoing extensive overhaul.

A double grab dredge, "Isis," is being fitted up at Dyke Shop, Newcastle.

Extensive repairs have been effected to a number of vessels, and as most of the plant is old, and is not being replaced by modern vessels as rapidly as desirable, heavy repairs are likely to continue.

The Dredge Service is in need of another bar dredge, a powerful sea going tug, and a salvage steamer, besides the replacement of much of the oldest of the plant by new vessels.

STATEMENT

STATEMENT of Ladder Dredge Expenditure for twelve months ending 30th June, 1912.

Ladder Dredge	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting punts.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
Samson	Newcastle	Mud, sand, stone ...	280,390	1,263	2,392	6,869 17 3	5'88	5 8 9	2 17 5	53	2	1	...	6	37	1	Extensive repairs and docking.
Newcastle	Newcastle	Mud and sand	250,290	1,341	2,397	8,502 6 1	8'15	6 6 10	3 10 11	56	1	5	...	1	36	1	Extensive repairs and docking.
Hunter	Newcastle	Mud, sand, rock	150,738	1,970	2,630	4,320 2 7	6'87	2 3 10	1 12 9	75	4	6	2	3	8	2	
Ulysses	Richmond River	Mud, sand, clay, &c...	152,994	1,701	2,417	2,784 19 11	4'36	1 12 9	1 3 2	71	3	11	...	1	13	1	
Minos	Clarence River	Mud, sand, &c.	146,580	1,370	2,399	2,548 14 6	4'17	1 17 2	1 1 3	57	3	11	...	11	15	3	
Pluto	Manning River	Shingle, boulders, sand	143,220	1,282	2,408	1,979 12 11	3'28	1 10 10	0 16 5	53	2	16	3	8	17	1	
		Totals	1,124,212	8,927	14,643	27,005 13 3											
		Averages					5'75	3 0 6	1 16 9	61	3	8	1	5	21	1	

STATEMENT of Sand-pump Dredge Expenditure for twelve months ending 30th June, 1912.

Sand-pump Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Silt to Sea, &c.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
Neptune	Twofold Bay, Batem'n's B'y	Sand, mud, shingle ...	154,010	765	2,940	6,171 13 10	9'61	8 1 4	2 2 0	26	2	3	7	14	31	17	
Juno	Clarence River	Sand, shell	372,179	1,158	2,410	3,321 18 6	2'14	2 17 4	1 7 2	48	7	14	...	...	28	3	
Jupiter	Newcastle	Sand, shingle	597,750	874	2,391	5,262 6 2	2'11	6 0 5	2 4 0	37	4	8	4	34	12	1	
Castor	do	Sand, mud	622,044	1,347	2,391	4,313 7 3	2'05	3 4 0	1 16 1	56	5	9	...	...	29	1	
Actor	Tweed River	Sand, mud, and clay	230,890	1,438	2,411	2,921 19 6	3'04	2 0 8	1 4 3	60	4	19	3	...	11	3	
Alesus	Camden Haven	Mud, sand	130,287	1,320	2,424	3,427 3 11	6'31	2 12 1	1 8 3	54	6	20	1	...	17	2	
Dorus	Manning River	Shingle, sand, clay...	146,480	1,139	2,404	3,304 14 6	5'41	2 18 0	1 7 6	47	4	20	1	...	24	4	
Dictys	Richmond River	Hard sand, sand, shell	67,465	583	2,403	4,988 2 8	17'74	8 11 1	2 1 6	24	2	13	...	1	57	3	Extensive repairs.
Glaucus	Newcastle	Mud, sand	745,600	1,417	2,392	0,300 19 4	2'01	4 8 11	2 12 8	59	4	7	...	14	15	1	
Antieon	Manning River, Macleay River, Bellinger River, Richmond River, Tweed River, Clarence River, Nambucca River	Sand	259,800	654	2,672	6,379 17 2	5'89	9 15 1	2 7 9	25	7	7	8	30	17	6	
Tethys	Tweed River, Clarence River, Macleay River, Richmond River, Port Macquarie, Byron Bay, Manning River.	Sand	377,300	844	2,967	6,053 7 11	3'82	7 3 5	2 0 10	28	5	10	8	25	19	5	
Latona	Broken Bay, Shoalhaven, Macleay River, Manning River.	Sand	55,156	165	2,139	4,663 0 11	20'29	28 5 3	2 3 7	8	2	3	3	10	35	39	Under trials and adjusting defects.
		Totals	3,758,961	11,704	29,944	57,108 11 8											
		Averages					3'65	4 17 7	1 18 2	39	4	11	3	11	25	7	

Small Sand Pump Dredge.	Where working.	Material lifted.	Tons towed.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting for punts.	Repairs.	Other causes.	
Gamma	Cook's River	Sand, clay, shell	200,352	2,690	4,800	£ s. d. 3,967 19 3	d. 4'75	£ s. d. 1 9 6	£ s. d. 0 16 6	56	...	5	31	8	Extensive repairs and docking.
Delta	Port Stephens	Mud, sand, shell, weeds.	74,988	1,395	2,410	1,713 18 8	5'31	1 4 7	0 14 3	58	3	17	...	...	18	4
Eta	Wagonga River	Sand, shell, shingle, mud, clay.	45,930	704	2,453	4,011 14 11	20'96	5 14 0	1 12 3	29	...	19	...	...	49	3
Theta	Cape Hawke	Sand, shell, shingle ...	149,634	1,444	2,399	1,851 17 7	2'97	1 5 8	0 15 5	60	4	25	1	...	9	1	Extensive repairs. do do
Sigma	Tweed River	Sand, stiff mud	71,157	2,512	4,822	3,024 3 2	10'19	1 4 1	0 12 6	52	3	7	...	...	38	...
Rho	Bellinger River	Sand, mud, shingle ...	74,659	1,079	2,402	2,624 16 7	8'44	2 8 7	1 1 10	45	2	9	...	...	42	2
Tau	Nambucca River	Sand, gravel	133,643	1,749	2,402	2,176 17 9	3'90	1 3 9	0 18 1	73	1	9	13	4	do do
Zeta	Brisbane Water	Sand, stone, mud	123,515	2,281	4,807	3,264 2 3	6'34	1 8 7	0 13 7	48	2	12	...	...	33	5
Totals			873,878	13,854	26,495	22,635 10 2											
Averages							6'21	1 12 8	0 17 1	53	2	13	29	3	

STATEMENT of Grab Dredge Expenditure for twelve months ending 30th June, 1912.

Grab Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting for punts.	Repairs.	Other causes.	
Beta	Newcastle, Wilson River	Timber, mud, rock, gravel.	26,719	1,385	2,419	£ s. d. 1,108 13 11	d. 9'96	£ s. d. 0 16 0	£ s. d. 0 9 2	57	8	14	1	4	8	8	Including shovelling back spoil.
Iota	Nambucca River	Gravel	10,824	979	2,412	1,667 2 9	36'96	1 14 1	0 13 10	41	1	1	1	...	56	...	Including shovelling back spoil; sunk, raised, and extensive repairs.
Kappa	Bellinger River	Sand, gravel	16,940	1,345	2,406	1,199 14 8	17'00	0 17 11	0 10 0	56	6	10	3	...	21	4	Including shovelling back spoil.
Mu	Richmond River	Sand, mud, clay	18,380	1,005	2,428	1,230 2 4	17'42	1 4 5	0 10 2	41	1	33	...	...	17	8	do do
Nu	Newcastle	Rock, sand, shingle, mud, boulders.	17,585	913	2,439	2,000 1 8	27'24	2 3 10	0 16 5	37	1	16	5	2	39	...	
No. 52	Richmond River	Mud, rock, sand, cane.	20,476	1,297	2,401	1,107 19 1	12'98	0 17 2	0 9 3	54	2	15	...	5	20	4	
Omega	Newcastle	Rock, stone, mud, timber, sand, boulders.	10,079	1,290	2,464	2,259 10 1	53'80	1 15 0	0 18 4	52	2	16	3	1	25	1	
Midget	Port Hacking River	Sand	13,403	1,198	2,403	1,014 6 3	18'16	0 16 11	0 8 5	50	7	18	4	9	6	6	do do
Pion	Macleay River	Silt, sand, shingle ...	13,137	1,385	2,434	1,190 13 7	21'75	0 17 4	0 9 10	57	1	4	1	...	27	10	do do
Von	Richmond River	Sand, mud	25,289	1,295	2,399	1,280 17 0	12'15	0 19 9	0 10 8	54	5	14	...	...	23	4	do do
Upsilon	Newcastle, Hunter River	Mud, timber, coarse sand.	34,280	1,042	2,396	1,289 14 8	9'03	1 4 9	0 10 9	43	9	8	...	6	28	6	
Totals			207,112	13,134	26,601	15,348 16 0											
Averages							17'78	1 3 4	0 11 6	49	4	14	2	2	24	5	

STATEMENT of Tug Expenditure and Work for twelve months ending 30th June, 1912.

Name of Tug.	Where employed.	Tons towed.	Miles run towing.	Miles run special service.	Total working hours.	Hours attending.	Cost of towing.	Cost of special service.	Cost per ton.	Cost per mile towing.	Cost per mile special service.	Cost per hour working.	Cost per hour attending.	Percentage of working hours.					Remarks.
														Steaming.	Coaling.	Repairs.	Bad weather.	Other causes.	
							£ s. d.	£ s. d.	d.	s. d.	s. d.	s. d.	s. d.						
Ceres	Newcastle	386,525	7,961	138	2,587	2,394	1,317 6 10	25 16 2	0'82	3 4	3 9	10 5	11 3	62	4	8	...	26	Extensive repairs in progress. Extensive repairs.
Orestes	do	323,050	6,644	30	2,418	1,867	1,755 7 1	13 5 2	1'30	5 3	8 10	14 8	18 11	57	3	23	...	17	
Rhea	do and Coast	138,385	3,623	8,389	3,618	3,385	592 5 6	1,518 3 4	1'03	3 4	3 7	11 1	12 6	64	3	7	8	18	
Galatea	do	60,795	1,700	822	1,940	1,399	1,175 2 3	837 2 2	4'64	13 10	20 4	20 9	28 9	33	1	28	4	34	
Dooribang	do	16,380	1,121	2,117	2,435	1,159	836 19 8	1,534 16 3	12'26	14 11	14 6	19 6	40 11	38	1	52	...	9	
Dione	Richmond River ...	84,100	5,833	.....	2,602	1,697	862 2 6	.....	2'46	2 11	...	6 8	10 2	53	2	35	...	10
Phoenix	Newcastle	2,642	468	5,011	2,735	2,178	112 0 8	1,357 18 2	10'18	4 9	5 5	10 9	13 6	39	3	20	3	35	
	Richmond River ...																		
	Bellinger River ...																		
Athena	Clarence River.....	146,580	8,432	.....	2,810	2,651	817 0 9	.....	1'34	1 11	.....	5 10	6 2	73	2	6	...	19
Ganymede.....	Newcastle	70	12	4,337	2,739	2,017	1 15 4	1,154 8 2	6'06	2 11	5 4	8 5	8 10	34	...	4	...	62	
Callisto	Manning River	143,080	6,097	40	2,651	2,360	349 12 4	4 2 6	0'59	1 2	2 1	2 8	3 0	75	4	11	2	8	
Yimmang	Newcastle .....	.....	.....	6,644	2,668	2,601	.....	1,155 14 10	...	.....	3 6	8 8	8 11	83	...	3	...	14
Burunda	do and Sydney	34,035	1,237	6,596	3,064	2,727	193 1 5	1,355 9 0	1'36	3 1	4 1	10 1	11 4	39	1	11	4	45	
Wollombi	do	126,865	4,422	2,075	3,057	2,703	1,189 13 5	630 4 7	2'25	5 5	6 1	11 11	13 1	51	2	12	...	35	
Lilian	do	370,415	7,700	190	2,533	2,323	1,234 6 7	34 19 6	0'79	3 2	3 8	10 0	10 11	78	2	8	...	12	
Minerva	do	4,850	765	6,761	2,685	2,241	169 18 11	1,256 9 8	8'41	4 5	3 9	10 7	12 8	57	4	17	...	22	
Powerful	do .....	.....	.....	2,466	2,365	1,932	.....	1,494 6 0	...	.....	12 1	12 8	15 0	19	...	16	...	65
Unara	do .....	.....	.....	2,402	1,226	917	.....	187 0 5	...	.....	1 7	3 1	4 1	65	...	25	...	10
Totals		1,837,772	56,015	48,018	44,133	37,208	10,606 13 3	12,559 15 11	1'38	3 9	5 3	10 6	12 5	55	2	16	1	26	

COMPARATIVE Statement of Quantity and Cost of Work done by Ladder Dredges (with towing), for periods as stated.

Ladder Dredge.	Where working.	1 July, 1910, to 30 June, 1911.			1 July, 1911, to 30 June, 1912.			Remarks.
		Dredging, Towing, and Repairing.			Dredging, Towing, and Repairing.			
		Tons.	Expenditure.	Pence per ton.	Tons.	Expenditure.	Pence per ton.	
			£ s. d.	d.		£ s. d.	d.	
Samson.....	Newcastle.....	355,500	5,466 17 8	3 69	280,390	9,438 19 4	8'07	
Newcastle	do	378,240	6,089 0 9	3 86	250,290	11,089 18 4	10'91	
Hunter.....	do	56,096	6,275 5 c	26 85	150,738	6,669 7 4	10'61	
Ulysses.....	Richmond River	143,383	6,204 6 1	10 38	152,994	3,241 5 11	5'08	
Minos	Clarence River.....	153,160	3,899 13 1	6 11	146,580	3,365 15 3	5'51	
Pluto	Manning River	2,100	5,137 17 5	587 18	143,220	2,333 7 9	3'91	

Sand-pump Dredge.	Where working.	1 July, 1910, to 30 June, 1911.				1 July, 1911, to 30 June, 1912.				Remarks.					
		Dredging, Towing, and Repairing.				Dredging, Towing, and Repairing.									
		Tons.	Expenditure.		Pence per ton.	Tons.	Expenditure.		Pence per ton.						
			£	s.	d.	d.	£	s.	d.	d.					
Neptune	Wollongong Coff's Harbour Twofold Bay Bateman's Bay	41,585	2,965	12	4	17'12	154,010	6,206	3	10	9'67	1911-12. Twofold Bay..... 2,160 Bateman's Bay..... 151,850 Coff's Harbour (Boring)..... 1,034	Cost. £ s. d. 627 3 6 4,544 3 7 1,034 16 9	Pence per ton. d. 69'62 7'18	
Juno	Clarence River	298,299	3,820	9	0	3'07	372,179	3,331	13	6	2'14				
Jupiter	Newcastle	571,800	4,526	7	0	1'90	597,750	5,944	2	4	2'38				
Castor	Newcastle	529,615	4,166	12	1	1'89	622,044	4,831	4	9	1'86				
Actor	Tweed River	178,491	3,489	10	11	4'69	230,890	2,938	4	6	3'05				
Alesus	Camden Haven	126,225	2,346	13	6	4'46	130,287	3,433	18	11	6'32				
Dorus	Manning River	61,614	7,367	16	2	28'70	146,480	3,315	4	6	5'29				
Dietys	Richmond River	135,660	4,430	14	6	7'84	67,465	5,427	11	2	19'30				
Glaucus	Newcastle	695,550	8,444	18	5	2'91	745,600	12,329	14	3	3'96				
	Camden Haven											1911-12.	Tons.	Cost. £ s. d.	Pence per ton. d.
	Port Macquarie											Manning River	119,450	2,566 7 2	5'15
	Shoalhaven River											Macleay River	67,450	1,380 3 7	4'91
	Manning River											Bellinger River	21,150	881 6 4	10'00
Antleón	Macleay River	293,200	6,205	17	4	5'08	259,800	6,379	17	2	5'89	Richmond River	23,650	540 8 7	5'48
	Bellinger River											Tweed River	19,650	440 13 2	5'38
	Richmond River											Clarence River	8,450	365 16 7	10'39
	Tweed River											Nambucca River	nil.	205 1 9	.....
	Clarence River														
	Nambucca River														
	Cape Hawke											Tweed River	29,590	704 3 4	5'71
	Tweed River											Clarence River	90,340	1,294 16 7	3'43
	Clarence River											Macleay River	122,440	1,533 8 3	3'00
Tethys	Macleay River	386,520	6,305	9	8	3'92	377,300	6,054	17	11	3'85	Richmond River	75,600	1,401 7 7	4'44
	Richmond River											Port Macquarie	31,660	581 8 0	4'40
	Port Macquarie											Manning River	12,800	296 9 10	5'55
	Manning River											Byron Bay	14,870	243 4 4	3'92
	Byron Bay														
	Broken Bay											Broken Bay	12,504	1,233 14 10	23'68
	Shoalhaven											Shoalhaven	33,352	2,356 14 0	16'95
Latóns	Macleay River	.....	.....				55,156	4,663	0	11	20'29	Macleay River	8,700	866 2 9	23'89
	Manning River											Manning River	600	206 9 4	82'58

COMPARATIVE Statement of Quantity and Cost of Work done by Small Sand-pump Dredges (with towing), for periods as stated.

Small Sand-pump Dredge.	Where working.	1 July, 1910, to 30 June, 1911.				1 July, 1911, to 30 June, 1912.				Remarks.		
		Dredging, Towing, and Repairing.				Dredging, Towing, and Repairing.						
		Tons.	Expenditure.		Pence per ton.	Tons.	Expenditure.		Pence per ton.			
			£	s.	d.		£	s.	d.			
Gamma	{ Cook's River	184,437	3,439	9	2	4'47	200,352	3,982	19	3	4'77	1911-12. All Cook's River.
	{ George's River											
Delta	{ Lake Macquarie	89,742	2,440	3	6	6'53	74,988	1,721	18	8	5'51	1911-12. All Port Stephens.
	{ Port Stephens											
Eta	{ Moruya	131,405	1,892	19	3	3'46	45,930	4,353	8	7	22'74	1911-12. All Wagonga River.
	{ Wagonga River.....											
Theta	Cape Hawke	126,314	2,208	2	2	4'19	149,634	1,856	17	7	2'97	
Sigma	Tweed River	80,223	2,827	3	0	8'46	71,157	3,045	3	2	10'27	
Rho	Bellinger River	73,811	1,825	17	4	5'94	74,659	2,646	6	7	8'50	
Tau	Nambucca River	54,546	4,894	4	7	21'53	133,643	2,181	17	9	3'92	
Zeta	Brisbane Water.....	107,794	4,053	14	8	9'03	123,515	3,384	11	7	6'59	

Country Towns Water Supplies.

THE map of New South Wales at the end of this Report shows the towns already supplied with water and hose for which works of water supply are now in progress.

Works Completed.

Ballina.—A considerable quantity of pipes and specials have been supplied for the extension of the reticulation.

Blayney.—The boilers have been thoroughly tested.

Cobar.—185 chains of surface drains on the catchment area have been widened and 175 chains of additional drain have been excavated with satisfactory results.

Cooma.—This scheme, which was approaching completion at the end of the financial year, comprises a suction well 12 feet inside diameter and a pump chamber on the right bank of the Murrumbidgee River at Mittagang, whence the water is pumped through about $4\frac{3}{4}$ miles of 6-inch cast-iron and steel pipes into a concrete service reservoir 44 feet in diameter, 16 feet deep, with a capacity of 159,000 gallons. The height of this service reservoir above river at the pumping station is 330 feet. The pumping machinery in duplicate consists of condensing single action compound triplex ram pumping engines with boiler, feed heater, feed pumps, air vessels, &c. The estimated cost is £18,500. Telephonic communication has been established between Cooma and the pumping station. From the service reservoir the water reticulates the town through about 458 chains of 6-inch, 223 chains of 4-inch, and 386 chains of 3-inch cast-iron pipes.

Dungog.—This scheme consists of a well 20 feet inside diameter and a filtration channel on the right bank of the Williams River, whence the water is pumped through a cast-iron rising main 6 inch diameter about $1\frac{1}{2}$ miles long, which is also a service main, to a concrete reservoir 51 feet diameter, 17 feet high, with a capacity of 200,000 gallons. The water reticulates the town through 427 chains of cast-iron pipes. There are two sets of pumping machinery capable of raising 8,000 gallons per hour each, and one boiler equal to supplying steam for both sets. The estimated cost is £11,500.

Forbes.—A covered new steel service reservoir on a concrete foundation has been constructed, 50 feet in diameter and 60 feet high, with a capacity of 735,000 gallons.

A considerable length of additional service and reticulation mains has also been laid. Successful experiments were carried out here in testing the efficacy of alumino-ferric in clearing this water by coagulation.

Moree.—A drive 228 feet long and 6 feet high, closely timbered throughout, has been excavated and constructed in order to increase the inflow to the existing well. An abundant supply for present requirements has thus been ensured.

Singleton.—Additional pipes and fittings have been provided.

Tamworth.—In order to avert a water famine a temporary pumping scheme was installed, the pump being driven by electric power generated in the Council's electric lighting station. A well was sunk at Paradise Flat, pumps having a capacity of 25,000 gallons per hour were installed, $3\frac{1}{2}$ miles of 8-inch woodstave pipes were made and laid, and the whole scheme brought into action *within one month of its inception.*

Wellington.—Additional drives in the drift near the present well, aggregating 301 feet in length, were excavated and timbered. These works have so increased the inflow that the pumps delivered during last summer as much as 1,300,000 gallons per week. The filtration plant (Candy type), imported for this town, has arrived and will shortly be sent on and erected.

Works Under Construction.

Broken Hill (Umberumberka Water Scheme).—This work, which was commenced last year, was to some extent delayed owing to the non-arrival of plant, sleepers, &c. Works had been commenced with horses, carts, &c., and 16,932 cubic yards of excavation in foundations carried out prior to 30 June, 1911. Cableways Nos. 1 and 2 were completed in August and October respectively; surveys for pipeline and service reservoir were put in hand and completed.

The stone breaking and concrete mixing machinery were erected complete in December. Electric lighting plant was installed and a three-shift system commenced in January. The work was considerably delayed by the floods of October and November, and no less than twenty-one floods have occurred since the operations started in February, 1911. A total length of 265 feet of foundation has been concreted. The highest concrete is 58 feet above the rock foundation, where the latter is 50 feet below the bed of the creek. Contracts have been let for 70,420 feet of 18-inch wood-stave pipes for the gravitation main where the pressure is less than 350 feet head, and for 17,950 feet of steel pipes for the lower part of the gravitation main and for the rising main. The estimated cost of this work is £359,000.

Concreting of the first section was commenced in February and completed in April. Considerable difficulty occurred early this year in obtaining sufficient suitable men for the work. Concreting on the second section in the bed of the river was commenced in May. 26,600 cubic yards of excavation have been removed and 11,000 cubic yards of concrete built in place.

Corowa.—Pipes and specials are being supplied for extending the reticulation.

Grafton and South Grafton.—This is a gravitation scheme from the Nymboida River. Three ventilation shafts, between 64 and 83 feet deep, have been sunk in the tunnel. Nineteen chains of the tunnel have been excavated, leaving about 11 chains to be completed. The intake chamber shaft has been sunk and a concrete bulkhead has been put in, with a manhole door. Practically the

the whole of the shafts and tunnel are in rock, mostly very hard diorite with some soft patches. Ten-inch pipes for 2 miles of the gravitation mains have been received. Pipes for 19 miles will be required. The supply has been checked by the long strike in the iron trade. The estimated cost of this work is £68,500.

June.—The well on the right bank of the Murrumbidgee River, near Tenandra, 16 feet in diameter has been excavated and is ready for concreting. The drive, 63 feet long, has been made and timbered. A stage in the river, to carry the intake pipe, is being constructed. Half-a-mile of the steel rising main, 12 inches in diameter, has been laid. Foundations for two of the Settling Tanks on Mount Tenandra, each 65 feet in diameter, with a capacity of 353,000 gallons, have been excavated in decomposed and loose granite, and are ready for concrete. Nearly 7 miles of the 9-inch gravitation main from the Settling Tanks on Mount Tenandra to the existing service reservoir at June have been laid. The total length of this main will be about 18 miles. A contract has been let for the supply and erection of the pumping machinery for this work. The estimated cost of this work is £65,500.

Kempsey.—Works have just been commenced for supplying this town with water by the construction of a well, 20 feet in diameter, sunk into the drift on the right bank of the Macleay River. Thence the water is to be pumped through a 9-inch main to a steel service reservoir at East Kempsey, whence the town will be reticulated with about 119 chains of 6-inch, 146 chains of 4-inch, and 80 chains of 3-inch pipes. Tenders for the supply of pumping machinery for this work are now being called for. The estimated cost of this work is £13,250.

Kosciusko Hotel.—A pipehead dam has been constructed on Digger's Creek, and a gravitation main $1\frac{1}{4}$ miles long, of 9-inch wood pipes, has been laid to the hotel. A fire-service with a pressure of over 300 feet head has been installed, and water laid on to the Lake and Tennis Court, to facilitate their flooding for smooth ice. A storage dam is to be constructed later on in connection with this supply.

Medlow Bath.—A rising main is being laid with the object of supplying the Hotel Majestic with water from the reservoir on Adam's Creek, in accordance with an agreement made with the proprietors. A tender for the pumping machinery has been accepted.

Parkes.—In consequence of the very poor run-off from the catchment area during the past two years the storage reservoir has continued to hold very little water. In order to provide a supplementary supply a 4-inch gravitation main, 3 miles long, was laid from the Beargamil Spring to the existing main. A storage reservoir is now being constructed on the Beargamil Creek, by means of an earthen dam 20-eight feet high, with a reinforced concrete core wall. The estimated cost of this work is £3,500. Recent rains have filled the old storage dam on Bunberry Creek.

Quirindi.—A well, 20 feet diameter and 35 feet deep, has been excavated and constructed in brickwork, sunk on a cast-iron curb near Jacob's Creek. The 9-inch cast-iron rising main 88 chains long, 139 chains of 6-inch, 219 chains of 4-inch and 134 chains of 3-inch cast-iron pipes for service main and reticulation have been laid, and some extensions are in hand. The "Kennicott" Water Softener and steel service reservoir are nearly finished. The Pumping Machinery, consisting of two horizontal compound non-condensing engines, working two sets of Triplex Pumps, is now being installed. The estimated cost of this work is £16,000.

Richmond.—Three "Candy" mechanical filters have been installed, and a coagulation plant for applying alumino-ferric to the turbid water before filtration is being added. This plant has made a very satisfactory improvement in the condition and appearance of the water.

Wollongong, Towns North of.—The concrete dam on the Cordeaux River is nearly completed. This dam is 60 feet high, and has a capacity of 260,000,000 gallons, making a total storage for these towns of 431,000,000 gallons. During the year $3\frac{1}{4}$ miles of 6-inch Mannesmann pipe in the gravitation main from Coledale to Scarborough have been laid. The service reservoir for Mount Keira has been concreted, that for Balgownie has been excavated and concreted, the one for Corrimall excavated and partly concreted, and the one for Bulli has been excavated. For the hydro-electric pumping plant, the power station and pump-house have been erected, and the installation of the machinery is nearly completed. Service Tanks have been erected, and the reticulation of Mount Keira village and Balgownie is nearly finished. An additional service reservoir is being provided at Wollongong for the supply of the higher levels of the town.

Works Projected.

Albury.—The rising main from the Pumping Station to the Service Reservoir is now found to be too small to allow of the water required for additional consumption, owing to the expansion of the town, being carried economically, and it is proposed to duplicate the present 10-inch pipe to accommodate present and future requirements.

Bowral.—As the Municipal Council did not concur with the proposed scheme of supply by pumping from the Wingecarribee River, a survey was made, and design and estimate prepared for a supply by pumping from Nattai Creek. This scheme has also been submitted to the Council, but the estimated annual charges are apparently beyond the finances of the town.

Casino.—The Council has agreed to the following additions to the existing water works: A new steel service reservoir of 408,000 gallons capacity, on concrete foundation, at Madden's Hill, with additions to the Pumping Plant, a new 8-inch diameter cast-iron rising main, a new 8-inch diameter service main from the new reservoir, extension of reticulation to River-view, Show Ground, Carrington Park, &c. A tender has been accepted for the supply of additional pumping machinery, comprising a pump, engine and boiler, capable of lifting 25,000 gallons per hour to the proposed new reservoir.

Goulburn.—A design and an estimate are being prepared for the construction of a Storage Dam below the junction of the Wollondilly River and Sully Creek. This will necessitate a bridge over the Wollondilly at Baw Baw crossing, and a bridge over Sully Creek, the duplication of 10-inch rising main, tanks, store, and pumps for a coagulant, and possibly a new settling tank near the existing tank; also a high-level service reservoir on Quarry Hill, an oil engine plant to pump water from the present service reservoir to the high-level reservoir, and some additional service mains.

Inverell.

Inverell.—The Public Works Committee is still inquiring into the proposed scheme of supplying this town with water by pumping from a reservoir formed by a dam across the McIntyre River at Mather's. Further investigation is being made as to finding a drift scheme in the vicinity of Brodie's Plains near the McIntyre River.

Kiama.—The Council has agreed to the construction by day labour of a new storage dam across Fountaindale Creek, 7 chains below the existing pipehead; preparations to start the work are in hand.

Murwillumbah.—Surveys, plans, and estimates have been made for a gravitation supply from Korrumbyn Creek, which is now being considered by the Council. The proposal is to construct a small storage reservoir on that creek, thence to convey the water by gravitation through a 6-inch diameter cast-iron main, 9 miles long, to the existing service reservoir; $3\frac{1}{4}$ miles of additional reticulation is included in the scheme.

Muswellbrook.—Satisfactory tenders have been received for the construction of the Pump-well, Engine House, Service Reservoir, Rising Main and Reticulation. The work will probably be commenced at an early date.

Nyngan.—Tenders are about to be invited for an additional storage dam on the Bogan River at Darouble.

Investigations.

Bathurst.—Efforts are being made by boring to ascertain what additional supply can be obtained from the drift in the valley of the Macquarie River at Bathurst, near the present pumping station.

Berrigan.—An investigation has been made and estimate prepared of a scheme for supplying this village with water to be delivered into a storage tank by the Barooga Water Trust, pumped therefrom into a service reservoir and distributed by the usual reticulation.

Berry.—The question of providing an additional supply for portion of this Municipality now supplied from the Nowra water works, is being investigated.

Blayney.—It is proposed to increase the infiltration area by additional drives.

Blue Mountain Villages.—Surveys of the proposed storage reservoir sites on Wentworth Creek and Linden Creek have been carried out; also surveys of the lines for the mains and of the sites for the service reservoirs.

Bolongora.—This village could be supplied from a well sunk on the Water Reserve near the left bank of Mitchell's Creek about a mile north of the village, from which the water could be raised by a windmill pump to an elevated tank.

Collarenebri.—A suitable scheme would be to pump by suction gas from the Barwon River a little way upstream of the town and lift the water through a rising main to a service tank on a timber support 50 feet high on the reserve near the foot of Wilson-street, from which the town could be reticulated.

Coraki.—An estimate was made for providing water by pumping from the south arm of the Richmond River to a service reservoir on Spring Hill with a filtration plant. The analysis of the water from the Richmond River showed that filtration would be necessary. Further investigation as to obtaining a supply from the drift underlying the flats in the vicinity is being made.

Dubbo.—In order to increase the inflow to the existing wells a recommendation has been made that a 6 foot by 6 foot timbered drive be constructed from the new well to the old one, and three other drives from the new well. A second service reservoir is also required to serve some houses that have been built on high sites. A covered steel tank on concrete base is proposed, 38 feet in diameter and 30 feet high, to hold 200,000 gallons.

Finley.—After putting down two borings a trial shaft was excavated to the drift, and a supply by pumping is being investigated.

Grurie.—Two borings and a trial shaft have been made to test the underground sources, and these show that a satisfactory supply is likely to be obtained.

Glen Innes.—At the request of the Council the possibility of obtaining a supply by gravitation was considered. This involved the investigation of three schemes for bringing the water from storage reservoirs on Furracabad Creek, Graham's Valley, and Beardsy Waters. None of these schemes could be recommended.

Gosford.—Survey, design, and estimates have been prepared for a supply by gravitation from a storage reservoir to be constructed on Fountain Creek; thence the water would come through an 8-inch cast-iron main 2 miles long to a service reservoir in Waterview Park, whence the town would be reticulated.

Greenethorpe.—One or two private wells show it to be probable that an adequate supply may be obtained from shallow drift underlying the channel of the Tyagong Creek, near the village.

Gulgong.—A trial shaft, survey and estimate have been made for a pumping scheme from the Cudgegong River. As this scheme was more costly than the town could afford, at the request of the Council a trial shaft has been put down at the "Wait-a-While" Flat with a view to testing the underground supply in that neighbourhood.

Jenolan Caves.—It is proposed to construct a low pipehead weir in the Jenolan River about 3 miles above the Caves and 500 feet above the Caves House; thence to lay pipes to a new service reservoir on the saddle about 5 chains north-west of the Carlotta Arch, from which the Caves House will be supplied. The scheme is capable of great expansion to meet the development of this tourist resort.

Lismore.—A survey is about to be made for an additional supply by gravitation from Rocky Creek, above the junction of Bull Frog Creek.

Millthorpe.—Brown's Creek appears to be the best source of supply for this town, which cannot yet afford reticulation. For the present requirements, enough water may be pumped from a waterhole in that creek 2 miles west of the town, through a rising main $2\frac{3}{4}$ miles long to elevated tanks near the summit of William-street.

Murrurundi.

Murrurundi.—A design and estimate were made for a supply by gravitation from a small storage reservoir proposed on Page's River, made by a rockfill weir with a reinforced concrete core. Thence the water would be brought in a gravitation main 6 inches in diameter, 5 miles long, to a Softener and service reservoir at Murrurundi, which would give a good pressure in the reticulation pipes. The scheme would be within the legal limit of rating, but the Council declines the liability.

Oaklands.—A trial boring was made at the existing Government well, near the right bank of South Creek, to the depth of 180 feet, but the water was found to be too brackish for domestic use. The proposal is to enlarge the existing Shire well and construct a gallery in the drift in order to increase the supply; to pump thence through 34 chains of 4-inch pipes to the Railway Tank, and also through 27 chains of 4 inch pipes to another tank in the centre of the village.

Orange.—Surveys and estimates have been made for another dam across Gosling Creek, and also for one across Brandy Creek. The water from these sites would be taken in pipes by gravitation to the existing main for the supply of Orange and East Orange.

Portland.—Surveys have been made and estimates are being prepared for alternative schemes, the one by pumping from Willywa Creek at a proposed reservoir about a mile and a half from the town, the other by gravitation from the Marangaroo River, which would be about 16 miles south west of the town.

Rookwood Asylum.—In order to obtain a pressure sufficient for all purposes, including fire extinction, it is proposed to construct on high ground near the existing water tank a steel water tower 100 feet in height and 40 feet in diameter, to hold 360,000 gallons in the upper 45 feet. The existing pumps, when repaired, would suffice to supply this tower. The present reticulation would need to be altered and renewed in several lengths.

South-western Tableland.—An investigation of a proposal to construct a large National Scheme of Water Supply for the Towns and adjoining districts on the South-western tableland, comprising Cootamundra, Young, Temora, Barmedman, Wyalong, Yass, Harden, Grenfell, Murrumburrah, and Wallendbeen has been made. Several proposals have been subject to preliminary investigation, including one to use water from Burrinjuck and one from the Adjungbilly River, the estimated cost ranging from £419,700 to £1,491,000.

Sydney.—Additional Storage Dam on the Cordeaux River: Surveys have been made and plotted for a tramway from the Dam Site to the Quarry, and for another from the Dam Site to Douglas Park railway station. Plans for the work are in course of preparation. The capacity of the Dam proposed is 15,858,000 gallons, and the estimated cost £520,000.

Taree, Wingham, and the Lower Manning.—Surveys, plans, and estimates have been made for supplying this district by pumping from the Manning River immediately above Abbott's Falls, where there is a good permanent flow of fresh water. The rising main would be about 73 chains long. The distributing reservoir would be excavated and concrete-lined; with T.W.L. at about R.L. 283. Thence the water would flow by gravitation to the service reservoirs at Bay's Hill and Wingham. The mains would cross the Manning River in trenches dredged in the bed, the pipes being provided with flexible joints at intervals. The reticulation would extend to Taree, Wingham, Coopernook, Oxley Island, and Mote Estate.

Tenterfield.—A survey was made and borings taken for a supply by pumping from the natural filter bed in Tenterfield Creek near the town; but the very dry weather in the first half year (1912) so lowered the line of saturation in this creek that an alternative scheme is being surveyed for a larger storage reservoir than was previously proposed at a site further up the valley, yet nearer to the site for the service reservoir.

Urana.—It is proposed to supply the railway by pumping from the existing storage in Urana Creek, and the best method of increasing the volume in that creek is under consideration, with a view to supplying the town by reticulation.

Wagga.—In order to increase the inflow to the existing well, it is proposed to make a drive from it through the drift.

Warren.—The question of a supplementary scheme by pumping from the drift is being considered.

Yass.—Several schemes have been investigated for the supply of this town. The most suitable one provides for a supply to be obtained by pumping from a storage reservoir on the Yass River to a service reservoir on Garland's Hill, whence the town and railway would be supplied by gravitation. A survey is also in hand for a larger supply to the railway as well as the town.

Schemes are also being devised for the supply of water to Wallendbeen, Manilla, Narromine, and Manildra.

Water Conservation and Drainage Branch.

On 1st August, 1911, Mr. L. A. B. Wade, M. Inst. C.E., Chief Engineer for Irrigation and Drainage, relinquished control of Sewerage Construction, Swamp Drainage, Water Conservation, and Artesian Boring, which work was placed under my charge, the name of this Branch being altered as above. Preliminary investigations into irrigation proposals, other than those from the Murrumbidgee and Murray Rivers are also carried out in this Branch, subject to the concurrence of Mr. Wade, now Chief Engineer for Irrigation.

I now have the honour to submit a report covering the operations of the Water Conservation and Drainage Branch for the year ended 30th June, 1912. From this it will be seen that the year has been a busy one, and that the officers have been engaged upon the design and construction of some important works. A large proportion of the expenditure has been on day-labour works, upon which about 900 men were engaged at the close of the year.

The sub-branches of the Water Conservation and Drainage Branch are under the charge of the following officers, to whom and to the officers generally I have to express my thanks for loyal assistance rendered:—

Sewerage Construction and Stormwater Drainage.—Mr. A. Peake, Assoc. M. Inst. C.E., Deputy Engineer-in-Charge.

Swamp Drainage and Water Conservation.—Mr. S. H. Weedon, Inspecting Engineer.

Artesian Boring.—Mr. R. F. Jenkins.

River Gauging.—Mr. H. Shute.

H. H. DARE, M.E., M. Inst. C.E.,
Engineer in Charge of Water Conservation and Drainage.

Sydney, 17th September, 1912.

SEWERAGE AND STORMWATER DRAINAGE.

Metropolitan District.

Southern and Western Suburbs Ocean Outfall Sewer.

General Description.—This sewer will provide for discharging by gravitation into the Pacific Ocean, near Long Bay, the sewage from the Western, Southern, and Illawarra suburbs of Sydney, together with that from a large tract of land, including Botany, lying between Cook's River Road and the ocean, and south of Coogee. At the present time the sewage is being dealt with at the Botany Sewage Farm, where about 200 acres are used, partly for irrigation and partly for intermittent downward filtration. The soil on the farm is raw sand, and as much of it is subject to tidal influence, it becomes saturated with salt water and sewage to such an extent as to render successful operation impossible, and great exception has been taken to the objectionable odours which prevail at certain seasons.

The total area to be dealt with by the new sewer is about 25,860 acres, with a population estimated in 1907 at 193,820, and a prospective population of 657,290 persons.

The sewer will have a total length of about $6\frac{1}{4}$ miles, exclusive of the branch to connect with the existing screening chamber for the sewage from the Southern suburbs, and will have a discharging capacity of 210 cusecs, with a depth of flow of 5 ft. 5 in. at the outfall end. The section will vary from 11 ft. $4\frac{1}{2}$ in. x 5 ft. 9 in. to 12 ft. 3 in. x 7 ft. 6 in., with vertical side walls and slopes of 1 in $3\frac{1}{2}$ on the bottom, the corners at the junction of the bottom and side walls being rounded off. Concrete, plain or reinforced, is being used throughout.

The grade will be 1 in 3,650, and the sewer will discharge into a large air-chamber, where the invert will be at 2 ft. 6 in. below high-water of spring tides. From the air-chamber two outfall pipes, 5 feet diameter, will spread in the form of a V, and will discharge, on a grade of 1 in 22, to the face of a rocky ledge, where the soffits will be at 20 feet below high-water of spring-tides. The estimated cost of the scheme, which is now being carried out by day labour throughout, is £484,000.

Section No. 1.—This section includes a length of 11,406 feet of sewer at the outlet end. Excepting for about 1,100 feet of deep trench, the construction is in tunnel through sandstone rock, which is chiefly of a hard character. In the shallower working the rock is softer in parts, and here and there bands of shale are met with. The longest drive is 1,586 feet, and the shafts range from 40 to 132 feet deep.

The size of the sewer when completed will be 12 ft. 3 in. by 7 ft. 6 in., and the shafts have been sunk 12 feet by 6 feet for convenience in alignment and working.

A contract was let to Messrs. George Maddison and Co. for the construction of this section on 15th June, 1910. Mr. Maddison died in December, 1910, and shortly before his death he assigned the contract to his wife, who then carried it on in the name of Mary Maddison.

In February, 1912, the contractors applied to the Minister to be relieved of the contract, and an agreement was arrived at, and the work taken over by the Department on 13th March, 1912, since which date it has been carried out by day labour, Mr. H. E. Bellamy, Assoc. M. Inst. C.E., acting as Resident Engineer.

In the tunnelling operations under the Department, hand drilling has been chiefly used. Pneumatic drills were used in four drives, but it was found that no saving in the cost of excavation was effected, and they were not further installed.

For

For dressing the tunnels to section, pneumatic popper drills and explosives are used, each drill being perforated, and used in conjunction with a water jet, thereby keeping down the dust which, in hand scabbling, has in the past proved so injurious to the health of the workers in sewer tunnels. Electric current, supplied by the City Council, has been installed along the full length of this section, and is used for driving air compressors, ventilating fans, shaft hoists, etc. A transformer house has been erected on the works, where the current is reduced from 5,000 to 415 volts.

The drives are all holed through, and are being dressed to section preparatory to concreting.

A start has been made upon the excavation in open trench, the spoil from which will be used in levelling up the Long Bay Park adjoining.

Section No. 2.—The length of this section is 9,420 feet, and the sewer construction is in trench principally through sand, the lower portion of which is very wet. The depth ranges from 14 feet to 60 feet below the surface. To a height of 30 feet above the bottom the excavation is being taken out with vertical sides; above that level the excavation has sides cut to a batter of two horizontal to one vertical, sloping to a 10 feet berm on either side of the vertical trench.

A contract for this section was let in October, 1910, but after a few months the contractors asked to be relieved of their responsibilities, and the work was taken over, and has since been carried out by day labour under the officers of this Department, the Resident Engineer upon this section being Mr. C. Simons, Assoc. M. Inst. C.E.

There were serious delays at the outset with regard to the supply, by the City Council, of electric current for power for driving the excavating plant, and there have also been delays owing to the suspension of the supply from Lithgow of the steel rods and to the shortage of blue metal required for the concrete. Good progress is, however, now being made. The excavation through the sandhills to the berm level has been completed, and the trench excavation is being proceeded with at three places on this section. Concreting is at present proceeding at only one face, but will shortly be in progress at five faces. In the shallow trenches the ground is being held with timber runners, but in the deep trench steel interlocking piles are used. These piles were obtained from the Carnegie Steel Co., and are 12 inches wide and 40 feet long, weighing 40 lb. per lineal foot.

A travelling gantry, 52 feet high, equipped with a 2-ton Arnott pneumatic hammer, has been constructed for driving the sheet piling, and two water jets are being used, one at the back and one in front of the toe of each pile. The excavated sand is being taken out to a depth of 12 feet below berm level between the steel piling by shovelling into skips, and led out of the end of the cutting. Walings are suspended from the top of the steel piling, and struts placed as required, and below 12 feet the sand will be lifted in buckets by a travelling excavating gantry, which will follow the driving gantry.

At the lower end of the section water has been met with in such quantity that a large quantity of sand is being lifted by a dredge pump and pumped clear of the works into a paddock, where the sand is deposited and the water flows off into a creek.

In the shallowest trenches, the excavation has been taken out by hand, but now that the depth is increasing two electrically driven travelling cranes are being installed, which will be shortly supplemented by several travelling steam cranes.

The sewer on this length is 12 feet wide by 7 ft. 6 in. high inside; it is heavily reinforced.

Electric power has been installed the full length of the section, and is being used for pumping, hoisting, air compressing, concrete mixing and lighting.

The difficulties of carriage of material to site have been considerable, and are not altogether surmounted. To convey material between points on the section, a track with 2 feet gauge has been laid parallel to the line of sewer, along which a "Kraus" locomotive draws trucks, carrying material or spoil to the dumps.

The pumping on this section is very heavy, and 6-inch pumps, electrically driven, are running continuously.

Section No. 3.—This section, which is 12,038 feet in length, includes sewer construction both in trench and aqueduct, and also a syphon under Cook's River.

This section has from its inception been carried out by day labour, Mr. H. M. Clarke, Assoc. M. Inst. C.E., acting as Resident Engineer.

Good progress has been made with its construction, about 2,400 feet of sewer having been completed, and another 600 feet of bottom concreted ready for the superstructure. In addition to this, all the piles for the piers of the aqueduct have been driven, the shafts at each end of the syphon sunk, and the tunnel under the river partly excavated. Extensive road deviation works have been carried out, the Bald Face Quarry has been developed, and a stone crusher installed. A wharf on the Arncliffe side of Cook's River has been built, and a long coffer dam erected to protect the concrete aqueduct construction.

The internal dimensions of the sewer on this section are 11 ft. 2 in. by 6 feet from the end of section to the river, and 11 ft. 4½ in. by 5 ft. 9 in. from the river to the present terminal of the main western sewer.

Concrete and steel are used in its construction throughout. In shallow trench under roadways a heavy concrete section with covering of I girders and jack arches is adopted. In deeper trench a concrete section heavily reinforced as for section 2. The aqueducts will consist of reinforced concrete arches of 50 feet span, carrying the sewer, which will have expansion joints at suitable positions. At each end of the aqueduct, where the sewer is out of ground, a foundation in the sand is formed a short distance below the surface with reinforced concrete, and cross walls carry the sewer. In this form of construction expansion joints are provided at 50-foot intervals.

Self-contained continuous concrete-mixers, driven by benzine engines, have been used for mixing all concrete on this section, and have been found to be economical and satisfactory.

Section No. 4.—This will include the connecting sewer to intercept the sewage from the Southern Outfall Sewer, which at present passes through a shallow syphon pipe under Cook's River to the Botany Sewage Farm. A junction will be made with the sewer between the screening chamber and Cook's River, and the intercepting sewer will be constructed along the foreshores to discharge into the Main Outfall Sewer near the old Botany pumping station.

The sewer and pumping station for collecting the polluted water from the wool-scouring works established upon the Chain of Ponds, Botany, and lifting it into the outfall sewer, will also be included in this contract.

Section No 5.—This includes the ventilation of the whole of the ocean outfall sewer, which will be dealt with under a separate contract.

Canterbury North, Campsie, Belmore, and Bankstown District.—A scheme for the sewerage of this large and rapidly growing district has been prepared for submission to Parliament.

Canterbury South and Enfield Sewerage.—The contract for the extension of the main sewer to Fern Hill has been completed. This sewer is oviform in section, its dimensions being 4 ft. 6 in. x 3 ft. 6 in. It has been constructed in tunnel through hard sandstone rock, with permanent shafts at intervals of about 12 chains.

The depth of shafts range from 34 feet to 37 feet. The length of the extension is 3,844 feet.

Rookwood, Auburn, and Granville Sewerage.—A sewerage scheme for the suburbs of Rookwood, Auburn, and Granville is being prepared for submission to Parliament.

Stormwater Drainage.

Some extensive stormwater drainage works are in progress in the metropolitan district. Mr. W. Smith, Assoc. M.Inst.C.E., acting as Resident Engineer upon their construction.

Auburn Stormwater Channel, Contract No. 949.—The stormwater channel at Auburn, on the line of the creek which crosses at Auburn railway station and discharges into Haslem's Creek near the meat works, was completed by day labour during the year, and transferred to the Metropolitan Board of Water Supply and Sewerage for maintenance. The lower length of this channel is open, 6 ft. 6 in. wide by 3 feet deep, the material used being concrete throughout. The upper length is constructed of reinforced concrete pipes, ranging from 4 ft. 6 in. to 2 ft. 6 in. in diameter. The cost of this channel was about £6,750.

Rookwood Stormwater Channel.—An extension to the railway line of the channel constructed some years ago by the Department across Joseph-street, Rookwood, is being carried out by day labour. The channel is open, with concrete bottom, and sides constructed of concrete blocks. Its dimensions vary from 10 feet to 9 feet wide, by 4 ft. 6 in. deep. The length of the extension is 1,842 feet, and the estimated cost £5,257.

Alexandria Stormwater Channel.—A further portion of the Shea's Creek system of stormwater drainage is being carried out, and a stormwater channel is being constructed by day labour, along a branch creek from its junction with the concrete channel forming the extension of the Shea's Creek canal, to the outlet of the stormwater channel through Alexandria Park. The channel will be open, with bottom and sides of concrete. Its dimensions vary from 6 feet to 5 feet wide, by 3 feet deep, and its length is 32½ chains.

A branch channel along the creek crossing McEvoy-street, and heading close to the Botany-road, at Wyndham-street, is also in course of construction. This channel is being constructed of reinforced concrete pipe, 4 ft. 6 in. in diameter, and its length is 27½ chains.

These channels will drain an area intersected by Euston and Buckland streets and Botany-road, within which area factories are rapidly springing up. Their estimated cost is £9,000.

Newtown-Marrickville Stormwater Channel.—A stormwater channel to drain portions of Newtown and Marrickville was completed by day labour during the year. This channel discharges into the eastern channel of the Marrickville valley, near Messrs. Vicars' woollen mill. In its course it crosses Edgware-road, and traverses Camden and Margaret streets. The lower length is open channel, 6 ft. 6 in. by 3 ft. 6 in., constructed of concrete and brickwork. The upper portion is of reinforced pipes 3 ft. 6 in., and 3 feet in diameter. The total length of channel is about 3,300 feet, and the approximate cost has been £5,350.

Hurstville Stormwater Channel.—Plans have been prepared, and reinforced concrete pipes are being made for a stormwater channel to drain portion of Hurstville, near the railway station from Forest-road to Park-road, discharging into an existing culvert and earthen channel, constructed by the Hurstville Council. It will be constructed of reinforced concrete pipes, 2 ft. 6 in. diameter, and 766 feet in length. The estimated cost is £707, and upon completion it will be handed to the Hurstville Council, who have entered into an agreement with the Department to repay the cost by twenty-eight annual payments.

Chatswood Stormwater Drainage, Contract No. 1,006.—A stormwater channel is in course of construction by day labour, along the creek forming the main outlet for the stormwater drainage of Chatswood. The portion of the creek dealt with lies between Victoria-street and a point near Chatswood-avenue, a length of 3,456 feet. The channel below Victoria-avenue is open, with concrete bottom and sides, built of concrete blocks, the dimensions being from 11 ft. 6 in. to 9 ft. 6 in. wide by 3 ft. deep, with 240 feet of open earth channel. This is the first stormwater channel in which concrete blocks have been used. The blocks were made in two sizes, viz., 18 in. x 7 in. and 9 in. by 7 in., and were laid alternately header and stretcher in 2 to 1 cement mortar. The concrete used consisted of 5 parts of blue metal, 1½ in. to ¾ in. gauge, to 2½ sand, to 1 cement. The blocks were made in moulds upon a shaking table driven by an oil engine, and were stripped in from 24 to 48 hours after manufacture. The appearance is good and the cost reasonable, as compared with brickwork, while with this form of construction the cracks which occur in mass concrete are avoided. Above Victoria-avenue the channel is covered, the material used being partly reinforced concrete in bottom and sides, and a reinforced concrete cover. The dimensions range from 6 ft. 6 in. to 3 ft. 9 in. wide x 2 ft. 6 in. deep.

A branch channel, 4 ft. 6 in. to 3 ft. 9 in. x 2 ft. 3 in. deep, built of concrete, partly reinforced, extends from Archer-street to Anderson-street, a distance of 820 feet.

The total cost of these channels is estimated at £9,340.

Centennial Park Lands Drainage, Birrell-street Stormwater Channel, Contract No. 1,041.—In order to allow of a section of the Centennial Park lands at Birrell-street being cut into allotments for building purposes, a deviation has been made in the existing 3 feet reinforced concrete pipes, whereby the channel has been carried square across the allotments. The cost of this work, which was carried out by day labour, was £930.

Centennial Park Drainage, Outlet from No. 1 Lake, Contract No. 1,064.—In heavy storms, the flood waters brought down by the stormwater channels discharging into No. 1 lake of the chain of lakes in the Centennial Park back up in this lake, owing to the existing pipe outlet not being of sufficient capacity to quickly carry off the inflowing flood. A line of 3 feet reinforced pipes have been laid with a bell-mouthed weir entrance, to give an enlarged entrance as an additional outlet for the lake for stormwaters. The cost of this work, which was carried out by day labour, was £306.

Dacey Garden Suburb Stormwater Channel.—Surveys have been made, and plans are being prepared for a stormwater channel to carry off the surface water from the northern end of the Dacey Garden Suburb and discharge it into the swamp at the head of Mill Stream Creek. The channel will be of concrete, oviform in shape, and 9 ft. 5 in. x 6 ft. internal dimensions.

Country Sewerage and Stormwater Drainage.

Katoomba Sewerage.—The sewerage of Leura has been proceeded with during the year by day labour, and is now practically completed. The scheme includes the construction of septic tanks and filters and a system of reticulation sewers. Owing to the phenomenal growth of settlement, the length of sewers being constructed is about double that proposed in the scheme designed three years ago. The length of sewers in the present scheme is about 8 miles, and the estimated cost is about £18,000.

At the request of the Council, the design for the sewerage of Katoomba West has been completed and will shortly be proceeded with.

Lithgow Sewerage.—Rapid progress has been made with sewerage construction at Lithgow by day labour, and it is anticipated that the treatment works, main sewers, and reticulation sewers will be completed before the end of the year. The sewage of the whole of the town will gravitate to septic tanks upon a site resumed north of the Bowenfels railway station. After passing through the tanks, it will be pumped and distributed over the surface of filters composed of slag from the iron smelting furnaces, after which the filtrate will be run upon earth beds. The estimated cost of these works is £39,955.

Wagga Wagga Sewerage.—A contract for the main sewerage, reticulation, rising main and treatment works for Wagga Wagga has been let, and the contractors expect to break ground in a few weeks. Concrete pipes made by the Kielberg process will be used, and a contract for their supply has been entered into with Mr. Richard Taylor, of Melbourne. A factory has been established at Wagga Wagga, where the pipes are being made, and about half their number is now ready for testing. The gravel and sand used in the concrete for these pipes are obtained from the bed of the Murrumbidgee River, and are excellent in quality. As the deposits of gravel are not accessible when the river is high, advantage was taken of the low river during the summer months to obtain such quantities as are required for all concrete work upon the sewerage works.

The collecting station for the sewage of the portion of Wagga Wagga that is to be dealt with is near the Wollundry Lagoon, where it will be delivered by the gravitation sewers into a pump well, whence it will be forced through a line of cast-iron pipes to the Police Paddock situated on the bank of the river to the north of the town. The sewage will be here subjected to the usual treatment adopted for purification. The estimated cost of the works is £29,349.

Murwillumbah Sewerage.—During the year the slopwater system of sewerage at the northern side of the sewer was completed, and some extensions were also carried out. A few lines of sewer to serve the same purpose for the settlement of the south of the river are in progress.

Lismore Sewerage.—The contract for the sewerage extension of Lismore, which includes Gerard's Hill, was, after numerous delays, completed during the year. A further extension of reticulation to serve settlement which has recently sprung up to the south of the treatment works, in an area intersected by Orion-street, has been commenced. The estimated cost of the extension is £1,550.

Casino Stormwater Drainage—Contract No. 1,099.—Relief drains are being carried out by day labour to deal with the stormwater of Casino. The only outlet for the stormwater from the flat area it is built on has previously been to a swamp, the surface of which is little below that of the town. A new outlet has been provided by a drain consisting of reinforced pipes, 3 feet 6 inches in diameter, along East-street and discharging through Joseph's Gully into the Richmond River.

The creek forming the main drain of the town has been deepened, a concrete bottom formed, and the sides battered to a flat slope. The work is almost completed, and its efficiency was tested by recent heavy rains, when the water was quickly carried off by the new drains. The total length of drains is about 12,600 feet, and the estimated cost, inclusive of new bridges, is £10,000.

Casino Sewerage.—In response to a request of the Municipal Council of Casino, surveys have been commenced for the preparation of a scheme of sewerage for Casino.

Newcastle Sewerage.—Owing to administrative changes this work is now being carried out under the charge of the Chief Engineer for Public Works, Newcastle District.

Bathurst Sewerage.—The detail survey, and the survey and levelling for locating sewers were completed during the year. A contract for the main sewer has been prepared, and tenders will shortly be called. With the exception of a low-lying area near Charlotte Vale Creek the sewage from the town will be carried by gravitation to treatment works situated between Morrisset-street and the Macquarie River the land being bounded on the east and west by Creek and Patna streets respectively. The low-level area, referred to will be served by a pumping station near the junction of Russell and Acteron streets, whence it will be pumped into the main gravitation sewer. The treatment of the sewage will be similar to that of Lithgow, viz., the septic tank effluent will be pumped and distributed over artificial filters, and the filtrate will be used for irrigation. As the soil at Bathurst is very suitable for the purpose, successful cropping from the irrigation area is expected. The estimated cost of this scheme, as submitted to the Public Works Committee, was £43,144.

Orange Sewerage.—All the survey work in connection with the sewerage of Orange is finished, and contracts for the sewers and treatment works are now being prepared. Owing to the rapid fall of Blackman's Swamp Creek, a mile below the town, it is practicable to collect and treat the sewage of

Orange

Orange entirely by gravitation. In the treatment, the septic tank, artificial filter, and earth filtration will all be asked to do their share; but as the soil is decomposed basalt of a gluey nature when wet, and the irrigation area is limited, a larger area than usual of artificial filters will be provided. The estimated cost of the scheme is £27,500.

Albury Sewerage.—The detail survey for the sewerage of Albury is completed, and the survey for locating the lines of sewer and site for treatment works is in progress. The estimated cost of the works is £39,675.

Dubbo Sewerage.—The Public Works Committee recently examined into the scheme for the sewerage of Dubbo, prepared by the Department, and reported in favour of it.

The site of the town is very flat, and it will be necessary to collect the sewage into a centrally-situated well, and pump it to the treatment works. No suitable site for treatment could be found on the same side of the Macquarie River as the town, but a site about a mile below was found on the opposite side where there is a good area for irrigation situated above flood level. It is proposed, therefore, to pump to septic tanks on this area, and after treating the effluent in artificial filters, to finally purify it in the process of irrigation. The estimated cost of construction is £35,800.

Tamworth Sewerage.—The sewerage scheme for the town of Tamworth has been inquired into by the Public Works Committee, but their report has not yet been presented to Parliament.

Provision is made for draining the upper part of the town by gravitation to a site for treatment works below the town; the sewage from the lower portion of the town to be pumped into the gravitation sewer. The estimated cost is £47,200.

West Maitland Sewerage.—A scheme for the sewerage of West Maitland is now under consideration by the Public Works Committee. It provides for the collection of the sewage by gravitation sewers leading to a pumping station a little west of the railway station, whence it will be pumped to treatment works upon a selected site on the bank of the Hunter River between East and West Maitland. The estimated cost of the scheme is £54,500.

Parramatta Sewerage.—Surveys have been prepared for extensions of the sewerage reticulation to the north-eastern portion of Parramatta and to May's Hill. The length of proposed sewer is about 5 miles, and the estimated cost of the north-eastern extension is £6,700.

Grafton Sewerage.—The detail survey for the sewerage of Grafton is in progress, and upon its completion the setting out of a system of sewers will be proceeded with.

Wollongong Sewerage.—Three schemes of sewerage for Wollongong were prepared, the scheme selected by the Council being one which deals with the business and southern portions of the town only, but is designed so as to be capable of extension to include the remaining town area. The Council has not yet decided to proceed with the scheme.

Coonamble Sewerage.—A further investigation into the sewerage of Coonamble shows that the cost of the cheapest scheme that can be recommended for collection and disposal of sewage is so high that a rate of 2s. in the £ upon the assessed annual value of property within the sewerage district would be necessary to pay interest and sinking fund on the capital cost. The Council are being advised to adhere to the present system of collection until population and ratable values increase.

Inverell Sewerage.—A scheme of sewerage for the town of Inverell is almost completed, and will be ready for submitting to Parliament as soon as the question of an adequate water supply for the town is satisfactorily settled.

Glen Innes Experimental Farm.—Sewerage and a septic tank have been installed at the Glen Innes Experimental Farm. The septic tank effluent will be subjected to filtration through soil for its final purification. The cost of this installation was £265.

Kosciusko Hotel Sewerage.—The extensions to the Hotel Kosciusko providing accommodation for an increased number of visitors necessitated increased septic tank capacity. Instead of duplicating the existing tank, it was decided, on account of its proximity to the hotel, to discard that site and build tanks further away. A site was accordingly selected about a quarter of a mile from Digger's Creek, where there is a small area of alluvial suitable for treating the filter effluent. To protect the filters from being snowed up, they have been roofed over, and it is proposed to burn the gas from the septic tanks within the filter chamber during winter, in order to keep the temperature if possible above freezing point, and so that distributing pipes will not be choked with ice. The cost of treatment works and sewer is about £1,300.

Nepean River Compensation Weirs.

Wallacia Weir.—A concrete weir has been contributed by contract across the Nepean River at Wallacia at a cost of £1,531. The weir is an overshot one, curved in plan to 150 feet radius, and about 182 feet long on the crest. The maximum height above the river bed is about 16 feet.

Katoomba-Leura Swimming Baths and Road.

A new drive has been constructed by day labour between Katoomba and Leura, skirting the new swimming baths, which are being constructed by day labour near the Meeting of the Waters. The baths are being constructed by means of two concrete dams across the creek, and will include a deep pool for men and shallower pools for women and children, together with the necessary sheds and appurtenances.

DRAINAGE WORKS.

Good progress has been made during the year in the preparation of Trust for drainage works proposals under the Water and Drainage Act, and the construction of works for schemes already approved. At the commencement of the year six contracts were in hand, and two schemes were being carried out by day labour. Of these eight schemes, six have been completed, together with two others which were let by contract during the year, and also an extension to a completed work.

The

The area in which drainage has been completed during the year amounts to 18,641 acres, the cost being £19,993 9s. 8d. Works are now in hand in nine Trust districts, comprising an area of 42,306 acres, the expenditure on which to the end of the financial year has been £19,801 11s. 9d.

The accompanying statement (A) shows particulars of all drainage works carried out to date under the Water and Drainage Act. Sixteen schemes have been completed and handed over, or are ready to be handed over to trustees. These represent an area of 67,857 acres, and were carried out at a cost of £50,059 6s. 6d., the annual payment therefrom to the Crown for interest and sinking fund being £2,871 17s. 4d.

Generally speaking the results of drainage have been most satisfactory. It was observed at a recent inspection of works that one district, which prior to drainage could only be traversed by wading knee-deep, can now be driven over with a vehicle without difficulty, and that the whole of the drained area was practically dry and grassed. This is only a typical case. In other drained areas maize is being grown, and in at least one case a residence, stockyards, and cowbails have been erected on land which a few years ago was only to be reached by wading.

The full importance of drainage works cannot be realised until it is remembered that what was practically waste land more or less inundated with water, is, after drainage, capable of producing a return, in some cases of about £8 per acre per annum.

In several instances most effective results have been obtained at a low expense by merely damming a tidal channel and putting in one or more monier pipes with reflux doors on the outside. In draining low-lying lands automatic tidal gates are usually employed. The sills of gates and inverts of channels are kept as low as possible, often below low-water mark, to give an adequate channel to effect the required discharge in times of heavy rainfall. Amongst others the Shark Creek drainage scheme has been carried out on these lines with most satisfactory results. In cases where the pipes are at the outlet of an excavated channel, it is advisable at times to lift the doors and allow a certain amount of salt water to flow up the channel. This has the effect of killing certain grasses and vegetation which flourish in fresh water, and thus reduces the cost of maintenance. On two of the schemes which were in progress during the year, the contractors used mechanical plants. In one case two derrick scoop excavators were used, the larger being supplied with a boiler of 8-horse power capacity and two sets of steam winches. The whole plant was mounted on flanged wheels and traversed a short length of rails, which was taken up and shifted forward as the work advanced. In the other case the plant used was a small Priestman grab dredge mounted on a punt, which was floated up the drain as the material was excavated, the men's quarters, office, and cookhouse being on another punt. In this swamp three well defined ridges of hard compact black indurated sand were found, and proved a source of delay and annoyance to the contractor. Explosives were used with somewhat indifferent results. He now intends to try a rooter plough on it.

A surveyor has been constantly employed on drainage surveys during nine months of the year, and surveys of four schemes have been carried out, and one completed which had been started previously. The survey of the Hastings-Macleay Canal was also carried out. A survey was also made and plan and estimate supplied to a municipality for the drainage of a small lagoon which the local authorities proposed to carry out themselves.

WATER CONSERVATION.

Water Trust Works.

During the year, three schemes under the Water and Drainage Act have been under construction for Water Trust works at Nidgery, Little Merran Creek, and Barooga. The first named consists of a concrete overshot weir to provide water for a number of holdings on the Bogan River. This has been completed at a cost of £1,105 19s. 7d.

Little Merran Water Trust consists of a cutting and regulator, by means of which water is to be conveyed from the Little Murray River (an anabranch of the Murray) to a creek, which, with its branches, will water a Trust district comprising an area of 246 square miles. The estimated cost of the works is only £3,547, so that the scheme is an exceedingly cheap one; this work is still in hand. Barooga Water Trust embraces a scheme for pumping from the Murray River, and, by means of about 59 miles of distributing channels, of supplying water to about 84½ square miles of wheat-growing country; this work is not yet complete. A small extension is also in hand to the Algdugerie Creek Trust Weir.

Extensive surveys and investigations have been made with a view to forming Trusts in the southern portion of the State, in some cases by means of levee banks to prevent flooding, and in others by the construction of cuttings and regulators to fill natural lagoons and watercourses, and provide water for very large areas of country.

A statement (B) is attached, showing the various Water Trust schemes which have been completed to date, and the position of other schemes now in course of preparation.

Public Watering Places in the Western Division.

Great difficulty has been experienced in carrying on the contracts let for tanks in the Western Division, where dry weather and scarcity of men have greatly delayed the works in hand, and have prevented contractors from tendering in the other cases for which tenders have been called on several occasions. Five tanks have been completed during the year, having a total capacity of 74,000 cubic yards, at a cost of £5,694 16s. 11d. There are at present seven tanks and one well under construction, the total amount of the contracts being £9,840. A number of tanks have been authorised, for which it is anticipated that tenders will shortly be called.

The standard design for excavated tanks, both open and enclosed, has been revised, and certain improvements have been introduced.

In the case of enclosed tanks where water is pumped, the batter adopted is 2 to 1 on all the sides, so that there may be as little evaporation as possible. Where there is not sufficient traffic to warrant the erection of pumping machinery and payment of a caretaker, the tanks are constructed with 2 to 1 batters on three sides, and 4 to 1 batters on the fourth, where the stock have access to water.

Extensive repairs have been effected at many of the public watering places. In several cases the pumping appliances, troughing, &c., are completely worn out, and new and approved plants are being supplied. The total expenditure in this direction during the year was £3,727.

The establishing of public watering place tanks at reasonable intervals on the dry stock routes is a work which is greatly appreciated by drovers and others, who are forced to travel in these extremely hot and dry localities.

In one district the District Works Officer has obtained, through the Department, fruit-trees which have been supplied to the lessees, who, it is anticipated will, in their own interest, look after them, as travellers are only too ready to purchase the fruit when available. In the district referred to there are at various tanks over 2,000 fruit-trees, and other District Officers intend arranging for tree planting at the public watering place tanks where circumstances are favourable.

Appendix D shows particulars of all public watering places in the Western Division, irrespective of year of construction.

Other Water Conservation Works.

Besides the works under the Water and Drainage Act there are others which have been contemplated for a considerable time. In some cases the investigation and surveys have been advanced, and in others construction has been commenced.

Gunningbar Creek Weir.—Tenders were called for this work, but as none were received it was decided to carry it out by day labour. A good deal of difficulty was experienced in getting material delivered, but work is progressing satisfactorily and approaching completion. This weir is being constructed of timber, in No. 1 cutting at Gunningbar Creek, and when completed, together with repairs to the drop board regulators in Crooked Creek and Duck Creek, a fine body of water will be retained. This water is diverted from the Macquarie River at Warren Weir through the Gunningbar Creek regulator, amended regulations for the working of which are being prepared.

Hay Irrigation Trust.—These works comprise the erection of a suction gas-driven pumping plant, engine house, stilling basin, and a channel for conveying water from the Murrumbidgee River to the irrigated area, including culverts over channel, at an estimated cost of £3,850. The irrigation works are under the control of the Agricultural Department, by whom the funds for this work are being provided. This scheme, which will supersede an existing pumping plant, now out of date, is approaching completion.

Wentworth Irrigation.—Branch drains and culverts were completed during the year at a cost of £802 1s. 5d. Two charcoal retorts were obtained by contract, at a cost of £259, and erected by day labour, for the purpose of supplying charcoal to the suction gas engine used for pumping. These works were carried out by this Department for the Agricultural Department.

Great Ana Branch Cutting.—This is a work which has been in contemplation for many years, but it was not till last year that tenders were actually accepted. One contract was let for the construction of culverts and regulators; this was completed at a cost of £1,468 8s. 3d. The other, comprising about 18 miles of cutting, was not started, the contractor declining to proceed with the work on account of dry weather and other disabilities. Fresh tenders will shortly be called. This scheme will be the means of providing water for a large area of country west of the Darling, at the request of the Western Land Board.

Liverpool Dam.—This dam, situated on George's River, was erected about sixty years ago. Extensive repairs, including the laying of a concrete apron, were commenced during 1910-11, and satisfactorily completed last year, at a cost of £1,395 4s. 11d.

Murrumbidgee River Snagging.—Some snagging was done in the vicinity of Hay, at a cost of £386. A fresh in the river caused stoppage of the work, which will be recommenced later. There were, besides works mentioned above, sundry works of the nature of maintenance and repairs to existing structures carried out in various districts at a cost of £306 16s. 3d.

Drainage of Watercourse Country.—The drainage of the watercourse country on the Gwydir River below Moree was to have been inspected last year with a view to arranging for a comprehensive survey to be made; so far this has not been done, as officers were not available. It is a matter that remains to be done, and requires careful investigation.

Hastings and Macleay Canal.—The survey for the proposed canal is in hand, and the design and estimate will shortly be proceeded with. The proposal gives great satisfaction on both the rivers affected, not only on account of the relief which the canal would give in times of flood and its uses as a means of draining a considerable area of low country, but because of the facilities it would give as a navigable channel for small craft, log punts, and cream launches, between the two rivers.

Regulation of Water Supply in Watercourses.

In some instances cutting and regulators have been provided with a view to sending down a supply of water through dry watercourses from rivers where the flow of the water in the rivers permits. Regulations have not in all cases been made as to when water shall be allowed to run down the creeks, the amount, and when it should be shut off. This is a matter which is receiving attention, and it is proposed to provide regulations where none exist and to modify others which do not meet the requirements of the localities affected. This is most necessary, otherwise some landowners will not receive the amount of water to which they are entitled, and naturally this gives rise to numerous complaints. It is only by experiment and careful observation of the results when water is released under varying conditions that satisfactory regulations can be compiled.

Goulburn

Goulburn River—Dam near Junction of Bylong Creek.

The Hunter District Water Supply and Sewerage Board has for some past been pressing for an investigation for a scheme for supplementing the flow of the Hunter River in dry seasons. This is necessary, owing to the increasing consumption of water in the Newcastle district. There are also a number of pumping plants on the Hunter River, which divert considerable quantities of water for irrigation purposes under licenses under the Water Rights Act. Alternative schemes are in course of preparation for the storage of water on either the Goulburn River or the Upper Hunter River by means of a large dam. On the Goulburn River a suitable site has been located below the junction of Bylong Creek, where a contour survey of the storage area was made last year. During the year an investigation was made with regard to the run-off from the catchment and also into various matters affecting the design of the dam. A test of the foundations will shortly be put in hand.

Dam on Upper Hunter River, near Moonan Flat.

Some years ago Mr. J. B. Henson, Engineer to the Hunter District Water Supply and Sewerage Board, located a site for a dam above Moonan Flat. On examination by the departmental officers, another site was found on this river below the township of Moonan Flat. The latter site has the advantage that it is below the junction of Moonan Brook with the river. A contour survey is now in hand, and tests of foundations are being made at both sites. A gauging station has been established at Moonan Flat, and estimates are being prepared of the run-off from the catchment.

Darling River—Storage in Lakes on the Eastern Side.

At the request of the Minister for Lands, the question of locking the Darling River, between Wentworth and Menindie, has been again looked into, with a view to supplying a stock and domestic water supply in connection with the development of 5,000,000 acres of mallee lands lying to the eastern side of the Darling River, between Balranald, Euston, and Menindie. The Chief Engineer for Irrigation has reported that, in his opinion, the locking of the river would serve no useful purpose in connection with the development of these lands. There is, however, another scheme for consideration, namely, the storage of water by using the series of lakes, including Boolaboolka and Ratcatcher Lakes, which lie to the east of the Darling. A preliminary investigation of this scheme has been made by Mr. Assistant Engineer Fruhling, which indicates that it will be feasible to store a considerable quantity of water by diversion from the Darling River, through the Talywalka Creek, into the lake system. This water could be used either for irrigation or for stock and domestic supplies to settlers. Before, however, an estimate can be prepared, it will be necessary to have further extensive surveys carried out. In accordance with instructions, this matter is standing over for the present.

Namoi River—Dam near Boggabri.

At the request of a deputation, an investigation was made for a large dam across the Namoi River, about 6 miles below Boggabri, where it was estimated by the Shire Engineer that a dam 60 feet high would store about 5,000,000 acre feet. A section taken showed that a dam of the height proposed would be 3,730 feet long at the crest. The foundations were tested by boring, with the result that no rock was found at a depth of 145 feet below the surface, and the proposal was consequently abandoned.

Namoi River—Dam at Keepit.

This proposal was referred to by Colonel Home in his report in 1897, but it was then thought very doubtful whether a satisfactory project could be formulated. Instructions have been received to have an investigation made, and so soon as an officer is available this work will be undertaken.

Murray River—Diversion into Lake Taila.

At the request of the Western Land Board, an investigation is being made into a proposal to divert waters from the Murray River into Lake Taila, from which it is proposed to pump for stock and domestic supplies in connection with a large area of new country which it is proposed to open up.

Administration of Water Rights Act.

During the year 128 applications were received for licenses under the Water Rights Act. Eighty-one licenses and one amended license were issued.

RIVER GAUGING.

River Discharge Records.

With the exception of 1902, the rainfall was one of the lowest on record, consequently there was little opportunity to increase the information with regard to high discharges. Altogether 130 observations were taken at different stations on the undermentioned rivers, viz., Hunter, Macquarie, Murrumbidgee, Namoi, and their tributaries.

BURRINJUCK DAM.

The contour map and cross sections of the area covered by the Burrinjuck Dam have been completed and heliographs supplied to the Resident Engineer and Contractors. Several diagrams and statements have been prepared showing the behaviour of the dam in supplying the demands of the Irrigation settlement at Leeton.

Investigations.

INVESTIGATIONS.

Many investigations and diagrams have been made in connection with proposed water supply schemes for Bowral, Inverell, and Goulburn, the regulation of water from the Macquarie River down Gunningbar Creek, and from Lake Cudgellico down the Lachlan River and Willandra Creek. Levels and cross sections have been taken over the Emu Gravel Company's land at Penrith.

YANKO CREEK.

In order that some idea of the requirements of that part of Riverina supplied by Yanko Creek and its tributaries and the amount of water available when the Murrumbidgee Northern Canal is in full operation might be gained, an inspection was made of the Yanko, Colombo, Billabong, Forest and Eight-mile Creeks, which involved about 500 miles of travelling, gauges have been established, and discharge observations will be taken to form a curve when opportunity arises.

HUNTER DISTRICT WATER SUPPLY.

In connection with the proposed scheme for amplifying the Newcastle and Hunter District Water Supply, a large amount of investigation work both in field and office has been done *re* two proposed dam sites at Moonan Flat and the proposed dam on the Goulburn River below Bylong Creek.

MURRAY WATERS.

Several diagrams and a large amount of statistical information has been supplied to the Interstate Conference of Engineers on the Murray Waters question.

RAINFALL.

In the absence of actual stream measurements it is often necessary to estimate the proportion of rainfall likely to be discharged from a catchment, by comparison with other similar catchments.

To assist in this matter an 8-mile map of New South Wales has been mounted, showing the catchment areas at each river gauging station and all the rain-observing stations thereon.

In catchments of small extent, monthly run-off percentages have been worked out, and for large areas the proportions are shown yearly.

The resulting figures should be of interest to engineers designing water supply schemes, and will help to dissipate many popular fallacies as to the actual amount of rainfall discharged by the rivers of this State.

METERS AND EQUIPMENT.

The present method of rating meters, which is carried out at Potts Hill Reservoir, is to set up taut, between rigid supports, two 200 feet lengths of flexible steel wire ropes 2 feet apart horizontally, and a similar height above water surface.

On one wire a boat with a meter suspended from the bow is pulled backwards and forwards for a length of three contacts, the pace ranging from the lowest measurable velocity to the maximum velocity of high floods.

To the other wire a specially marked 200 feet steel band chain is seized, on which spring clips are placed at end of each battery contact, marking the distance travelled per fifty revolutions of meter, and the time taken in seconds.

This method gives good results in medium and high velocities, but leaves much to be desired in low speeds owing to the difficulty of securing an unvarying rate of speed between contacts.

If a high standard of precision is to be attained in low-water measurements, the rating base must be equipped with an electrically controlled car and track similar to that in use at Los Angeles, California, see p. 36 "Hoyt's River discharge."

Appendix A.

PARTICULARS of Drainage Trusts to 30th June, 1912.
Completed and Handed Over.

Name.	River.	Approximate area of Trust District.	Total Cost.	Annual Payment to the Crown.	Remarks.
		acres.	£ s. d.	£ s. d.	
Duranbah	Tweed	4,800	1,348 5 7	80 5 4	Extension in hand.
Black's Drain	"	2,155	836 19 0	49 16 8	
Terranora	"	1,535	179 7 7	10 13 8	
Murwillumbah	"	780	1,534 18 10	92 1 11	
Myocum	Brunswick	945	1,089 10 7	64 17 4	
North Casino	Richmond	6,305	5,506 10 9	327 16 8	
Little Broadwater	Clarence	970	761 13 8	45 7 0	
Ulmara	"	13,920	4,345 0 0	258 13 8	
Alipou	"	900	770 19 8	45 18 0	
Cooroobongatti	Macleay	5,750	4,888 14 3	291 1 0	
Big Swamp	Manning	6,560	7,797 12 8	355 2 4	
Nelson's Plains	Hunter	1,826	150 0 5	18 6 8	
Anna Bay	"	2,486	1,518 12 5	90 8 4	
Grahamstown and Campvale	"	12,380	14,317 14 6	852 8 4	
Brundee	Crookhaven	6,080	880 11 4	43 8 9	
Curl Curl	Coastal	465	4,132 15 3	245 11 8	

Under Construction and Proposals in Course of Preparation.

Name.	River.	Approximate Area of Trust District.	Estimated Cost.	Remarks
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Proposals in Course of Preparation.

		acres.	£ s. d.	
Dalguigan	Tweed			Modified proposal.
Condong	"			
Kynnumboon	"			
Cudgen	Coastal			
Brunswick	Brunswick			
Bungawalbyn	Richmond			
Reedy Creek	"			
James Creek	Clarence			
Everlasting	"			
Tyndale	"			
Frogmore	Macleay			
Kempsey	"			
Clancy	"			
Phoenix Park	Hunter			
Long Bight	"			
Bushell's Lagoon	Hawkesbury			

Proposals Gazetted.

Chindera	Tweed	1,080	1,665 0 0		Proposal to be modified.
Tucki	Richmond	489	1,010 0 0		
German Creek	"	4,750	2,800 0 0		
Horse Springs	"	2,030	3,510 0 0		
Duck	Clarence	1,790	2,660 0 0		
Lake	"	8,960	4,687 0 0		Proposal to be modified.
Glenrock and Tennessee	Macleay	2,630	3,680 0 0		
Arakon	"	5,120	580 0 0		
Louth Park	Hunter	880	2,320 0 0		

Proposals Constituted.

Robb	Tweed	1,095	1,170 0 0		
Cudgera	Coastal	3,040	3,630 0 0		
Swampy Creek	Richmond	1,255	750 0 0		
Gladstone	Macleay	5,660	4,767 0 0		

Works in Progress.

Name.	River.	Approx. Area of Trust District.	Gazetted Estimate.	Amount of Contract.	Remarks.
			£	£ s. d.	
Lavender	Tweed	404	1,343	1,049 16 0	Contract let 14th May, 1912. Contract. } Completed, but not handed Day labour. } over.
Black's Drain Extension	"	2,155	422 (Estimate for extension)	99 13 11 359 1 11	
Mooball and Crabbe's Creek	Coastal	6,560	8,600	4,848 0 0	
Belongil	Byron Bay	2,390	1,360	336 7 6	Drains completed in March, 1912. Some culverts still to be erected. Contract. } Drains complete. Fencing Day labour. } in hand.
Newrybar	Richmond	8,746	12,950	10,963 2 0	
Tuckean	"	15,580	14,105	13,474 0 0	
Martin	Clarence	517	770	630 0 0	Completion expected by end of year. Contract let 8th June, 1912. Completed, but not yet handed over.
Shark	"	2,747	3,040	2,836 0 0	
Hinton	Hunter	3,207	3,870	2,894 0 0	

Appendix B.

PARTICULARS of Water Trusts to 30th June, 1912.

Name.	Date of Proposal.	Date of Constitution.	Date of Completion.	Cost.	Annual Payments to Crown.	Remarks.
Tuppall Creek	30 Oct., 1907	8 Apl., 1908	29 July, 1908	£ 5,800	£ s. d. 345 6 0	Completed and handed over.
Bullatale Creek	23 Oct., 1907	1 July, 1908	1 July, 1910	2,108	125 9 4	" "
Torriganney, Muggabah, and Merrimajeel Creeks	3 July, 1907	13 May, 1908	21 Apl., 1909	344	20 9 8	" "
Algudgerie Creek Weir	8 Apl., 1908	12 May, 1909	1 June, 1910	742	57 19 4	" "
Condobolin West Weir	28 Jan., 1909	23 June, 1909	23 Mar., 1910	692	41 3 8	" "
Nidgerie Weir	10 Aug., 1910	18 Jan., 1911	12 Dec., 1911	1105/19/7	65 17 0	" "
Barooga	13 Apl., 1910	11 Jan., 1911	Est. £10,800	...	...	Works in progress.
Little Merran Creek	27 July, 1910	30 Nov., 1910	" £3,547	...	...	" "
Oakleigh Weirs	13 Dec., 1911	8 May, 1912	" £2,500	...	...	Trust constituted.
Thule Creek .....	.....	.....	.....	.....	.....	Proposal being prepared.

Appendix C.

PARTICULARS of Drainage Unions to 30th June, 1912.

Name.	River.	Approx. Area of District.
Miller's Swamp	Manning	acres. 1,280
Cundle Plains	"	1,400
Dumaresq Island	"	570
Miller's Forest	Hunter	4,194
Alnwick	"	1,685

Appendix D.

PARTICULARS OF PUBLIC Watering-places—Western Division—to 30th June, 1912.

Stock Route.	Name.	Capacity in cubic yds.	Depth in feet.	Leased, Open, or Subsidised.	Cost.*	Remarks dealing with Works of year 1911-12.
Adelaide Gates-Burns	Tongowoko .....	.....	.....	.....	£	Authorised.
	Gidgea .....	.....	.....	.....	.....	"
Balranald-Euston	Waldaira Lake Tank .....	.....	.....	L.	105	
	Abbott's Tank	4,000	.....	O.	352	
Balranald-Oxley	Morven	10,007	.....	L.	1,351	
Balranald-Pooncarie	Bidura Bore .....	.....	1,387	L.	2,437	
Bourke-Barrigun	Gidgea Camp Bore .....	.....	2,002	L.	3,118	
	Lake Tank	17,000	.....	L.	2,845	
	Grass Hut Tank .....	.....	.....	L.	3,662	
	Native Dog Bore .....	.....	476	L.	2,260	
	Enngonia .....	.....	1,666	L.	3,676	
	Belalie Bore .....	.....	1,565	L.	3,089	
	Barrigun Bore .....	.....	1,711	L.	4,549	
Bourke-Brewarrina	Dry Bogan Weir .....	.....	.....	O.	960	
Bourke-Byrock	Waddell Tank	14,024	.....	L.	2,094	
	Byrock	14,858	.....	L.	2,178	
Bourke Hungerford	Walkden's Bore .....	.....	1,605	L.	2,238	
	Ford's Bridge Tank	22,666	.....	L.	3,958	
	Kelly's Camp Bore .....	.....	1,577	L.	2,650	
	Ford's Bridge Bore .....	.....	1,616	L.	2,366	
	Kerribree Creek Bore .....	.....	1,193	L.	1,936	
	Youngerrina Bore .....	.....	165	L.	1,181	
	Boongunyarra Springs .....	.....	.....	O.	97	
	Yantabulla Bore .....	.....	587	L.	986	
	Mukudjerroo Waterhole .....	.....	.....	O.	.....
	Kenmare Bore .....	.....	1,539	L.	2,001	
	Kilberoo Tank	20,000	.....	O.	2,360	
	Brindingabba Bore .....	.....	1,211	L.	1,996	
	Parragundy .....	.....	1,078	L.	1,275	
	Waroo .....	.....	385	O.	1,144	

*The figures given for cost are, in some instances, approximate only.

PUBLIC Watering-places, Western Division—continued.

Stock Route.	Name.	Capacity in cubic yds.	Depth in feet.	Leased, Open, or Sub- sidised.	Cost.	Remarks dealing with works of year 1911-12.
Bourke-Wanaaring	Paka Tank	18,196	.....	L.	£ 2,161	
	Sibraas Bore .....	.....	1,059	L.	1,946	
	Poison Point Bore .....	.....	1,399	O.	1,651	
	Goonery " .....	.....	89	L.	736	
	Gaffney's " .....	.....	1,600	O.	.....
	Dargle " .....	.....	1,182	S.	2,795	
	Tinchelooka " .....	.....	1,231	L.	2,277	
	Kulkyne Tank	13,200	.....	L.	1,165	
Brewarrina-Byrock	Cuttaburra Bore .....	.....	1,707	S.	2,892	
	Bendermere Tank	15,000	.....	L.	3,094	
Brewarrina-Enngonia	Mulga Tank	15,000	.....	L.	3,125	
	Brigalow Bore .....	.....	2,292	L.	3,498	
Brewarrina-Enngonia	Ledknapper Tank	18,219	.....	L.	3,532	
	Eighteen Mile Tank .....	.....	.....	L.	2,320	
Brewarrina-Goodooga	Whitewood Bore .....	.....	1,210	O.	1,367	
	Nineteen Mile Dam	5,056	.....	O.	529	
	Wolfrey's Weir .....	.....	.....	L.	913	
	Mackenzie's Point Bore .....	.....	2,224	L.	2,073	
	Goodooga Bore .....	.....	2,812	L.	5,672	
Broken Hill-Menindee	Munka Munka Tank	14,153	.....	L.	1,288	
	Horse Lake "	16,224	.....	L.	1,018	
	Box Tank	14,146	.....	L.	3,951	
Broken Hill-Silverton	Limestone Bore .....	.....	25	O.	1,284	
	Silverton Tank	44,712	.....	L.	.....
Broken Hill-White Cliffs Rd.	Rowena "	13,938	.....	L.	683	
	Mount Wright Tank	11,077	.....	L.	473	
Broken Hill-Wompah	Stephen's Creek " .....	.....	.....	O.	.....
	Day Dream "	10,528	.....	L.	2,215	
	Kennedy's "	6,000	.....	L.	1,104	
	Purnamoota "	16,111	.....	L.	2,646	
	Gardener's Creek Tank	10,815	.....	L.	1,327	
	Euriowie Tank	8,986	.....	L.	870	
	Fowler's Gap Tank	14,000	.....	S.	1,471	
	Sandy Creek Bore .....	.....	730	S.	3,295	
	Bancannia Tank	13,087	.....	S.	1,405	
	Packsaddle Bore .....	.....	1,942	S.	5,409	
	Packsaddle Tank .....	.....	.....	.....	1,344	Under construction.
	Wonnaminta Tank	20,874	.....	S.	2,067	
	Palgamurtie Tank	4,590	.....	L.	1,443	
	Mount Brown Well .....	.....	258	L.	1,146	
	Warratta Tank	25,632	.....	L.	2,567	
	Allpress Dam	6,282	.....	S.	882	
	Tibooburra Well .....	.....	290	S.	2,222	
	Tibooburra Bore .....	.....	250	S.	.....
Clare-Balranald	Ooarnoo Bore .....	.....	1,359	S.	4,111	
	Yalpunga Tank	16,272	.....	S.	1,720	
Clare-Balranald	Warri Warri Bore .....	.....	3,925	O.	9,085	
	Dolmoreve Well .....	.....	111	L.	1,919	
Clare-Balranald	Til Til Tank	12,500	.....	L.	3,622	
	Youhl Plain Tank	13,000	.....	L.	3,659	
	Box Creek "	13,000	.....	L.	3,951	
	Penarie "	14,500	.....	S.	1,352	
	Yarrowal "	1,060	.....	O.	58	
	Clare "	22,000	.....	L.	2,989	
Clare-Ivanhoe	Gunnaramby "	20,000	.....	S.	3,086	
	Kilfera " .....	.....	.....	.....	1,042	Tender under consideration.
Clare-Menindie	Manfred " .....	.....	.....	.....	1,603	Under construction.
	Linbee " .....	.....	.....	.....	1,630	" "
	Sayer's Lake " .....	.....	.....	.....	1,690	" "
	Huco " .....	.....	.....	.....	1,341	" "
	Toorincaca "	20,000	.....	.....	1,430	Completed during 1911-12.
Clare-Oxley	Younga " .....	.....	.....	.....	770	Tenders called, none received.
	Bomarthong " .....	.....	.....	.....	770	" "
	Kitcho " .....	.....	.....	.....	770	" "
	Nandum "	12,000	.....	.....	1,220	Completed during 1911-12.
Cobar-Bourke	Nullamut "	5,688	.....	L.	1,732	
	Mount Drysdale Tank	9,680	.....	L.	1,055	
	Tinderra "	14,500	.....	S.	1,671	
	Helman's "	15,310	.....	S.	2,583	
	Curraweena "	8,434	.....	L.	1,909	
	Corilla " .....	.....	.....	S.	1,791	
	Two Waterholes "	1,200	.....	S.	2,199	
Cobar-Bourke	Quarry Bore .....	.....	1,391	O.	1,531	

PUBLIC Watering-places, Western Division.—*continued.*

Stock Route	Name.	Capacity in cubic yds	Depth in feet.	Leased, Open, or Sub- sidised.	Cost.	Remarks dealing with Works of year 1911-12.
Cobar-Hillston	Illewong Tank	13,620	.....	L.	£ 1,265	
	Brura "	18,379	.....	L.	3,202	
	Shearlegs "	18,055	.....	L.	3,400	
	Priory "	20,256	.....	L.	2,976	
	Shuttleton North Tank ..	.....	.....	L.	1,242	
	Sandy Creek "	18,219	.....	L.	3,193	
	Gilgunnia "	9,867	.....	L.	1,442	
	The Rock Holes "	17,875	.....	L.	3,197	
	Wagga "	18,055	.....	L.	3,478	
	Merri Meriwa "	19,104	.....	L.	3,501	
Cobar-Louth	North Roto Well .....	.....	160	L.	1,414	
	Roto Well .....	.....	160	L.	1,309	
	Cuttigullyaroo Tank	15,000	.....	L.	2,395	
	Booroondarra "	20,114	.....	S.	3,177	
	Kerrigundi "	19,616	.....	S.	3,314	
	Mulya "	15,000	.....	S.	1,975	
	Bulgoo "	11,276	.....	L.	779	
	Booroomugga "	9,408	.....	S.	1,742	
	Canbelego "	4,181	.....	L.	3,232	New service tank erected.
Cobar-Mossgiel	Amphitheatre "	6,308	.....	L.	3,066	
	Springfield "	18,218	.....	S.	2,229	
	Meadows "	20,472	.....	S.	2,316	
	Barnato "	14,112	.....	L.	2,325	
	Bulla Bulla "	17,784	.....	L.	2,509	
	Donald's Plain " .....	.....	.....	O.	750	Under construction.
	Keilor "	15,186	.....	O.	740	
	Coonavitra " .....	.....	.....	O.	750	
	Yoree "	15,000	.....	O.	874	Completed during 1911-12.
	Caltigeena "	15,000	.....	O.	800	" " "
Collarendabri-Angledool	Moongulla Bore .....	.....	2,570	L.	8,824	
	Dungle Ridge Bore .....	.....	2,566	L.	8,044	
Euabalong-Gilgunnia	Whoey Tank .....	.....	.....	O.	712	
	Walter's Range Tank	7,160	.....	O.	111	
Euabalong-Mount Hope ..	One Eye "	1,664	.....	L.	396	
	Mount Hope "	18,658	.....	L.	2,926	
Euston-Pooncarie	Prungle "	10,000	.....	L.	626	
	Mundonah "	5,835	.....	L.	251	
	Arumpo " .....	.....	.....	O.	422	
Goodooga-Angledool	Finger Post Bore .....	.....	3,155	L.	6,146	
Ivanhoe-Booligal	Holy Box Well .....	.....	125	L.	2,369	
	Mossgiel Tank .....	.....	.....	S.	3,997	
	Polygonum Hut Well .....	.....	.....	L.	2,647	
	Moolbong Tank .....	.....	.....	O.	.....
	Jumping Sandhill Well ..	.....	123	S.	3,057	
	Tom's Lake Tank	12,977	.....	L.	3,648	
Louth-Wanaaring	Opera Bore .....	.....	804	O.	2,421	
	Barrona Bore .....	.....	1,011	L.	1,512	
Milparinka-Wanaaring	Warrata " .....	.....	2,393	O.	4,992	
	Tineroo " .....	.....	1,858	L.	4,279	
	Clifton " .....	.....	1,638	L.	4,659	
	Birrigoolpa Tank	17,392	.....	S.	2,285	
	Osaca Bore .....	.....	1,646	O.	5,224	
	Ninety-one Mile Bore .....	.....	2,002	S.	5,545	
	Currabulla Bore .....	.....	1,973	S.	3,722	
	Mulgany " .....	.....	1,700	S.	2,700	
	Wanaaring " .....	.....	1,645	L.	4,042	
Mossgiel-Barnato	Waverly Tank .....	.....	12,000	.....	1,371	Completed during 1911-12.
	Conoble " .....	.....	.....	.....	1,100	Tenders called, none received.
	Ninty " .....	.....	.....	.....	1,100	" " "
	Corowra "	19,104	.....	L.	2,908	
	Gidgeroo " .....	.....	.....	.....	1,125	Tender under consideration.
	Winini " .....	.....	.....	.....	1,125	Contract being prepared.
	Balarabon " .....	.....	.....	.....	1,125	" " "
	Tiltagara " .....	.....	.....	.....	1,125	" " "
	Carolina " .....	.....	.....	.....	1,085	Under construction.
Nymagee-Cobar	Nymagee "	17,597	.....	L.	5,957	
	Keighran's "	20,301	.....	L.	3,269	
Nymagee-Euabalong	Nymagee Small Tank	2,510	.....	L.	70	
	Beloura Tank	18,631	.....	L.	3,103	

PUBLIC Watering-places, Western Division—*continued*.

Stock Route.	Name.	Capacity in cubic yds.	Depth in feet.	Leased, Open, or Sub- sidised.	Cost.	Remarks dealing with Works of year 1911-12.
Silverton-Menindie	Rat-hole Tank	16,139	L.	£ 1,460	Tender accepted.
	Thackaringa Tank	20,448	.....	S.	2,803
	Pinnacles " 	5,570	.....	L.	854
	Farmcoat " 	14,408	.....	S.	1,661
Walgett-Goodooga	Aldsborough " .....	.....	.....	O.	16
	Borah " 	20,000	.....	L.	2,948
	Wallangulla No. 1 Tank..	11,000	.....	L.	860
	Wallangulla No. 2 " 	11,500	.....	.....	950
Walgett, via Spring— Goodooga.	Lightning Ridge " 	36,609	.....	L.	2,948
	Glendon " 	20,000	.....	L.	2,866
	Moramina Bore .....	.....	2,272	L.	3,510
	Bunghill Tank .....	.....	.....	L.	2,889
Wilcannia-Broken Hill	Cumborah Springs .....	.....	.....	O.	109
	Wilby Wilby Bore .....	.....	2,162	L.	2,913
	Nineteen-mile Tank	16,272	.....	L.	2,312
	Dolo " 	17,785	.....	L.	2,037
Wilcannia-Hungerford.....	Worongil Tank	16,272	.....	L.	1,923
	Scope's Range Tank .....	.....	.....	O.	150
	Little Topar " 	39,980	.....	L.	2,156
	Myalla " 	16,600	.....	L.	1,733
Wilcannia-Ivanhoe.....	Tara " 	23,500	.....	L.	1,383
	Seaville's " 	16,272	.....	S.	5,113
	Copago " 	18,793	.....	O.	3,167
	Momba Bore .....	.....	482	O.	1,099
Wilcannia-Milparinka	Peri Springs Tank	13,447	.....	O.	1,550
	Coorpooka " 	12,773	.....	O.	775
	Yantabangee " 	13,447	.....	S.	1,621
	Warramurtee " 	13,447	.....	L.	1,584
Wilcannia-Ivanhoe.....	Goombcolara " 	13,447	.....	L.	1,438
	Forty-eight Mile Tank ...	7,890	.....	L.	3,965
	Thirty-five Mile " 	18,246	.....	L.	4,184
	Twenty-six Mile " 	18,688	.....	O.	2,451
Wilcannia-Milparinka	Twelve Mile " 	21,888	.....	L.	3,569
	Mount Manara " 	12,288	.....	L.	2,638
	Boonoonna " 	20,370	.....	L.	3,170
	Ivanhoe " 	20,000	.....	L.	4,386
Wilcannia-Milparinka	Mulga Valley " 	19,852	.....	L.	3,629
	Dry Lake " 	9,384	.....	L.	2,048
	Beefwood Well.....	.....	134	S.	1,836
	" " No. 2 .....	.....	.....	.....	398
Wilcannia-Milparinka	Menamurtie Well	193	O.	1,036	New well under construc- tion.
	Tarella Tank	12,072	.....	L.	2,230
	Gemville " .....	.....	.....	S.	1,069
	White Cliffs No. 1 Tank..	12,391	.....	O.	4,530
White Cliffs No. 2 " 	25,084	.....	L.		
Bunker Tank	16,272	.....	L.	1,630	
Peak " 	12,000	.....	S.	2,763	
J. K. " 	14,056	.....	L.	3,864	
Murlippa " 	26,352	.....	L.	2,997	
Paldrumatta Bore .....	.....	780	L.	1,940	
Cobham Tank	15,000	.....	L.	2,207	
One-tree Waterhole .....	.....	.....	O.	.....	
Coally Dam .....	.....	.....	O.	625	
Milbring Tank .....	.....	.....	O.	.....	
Milparinka Dam	15,030	.....	L.	1,635	
Milparinka Well No. 1 .....	.....	122	L.	2,561	
Milparinka " No. 2 .....	.....	.....	L.	.....	
Milparinka Stock Tank	15,030	.....	L.	668	

ARTESIAN BORING.

During the year two Trust proposals have been notified, and three Trust works completed and handed over to the Trustees.

Contracts are in hand for sinking four bores for Trusts already constituted, and distributing works are in progress in connection with seven Trusts.

Distributing Works—Bore Water Trusts.

Owing to the difficulty experienced in obtaining reasonable prices for drain construction, the Minister authorised the purchase of a horse team and drain-making plant, with the object of doing part of the work by day labour. The work done by this plant up to this time has been highly satisfactory, the cost of drain construction being £12 per mile as against £25 per mile, the lowest offer received from a contractor after inviting tenders on three occasions. Other drain construction is being carried out by day labour with a hired plant, and is also proving satisfactory, the cost per mile being much below the best offer from contractors. With the object of further reducing the cost of drain construction and carrying out the work more expeditiously, the Minister approved of experiments being made with a traction engine in lieu of a horse team. The question of providing a suitable scarifier, and also a traction engine of sufficient power without being unduly heavy, to enable both the ploughing and delving to be carried out in one operation, has proved a matter of some difficulty, but the result of some recent tests made indicates that this difficulty will shortly be overcome.

Management

Management and Administration of Bore-Water Trusts.

The affairs of the Bore Trusts, with the exception of two out of the forty-four in operation, have during the year been conducted satisfactorily. Hitherto the practice has been for the District Works officer in whose district the Trust is constituted to act as Official Trustee. Apart from the impossibility of these officers giving the Trust work the amount of attention necessary in consequence of the various other duties they are called upon to perform, it has been found that the desired uniformity of practice in respect to maintenance and administration has not resulted, owing to the Departmental control being under different officers in the various districts. It might be mentioned that the instalments due to the Crown by the Trusts are small when compared with the cost of maintenance of the drains. It is, therefore, necessary that every effort should be made to obtain the utmost economy in maintenance compatible with efficiency. Some of the more progressive of the local Trustees have adopted experimental methods, and, as a result, have brought down the cost of maintenance considerably below the original outlay per annum, at the same time ensuring greater efficiency. The experience thus gained by any one Trust has not been availed of by others, owing to their not being in touch with one another.

Waste of water is another matter which the District Works officers have no time to properly control, and with closer supervision much of the bore water that is now allowed to run to waste in the winter time could be saved by partially closing the bore. On these difficulties being placed before the Minister, he approved of the appointment of an officer to act as Official Trustee in connection with all Bore Trusts. This officer will be provided with a motor car, and will devote his whole time to the work. It is anticipated that this appointment will greatly assist in the smooth working of the Trusts, and will do much towards establishing efficient and economical methods in respect of the maintenance of the distributing works, in addition to guarding against waste of water and enabling valuable data in connection with the flow of water in country of varying character and fall being obtained.

Boring for Underground Water, Mallee Country.

Last year boring for underground water in the Mallee Country, near Euston, was undertaken, as it was hoped a supply adequate for stock and domestic purposes would be obtained at a shallow depth. However, after drilling for 1,000 feet, the work was abandoned, as only salt water had been met with, and the depth drilled was the maximum capacity of the plant provided. Subsequently, the question of further investigation work in testing for underground water in the Mallee Country in the Counties of Perry, Wentworth and Tailla, between the Murray and the Darling Rivers, was given consideration, and in this connection the Western Land Board, on being referred to, reported as follows:—

"As pointed out by Mr. Jenkins there are about 650,000 acres of unoccupied mallee lands extending from the Murray River, opposite to Mildura, northerly towards Menindie.

"Under existing conditions these lands are unproductive, and must remain so until water can be supplied for domestic and stock purposes.

"With water they are capable of maintaining about 200 families.

"In addition to this particular area, which can be made available for settlement at any time, there are some millions of acres of somewhat similar country, held under lease until the 30th June, 1943, which is equally suitable for settlement, provided that a water supply can be assured.

"It is considered that the cost of testing this country is warranted—if successful, the cost may be recovered from incoming tenants, and if unsuccessful the money will have been well spent in demonstrating the fact.

"The carrying out of this work is strongly recommended."

Drilling near Euston having proved that the cost of boring with percussion drill was prohibitive owing to the quantity of sand and caving shale met with, a recommendation was made for the purchase of a standard cable boring plant, having hydraulic rotary and calyx attachments, with which it is anticipated there will be no difficulty in drilling through the bad country above referred to. Upon the whole question being placed before the Minister he approved of the purchase of the plant recommended and also to the noting on next year's estimates of a sum sufficient to enable the work being proceeded with as soon as the boring plant, for which tenders are now advertised, is available.

Artesian Bore Investigation.

The continued decrease in the flow of the bores has caused considerable alarm, and from a commercial standpoint the question as to whether the decrease is due to partial exhaustion of the sources of supply or to local causes—such as the escape of the water into dry drifts above the flow—is of paramount importance. It is clear that, provided the casing of a bore can be sealed in an impervious strata above the main flow, in such a manner that there is no possibility of water escaping between the wall of the bore and the casing, all possible loss from leakage would be obviated, and in a bore so constructed, if the decrease continued at the same rate as in the existing bores, it would be conclusive evidence of loss in source of supply; whereas, should such a bore maintain its rate of discharge, it would establish leakage as being the cause of decrease, and would also prove the practicability of providing against such loss in the future. In the diagram accompanying this Report are shown the decreases in flow, pressure, and temperature from date of first measurement in the case of Wallon, Dolgelly, and Florida Bores. An experiment in sealing with cement the 8 in. casing of the Pagan Creek Bore was carried out with gratifying success, the top flow being completely shut off, and the casing firmly held in soft shale. Additional experiments, more especially in respect to seating in cement the 6 in. casing immediately above the main flow, will be carried out, and further developments in this direction may shortly be looked for. The Minister has approved of the purchase of an up-to-date boring plant with hydraulic rotary and calyx attachments, in order that experimental work in boring, such as that mentioned above, and investigation work of equal importance, may be carried out to the best advantage. Tenders for this plant are now advertised.

In

In April and May of this year an Interstate Conference on Artesian Waters was held in Sydney. The conference, which comprised geologists and engineers representing the States of Queensland, Victoria, Western Australia, South Australia, and New South Wales, with Mr. E. F. Pittman, Government Geologist and Under-Secretary for Mines as chairman, has issued a preliminary report containing many important recommendations which it is hoped that the various Governments interested will adopt. The Conference points out that though Australia contains what is probably the largest artesian area in the world, it has had carried out less scientific work than any other country. As instancing the extent to which investigation in respect to underground waters has been carried out in the United States of America, the following extracts from the proceedings of the recent Irrigation Congress at Chicago are of interest :—

DR. W. J. MCGEE, OF WASHINGTON, D.C. :—

In an enquiry addressed through the Chair to Judge Hutton a few moments ago by the gentleman from New Mexico, a premise was made which strikes me as unfortunate, namely, the case in which the source of the water is absolutely unknown. It seems to me, Mr. Chairman, that the premise cannot be argued anywhere within the length or breadth of the United States to-day. There are several departments of the Federal Government engaged in the work of determining the sources of the ground waters, the artesian waters in every portion of the country, and I believe I may summarise very briefly the result of these investigations to-day when I say there are no artesian waters or other ground waters anywhere in the United States whose sources are unknown. By a proper appeal to the experts on the subject, the sources of any waters in the United States can be determined.

JUDGE HUTTON : I would like to back up Dr. McGee in that statement, so far as California is concerned, or so far as Southern California is concerned. I was not prepared to make the statement as broad as he was, because my knowledge of the situation is confined to California, and largely to the Southland. But I do know that in a very large number of cases that I have tried both as a lawyer at the Bar and for the last five years as a judge of the Supreme Court of Los Angeles County, and I think I have tried more cases than any other judge on that bench, and I have invariably done this : I have sent to the Department and obtained the water supply papers that covered the particular canyon or valley or area that was involved. I then do what I may have a questionable legal right to do—but I do it—I introduce the government report as Court's exhibit No. 1, and then if any lawyer wants to attack anything in it, he may do so. I find from actual experience that, except in some minor details, the parties on both sides of the controversy, as a general rule, accept that report as being final. I cannot speak too highly of these reports.

It is hoped that if approval be given to appoint the Interstate Conference as a permanent body, similar happy results may in time be attained with regard to the Australian artesian waters.

Corrosion of Casing.

During the year every effort has been made with a view to obtaining a material which will withstand the corrosive action of the water in certain bores in the Coonamble district, but so far without success. A number of samples of casing specially manufactured with the object of resisting corrosion, in addition to several coatings, are now being experimented with, but sufficient time has not elapsed to enable the corrosive resisting properties of these samples being demonstrated. Further chemical research work has been proceeded with, but no definite conclusion has yet been arrived at. Arrangements are being made for the Testing Engineer, Mr. B. J. Smart, B.Sc., London, who has had special experience in testing iron and steel, to make microscopic examinations of different types of steel and iron suitable for bore casing, and investigate as to their respective powers of resisting corrosion, and also the efficacy of coatings or linings for such metals. Further investigations are also being made by the Mannesmann Tube Company and Messrs. Stewart and Lloyd with the object of producing a suitable casing.

Shallow Boring.

For some time past many applications have been received from settlers for assistance in sinking of shallow bores, and there is no doubt that by assisting small settlers in securing permanent water supplies for stock and domestic purposes, in such parts of the State where natural facilities do not exist for storing surface water at a reasonable price, the Government would do much to render the land capable of permanent and successful occupation. Settlers with small means cannot afford the expenditure necessary to sink shallow bores without assistance. Consequently, they mostly depend upon a wholly inadequate supply from surface sources, often with disastrous results during dry periods. To enable the desired assistance to be given by the Government, Regulations under which it is proposed to undertake the sinking of shallow bores for settlers have been prepared and approved by the Minister. The Regulations have been framed with the object of enabling the work to be carried out in the cheapest possible manner by the co-operation of the settlers themselves in regard to transport of plant, providing fuel and water, etc., which can in most cases be done by them without expenditure of any actual cash. It is at the same time proposed to provide that the Department will be ultimately recouped for all outlay. Systems somewhat similar have been very successfully adopted in other States and also in South Africa. One boring plant will shortly be ready to take up this work, and tenders are now invited for three additional plants, in order that the scheme may be proceeded with on a sufficiently large scale to meet immediate requirements.

Bore Licenses.

During the year sixteen applications for licenses to sink bores have been applied for, of which seven have been granted, seven refused, withdrawn or abandoned, and two not finally dealt with.

GOVERNMENT BORES (completed to date).

PUBLIC Watering Place (Flowing) Bores.

Bore.	Road where situated.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		feet.	gallons.	degs. Fah.	lb. per sq. inch.	£
Barrington	Bourke to Barrington.....	1,711	38,431	115	27	3,786
Barrona	Louth to Wanaaring	1,011	200,000	100	...	1,482
Belalie	Bourke to Barrington	1,565	107,348	115	76	2,882
Brigalow	Brewarrina to Enngonia	2,292	52,672	103	46	3,233
Brindingabba	Bourke to Hungerford	1,211	46,430	99	20	1,439
Carinda	At Carinda	2,246	809,500	98	32	2,531
Clifton	Wanaaring to Milparinka	1,638	607,407	139	...	3,477
Coolabah	Near Coolabah	781	13,130	77	15	1,209
Cuttaburra	Bourke to Wanaaring	1,707	13,130	87	Nil.	2,303
Dargle	"	1,182	1,348	85	Nil.	1,618
Dungle Ridge	Collarendabri to Angledool ..	2,566	119,440	117	54	7,316
Enngonia	Bourke to Barrington	1,666	200,316	120	85	3,079
Finger Post	Angledool to Goodooga	3,155	112,677	121	138	5,814
Ford's Bridge	Bourke to Hungerford	1,616	16,753	96	Nil.	1,990
Galgambone	At Gulgambone	1,748	36,448	85	7	2,462
Gidgea Camp	Bourke to Barrington	2,002	2,735	90	18	2,599
Goodooga	At Goodooga	2,812	491,950	118	150	5,608
Goonery	Bourke to Wanaaring	89	1,000	.....	...	240
Kelly's Camp	Bourke to Hungerford	1,577	239,178	109	*37	2,188
Kenmare	"	1,539	924,999	112	80	1,672
Kerribree Creek	"	1,193	381,104	109	25	1,603
Kulkyne	Bourke to Wanaaring	1,781	2,735	.....	Nil.	2,565
Mackenzie's Point	Brewarrina to Goodooga	2,224	134,582	96	88	2,074
Moongulla	Collarendabri to Angledool ..	2,570	194,060	120	38	6,839
Moramina	Walgett to Wilby Wilby	2,272	321,794	108	123	3,540
Moree	At Moree	2,793	622,185	110	46	6,496
Mumblebone	Warren to Brewarrina	1,276	97,003	90½	5	1,558
Native Dog	Bourke to Barrington	476	46,430	93	13	1,009
Nedgera	Warren to Coonamble	1,911	200,316	101	15	2,039
Parragundy	At Parragundy, Queensland Border.	1,078	15,454	94	Nil.	1,275
Pera No. 1	Bourke to Wanaaring	1,154	82,146	104	17	1,488
Pera No. 2	"	1,569	107,348	100	18	1,582
Pilliga	At Pilliga	1,852	825,410	102	82	1,816
Sibraas	Bourke to Wanaaring	1,059	344,049	100	24	1,555
Tenandra	Warren to Coonamble	1,036	200,316	85½	4	1,348
Tineroo	Wanaaring to Milparinka	1,858	15,454	139	...	3,835
Tinchelooka	Bourke to Wanaaring	1,236	273,004	92	Nil.	1,690
Tooloora	Coonamble to Walgett	1,543	334,011	104	14	2,429
Wallon	Moree to Boggabilla	3,747	652,782	114½	95	7,993
Walkden's	Bourke to Hungerford	1,605	59,062	98	18	2,060
Wanaaring	At Wanaaring	1,645	67,994	116	3	2,702
Waroo	Bourke to Hungerford	385	9,163	78	12	705
Wilby Wilby	Walgett to Goodooga	2,162	285,867	114	30	2,913
Woolabra	Narrabri to Moree	1,988	57,168	87	9	3,544
Yantabulla No. 1	Bourke to Hungerford	209	trickle.	90	...	754
" No. 2	"	587	20,789	84	18	691
Youngerina	"	165	trickle.	86	...	763

* Approximate.

PUBLIC Watering Place (Pumping) Bores.

Bore.	Road where situated.	Depth.	Pumping Supply— Per diem.	Temperature.	Cost.
		feet.	gallons.	degs. Fah.	£
Bidura	Balranald District	1,387	.....	.....	2,437
Curabulla	Milparinka to Wanaaring	1,973	.....	96	2,711
Dolmoreve	Balranald to Ivanhoe	1,237	.....	.....	2,817
Finley	At Finley	930	.....	.....	1,510
Gaffney's	Bourke to Wanaaring	600	.....	.....	.....
Gilgandra	At Gilgandra	3,035	.....	.....	6,272
Grafton	At Grafton	3,698	.....	.....	8,762
Green Camp	Nyngan to Warren	1,509	*60,000	.....	2,156
Hay	At Hay	1,962	* 2,000	.....	4,011
Hungerford No. 2	On Queensland border, near Hungerford	768	29,000	.....	701†
Momba	Wilcannia to Wanaaring	482	.....	.....	1,699
Mulgany	Milparinka to Wanaaring	1,700	*30,000	105	1,446
Mullaley	At Mullaley	1,953	.....	.....	3,659
Narrowin	Nyngan to Brewarrina	1,179	6,000	.....	1,639
Nevertire	At Nevertire	2,525	.....	.....	5,301
Ninety-one Mile	Milparinka to Wanaaring	2,002	50,000	.....	4,013
Nyngan	At Nyngan	710	*11,000	.....	1,733
Ooarnoo	Wilcannia to Yalpunga	1,359	.....	.....	1,970
Opera	Louth to Wanaaring	804	50,000	.....	1,358
Packsaddle	Cobham to Broken Hill	1,942	15,000	.....	3,982
Paldrumata	" Wilcannia	780	43,000	.....	1,282
Sandy Creek	" Broken Hill	730	50,000	.....	1,872
Tiboburra	Broken Hill to Yalpunga	* 1,200	.....	.....	.....
Tolaro	Ivanhoe to Menindie	1,602	*50,000	.....	3,036
Trangie	At Trangie	1,021	.....	.....	1,239
Warratta	Milparinka to Wanaaring	2,393	6,000	.....	4,992
Warri Warri	Cobham to Queensland border	3,925	57,600	.....	9,085
Yellow Waterholes	Deniliquin to Moama	800	.....	.....	1,075

* Approximate.

† Half cost of bore; balance paid by Queensland Government.

Note.—The figures given for flow, temperature, and pressure represent the latest measurements. The figures given for cost are in some instances approximate only.

BORES which failed.—P.W.P.

Bore.	Road where situated.	Depth.	Causes of Failure.	Cost.
		feet.		£
Arumpo	Euston to Pooncarie	2,000	Salt water struck	3,913
Bancannia	Cobham to Broken Hill	3,615	.....	8,535
Bendemere	Brewarrina to Gongolgon	1,726	Salt water struck	2,391
Berawinnia	Near Hungerford	855	"	1,720
Bourke	At Bourke	1,467	No water struck	2,270
Collie	At Collie	2,123	"	7,234
Holey Box	Ivanhoe to Mossgiel	1,230	.....	1,919
Hungerford No. 1	Near Hungerford	318	Salt water struck	224*
Limestone	Silverton to Broken Hill .....	.....	.....	.....
Manfred	Mossgiel to Menindie	2,027	.....	3,964
Narrabri	At Narrabri	2,040	.....	1,772
Osaca	Wanaaring to Milparinka	1,646	Bore choked ; flow ceased	3,276
Poison Point	Bourke to Wanaaring	1,399	Brackish supply ; trickles over surface	1,651
Quarry	Bourke to Cobar	1,391	Salt water struck	1,531
Toorincaca	Menindie to Ivanhoe	1,488	.....	2,556
Whitewood	Brewarrina to Goodooga	1,240	No water struck	1,358

* Half cost of bore ; balance paid by Queensland Government.

ARTESIAN Wells Act (Flowing) BORES.

Bore.	District.	Depth.	Flow per diem.	Temperature.	Pressure.	Cost.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.	£
Artesia	Bourke	1,201	18,052	90	17	1,407
Curragh	"	786	4,239	.....	.....	731
Ginghett	Coonamble	1,319	307,960	94½	18	1,743
Glenalbyn	Bourke	2,081	548,803	119	75	2,112
Goangra	Coonamble	3,063	217,971	121	29	2,933
Haddon Rigg	"	1,251	300,900	88½	9	1,192
Kensington	"	2,666	682,760	114	49	2,434
Killowen	Bourke	1,486	563,366	104	35	1,500
Milchomi	Coonamble	2,029	908,090	103	107	1,950
Rowena	Moree	2,669	744,780	126	91	2,489
Tubba	Coonamble	741	3,190	82	21	1,288
Tuon	Bourke	1,790	397,881	116	58	2,300
Willie	Coonamble	1,009	18,052	84	Nil.	1,250
<i>Failure.</i>						
Tuncoona	Bourke	1,691	.....	.....	.....	1,858
Willara	"	331	.....	.....	.....	432

P.W.P. BORES and W. and D. Act (Flowing) BORES.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.	£
Boomi	Moree	4,008	1,168,710	135	150	9,647
Bourbah	Coonamble	1,797	219,539	94	24	4,049
Bulyeroi	Moree	2,405	467,600	111	76	3,773
Dolgelly	"	4,086	622,185	128	112½	11,125
Euraba	"	4,002	941,887	131	109	9,599
Gil Gil	"	3,093	505,980	115	62	7,756
Millie	"	2,228	520,010	101	35	2,062
Moomin	"	2,690	254,442	111	55	4,263
Tulloona	"	3,537	577,930	118	67	9,461
Uranbah	"	2,522	690,080	122	80	2,166
Walgett	Coonamble	2,036	908,090	108	74	2,469
Youendah	"	1,954	359,044	103	52	2,384

WATER and Drainage Act (Flowing) Bores.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.	£
Baroma	Moree	2,702	143,820	107	8*
Bogewong	Coonamble	1,459	26,790	90	37	1,287
Bomuckledi	Moree	2,186	285,867	99	24	1,923
Boobora	"	3,225	1,133,300	114½	95	3,287
Booloroo	"	3,500	607,247	109	.....	.....
Boronga	"	4,341	1,062,133	128	124*
Brewon	"	1,525	713,872	97	30	.....
Bugilbone	Coonamble	2,494	966,320	111	80	2,237
Bunyah	Moree	2,226	667,440	100	45	2,438
Careunga	"	4,013	520,010	125	91	8,640
Come-by-Chance	Coonamble	2,504	592,588	111	.....	2,875
Cooleearlee	Moree	3,334	4,000	.....	Nil	.....
Coubal	"	3,991	1,097,420	140	149	4,483
Curumbah	"	2,816	992,943	97½	39*
Drildool	"	2,163	924,990	101	75	2,356
Eurie Eurie	"	2,722	825,410	120	74	3,881
Florida	Moree	2,374	682,760	118	57	2,159
Four Posts	"	3,583	1,133,300	128	.....	.....
Gurley Siding	"	2,923	359,044	98	22	3,012
Hollywood	Coonamble	2,065	809,251	104	55	1,846
Kiga	Moree	3,048	577,930	112	36	4,704
Mercadool	"	1,872	221,547	112	.....	2,291
Merrigal	Coonamble	1,605	2,330	77½	Nil	1,752
Mungyer	Moree	2,716	850,935	113	70	6,049
Munna Munna	Coonamble	2,197	777,117	103	117	.....
Neargo	Moree	3,005	858,134	124	100	6,123
Nowley	"	2,156	809,251	104	58*
Old Gnomery	Bourke	2,576	557,930	124	80	3,612
Orel No. 1	Moree	2,728	831,450	124	120	3,327
Orel No. 2	"	3,117	943,490	126	150	3,937
Sherwood	"	2,945	920,660	122	103	2,394
Talmoi	Moree	3,573	992,943	122	106	3,638
Telleraga	"	2,853	478,170	120	56	2,706
3B	Coonamble	2,729	966,320	116	91	2,211
Three Corners	Coonamble	968	67,994	86	7	1,246
Tunda	"	2,376	809,251	108	91†
Tycannah	Moree	2,547	110,452	106	10	2,256
Tyreel	"	3,046	761,141	115	53	3,038
Umbie	Coonamble	2,660	410,553	112	61	2,772
Weetaliba	Coonamble	2,073	520,010	100	31	1,962
Welbondonga	Moree	3,734	1,115,360	136	150	3,926

* Cost not yet determined.

† Cancelled improvement lease bore; no compensation paid.

COUNTRY TOWNS Water Supply (Flowing) Bores.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.	£
Coonamble No. 1	Coonamble	1,303	40,000	96	43	3,060
" No. 2	"	2,180	807,117	101½	...	1,895
Warren	"	871	80,500	70	12	1,151
			927,617			

IMPROVEMENT Lease (Flowing) Bores.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.
Beanbah No. 2	Coonamble	2,372	908,090	106	.....
Benah	"	1,235	27,080	87	2
Bouka	"	1,003	181,667	86½	21
Box Camp	"	1,542	437,318	102	24
Brewon No. 1	"	1,740	186,607	96	24
" No. 3	"	1,689	548,803	95	.....
" No. 4	"	2,384	379,297	100	35
Brigalow	"	1,500	577,930	98	24
Bungle Gully	"	2,365	858,134	108	64
Collymongle	Moree	3,203	874,662	110	.....
Combogolong (I.L. 1682)	Coonamble	1,572	229,060	134	.....
" (I.L. 1161)	"	1,953	491,950	100	68
Gilgoin No. 1	"	1,077	207,410	91	26
" No. 2	"	972	11,520	87	19
Ginghatt	"	1,674	186,607	98	35
Kialgara	"	2,199	607,247	100	21
Kiameron	"	1,014	7,522	92	12
Lower Quambone	"	1,567	682,185	102	59
Mercadool	Moree	2,753	661,580	116	112
Middle Paddock	Coonamble	1,113	81,682	87	7
Midkin No. 3	Moree	3,642	1,027,366	137	92
Mole No. 2	Coonamble	1,330	351,366	98	10
Muckerawa	Moree	2,290	577,930	119	59

IMPROVEMENT Lease (Flowing) Bores—*continued.*

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		feet.	gallons.	deg. Fah.	lb. per sq. inch
Mungrabambone	Coonamble	1,815	371,977	96	12
Narraway	"	1,976	219,539	100	22
Noonbah	"	1,617	581,770	96	17
Ottendorf	"	1,500	118,007	94	10
Pillicawarrina	"	1,403	520,010	104	22
Polly Brewon No. 1	"	1,492	464,390	98	16
" No. 2	"	1,792	137,604	103	14
Quabothoo	"	1,723	702,790	97	28
Quambone No. 4	"	1,600	91,993	99	35
" No. 5	"	1,516	577,930	98½	21
Quondong	"	1,342	60,665	92	.....
Sandy Camp	"	1,260	128,522	100½	10
Trialgara	"	1,472	554,421	100	34
Urawilkie No. 1	"	1,313	187,805	87	.....
" No. 2	"	1,470	244,865	92	40
Wallamgambone	"	1,702	229,060	102	18
Wangrewally	"	2,166	186,607	108	27
Willie	"	1,139	151,718	88	13
Willow Camp	"	1,322	219,539	96	18
Wingadee No. 3	"	1,644	277,301	98	12
Womboin No. 1	"	1,439	194,060	98	33
" No. 2	"	1,440	293,833	96	13
" No. 3	"	1,614	434,575	99	17
<i>Pumping.</i>					
Gilgoin No. 3	Coonamble	661	.....	.....	.....
" No. 4	"	822	.....	.....	.....
Ogle's Camp	Dubbo	778	.....	.....	.....
<i>Failures.</i>					
Buckinguy	Coonamble	440	.....	.....	.....
Burrawang No. 1	Forbes	322	.....	.....	.....
" No. 2	"	280	.....	.....	.....

PRIVATE BORES (completed to date).

FLOWING.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.
Angledool	Moree	2,664	32,530	115	48
Bangate No. 1	"	2,473	240,150	119	.....
" No. 2	"	2,640	637,124	111	65
Beanbah No. 1	Coonamble	2,346	745,403	108	16
Belalie No. 1	Bourke	1,693	140,203	110	.....
" No. 2	"	1,720	397,881	124	.....
" No. 3	"	1,720	424,085	118	95
Biblah	Coonamble	1,464	450,854	99	21
Bimble	"	1,350	239,178	93	.....
Bogamildi	Moree	2,518	297,722	112	20
Booloroo	"	2,408	321,794	112	35
Bootra No. 2	Broken Hill .....	.....	.....	.....	.....
Bowillan	Bourke	577	15,454	89	5
Brindigabba No. 1	"	760	52,458	93	10
" No. 2	"	820	30,595	94	7
" No. 3	"	1,276	70,140	108	.....
" No. 4	"	1,221	18,052	103	Nil
Bryanungra	Moree	3,520	667,440	114	59
Buckinguy No. 1	Coonamble	1,195	102,175	90	.....
" No. 2	"	1,069	2,302	86	Nil
Bulgah	"	1,453	266,123	98	37½
Bullagreen	"	1,823	67,994	88	12
Bunaba	Moree	3,514	958,784	138½	134
Bundy	Coonamble	2,289	437,318	104	45
Bunna Bunna No. 1	Moree	2,311	437,318	109	43
" No. 2	"	2,347	534,406	123	74
Buttabone No. 1	Coonamble	1,039	36,448	88	Nil
" No. 2	"	1,341	102,175	92	7
" No. 3	"	1,458	46,430	88½	Nil
" No. 4	"	1,260	63,582	89	2
" No. 5	"	1,237	77,308	92	7
" No. 6	"	1,221	16,753	80	8
Calga No. 3	"	1,013	112,677	86	.....
" No. 4	"	1,175	112,677	86	20½
Carney's Tree	"	1,265	71,392	96	10½
Carwell	"	1,414	300,900	95	10
Cherrigorang (Larkins)	"	2,084	745,403	104½	50
Clifton Downs	Bourke	1,074	18,052	92	.....
Combado	Moree	2,749	729,665	123	57
Come-by-Chance (Colless)	Coonamble	1,862	437,318	109	52½
Coonimbria	Coonamble	1,504	254,442	98½	10
Corella No. 1	Bourke	943	175,529	100	57

PRIVATE Bores (Flowing)—continued.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.
Corella No. 2	Bourke	1,112	36,448	94½	.....
" No. 3	"	1,327	67,994	106	35
" No. 4	"	.....	.....	.....	.....
Cuttabunda	Moree	2,168	268,735	115	.....
Darnley Chase	Coonamble	1,740	213,053	98	21
Dobikin	Moree	1,980	254,442	96	15
Dumble	"	3,106	1,097,420	125	146
Dunlop No. 1	Bourke	820	.....	.....	.....
" No. 2	"	940	.....	.....	.....
" No. 3	"	860	.....	.....	.....
" No. 4	"	740	.....	.....	.....
" No. 5	"	1,445	.....	.....	.....
" No. 8	"	883	.....	.....	.....
" No. 9	"	899	.....	.....	.....
" No. 10	"	1,030	77,308	102	Nil
" No. 11	"	816	.....	.....	.....
" No. 12	"	948	.....	.....	.....
" No. 13	"	823	.....	.....	.....
" No. 14	"	703	.....	.....	.....
" No. 16	"	589	.....	.....	.....
" No. 17	"	1,200	.....	.....	.....
" No. 18	"	1,087	.....	.....	.....
" No. 19	"	1,156	25,452	98	.....
Ellerslie	Coonamble	2,005	766,165	101	57
Elsinora No. 2	Bourke	1,757	.....	.....	.....
Emby	Coonamble	1,300	86,984	94	6
Erlside	"	1,300	34,465	88	Nil.
Eulalie	Moree	2,605	359,044	125	50½
Eulawah	Coonamble	840	5,402	81	Nil.
Euroka	"	2,433	464,390	112½	.....
Fairview	Moree	.....	137,604	89	6
Federal Park	Coonamble	567	42,441	80	12
Fort Bourke No. 1	Bourke	1,284	102,175	105	17
" No. 2	"	1,403	62,776	104	17
" No. 3	"	1,807	259,337	113	47
" No. 4	"	974	2,735	94	Nil.
" No. 5	"	1,104	46,430	94	7
Gingie	Moree	2,089	520,010	110	52
Glengera	Bourke	1,369	118,007	105	76
Glenroy	Moree	2,540	577,930	105	31
Gnomery	Bourke	2,415	268,735	116	40
Goolring	"	1,776	315,115	122	52
Goonal	Moree	2,980	761,141	126	85
Goonablui No. 1	"	2,802	254,442	126	.....
" No. 2	"	3,333	217,971	130	27
" No. 3	"	2,560	297,722	124	51
" No. 4	"	3,535	661,580	138	153
Goorianawa No. 6	Coonamble	611	trickle	89	Nil.
Haddon Rigg No. 1	"	1,445	181,667	90	9
" No. 2	"	2,002	206,684	99	22
Jew's Lagoon	Moree	2,711	450,854	107	40
Kallara No. 1	Bourke	140	.....	.....	.....
" No. 2	"	46	.....	.....	.....
" No. 7	"	540	.....	.....	.....
" No. 10	"	700	.....	.....	.....
" No. 12	"	463	.....	.....	.....
Keelendi	Coonamble	2,206	858,134	112	80
Kerribree No. 1	Bourke	1,073	36,448	100	.....
" No. 2	"	1,340	163,497	102	.....
" No. 3	"	940	6,018	92	.....
Krui	Moree	2,300	166,480	115	51
Kurrawa	Coonamble	774	49,819	82	22
Landers	"	960	19,420	82½	Nil.
Lila Springs No. 1	Bourke	1,357	4,787	92	11
" No. 2	"	2,001	30,595	108	18
" No. 3	"	1,729	698,080	123	125
Lissington No. 1	"	1,400	20,789	113	45
" No. 2	"	1,130	19,420	104	45
" No. 3	"	1,207	346,527	104	42
" No. 4	"	1,070	426,817	107	60
Llanillo	Moree	2,397	410,853	111	61
Llano	"	1,384	176,364	86	19
Loma	Coonamble	1,173	140,283	89	26
Maranoa No. 1	Bourke	1,340	381,140	116	32
" No. 2	"	1,510	97,003	111	.....
Marra	Coonamble	982	226,010	89	13
" No. 3	Wilcannia	.....	.....	.....	.....
Martindale	Coonamble	1,970	254,442	98	.....
Mascotte	Moree	1,508	277,301	97	15
Merimba	Coonamble	1,135	123,484	94	7
Midkin No. 1	Moree	3,420	491,950	124	69
" No. 2	"	3,478	908,090	134	85
Mole No. 1	Coonamble	800	11,078	86	Nil.
" No. 3	"	901	34,465	88	13
Momba No. 4	Wilcannia	223	.....	.....	.....
Moora	Coonamble	2,273½	520,010	118½	49
Moorlands	"	1,515	181,667	91	40
Morendah	"	2,151	491,950	114	50
Morton's Plains No. 1	Bourke	1,855	309,577	114	57

PRIVATE BORES (Flowing)—continued.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		feet.	gallons.	deg. Fah.	lb. per sq. inch.
Mount Tenandra No. 1	Coonamble	894	75,662	80	11
Muckerawa No. 2	Bourke	2,264	321,794	115	32
Multagoona No. 1	"	1,030	52,295	90	32
" No. 2	"	1,118	42,144	98	32
Mumblebone No. 1	Coonamble	1,150	72,651	90	Nil.
Mundadoo	"	730	4,787	80	24
Mungerie	"	600	4,787	80½	.....
Mungie Bundie	Moree	1,997	166,486	103	9
Nardoo	Coonamble	2,032	554,421	104	72
Nebea	"	1,507	377,977	94	.....
Nelgowrie	"	1,807	450,156	102	47
Nocoleche No. 1	Bourke	916	38,431	94	.....
" No. 3	"	1,227	151,718	108	.....
" No. 4	"	1,051	14,292	98	Nil.
" No. 5	"	1,289	32,530	101	.....
" No. 6	"	1,617	109,824	107	8
Noonbah (Newman's)	Coonamble	595	60,665	81	15
Nullawa	Moree	3,020	491,950	129	128
Nulty No. 1	Bourke	1,001	334,011	96	35
" No. 2	"	1,498	82,146	109	15
Pirillie No. 2	"	645	18,052	96	65
" No. 3	"	630	11,782	85	23
Quambone No. 1	Coonamble	2,135	745,403	102½	52
" No. 2	"	2,026	520,010	101	66
" No. 3	"	1,849	607,247	98	52½
Quinyambi	Broken Hill	1,496	600,000	118	.....
Regenbah	Coonamble	1,889	464,390	108	30
Roma	Moree	1,848	397,881	99	37
Salisbury Downs No. 1	Broken Hill	1,365	322,262	129	.....
" No. 2	"	1,568	.....	.....	.....
Santa Paula	Coonamble	1,480	72,651	90	.....
Silendale	"	735	32,530	84	4
Sunny Vale No. 1	"	1,396	239,138	98	5
" No. 2	"	1,578	86,984	86	Nil.
Talawanta	Bourke	1,949	38,431	103	103
Terrigal	Coonamble	1,928	505,980	106½	65
Thurloo	"	468	6,770	79	6½
Thurloo Downs No. 1	Bourke	1,968	245,000	148	15
" No. 2	"	2,217	.....	.....	.....
" No. 3	"	2,552	.....	.....	.....
Tinapagie No. 1	"	963	.....	80	.....
" No. 3	"	1,243	27,080	104	.....
Tooloon	Coonamble	1,550	72,651	99	9
Toorale No. 1	Bourke	730	112,677	92	12
" No. 2	"	385	6,018	89	Nil.
" No. 2A	"	262	1,340	75	Nil.
" No. 3	"	2,120	.....	.....	.....
" No. 5	"	256	.....	.....	.....
" No. 6	"	375	.....	.....	.....
" No. 13	"	1,393	112,677	95	17
Tundeberine No. 1	Coonamble	3,550	2,046	71	10
Tycannah	Moree	2,022	186,607	100	.....
Urella Downs No. 1	Broken Hill	1,874	.....	.....	.....
" No. 2	"	1,820	.....	.....	.....
Vatua	Coonamble	1,555	252,558	87	19
Wanaaring No. 1	Bourke	1,421	10,322	.....	.....
" No. 2	"	1,330	.....	.....	.....
Wapweelah No. 1	"	720	4,787	89	50
" No. 2	"	1,433	30,595	108	60
" No. 3	"	1,470	175,529	105	25
" No. 4	"	1,672	891,190	118	61
Warrana No. 1	Coonamble	1,000	8,342	82½	Nil.
" No. 2	"	1,100	140,203	88	12
" No. 3	"	1,660	745,403	89	45
Warraweena No. 1	Bourke	1,247	72,651	106	72
" No. 2	"	840	6,018	90	.....
" No. 3	"	997	8,342	94	45
Warren Downs	Coonamble	2,014	505,980	102	.....
Weemabung	"	960	19,420	87	4
Weetalibah (McAlary's)	"	1,694	213,053	100	18
Weilmoringle No. 1	Bourke	2,005	12,104	101	.....
" No. 2	"	1,590	942,117	108	.....
" No. 3	"	2,446	42,672	105	30
Wingadee No. 1	Coonamble	1,544	196,850	99	23
" No. 2	"	2,297	577,930	110½	77
" No. 4	"	2,312	777,117	107	68
" No. 5	"	2,183	713,872	113½	58
" No. 6	"	2,126	622,185	108	53
Wonbobbie	"	906	Trickle.	84	Nil
Woodlands	"	2,030	134,582	92	.....
Woolscour	"	1,400	163,497	96	32
Yamaramie	Bourke	726	50,535	95	5
Yancannia No. 1	Broken Hill	203	.....	.....	.....
" No. 4	"	727	.....	.....	.....
" No. 5	"	562	.....	.....	.....
" No. 6	"	917	.....	.....	.....
Yarraldool	Coonamble	2,436	891,190	116	69
Youngerina	Bourke	164	4,787	80	Nil.
Yuma	Coonamble	2,171	548,803	97	.....

PRIVATE BORES (Pumping).

Bore.	District.	Depth.	Bore.	District.	Depth.
		feet.			feet.
Bootra No. 1.....	Broken Hill	1,105	Kerribree No. 4.....	Bourke	880
Calga No. 1	Coonamble	1,823	Macsville	Coonamble	1,416
" No. 2	"	1,120	Marra No. 2.....	Wilcannia	895
Cruickshanks (Avondale) ...	Moree	1,800	Meryon.....	Coonamble	1,070
Dunlop No. 6	Bourke	935	Momba No. 1	Wilcannia	1,261
Elsinora No. 1	"	1,770	" No. 3	"	1,997
Goorianawa No. 1	Coonamble	1,550	Mount Tenandra No. 2.....	Coonamble	906
" No. 2	"	800	Nocoleche No. 2.....	Bourke	1,600
" No. 3	"	501	Pirillie No. 1	"	803
" No. 4	"	500	Salisbury Downs No. 3.....	"	1,400
" No. 5	"	357	" No. 4.....	"	1,344
" No. 7	"	911	" No. 6.....	"	1,404
Gurley No. 1.....	Moree	1,091	" No. 7.....	"	1,473
" No. 2	"	2,729	Toorale No. 4.....	"	1,485
" No. 3	"	2,503	" No. 11 .....	" .....	.....
Kallara No. 3	Bourke	600	Tundeberine No. 2.....	Coonamble	1,100
" No. 4	"	820	" No. 3.....	"	1,110
" No. 5	"	900	Urisino No. 1.....	Bourke	1,680
" No. 6	"	1,411	" No. 2	"	1,755
" No. 8	"	931	" No. 3	"	1,475
" No. 9	"	676	Wangamana	"	1,600
" No. 11.....	"	930	Yancannia No. 2	Broken Hill.....	1,130

FAILURES.

Bore.	District.	Depth.	Bore.	District.	Depth.
		feet.			feet.
Boorooma, No. 1	Moree	1,493	Terry-hie-hie No. 2	Moree	3,002
" No. 2	"	2,351	Tinapagie No. 2	Bourke	533
Buckanbe	Wilcannia	725	Toorale No. 7	"	1,700
Dunlop, No. 7	Bourke	576	" No. 8.....	"	900
" No. 15	"	751	" No. 9.....	"	890
Dunumbral	Moree	2,480	" No. 10	"	1,502
Marra No. 1	Wilcannia	1,482	" No. 12	"	1,147
Momba No. 2	"	1,947	Yancannia No. 3	Broken Hill	659
" No. 5	"	1,755	Yanda No. 1	Bourke	750
Salisbury Downs No. 5	Bourke	1,708	" No. 2	"	1,008
Terry-hie-hie No. 1	Moree	550			

Summary.

Bores.	No.	Total Depth.	Total Flow per Diem.	Depth.		Temperature.	
				Max.	Min.	Max.	Min.
STATE.		feet.	gallons.	feet.	feet.	deg. Fah.	deg. Fah.
Public Watering-place—							
Flowing	47	74,941	9,495,850	3,747	89	139	78
Pumping	28	44,208	459,600*	3,925	482	105	96
Failures	16	24,565	.....	3,615	318	.....	.....
Artesian Wells Act—							
Flowing	13	22,091	4,716,052	3,063	741	126	82
Failures	2	2,022	.....	1,691	331	.....	.....
Public Watering-place and Water and Drainage Act—							
Flowing	12	34,358	7,293,727	4,086	1,797	135	94
Water and Drainage Act—							
Flowing	41	110,658	26,098,473	4,338	968	140	77½
Country Towns Water Supply—							
Flowing	3	4,352	927,617	2,180	869	101½	70
Improvement Lease—							
Flowing	46†	77,952	16,979,246	3,642	972	137	86½
Pumping	3	2,261	.....	822	661	.....	.....
Failures	3	1,042	.....	440	280	.....	.....
Private—							
Flowing	220	329,230	44,494,999	3,550	46	138½	71
Pumping	44	53,537	.....	2,508	357	89	80
Failures	21	27,909	.....	3,002	533	.....	.....
Total—							
Flowing	382	653,582	110,005,964	4,338	46	140	70
Pumping	75	100,006	.....	3,925	357	105	80
Failures	42	55,538	.....	3,615	280	.....	.....
	499						

* Approximate.

† 10 of these Improvement Lease Bores with a total flow of 4,784,670 gallons per diem are now Crown property.

FLOWING BORES.

Government, 126—Flow 53,316,389 gallons per diem.

Private, 256—Flow 56,689,575 " "

Total depth of bores=809,126 feet, or about 153 miles,

35843—L

ARTESIAN

ARTESIAN BORE TRUSTS.

(COMPLETED.)

Name.	Area.	Length of Drains.	Latest Flow of Bore per diem.	Cost of Drains, Culverts, Fencing, &c.	Cost of Bore, if in Trust.	Cost of water if Bore not in Trust per annum.	Total capital cost gazetted.	Annual liability to Crown.	Date when handed over to Trustees.	Remarks.
	acres.	ms. ch.	galls.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
Baroma	74,880	39 62½	143,820	725 12 2	2,541 10 1	.....	3,741 11 9	222 15 0	8 Nov., 1911	
Bomuckledi	48,640	25 10	285,867	780 18 0	1,923 4 2	.....	2,704 2 2	160 19 8	2 Sept., 1908	
Boobora	78,720	57 17	1,133,300	1,229 2 0	3,286 14 9	.....	4,515 16 9	268 17 0	15 June, 1910	
Booloroo	43,360	33 33	607,247	603 18 2	3,690 6 11	.....	4,709 4 9	280 7 4	21 Feb., 1912	
Boomi	114,750	68 52	1,168,710	1,451 12 9	.....	273 0 0	1,451 12 9	359 8 4	2 Oct., 1907	
Bourbah	84,424	46 65	200,316	1,194 7 6	.....	112 0 0	1,194 7 6	183 2 4	23 „ 1907	
Bugilbone	83,840	61 03	841,772	1,502 2 1	2,234 16 10	.....	3,736 18 11	222 9 8	28 July, 1909	
Bulyeroi	68,160	42 15	450,854	1,004 1 10	.....	143 0 0	1,004 1 10	202 15 8	15 „ 1908	
Bunyah	78,720	58 45	667,440	1,488 3 11	2,437 16 2	.....	3,926 0 1	233 14 8	7 June, 1911	
Careunga	86,800	57 20	520,010	735 14 10	5,500 0 0	.....	6,235 14 10	371 5 0	5 Feb., 1908	£8,640 1s. 7d., actual cost of bore.
Come-by-Chance ..	32,960	26 60	592,588	1,175 1 7	2,874 15 3	.....	4,049 16 10	242 15 0	12 Aug., 1905	
Coubal	106,720	83 69	1,097,420	2,028 18 5	4,482 16 7	.....	6,511 15 0	337 13 4	7 Sept., 1910	
Dokkelly	58,072	32 38	622,185	579 11 2	.....	294 0 0	579 11 2	328 10 0	28 April, 1909	
Driddool	95,360	64 37	874,662	1,738 12 3	2,355 12 11	.....	4,094 5 2	243 15 0	24 May, 1911	
Euraba	69,128	45 45	941,887	863 5 9	.....	273 6 0	995 5 9	332 11 4	1 May, 1907	
Eurie Eurie	81,604	38 40	809,251	1,229 13 6	3,881 3 2	.....	5,110 16 8	305 10 4	7 Dec., 1905	
Florida	53,440	29 10	682,760	825 10 2	2,158 13 7	.....	2,984 3 9	179 1 0	8 Feb., 1906	
Gil Gil	52,856	4 10	505,987	69 5 6	.....	214 0 0	69 5 6	218 2 8	28 Jan., 1909	
Gurley Siding	49,920	35 9	359,044	1,085 2 6	3,012 7 6	.....	4,097 10 0	243 19 0	24 May, 1911	
Hollywood	34,560	27 17	809,251	981 4 2	1,846 6 5	.....	2,827 10 7	168 6 8	2 Sept., 1908	
Kiga	118,720	63 55	577,930	1,149 3 8	4,704 5 4	.....	5,853 9 0	348 10 0	18 „ 1906	
Mercadool	46,200	43 65	207,410	161 8 10	2,291 12 10	.....	2,453 1 8	146 1 0	3 „ 1906	Drains cut by petitioner at own expense.
Millie	33,050	27 8	520,010	1,122 0 0	.....	126 0 6	1,122 0 0	192 16 0	29 July, 1908	
Moomin	51,500	30 69	254,442	849 11 4	.....	111 15 0	849 11 4	199 11 10	18 Dec., 1907	
Mungyer	62,080	36 47	850,935	1,130 0 10	2,728 15 4	.....	3,858 16 2	229 14 8	2 Sept., 1908	£6,048 13s. 4d., actual cost of bore.
Neargo	67,950	30 55	858,134	696 0 5	3,115 19 7	.....	3,812 0 0	226 19 0	24 April, 1907	£6,122 16s. 11d., actual cost of bore.
Old Gnomery	159,360	31 23	557,930	520 6 8	3,612 3 4	.....	4,132 10 0	246 0 8	4 Feb., 1908	
Oreel No. 1	73,280	50 48	793,093	1,530 0 0	3,326 13 7	.....	4,856 13 7	289 3 0	21 Aug., 1907	
Oreel No. 2	72,345	52 00	924,990	1,720 13 8	3,937 3 5	.....	5,657 17 1	336 17 0	15 Jan., 1908	
Sherwood	78,430	46 60	874,662	1,386 11 7	2,393 12 1	.....	3,780 3 8	225 1 0	10 May, 1911	
Talmoi	92,615	49 78	992,943	1,199 14 5	3,637 16 11	.....	5,069 12 1	301 16 4	2 Feb., 1910	
Telleraga	64,000	47 51	478,170	1,260 0 6	2,706 1 3	.....	3,966 1 9	236 2 8	9 Sept., 1908	
Three B.	55,520	41 25	966,320	.....	.....	154 0 0	1,058 19 4	63 1 0	13 Mar., 1912	
Three Corners ..	34,560	7 50	67,994	284 5 2	1,245 19 2	.....	1,530 4 4	91 16 4	30 June, 1905	
Tulloona	89,600	49 5	577,930	1,283 9 0	.....	220 0 0	1,301 9 0	297 9 8	12 „ 1907	
Tunda	25,280	21 26	809,251	585 4 0	.....	75 0 0	585 4 0	109 16 8	18 Jan., 1911	
Tycannah	54,720	35 38	110,462	886 16 3	2,255 16 2	.....	3,142 12 5	187 2 0	8 July, 1908	
Tyreel	91,520	62 19	761,141	1,405 10 11	3,038 9 1	.....	4,444 0 0	264 11 8	2 Feb., 1910	
Umbie	28,617	21 50	410,853	576 3 0	2,771 17 2	.....	3,348 0 2	199 6 4	8 Oct., 1906	
Uranbah	92,500	56 27	690,080	928 19 10	.....	150 0 0	928 19 10	205 6 0	16 Jan., 1907	
Walgett	693	Nil	908,090	2,530 0 9	.....	76 0 0	2,530 0 9	226 13 4	20 Mar., 1907	£2,530 0s. 9d. for reticulation.
Weetaliba	44,800	33 2	520,010	1,424 14 9	1,961 15 1	.....	3,386 9 10	291 12 4	28 April, 1909	
Welbondonga	70,599	42 58	1,115,360	1,214 2 0	3,926 5 5	.....	5,140 7 5	306 0 4	21 July, 1909	
Yeendah	51,714	23 45	359,044	759 9 5	.....	144 0 0	814 11 11	192 10 0	3 „ 1907	

(UNDER CONSTRUCTION ON 30TH JUNE, 1912.)

Name.	Area.	Length of Drains.	Flow of Bore per diem.	Cost of Water per annum if bore not in Trust.	Estimated Cost.	Remarks.
	acres.	ms. ch.	gallons.	£	£	
Boronga	133,760	73 48	1,062,133	.....	6,725	Bore completed. Drains under construction by day labour.
Brewon	52,000	24 6	713,872	164	665	All works but drains completed, for which contract is let.
Currumbah	94,080	46 5	992,943	.....	5,420	All works nearly complete.
Four Posts	99,680	57 60	1,133,300	.....	6,440	Bore completed. Distributing works under construction by day labour.
Gilgooma	60,481	56 27	.....	.....	4,620	Bore only under construction.
Munna Munna	46,880	29 42	777,117	132	1,035	Distributing works to be completed.
New Yarrowa	94,080	64 68	.....	.....	6,800	Bore nearly complete. Distributing works to be carried out by day labour.
Nowley	109,280	74 15	809,251	.....	4,665	All works completed except culverts and fencing, for which contract in hand.
Pagan Creek	37,440	25 35	.....	.....	4,220	Bore only under construction.
Yowie	31,440	32 0	.....	.....	3,834	Bore only under construction.

Proposals gazetted but not yet constituted on 30th June, 1912.

Beanbah	30,130	41 40	908,090	210	1,910	
Combogolong	48,000	33 5	491,950	120	1,040	
Meroe	70,880	48 70	.....	.....	5,936	
Rowena	56,640	40 28	744,780	.....	3,373 11 8	(Of existing works.)

ANALYSES OF ARTESIAN AND SUB-ARTESIAN WATERS, NEW SOUTH WALES.

By *John C. H. Mingaye, F.I.C., F.C.S., Analyst*; *Harold P. White, Assistant Analyst*; and *R. S. Symmonds, Assistant Chemist*,
Chemical Laboratory, Department of Mines.

GRAINS per Imperial Gallon.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na ₂ CO ₃).	Potassium Carbonate (K ₂ CO ₃).	Calcium Carbonate (CaCO ₃).	Magnesium Carbonate (MgCO ₃).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride (MgCl ₂).	Sodium Sulphate (Na ₂ SO ₄).	Potassium Sulphate (K ₂ SO ₄).	Iron Oxide and Alumina (Fe ₂ O ₃ and Al ₂ O ₃).	Silica (SiO ₂).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks.
Angledool (P)	27 July, 1908	52·748	trace.	·449	trace.	9·331	.....	.....	absent.	.....	trace.	2·072	64·600	·9228	
Artesia (G)	6 Aug., 1909	38·122	"	1·400	·399	14·062	.....	.....	"	.....	"	1·176	55·159	·7850	B ₂ O ₃ a trace.
Bancannia (G)	10 April, 1895	47·469	.....	5·150	10·697	171·912	.....	.....	17·743	.....	·210	·420	253·601	3·6226	
Bangate No. 1 (P)	16 Nov., 1908	33·837	trace.	·299	trace.	7·646	.....	.....	absent.	.....	nil.	1·652	43·434	·6204	B ₂ O ₃ a minute trace.
" No. 2 (P)	19 " 1908	35·994	"	·357	"	7·395	.....	.....	"	.....	trace.	1·680	45·426	·6489	B ₂ O ₃ a strong trace.
Baroma, 1,640 ft. (under construction) (G)	16 Dec., 1910	67·534	absent	2·250	absent	21·357	.....	.....	"	.....	"	1·750	92·891	1·3270	B ₂ O ₃ a trace.
Baroma, 2,000 ft. (under construction) (G)	16 Dec., 1910	69·240	"	1·750	"	23·114	.....	.....	"	.....	"	1·596	95·700	1·3671	" "
Baroma, 2,500 ft. (under construction) (G)	16 Dec., 1910	75·371	"	1·750	"	24·889	.....	.....	"	.....	"	1·540	103·550	1·4792	" "
Baroma (G)	24 Jan., 1911	50·734	trace.	1·003	trace.	14·153	.....	.....	·478	.....	traces.	1·288	67·653	·9665	" "
Barrington (G)	3 Jan., 1893	23·932	6·104	·350	.....	6·739	.....	.....	.....	.....	·252	1·736	39·113	·5588	
Barrington (G)	23 Jan., 1911	28·436	absent.	·750	trace.	6·917	.....	.....	absent.	.....	traces.	1·260	37·363	·5337	B ₂ O ₃ faint trace. Temperature 114° F.
Beanbah No. 1, deepened (P)	8 Dec., 1909	19·546	1·937	5·296	2·076	4·032	.....	.....	2·286	.....	·056	1·425	36·687	·5238	B ₂ O ₃ absent.
" No. 2 (I.L.)	9 Oct., 1905	24·577	1·419	4·050	1·303	3·503	.....	.....	1·450	.....	traces.	1·246	37·548	·5364	
" No. 2 (I.L.)	4 June, 1907	21·884	1·890	3·599	1·217	3·925	.....	.....	1·466	.....	"	1·596	35·577	·5083	B ₂ O ₃ absent.
Belalie (G)	21 Nov., 1893	27·773	1·269	·649	trace.	7·009	.....	.....	.....	.....	"	1·260	39·784	·5683	
" (G)	10 Jan., 1911	30·005	trace.	·749	"	6·893	.....	.....	absent.	.....	traces.	1·624	39·271	·5610	B ₂ O ₃ trace. Temp. 114° F.
" No. 1 (P)	29 Jan., 1898	33·992	"	·642	"	6·916	.....	.....	"	.....	·112	1·792	43·454	·6208	
" No. 1 (P)	26 Oct., 1909	34·966	"	·649	"	6·961	.....	.....	absent.	.....	·140	2·100	44·816	·6401	B ₂ O ₃ a trace.
" No. 2 (P)	29 Jan., 1898	29·040	"	1·000	·317	6·699	.....	.....	.....	.....	·280	1·932	39·267	·5609	
" No. 2 (P)	4 June, 1909	21·728	nil.	·500	nil.	7·601	.....	.....	nil.	.....	·112	1·288	31·229	·4461	B ₂ O ₃ absent.
" No. 3 (P)	4 May, 1899	24·308	trace.	·599	·105	6·573	.....	.....	.....	.....	trace.	1·540	33·125	·4732	
" No. 3 (P)	8 June, 1909	24·578	"	·449	trace	6·580	.....	.....	nil.	.....	"	1·540	33·147	·4735	B ₂ O ₃ a trace.
Benah (I.L.)	16 " 1906	29·011	"	·589	·249	2·558	.....	.....	absent.	.....	·140	1·428	33·975	·4852	
Biblah (P)	15 Jan., 1906	51·324	"	·637	·204	8·730	.....	.....	"	.....	trace	1·442	62·337	·8905	
" (P)	3 May, 1907	50·105	"	·700	·084	10·356	.....	.....	"	.....	"	1·484	62·729	·8961	
Bimble (P)	11 Jan., 1906	23·655	"	3·000	·556	3·686	.....	.....	1·389	.....	"	1·582	33·868	·4836	
" (P)	26 Mar., 1907	22·619	·972	3·000	·576	3·578	.....	.....	1·466	.....	·112	1·876	34·199	·4884	
Bogamildi (P)	27 April, 1908	33·496	trace.	·338	trace.	6·987	.....	.....	·647	.....	trace.	1·540	43·008	·6143	B ₂ O ₃ a trace.
Bogewong (G)	15 Dec., 1908	37·609	absent.	·199	"	11·436	.....	.....	absent.	.....	·252	1·848	51·344	·7334	B ₂ O ₃ a strong trace.
Bomuckledi (G)	12 Oct., 1908	36·093	"	·399	"	8·377	.....	.....	"	.....	trace.	1·512	46·381	·6626	B ₂ O ₃ absent.
Boobora (G)	3 Dec., 1909	29·446	·271	·799	"	16·910	.....	.....	2·081	.....	·140	1·904	45·551	·6506	B ₂ O ₃ a minute trace.
Boolooroo (T) at a depth of 1,411 ft. (G)	23 June, 1910	54·355	absent.	·499	trace.	17·877	.....	.....	absent.	.....	·196	1·736	74·663	1·0666	B ₂ O ₃ a trace.
" at a depth of 2,215 ft. (G)	24 Aug., 1910	36·315	0·214	·450	absent.	6·643	.....	.....	"	.....	trace.	1·736	45·358	·6478	B ₂ O ₃ absent; strontia a minute trace.
" at a depth of 2,650 ft. (G)	30 Nov., 1910	32·208	trace.	·367	trace.	6·505	.....	.....	"	.....	·084	1·484	40·648	·5806	B ₂ O ₃ a trace.
"	25 July, 1906	35·597	trace.	·550	·157	7·133	.....	.....	"	.....	trace.	1·540	44·977	·6426	
Boomi (G)	31 Aug., 1906	30·759	·142	·725	·156	8·514	.....	.....	2·643	.....	"	2·002	44·941	·6419	
Boronga (G)	28 April, 1911	28·834	trace.	·850	trace.	9·367	.....	.....	2·319	.....	"	1·736	43·106	·6157	B ₂ O ₃ a trace. Temp. 131° F.
Bourbah (G)	16 May, 1894	23·36	.....	1·12	·84	2·96	trace.	.....	.....	.....	"	1·26	29·54	·422	
" (G)	2 Feb., 1912	21·798	·558	2·500	·424	3·792	.....	.....	.....	.....	trace.	1·204	30·800	·4400	Boric acid a trace. Temp. 93° F.

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—continued.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na ₂ CO ₃).	Potassium Carbonate (K ₂ CO ₃).	Calcium Carbonate (CaCO ₃).	Magnesium Carbonate (MgCO ₃).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride (MgCl ₂).	Sodium Sulphate (Na ₂ SO ₄).	Potassium Sulphate (K ₂ SO ₄).	Iron Oxide and Alumina (Fe ₂ O ₃ and Al ₂ O ₃).	Silica (SiO ₂).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks
Bouka (I.L.)	24 July, 1907	40.123	trace.	.499	.127	7.065	.....	.....	absent.	.....	trace.	1.764	49.578	.7082	
Bourke (G)	20 Jan., 1892	20.941	2.952	.....	trace.	8.445	.....	.....	.....	.....	.....	1.960	34.298	.4899	
Bowila (P)	21 May, 1912	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1106.770	15.8110	
Box Camp (I.L.)	31 July, 1906	35.607	trace.	.549	.084	2.389	.....	.....	absent.	.....	trace.	1.344	39.973	.5710	
Brewon No. 1 (I.L.)	4 Nov., 1904	41.060	absent.	1.000	trace.	7.375	.....	.....	.....	.....	.....	1.288	50.723	.7246	
" No. 2 (G)	4 " 1904	42.155	"	.821	"	6.888	.....	.....	.....	.....	.....	1.260	51.124	.7303	
" No. 3 (I.L.)	27 Dec., 1905	39.152	trace.	.407	"	7.269	.....	.....	.....	.....	.....	1.274	48.102	.6871	
" No. 4 (I.L.)	5 Feb., 1907	40.393	absent.	.499	.105	7.327	.....	.....	absent.	.....	.....	1.484	49.808	.7114	
Brigalow (G)	1 " 1896	31.254	2.674	.914	trace.	7.647	.....	.....	.....	.....	.476	1.510	45.337	.6484	
" (G)	20 April, 1909	33.244	.349	.899	.190	7.994	.....	.....	absent.	.....	trace.	1.288	43.955	.6278	B ₂ O ₃ a trace.
" (I.L.)	27 Dec., 1905	42.121	trace.	.562	trace.	7.212	.....	.....	.....	.....	.....	1.232	51.127	.7303	
Brindingabba No. 5, 143 ft., under construction (P).	31 Aug., 1911	3.333	"	7.501	4.928	31.758	.....	.....	13.471	.....	.....	2.870	64.705	.9244	B ₂ O ₃ a trace. N ₂ CO ₃ = 0.844 grs. = 0.0121 in 1,000 parts.
Bryanungra, 2,075 ft. (under construction) (P).	28 June, 1910	56.484	absent.	.720	.293	25.952	.....	.....	.136	.....	.196	2.044	85.858	1.2264	B ₂ O ₃ a trace.
Bryanungra, 2,615 ft. to 2,262 ft. (under construction) (P).	22 Dec., 1910	32.808	trace.	.625	trace.	7.048	.....	.....	.392	.....	trace.	1.484	42.357	.6050	B ₂ O ₃ a trace. Temperature 117° F.
Bryanungra, 2,927 ft. to 2,990 ft. (under construction) (P).	30 Dec., 1910	32.948	"	.625	"	7.054	.....	.....	.511	.....	"	1.960	43.098	.6156	" " "
Bryanungra, 2,993 ft. to 3,048 ft. (under construction) (P).	30 Dec., 1910	32.508	"	.700	"	6.871	.....	.....	.648	.....	"	1.680	42.407	.6057	" " "
Bryanungra, 3,050 ft. (under construction) (P).	6 Oct., 1910	31.793	"	.200	.190	7.167	.....	.....	.238	.....	.420	1.932	44.940	.6421	" " "
Bryanungra, 3,408 ft. to 3,408 ft. (under construction) (P).	4 Jan., 1911	32.146	"	.750	trace.	7.031	.....	.....	.887	.....	trace.	2.128	42.942	.6134	" absent. "
Bryanungra, 3,400 ft. (under construction) (P).	1 Dec., 1910	33.111	"	.449	"	7.076	.....	.....	absent.	.....	"	1.630	42.316	.6045	" " "
Buckinguy No. 1 (P)	19 Nov., 1908	38.296	"	.775	.189	3.370	.....	.....	"	.....	"	1.204	43.834	.6261	B ₂ O ₃ a trace.
" No. 2 (P)	23 " 1908	35.191	"	.750	trace.	6.573	.....	.....	"	.....	.112	1.512	44.138	.6305	" " "
Bugilbone (G)	5 Dec. 1911	39.439	"	.850	.212	7.288	.....	.....	"	.....	traces.	1.428	49.217	.7031	B ₂ O ₃ faint trace. Temperature 115° F.
Bulgah (P)	15 Jan., 1906	36.523	1.714	3.437	.078	3.560	.....	.....	2.450	.....	trace.	1.498	49.260	.7036	
" (P)	3 May, 1907	35.784	1.145	3.850	1.134	4.056	.....	.....	2.353	.....	"	1.876	50.198	.7170	B ₂ O ₃ absent.
Bullagreen (P)	25 July, 1906	28.390	trace.	.649	.127	5.734	.....	.....	1.157	.....	.056	1.176	37.289	.5326	
Bulyeroi (G)	24 Dec., 1897	45.32	"	.94	.....	6.27	.....	.....	.....	.....	.42	1.76	54.71	.782	
" (G)	7 Sept., 1911	44.104	"	1.000	.265	6.340	.....	.....	absent.	.....	traces	1.540	53.249	.7607	B ₂ O ₃ faint trace. Temp. 114° F.
Bunaba (P)	29 Oct., 1908	36.352	.172	.400	trace.	5.889	.....	.....	trace.	.....	trace.	1.960	44.773	.6395	B ₂ O ₃ absent.
Bundy (P)	5 Mar., 1906	27.837	.446	.900	.168	3.343	.....	.....	2.049	.....	"	1.890	36.633	.5230	
" (P)	4 June, 1907	29.808	.341	.750	.231	3.943	.....	.....	1.568	.....	.084	1.848	38.573	.5510	B ₂ O ₃ absent.
" Deepened, 2,289 ft. (P)	20 Mar., 1911	15.292	2.512	6.751	1.377	3.313	.....	.....	1.535	.....	traces.	1.260	32.040	.4576	B ₂ O ₃ trace. Temp. 104° F.
Bungle Gully (I.L.)	17 Nov., 1909	38.867	.701	1.249	.593	3.537	.....	.....	1.603	.....	.168	2.380	49.098	.7013	B ₂ O ₃ a trace.
Bunna Bunna No. 1 (P)	18 Sept., 1906	38.276	trace.	.450	.231	5.786	.....	.....	absent.	.....	trace.	1.456	46.199	.6599	" " "
" No. 1 (P)	8 Jan., 1909	39.147	"	.574	.127	5.403	.....	.....	nil.	.....	.042	1.624	46.922	.6703	B ₂ O ₃ a minute trace.
" No. 2 (P)	8 " 1909	44.804	"	.685	.169	6.322	.....	.....	"	.....	.084	1.764	53.828	.7689	B ₂ O ₃ a trace.
Bunyah (G)	11 Dec., 1911	44.911	"	.750	.212	6.009	.....	.....	absent.	.....	traces.	1.260	53.142	.7591	B ₂ O ₃ faint trace. Temperature 100° F.
Burrawang No. 2 (I.L.)	27 Jan. 1905	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1802.000	25.7428	
Buttabone No. 1 (P)	19 Nov., 1898	36.913	trace.	.899	.210	3.468	.....	.....	.....	.....	trace.	1.428	42.118	.6017	
" No. 2 (P)	22 Mar., 1899	31.467	"	.649	.211	3.229	.....	.....	.....	.....	"	1.428	36.984	.5283	

"	No. 3 (P)	24 July, 1907	37-461	absent.	399	169	3-428	.....	absent.	.....	168	1-078	42-703	6100	B ₂ O ₃ absent.
"	No. 4 (P)	7 Aug., 1907	34-067	trace.	849	296	3-081	.....	"	.....	084	1-764	40-141	5734	
"	No. 5 (P)	12 " 1907	30-784	"	900	336	2-450	.....	"	.....	112	1-176	35-758	5107	B ₂ O ₃ a trace.
"	No. 6 (P)	12 " 1907	40-139	"	1-200	189	3-464	.....	"	.....	084	1-456	46-532	6647	B ₂ O ₃ absent.
Calga, No. 1 (P)		16 May, 1904	5-016	.....	4-225	2-900	4-314	.....	.....	3-014	trace.	1-148	20-517	2945	
"	No. 1 (P)	22 Mar., 1906	4-677	1-961	5-750	3-005	5-090	.....	2-252	.....	840	1-960	25-535	3660	
"	No. 2 (P)	22 " 1906	2-569	1-642	5-200	3-090	4-062	.....	2-491	.....	728	1-703	21-490	3068	
"	No. 3 (P)	24 " 1906	6-178	2-551	6-750	3-746	2-168	.....	1-151	.....	364	1-456	24-364	3478	
"	No. 4 (P)	2 May, 1907	2-722	2-302	4-499	2-860	4-217	.....	2-490	.....	trace.	980	20-070	2865	B ₂ O ₃ absent.
Careunga (G)		14 Feb., 1905	34-686	trace.	275	trace.	7-897	.....	954	.....	"	1-554	45-366	6481	
Carinda (G)		17 June, 1897	42-529	2-379	549	"	10-226	.....	.....	.....	224	1-400	57-307	8187	
"	(G)	13 Feb., 1911	37-837	trace.	750	"	8-161	.....	absent.	.....	traces.	1-260	48-008	6859	B ₂ O ₃ trace.
"	1,760 ft., being deepened (G)	15 Jan., 1912	45-879	"	500	212	6-900	.....	"	.....	"	1-764	55-255	7893	
"	1,990 ft. do (G)	15 " 1912	48-794	"	850	297	6-763	.....	"	.....	"	1-960	58-664	8380	
"	2,065 ft. do (G)	15 " 1912	51-115	"	750	159	6-512	.....	"	.....	"	1-400	59-936	8562	
"	2,230 ft. do (G)	15 " 1912	51-262	"	750	212	6-055	.....	"	.....	"	1-400	59-679	8525	
"	2,245 ft., final depth (G)	25 Sept., 1911	47-252	"	500	trace.	6-169	.....	"	.....	"	1-260	55-181	7883	B ₂ O ₃ faint trace. Temperature 105° F.
Carney's Tree (P)		27 July, 1906	41-296	"	1-050	336	4-679	.....	"	.....	"	1-540	48-901	6935	
Carwell (P)		18 Sept., 1906	45-755	086	650	115	8-673	.....	"	.....	084	1-428	56-791	8112	
Cherrigorang (P)		20 Aug., 1907	42-813	175	850	357	7-156	.....	"	.....	trace.	1-316	52-667	7523	B ₂ O ₃ trace.
"	at a depth of 1,558 feet (P)	8 Sept., 1910	36-723	135	950	360	3-561	.....	"	.....	"	1-512	43-241	6175	B ₂ O ₃ a trace; a minute trace of strontia and lithia.
"	" 2,030 feet (P)	8 " 1910	23-845	1-275	3-600	974	1-575	.....	545	.....	"	1-344	33-158	4736	B ₂ O ₃ absent; a minute trace of strontia and lithia.
"	" 2,062 feet (P)	8 " 1910	22-876	1-411	3-450	995	1-575	.....	580	.....	"	1-204	32-091	4582	B ₂ O ₃ absent; a minute trace of strontia and lithia.
"	2,032 feet, final depth (P)	8 " 1910	24-408	1-132	3-300	911	2-031	.....	580	.....	"	1-428	33-790	4825	B ₂ O ₃ absent; a minute trace of strontia and lithia.
Clifton (G)		20 June, 1895	98-180	1-641	1-699	953	21-480	.....	.....	.....	166	1-708	125-830	1-7974	
"	(G)	31 July, 1911	96-325	1-754	1-750	572	22-505	.....	absent.	.....	traces.	2-296	125-202	1-7886	B ₂ O ₃ trace. Temp. 142° F.
Collymongle (I.L.)		10 Nov., 1911	40-143	trace.	1-100	318	6-512	.....	"	.....	"	1-708	49-781	7111	" " " 131° F.
Combadele (P)		14 Sept., 1905	36-234	"	700	084	5-694	.....	"	.....	"	1-274	43-986	6284	
Combogolong (I.L. 823)		13 Mar., 1906	55-058	154	400	199	11-469	.....	absent.	.....	"	1-652	68-932	9846	
"	(I.L. 1,161)	6 April, 1906	55-312	trace.	749	trace.	7-464	.....	"	.....	"	1-764	65-289	9327	
Come-by-Chance (P)		26 " 1906	50-171	absent.	399	084	8-994	.....	"	.....	"	1-512	61-160	8738	
"	" (G)	7 Mar., 1907	45-834	trace.	550	trace.	7-202	.....	absent.	.....	"	1-876	55-462	7922	B ₂ O ₃ a trace.
Conimbia (P)		21 Aug., 1906	45-942	"	400	"	9-071	.....	"	.....	"	1-540	56-953	8136	
Coolabah (G)		16 Nov., 1900	46-502	237	875	982	8-873	.....	"	.....	280	1-890	59-639	8519	
Coonamble No. 1, at a depth of 1,020 feet. (C.T.W.S.)		24 Aug., 1893	40-00	.....	1-12	trace.	6-91	.....	.....	.....	.....	.....	48-03	6861	
"	No. 1 (C.T.W.S.)	24 " 1910	8-878	3-333	10-700	2-370	2-602	.....	1-569	.....	trace.	1-820	31-272	4465	B ₂ O ₃ a minute trace; trace of strontia and lithia.
"	No. 2 (C.T.W.S.)	8 Dec., 1909	7-189	3-739	11-742	2-754	2-305	.....	1-365	.....	168	1-400	30-662	4379	B ₂ O ₃ absent.
"	No. 2 (C.T.W.S.)	1 Mar., 1911	7-053	3-963	11-777	1-165	2-694	.....	1-450	.....	364	2-184	30-650	4378	B ₂ O ₃ faint trace. Temperature 102° F.
Corella No. 1 (P)		10 Feb., 1892	27-813	7-170	1-000	336	8-733	.....	.....	.....	trace.	1-288	46-340	6620	
"	No. 1 (P)	28 Nov., 1908	33-811	320	749	360	8-354	.....	nil.	.....	168	1-372	45-134	6448	B ₂ O ₃ a strong trace.
"	No. 2 (P)	13 Mar., 1893	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50-316	7188	
"	No. 2 (P)	28 Nov., 1908	35-213	trace.	1-099	635	11-255	.....	nil.	.....	"	1-568	49-770	7110	B ₂ O ₃ a strong trace.
"	No. 3 (P)	13 Mar., 1893	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56-868	8124	
"	No. 3 (P)	28 Nov., 1908	33-714	trace.	850	168	7-224	.....	absent.	.....	trace.	1-736	43-692	6241	B ₂ O ₃ a strong trace.

NOTE.—Government bores marked (G). Improvement lease bores marked (I.L.) Country Town Water Supply bores marked (C.T.W.S.) Private bores marked (P).

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—continued.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na ₂ CO ₃).	Potassium Carbonate (K ₂ CO ₃).	Calcium Carbonate (CaCO ₃).	Magnesium Carbonate (MgCO ₃).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride (MgCl ₂).	Sodium Sulphate (Na ₂ SO ₄).	Potassium Sulphate (K ₂ SO ₄).	Iron Oxide and Alumina (Fe ₂ O ₃ and Al ₂ O ₃).	Silica (SiO ₂).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks
Couhal (G)	27 Oct., 1908	29.494	trace.	.450	absent	7.961	.....	.....	nil.	.....	.084	1.792	39.781	.5682	B ₂ O ₃ a minute trace.
Currahulla (G)	20 Nov., 1895	43.212	.940	1.499	.678	10.818	.....	.....	.....	.....	trace.	1.512	58.659	.8380	
Curumbah (G)	28 Aug., 1911	63.639	trace.	1.500	.371	13.137	.....	.....	.341	.....	traces.	1.120	80.103	1.1444	B ₂ O ₃ faint trace. Temperature 98° F.
Cattabunda (P)	22 Oct., 1908	33.715	„	.299	absent.	7.418	.....	.....	nil.	.....	„	1.904	43.336	.6189	B ₂ O ₃ a minute trace.
Cuttaburra (G)	22 Aug., 1889	6.712	.....	6.654	.336	349.040	trace.	4.190	.....	.....	.112	1.596	396.872	5.6696	
„ (G)	18 Sept., 1911	.....	.....	.....	.....	337.112	.....	.....	.....	.....	.....	.....	352.996	5.0425	
Darnley Chase (P)	23 June, 1908	33.967	.142	.887	.168	6.290	.....	.....	1.705	.....	trace.	1.652	44.811	.6399	B ₂ O ₃ a trace.
Dobikin (P)	11 Jan., 1909	40.384	trace.	.500	trace.	7.814	.....	.....	absent.	.....	„	1.400	50.098	.7156	B ₂ O ₃ a minute trace.
Dolgelly (G)	17 June, 1897	33.819	„	.348	„	7.829	.....	.....	1.876	.....	„	1.904	45.776	.6539	
„ (G)	12 Sept., 1911	31.573	„	.750	.169	7.551	.....	.....	1.910	.....	„	1.848	43.801	.6257	B ₂ O ₃ trace. Temp. 127° F.
Dolmoreve (from shaft by pump) ..	20 Feb., 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	164.136	2.3448	
„ (well bore)	28 „, 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	163.632	2.3376	
Dumble, 2,833 ft. (under construction) (P) ..	20 Dec., 1910	32.886	absent.	.449	absent.	7.161	.....	.....	.....	.....	trace.	1.172	42.288	.6041	B ₂ O ₃ a trace.
Dumble (P)	25 May, 1911	28.731	trace.	.750	trace.	7.768	.....	.....	absent.	.....	„	1.820	39.069	.5581	„ „ Temp. 125° F.
Dungle Ridge (G)	18 Mar., 1895	52.564	6.945	.324	2.528	15.936	.....	.....	.....	.....	„	1.792	80.039	1.1441	
„ (G)	11 Sept., 1911	58.681	trace.	.650	.275	15.731	.....	.....	absent	.....	traces.	1.568	76.905	1.0986	„ „ Temp. 118° F.
Dunlop No. 10 (P)	17 Dec., 1910	25.204	absent	3.000	.466	63.741	.....	.....	„	.....	„	1.120	93.531	1.3360	„ „ „ 102° F.
„ No. 19 (P)	20 Jan., 1911	12.538	trace.	6.550	1.016	150.961	.....	.....	„	.....	„	1.624	172.639	2.4668	B ₂ O ₃ strong trace. Temperature 93° F.
Ellerslie (P)	28 Dec., 1908	17.458	1.857	2.599	1.186	1.552	.....	.....	.750	.....	.140	1.568	27.110	.3371	B ₂ O ₃ absent.
Emby (P)	25 July, 1905	43.972	trace.	.319	.275	9.770	.....	.....	.....	.....	trace.	1.484	55.850	.7978	
Enngonia (G)	21 Nov., 1893	30.367	4.741	1.199	.....	7.745	.....	.....	.....	.....	„	1.694	45.746	.6535	
„ (G)	11 May, 1911	33.279	1.076	1.000	trace.	6.740	.....	.....	absent.	.....	„	1.680	43.775	.6254	B ₂ O ₃ trace. Temp. 115° F.
Erlside (Quigley's) (P)	12 Sept., 1906	35.000	trace.	.549	.148	2.602	.....	.....	.237	.....	.084	1.596	40.216	.5743	„ „ „
Fulalie (G)	22 Dec., 1910	51.626	„	.400	absent.	22.257	.....	.....	absent	.....	trace.	2.100	76.383	1.0911	„ „ „ Temperature 124° F.
Eulawah (P)	14 Oct., 1907	31.133	„	.900	.273	4.975	.....	.....	.477	.....	.084	1.596	39.438	.5632	B ₂ O ₃ absent.
Euraba (G)	31 July, 1905	34.872	.295	.421	.140	8.388	.....	.....	2.046	.....	trace.	1.540	47.702	.6315	
Eurie Eurie (G)	22 May, 1911	39.715	trace.	.750	.169	8.454	.....	.....	absent.	.....	„	1.540	50.628	.7233	B ₂ O ₃ faint trace. Temperature 116° F.
Euroka 1,584 ft. (P)	16 June, 1896	45.561	5.577	.249	.286	6.721	.....	.....	.....	.....	„	.980	60.326	.8615	Organic matter, 0.952.
„ 1,584 ft. (P)	9 May, 1906	56.156	trace.	.500	.273	15.578	.....	.....	absent.	.....	„	1.554	74.061	1.0379	
„ 1,950 ft., being deepened (P) ..	22 Nov., 1911	49.103	„	.550	.212	10.510	.....	.....	„	.....	„	1.988	62.363	.8909	B ₂ O ₃ trace. Temp. 110° F.
„ 2,125 ft. do (P)	22 „, 1911	43.737	„	.600	.212	6.535	.....	.....	„	.....	„	1.680	52.764	.7538	„ „ „ 114° F.
Fairview, 875 to 1,007 ft., under construction (P) ..	8 Aug., 1911	36.621	„	1.050	.392	9.139	.....	.....	„	.....	.504	4.550	52.256	.7465	„ „ „ 79° F.
„ 1,211 ft. do (P)	9 „, 1911	34.153	„	.500	.211	6.123	.....	.....	„	.....	traces.	1.120	42.107	.6015	B ₂ O ₃ faint trace. Temperature 84½° F.
Federal Park (P)	7 „, 1907	45.817	.070	.700	.147	7.453	.....	.....	„	.....	.084	2.016	56.237	.8040	B ₂ O ₃ absent.
Finger Post (G)	16 „, 1911	40.757	absent.	.699	.106	7.654	.....	.....	absent.	.....	traces.	1.064	50.280	.7182	B ₂ O ₃ trace. Temp. 121 F°.
Florida (G)	15 Dec., 1911	43.046	trace.	.699	.106	5.940	.....	.....	„	.....	„	1.680	51.471	.7352	B ₂ O ₃ faint trace. Temperature 110° F.
Ford's Bridge (G)	4 Dec., 1909	32.188	„	1.299	.466	20.611	.....	.....	.068	.....	.112	1.148	55.892	.7982	B ₂ O ₃ a trace.
Fort Bourke No. 1 (P)	3 „, 1908	33.888	„	.899	.060	13.171	.....	.....	nil.	.....	.140	2.072	50.230	.7176	„ „
„ No. 2 (P)	3 May, 1907	31.111	„	1.700	.252	25.861	.....	.....	absent.	.....	trace.	1.456	60.380	.8625	„ „
„ No. 3 (P)	12 Oct., 1908	34.579	„	.549	trace.	7.669	.....	.....	„	.....	„	1.596	44.393	.6340	B ₂ O ₃ a minute trace.
„ No. 4 (P)	25 Sept., 1908	35.917	„	.500	.273	12.884	.....	.....	„	.....	.168	1.260	51.062	.7285	B ₂ O ₃ trace.

No. i(P)	25 "	1908	35-243	absent.	1-750	-656	28-439	.....	.....	.....	-084	1-176	67-348	-9622	B ₂ O ₃ strong reaction
Four Posts, 3,200 ft. (under construction) (G).	8 Aug., 1911	37-086	-750	trace.	-750	-275	5-826	.....	.....	.....	1-960	45-897	-6556	-6556	B ₂ O ₃ trace, Temp. 132° F.
" 3,270 ft. do (G)	10 Nov., 1911	35-726	.....	"	-850	-212	6-123	.....	.....	.....	2-296	45-207	-6458	"	"
" 3,360 ft. do (G)	14 " 1911	35-082	.....	"	1-000	-212	6-034	.....	.....	.....	2-240	45-228	-6461	"	"
Gaffney's (G)	23 Mar., 1905	.....	.....	.....	10-500	4-009	246-215	.....	.....	.....	1-468	271-249	-3-8892	"	"
Galgambone (G)	19 Aug., 1905	.....	.....	-435	3-157	-767	2-910	.....	.....	10-077	1-463	27-308	-3901	"	"
Gidrea Camp (G)	21 May, 1895	30-712	3-347	3-347	1-299	-267	10-431	.....	.....	.....	1-344	47-568	-6794	"	"
" 35-382	31 Mar., 1904	trace.	.....	trace.	1-250	.....	.....	.....	.....	.....	1-351	47-770	-6824	"	"
Gilgandra (G)	13 July, 1897	20-070	.....	.....	3-946	1-991	149-219	.....	.....	.....	1-176	196-091	-2-8013	"	"
Gil Gil (G)	.....	32-630	1-701	.....	499	-127	7-258	.....	.....	.....	1-764	43-979	-6282	B ₂ O ₃ trace.	
" (G)	26 Aug., 1907	35-535	.....	.....	2-000	-042	7-075	.....	.....	.....	1-400	44-450	-6348	"	"
Gilgoin No. 1 (I.L.)	27 Dec., 1905	41-007	.....	.....	512	-063	7-098	.....	.....	.....	1-302	49-982	-7140	"	"
" No. 2 (I.L.)	27 " 1905	43-013	.....	.....	7-00	-136	6-984	.....	.....	.....	1-372	52-205	-7456	"	"
Gilgoma, at 107 feet, under construction (G)	31 Jan., 1912	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1711-640	24-4520	"	"
" at 730 feet, under construction (G)	27 April, 1912	50-192	.....	.....	-875	-106	27-760	.....	.....	.....	1-120	80-080	1-1440	"	"
Ginghett (G)	22 June, 1907	40-653	.....	.....	-799	-127	7-068	.....	.....	.....	1-792	50-439	-7205	B ₂ O ₃ a trace.	
" (I.L.)	27 Dec., 1905	42-383	.....	.....	525	-137	6-699	.....	.....	.....	1-022	50-766	-7251	B ₂ O ₃ a trace.	
Gingie (P)	13 May, 1908	36-753	.....	.....	475	trace.	7-509	.....	.....	.....	1-652	46-389	-6626	B ₂ O ₃ absent.	
Glenalbyn (G)	25 Nov., 1908	35-567	.....	.....	803	-127	7-305	.....	.....	.....	1-764	45-566	-6609	B ₂ O ₃ trace.	
Glengeera (G)	13 " 1908	34-655	.....	.....	724	-127	7-052	.....	.....	.....	1-512	44-070	-6295	"	"
Gnomery (P)	8 " 1909	41-396	.....	.....	399	trace.	7-395	.....	.....	.....	1-946	51-192	-7312	"	"
Goangra (G)	10 Mar., 1904	55-185	.....	.....	500	-084	17-346	.....	.....	.....	1-540	74-907	1-0701	B ₂ O ₃ trace, Temp. 119° F.	
Goodooga (G)	5 Sept., 1911	34-176	.....	.....	600	trace.	6-854	.....	.....	.....	2-156	43-786	-6255	B ₂ O ₃ a minute trace.	
Goooling (P)	11 June, 1909	27-000	.....	.....	446	.....	6-985	.....	.....	.....	1-596	36-027	-5146	B ₂ O ₃ a faint trace.	
Goonal (P)	29 Mar., 1903	40-324	.....	.....	650	.....	6-032	.....	.....	.....	1-988	48-994	-6998	B ₂ O ₃ a faint trace.	
Goondabini No. 1 (P)	10 Sept., 1908	65-441	.....	.....	446	.....	19-153	.....	.....	.....	1-820	86-860	-1-2408	B ₂ O ₃ strong reaction.	
" No. 2 (P)	10 " 1908	63-031	.....	.....	450	.....	13-866	.....	.....	.....	2-072	79-630	-1-1375	"	"
" No. 3 (P)	12 " 1908	59-019	.....	.....	300	.....	21-447	.....	.....	.....	1-736	82-502	-1-1786	"	"
" No. 4, 2,659 ft. (under construction) (P).	23 May, 1911	67-455	.....	.....	600	-212	18-506	.....	.....	.....	1-960	88-733	-1-2676	B ₂ O ₃ strong trace, Temperature 121° F. Temp. 138° F.	
" No. 4 (P)	14 Mar., 1912	40-306	.....	.....	950	-212	8-362	.....	.....	.....	2-240	52-220	-7460	B ₂ O ₃ a faint trace.	
Goonery (G)	3 May, 1901	28-746	.....	.....	550	-360	9-038	.....	.....	.....	1-624	40-318	-5759	"	"
Goorianawa No. 1 (P)	5 April, 1906	3-893	1-447	1-447	5-149	5-212	2-785	.....	.....	.....	1-326	20-903	-2986	B ₂ O ₃ absent.	
" No. 6 (P)	11 Nov., 1908	2-640	1-693	1-693	6-299	3-729	2-259	.....	.....	.....	1-624	19-266	-2750	B ₂ O ₃ trace.	
Gurley, No. 2 (P)	8 Jan, 1907	33-825	.....	.....	599	-635	6-557	.....	.....	.....	1-484	43-100	-6145	B ₂ O ₃ trace.	
Gurley Siding, 1,635 ft. to 1,820 ft. (under construction) (G).	12 Dec., 1910	31-071	absent.	absent.	400	trace.	6-213	.....	.....	.....	1-260	41-944	-6002	B ₂ O ₃ absent.	
Haddon Rigg (G)	30 Sept., 1903	28-974	.....	.....	400	-137	2-761	.....	.....	.....	994	33-266	-4752	"	"
" No. 1 (P)	19 Oct., 1899	33-943	.....	.....	750	trace.	5-734	.....	.....	.....	980	41-407	-5915	"	"
" No. 2 (P)	6 April, 1900	41-684	.....	.....	900	-402	9-154	.....	.....	.....	1-260	53-400	-7626	B ₂ O ₃ a slight trace.	
" No. 2 (P)	10 Sept., 1906	27-694	.....	.....	975	-283	3-857	.....	.....	.....	1-372	34-400	-4913	"	"
Hollywood (G)	28 July, 1908	21-762	5-325	5-325	4-999	3-538	3-126	.....	.....	.....	1-624	42-096	-6011	B ₂ O ₃ absent.	
Hungerford No. 2 (in Q'sland) (G)	10 Mar., 1904	28-365	5-28	5-28	1-650	2-265	48-678	.....	.....	.....	1-050	82-536	-1-1791	"	"
Jew's Lagoon (P)	8 Jan., 1909	41-675	.....	.....	549	-042	5-632	.....	.....	.....	1-456	49-354	-7049	B ₂ O ₃ a trace.	
Keeldin, 1,126 ft. (under construction) (P).	21 Dec., 1910	54-836	absent.	absent.	250	absent.	18-434	.....	.....	.....	1-736	75-256	-1-0750	Temperature 94° F.	
" 1,153 to 1,163 ft. (under construction) (P).	6 Jan., 1911	55-147	.....	.....	0-750	trace.	18-651	.....	.....	.....	1-680	76-223	-1-0889	B ₂ O ₃ " Temp. 97° F.	
" 1,837 ft. do (P)	22 Mar., 1911	46-015	9-56	9-56	550	"	7-585	.....	.....	.....	1-428	56-534	-8076	"	"
" 2,030 ft. do (P)	1 " 1911	37-422	-917	-917	900	"	7-243	.....	.....	.....	1-540	48-022	-6800	" Temp. 113° F.	
" (P)	1 May, 1911	37-818	-837	-837	650	"	7-174	.....	.....	.....	1-624	48-103	-6871	B ₂ O ₃ faint trace. Temperature 112° F.	
Kelly's Camp (G)	21 Nov., 1893	16-869	5-666	5-666	689	"	7-909	.....	.....	.....	1-316	35-081	-5011	"	"
Kenmare (G)	16 Dec., 1898	25-966	trace	trace	1-050	"	7-235	.....	.....	.....	1-372	35-623	-5088	"	"
" (G)	11 May, 1911	22-103	-239	-239	2-250	"	7-539	.....	.....	.....	448	32-579	-4653	B ₂ O ₃ trace, Temp. 112° F.	

Moorlands (P).....	15 June, 1906	7-731	2-129	6-100	2-919	3-994	.....	1-228	.....	112	1-148	25-361	3622	
Moramina (G).....	22 April, 1898	45-56	trace.	1-000	38	7-25	.....	.....	.....	28	1-68	56-15	8021	
" (G).....	14 May, 1908	45-355	"	168	trace.	7-395	.....	absent.	.....	trace.	1-596	54-514	7788	
Moree (G).....	28 Aug., 1895	39-259	1-101	642	295	7-029	.....	.....	.....	"	1-456	49-782	7112	
" (G).....	17 Dec., 1906	35-198	trace.	399	trace.	6-733	.....	absent.	.....	"	1-624	43-954	6278	B ₂ O ₃ absent.
Morendah (P).....	18 Nov., 1908	34-505	trace.	350	trace.	7-715	.....	absent.	.....	trace.	1-736	44-306	6329	B ₂ O ₃ absent.
Morton's Plains 750ft. (P).....	19 Jan., 1898	29-457	"	1-299	720	35-956	.....	.....	.....	560	1-456	69-443	9921	
" 1,658-1,668ft. (P).....	19 Jan., 1898	34-198	"	650	trace.	6-962	.....	.....	.....	trace.	1-764	43-574	6225	
" (P).....	1 Oct., 1909	33-260	"	349	"	7-304	.....	absent.	.....	140	1-456	42-509	6071	B ₂ O ₃ trace.
Mount Tenandra No. 1 (P).....	20 July, 1906	5-839	1-387	6-150	1-974	1-997	.....	1-262	.....	728	1-764	21-101	3013	B ₂ O ₃ absent.
" No. 2 (P).....	28 Nov., 1906	5-757	842	4-100	1-869	2-735	.....	absent.	.....	224	1-330	16-857	2406	" "
Muckerawa, No. 1 (I.L.).....	18 Dec., 1905	41-148	trace.	312	079	7-667	.....	.....	.....	trace.	1-302	50-508	7215	
" No. 2 (P).....	20 April, 1909	36-854	"	399	127	7-555	.....	absent.	.....	"	1-792	46-727	6675	B ₂ O ₃ a trace.
Mulgany (G).....	26 Nov., 1895	37-599	2-370	1-149	127	8-788	.....	.....	.....	"	1-680	51-713	7387	
" (G).....	7 July, 1911	31-507	trace.	1-125	trace.	18-564	.....	absent.	.....	"	1-680	52-876	7554	B ₂ O ₃ trace. Temp. 92° F.
Multagoona No. 1 (P).....	24 Nov., 1909	25-168	"	649	"	7-920	.....	"	.....	196	1-484	35-417	5058	" "
" No. 2 (P).....	19 Jan., 1909	30-954	"	1-149	084	6-573	.....	"	.....	112	1-120	39-992	5713	B ₂ O ₃ a minute trace.
Mumblebone (G).....	6 Aug., 1907	32-588	965	799	169	5-660	.....	"	.....	trace.	1-112	41-293	5898	B ₂ O ₃ a trace.
" (P).....	26 July, 1907	34-259	trace.	399	148	4-747	.....	"	.....	084	1-050	40-687	5812	" "
Mundadoo (P).....	24 Jan., 1907	48-890	672	875	656	5-866	.....	"	.....	154	1-176	58-289	8326	" "
Mungerie (P).....	19 May, 1911	25-808	trace.	875	212	3-084	.....	"	.....	traces	1-064	31-043	4434	" " Temp. 80½° F.
Mungie Bundie (P).....	14 Mar., 1906	35-503	"	450	200	6-733	.....	"	.....	140	1-540	44-566	6366	" "
Mungrabambone (I.L.).....	17 Jan., 1906	43-182	109	675	220	6-002	.....	trace.	.....	trace.	2-016	52-205	7456	
" (I.L.).....	12 April, 1906	43-195	trace.	775	199	6-026	.....	"	.....	"	1-666	51-861	7407	
Mungyer (G).....	4 Nov., 1907	52-893	"	300	084	8-091	.....	absent.	.....	"	1-624	62-992	8999	B ₂ O ₃ a trace.
" (G).....	22 Sept., 1911	41-072	"	1-050	275	6-215	.....	"	.....	"	1-540	50-152	7164	" " Temp. 116° F.
Munna Munna (G).....	11 Jan., 1906	51-995	"	575	210	6-219	.....	"	.....	"	1-512	60-962	8707	
Nardoo (P).....	19 Nov., 1909	17-140	2-368	6-545	1-695	3-823	.....	1-603	.....	140	1-400	34-714	4958	B ₂ O ₃ a minute trace.
Narrabri (G).....	26 Mar., 1907	670-851	trace.	3-349	5-742	86-744	.....	absent.	.....	280	1-820	768-786	10-9826	A strong alkaline water. B ₂ O ₃ present.
Narraway (I.L.).....	25 July, 1905	33-977	256	575	211	2-596	.....	.....	.....	trace.	1-498	39-113	5585	
" (I.L.).....	22 Mar., 1909	33-032	trace.	800	trace.	2-696	.....	absent.	.....	"	1-708	38-236	5462	B ₂ O ₃ a trace.
Native Dog (G).....	12 Nov., 1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45-108	6444	
" (G).....	13 Feb., 1907	36-591	trace.	700	252	6-666	.....	absent.	.....	168	1-414	45-791	6541	B ₂ O ₃ absent.
Neargo (G).....	28 Dec., 1906	42-719	"	785	127	6-299	.....	"	.....	trace.	2-408	52-338	7475	
Nebea (P).....	9 April, 1906	8-727	3-426	5-798	3-475	4-656	.....	2-729	.....	"	1-204	30-015	4285	
Nedgera (G).....	9 Oct., 1905	27-066	667	1-612	540	1-574	.....	314	.....	"	1-183	32-956	4708	
" (G).....	22 Mar., 1907	26-701	462	1-075	345	1-777	.....	386	.....	070	1-498	32-314	4615	B ₂ O ₃ a minute trace.
Nelgowrie (P).....	19 Sept., 1906	20-830	1-242	1-499	741	1-735	.....	715	.....	084	980	27-826	3973	
Nevertire (G).....	7 May, 1896	.....	.....	.....	.....	.....	.....	.....	.....	.....	119-564	1-7080	.....
Ninety-one Mile (G).....	31 Mar., 1904	49-490	trace.	825	trace	11-930	.....	.....	.....	126	861	63-232	9033	
Nocoleche No. 1 (P).....	7 Dec., 1910	5-175	absent.	7-799	540	137-088	.....	absent.	.....	trace.	1-456	152-058	2-1725	B ₂ O ₃ a trace. Tempera- ture 94° F.
" No. 3 (P).....	19 Jan., 1911	36-831	trace.	1-700	339	23-537	.....	"	.....	"	1-120	63-527	9074	B ₂ O ₃ strong trace. Tem- perature 108° F.
" No. 4 (P).....	19 Jan., 1911	5-098	"	14-000	1-737	186-573	.....	"	.....	"	1-344	208-752	2-9821	B ₂ O ₃ absent. Temp. 98° F.
" No. 5 (P).....	20 Dec., 1910	6-655	"	10-549	974	173-730	.....	trace.	.....	084	1-230	193-222	2-7603	B ₂ O ₃ a trace. " 101° F.
" No. 6, 1,215 ft., under construction (P).....	8 Nov., 1911	34-901	"	2-150	318	35-117	.....	absent.	.....	traces.	1-456	73-942	0563	B ₂ O ₃ trace " 105° F.
" No. 6, 1,383 ft. do (P).....	8 Jan., 1911	35-671	"	2-050	318	28-948	.....	"	.....	"	980	67-967	9709	" " " 105° F.
Noonbah (I.L.).....	7 June, 1906	33-025	"	800	126	2-328	.....	absent.	.....	trace.	1-498	37-777	5395	
" (Newman's) (P).....	1 Jan., 1906	51-128	"	500	168	7-418	.....	trace.	.....	084	1-050	60-348	8620	
Nowley (G).....	29 Dec., 1911	44-052	"	1-100	424	6-397	.....	absent.	.....	traces.	1-456	53-429	7633	B ₂ O ₃ faint trace. Tempe- rature 104° F.
Nullawa (P).....	7 April, 1909	40-265	"	300	trace.	6-923	.....	"	.....	"	2-156	49-644	7092	B ₂ O ₃ a trace.
Nulty No. 1 (P).....	3 May, 1907	25-282	"	1-050	252	10-096	.....	"	.....	"	1-176	37-856	5407	" "
" No. 2 (P).....	24 July, 1909	27-257	"	1-049	084	21-422	.....	"	.....	112	1-736	51-660	7379	B ₂ O ₃ a strong trace.

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—continued.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na ₂ CO ₃).	Potassium Carbonate (K ₂ CO ₃).	Calcium Carbonate (CaCO ₃).	Magnesium Carbonate (MgCO ₃).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride (MgCl ₂).	Sodium Sulphate (Na ₂ SO ₄).	Potassium Sulphate (K ₂ SO ₄).	Iron Oxide and Alumina (Fe ₂ O ₃ and Al ₂ O ₃).	Silica (SiO ₂).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks.
Nyngan Experimental Farm (G)....	24 June, 1910	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1752.352	25.0336	
Old Gnomery (G).....	10 Mar., 1904	34.834	.275	.450	.084	7.331	.....	.....	.....	.....	trace.	1.932	44.906	.6415	
Opera (G).....	.....	.....	.....	8.190	.....	278.382	12.274	6.580	5.838	.....	.....	.996	312.260	4.4608	
Osaca (G).....	2 Oct., 1895	56.508	2.437	.899	.699	11.368	.....	.....	.....	.....	trace.	1.596	73.507	1.0501	
Ottendorf (I.L.).....	6 Mar., 1906	51.407	trace.	.875	.199	20.679	.....	.....	absent.	.....	.....	1.274	74.434	1.0633	
" (I.L.).....	4 June, 1907	52.999	"	1.000	.252	20.406	.....	.....	"	.....	.112	1.260	76.029	1.0861	B ₂ O ₃ a trace.
Pagan Creek at 2,000 ft. under construction (G)	20 Mar., 1912	60.773	"	.750	.212	20.015	.....	.....	.....	.....	trace.	1.260	83.160	1.1880	" " Temp. 108 F.
Parragundy (G).....	3 April, 1905	31.991	"	.800	.285	7.621	.....	.....	.....	.....	"	1.456	42.153	.6022	
Paldrumata (G).....	6 Jan., 1898	19.750	"	6.100	8.897	321.300	.....	.....	.....	.....	.420	1.176	357.643	5.1092	
Pera No. 1 (G).....	12 Feb., 1895	33.118	1.225	.849	.402	7.600	.....	.....	.....	.....	.252	1.064	45.076	.6439	
" No. 1 (G).....	18 Dec., 1906	33.725	trace.	1.375	.273	17.781	.....	.....	absent.	.....	.112	1.232	54.498	.7785	B ₂ O ₃ a trace.
" No. 2 (G).....	18 " 1906	35.107	"	1.300	.189	12.140	.....	.....	"	.....	trace.	1.484	50.220	.7173	" "
Pillicawarrina (I.L.).....	31 May, 1905	40.433	.079	.650	.233	4.188	.....	.....	.....	.....	"	1.218	46.081	.6686	
Pilliga (G).....	10 Mar., 1904	40.935	.497	.550	.285	7.532	.....	.....	.....	.....	"	1.190	50.989	.7284	
Poison Point (G).....	4 " 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	296.632	4.2376	
Polly Brewon No. 1 (I.L.).....	7 " 1906	40.716	.103	.625	.147	7.589	.....	.....	absent.	.....	trace.	1.876	51.056	.7292	
" No. 2, 1,359 ft. (I.L.).....	.....	42.036	"	.375	.201	7.082	.....	.....	"	.....	"	1.400	51.094	.7299	B ₂ O ₃ trace. Temp. 104° F.
Quabothoo (I.L.).....	12 Jan., 1906	49.406	.334	.687	.084	7.269	.....	.....	"	.....	"	1.288	59.068	.8439	
Quambone No. 1 (P).....	17 May, 1901	40.145	trace.	.599	.317	7.099	.....	.....	"	.....	"	1.260	49.420	.7060	
" No. 1 (P).....	8 Aug., 1906	41.064	"	.600	.252	7.315	.....	.....	absent.	.....	"	1.288	50.519	.7216	
" No. 1, being deepened 1,619 feet (P).	26 " 1910	33.703	.247	1.100	.165	2.967	.....	.....	.102	.....	"	1.540	39.824	.5687	B ₂ O ₃ absent; strontia and lithia a minute trace.
" No. 1, being deepened 1,760 feet (P).	26 " 1910	27.776	.502	1.050	.252	2.008	.....	.....	.443	.....	.056	1.708	33.795	.4827	B ₂ O ₃ absent; strontia and lithia a trace.
" No. 1, 2,135 feet, final depth (P).	26 " 1910	21.624	1.260	3.000	.987	1.438	.....	.....	.477	.....	trace.	1.624	30.410	.4343	B ₂ O ₃ absent; strontia and lithia a trace.
" No. 2 (P).....	9 July, 1901	42.638	trace.	.475	trace.	7.201	.....	.....	.....	.....	"	.924	51.238	.7319	
" No. 2 (P).....	10 Aug., 1906	50.494	"	.800	.147	14.197	.....	.....	absent.	.....	"	1.316	66.954	.9564	
" No. 2, deepened (P).....	19 June, 1911	15.953	2.592	2.000	1.589	1.942	.....	.....	.409	.....	2.100	.280	26.865	.3838	B ₂ O ₃ a trace. 102° F.
" No. 3 (P).....	14 Aug., 1906	28.280	.493	1.800	.399	2.099	.....	.....	.504	.....	trace.	1.596	35.171	.5022	
" No. 4 (I.L.).....	9 Oct., 1905	39.246	.183	.650	.286	6.927	.....	.....	.575	.....	"	1.435	49.302	.7043	
" No. 4 (I.L.).....	4 June, 1907	38.113	.372	1.100	.210	6.950	.....	.....	.716	.....	.140	1.736	49.337	.7047	B ₂ O ₃ a trace.
" No. 5 (P).....	19 " 1911	38.737	trace.	.850	trace.	3.998	.....	.....	.426	.....	traces.	1.260	45.271	.6467	" " Temp. 98½° F.
Quondong (I.L.).....	30 July, 1906	41.734	"	.599	.060	4.839	.....	.....	absent.	.....	"	1.260	48.492	.6926	
Regenbah (P).....	21 Nov., 1906	28.003	.250	1.150	.273	1.891	.....	.....	"	.....	.112	1.680	33.359	.4764	B ₂ O ₃ absent.
Roma (P).....	8 Jan., 1909	41.280	trace.	.700	trace.	5.466	.....	.....	"	.....	trace.	1.456	48.902	.6986	" "
Rowena (G).....	13 April, 1905	46.347	"	.825	.233	7.027	.....	.....	.....	.....	"	1.820	56.252	.8036	
Salisbury Downs No. 1 (P).....	29 Aug., 1911	84.595	"	3.000	.784	61.187	.....	.....	absent.	.....	"	1.540	151.106	2.1586	B ₂ O ₃ strong trace. Temperature 130° F.
Sandy Creek (G).....	30 Jan., 1896	.....	.....	.....	5.185	108.914	3.886	6.687	28.118	(Mg SO ₄) 6.477	.280	.558	160.135	2.2876	
Sandy Camp (I.L.).....	9 Oct., 1905	40.853	.462	.878	.095	6.675	.....	.....	absent.	.....	trace.	.722	49.685	.7097	
Santa Paula (P).....	10 Sept., 1906	41.246	trace.	.850	trace.	9.312	.....	.....	"	.....	"	1.344	52.752	.7535	B ₂ O ₃ a faint trace.
Sherwood (G).....	1 " 1911	37.788	"	1.000	"	7.711	.....	.....	"	.....	"	2.100	48.599	.6942	" " Temperature 125° F.
Sibraas (G).....	21 Nov., 1893	24.951	8.289	2.799	"	30.321	.....	.....	.....	.....	.308	2.240	70.112	1.0016	
" (G).....	2 May, 1907	28.976	trace.	2.367	.227	38.353	.....	.....	absent.	.....	trace.	1.992	71.915	1.0271	B ₂ O ₃ a strong trace.
Silendale (Newman's) (P).....	27 June, 1906	20.999	"	1.000	.315	1.711	.....	.....	.836	.....	"	1.526	26.387	.3768	

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—continued.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na ₂ CO ₃).	Potassium Carbonate (K ₂ CO ₃).	Calcium Carbonate (CaCO ₃).	Magnesium Carbonate (MgCO ₃).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride (MgCl ₂).	Sodium Sulphate (Na ₂ SO ₄).	Potassium Sulphate (K ₂ SO ₄).	Iron Oxide and Alumina (Fe ₂ O ₃ and Al ₂ O ₃).	Silica (SiO ₂).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks.
Warren (C.T.W.S.)	24 Dec., 1897	38.34	trace.	1.21	.26	7.23					.19	1.37	48.60	.6940	
" Downs (P)	7 April, 1908	44.021	"	.600	trace.	6.473			absent.		trace.	1.708	52.802	.7543	
Waroo (G)	18 Dec., 1893	19.211	4.558	.599	.614	8.404					.252	1.288	35.794	.5113	
" (G)	4 May, 1911	22.428	1.275	.800	.615	7.997			trace.		traces.	1.176	34.291	.4898	B ₂ O ₃ faint trace. Temperature 78° F.
Weemabung (P)	— 1898	34.861	trace.	.599	.338	3.857					"	1.456	41.111	.5873	
" (P)	10 Sept., 1906	35.280	"	.849	.275	3.674			absent.		"	1.400	41.478	.5924	
Weetaliba (G)	3 Dec., 1909	8.276	4.210	4.846	3.030	3.583			1.603		.084	1.232	26.864	.3837	B ₂ O ₃ absent.
Weetalibah (McAlary's) (P)	10 Jan., 1906	50.866	1.393	.949	.466	2.956			1.721		.112	1.876	60.339	.8618	
" (P)	19 April, 1907	49.137	1.153	1.325	.651	3.168			2.762		.168	1.512	59.876	.8551	B ₂ O ₃ a mere trace.
Weilmoringle No. 1 (P)	5 Oct., 1909	34.244	trace.	1.124	.105	13.946			absent.		.140	1.890	51.449	.7349	B ₂ O ₃ a trace.
" No. 2 (P)*	7 " 1908	28.950	"	.599	.317	8.140			"		trace.	1.400	39.406	.5629*	See note.
" No. 3 (Yamba) (P)	10 Nov., 1909	41.081	"	1.998	.317	23.647			"		.196	1.932	69.171	.9881	
Welbondonga (G)	20 Oct., 1908	30.960	"	.550	trace.	7.316			.511		trace.	1.932	41.269	.5895	B ₂ O ₃ absent.
Wilby Wilby (G)	4 May, 1899	33.745	"	.224	.084	7.441					"	2.688	44.182	.6311	
" (G)	20 Feb., 1905	35.638	"	.487	trace.	7.246					"	1.505	44.876	.6410	
Willie (G)	10 Jan., 1906	43.146	"	.549	.275	6.642			absent.		"	1.456	52.068	.7438	
" (I.L.)	11 " 1906	40.653	"	.700	.189	5.249			"		"	1.232	48.023	.6859	
Willow Camp (Gandymungydell) (I.L.)	15 Mar., 1907	34.890	"	.550	trace.	2.666			.907		"	1.400	40.413	.5722	B ₂ O ₃ absent.
Wingadee No. 1 (P)	15 Aug., 1906	56.124	"	.600	.126	9.061	(FeCO ₃) .812		absent.			1.372	68.095	.9727	
" No. 1 (P)	15 April, 1907	55.182	"	.850	.252	9.344			"		trace.	1.568	67.196	.9599	
" No. 2 (P)	18 Aug., 1906	46.753	.111	.600	trace.	4.809			.238		.196	1.876	54.583	.7797	
" No. 2 (P)	15 April, 1907	47.231	trace.	.850	.168	4.877			trace.		trace.	1.624	54.750	.7821	B ₂ O ₃ trace.
" No. 2, deepened (P)	9 Nov., 1909	37.839	"	.849	.211	3.697			2.252		.196	1.400	46.444	.6633	" "
" No. 3 (I.L.)	20 Aug., 1906	54.630	"	.600	trace.	11.213			absent.		trace.	1.288	67.731	.9675	
" No. 3 (I.L.)	16 April, 1907	53.558	"	.700	.261	10.669			trace.		"	1.232	66.420	.9488	B ₂ O ₃ absent.
" No. 4 (P)	20 Aug., 1906	47.411	"	.750	.294	7.464			.224		"	1.624	57.767	.8252	
" No. 4 (P)	16 April, 1907	46.037	"	1.100	.336	7.658			.705		"	1.596	57.432	.8204	B ₂ O ₃ a trace.
" No. 4, deepened (P)	16 July, 1909	20.108	3.118	7.400	3.114	4.181			3.037		"	1.568	42.526	.6074	B ₂ O ₃ a minute trace.
" No. 5 (P)	20 Aug., 1907	28.610	1.940	4.600	3.222	3.008			2.830		.224	1.904	46.338	.6618	B ₂ O ₃ absent.
" No. 6 (P)	10 July, 1909	41.673	trace.	.950	.147	4.009			2.046		trace.	1.708	50.533	.7217	
Womboin, No. 1 (I.L.)	21 June, 1907	42.660	"	.450	.219	6.997			absent.		"	1.792	52.118	.7444	" "
" No. 2 (I.L.)	21 " 1907	43.655	.071	.650	.252	6.381			"		.084	1.484	52.577	.7510	" "
" No. 3 (I.L.)	27 " 1907	47.574	trace.	.700	.315	5.743			trace.		.112	1.204	55.648	.7949	" "
Wonbobbie (P)	10 Sept., 1906	39.377	"	.549	.106	3.744			absent.		trace.	.980	44.756	.6392	B ₂ O ₃ a trace.
Woodlands (P)	28 Aug., 1907	10.853	2.838	3.175	1.440	1.255			.511		.084	1.204	21.360	.3050	B ₂ O ₃ absent.
Woolabra (G)	27 May, 1906	31.572	3.259	.299	.190	6.049					.308	2.492	44.169	.6308	
Woolsour (P)	10 April, 1907	17.106	1.732	7.450	1.218	2.028			1.534		.196	1.764	33.028	.4716	B ₂ O ₃ absent.
Yamaramie (P)	21 May, 1912												404.600	5.7800	
Yantabulla No. 1 (G)	21 Nov., 1893	17.369	6.615	1.549	.930	9.557					trace.	1.456	39.996	.5713	
Yarraldool (P)	8 Dec., 1908	37.094	trace.	.500	trace.	7.105			absent.		"	1.974	46.673	.6667	
Youndah (G)	20 Oct., 1903	41.397	absent.	.300	"	7.211					"	1.260	50.168	.7167	
Youngerina (G)	12 Nov., 1891												32.984	.4712	
" (G)	5 May, 1911	22.8.5	trace.	1.500	.445	7.997			absent.		trace.	1.266	34.017	.4858	B ₂ O ₃ trace. Temp. 80° F.
Yowie at 91 ft. (under construction) (G)	31 Jan., 1912												1576.624	22.5232	
" at 910 ft. " (G)	29 April, 1912	44.694	trace.	1.000	.318	33.129					trace.	2.520	81.900	1.1700	B ₂ O ₃ trace. Temp. 86° F.
" at 1,072 ft. " (G)	13 May, 1912	44.186	"	1.000	.212	33.129						1.120	79.800	1.1400	" " " 87° F.
Yuma (P)	10 Jan., 1906	32.513	"	.749	trace.	3.811			1.643		.112	1.960	40.788	.5822	
" (Deepened) (P)	26 Aug., 1910	26.795	2.328	3.350	2.351	3.538			1.706		.336	1.568	42.172	.6021	B ₂ O ₃ absent; strontia and lithia a trace.

* NOTE.—Strong trace of P₂O₅, B₂O₃, and organic matter detected. Free ammonia, 0.064 parts in 100,000 parts. Albuminoid ammonia, 0.006 parts in 100,000 parts. Oxygen absorbed in 15 minutes, 0.0076. Oxygen absorbed in 4 hours, .0820.

Analyses compiled by G. Peterson, Chemical Laboratory, Clyde.

SYDNEY HARBOUR BRIDGE AND CITY TRANSIT.

When publishing the Regrading in January last, the Public Service Board recommended that if the Sydney Harbour Bridge was approved by Parliament, Mr. Bradfield should be selected to design and construct it.

Acting on this recommendation, the Honorable the Minister decided that I was to be set exclusively apart and supply him with certain information with regard to the Bridge submitted to Parliament, and of my own proposal for a bridge to Milson's Point.

Mr. David Hay, M. Inst. C.E., was requested by the Government to visit Sydney and submit a report on the question of improving the means of passenger traffic in the City and Suburbs of Sydney, including a connection with North Sydney. When Mr. Hay arrived, I was instructed by the Minister to supply him with all information at my disposal to enable Mr. Hay to consider the question.

Subsequently, on 25th June, the Honorable the Minister gave instructions that I was to be provided with a staff, so that once Parliament had given the necessary authority to carry out the Sydney Harbour Bridge and Sydney and Suburban Electric Railways, they could be undertaken as quickly as possible.

The Minister also instructed the Under-Secretary "to make such arrangements as are required with the Public Service Board, and to see that Mr. Bradfield is provided with such assistance as he may deem necessary to give effect to these instructions."

The Public Service Board then appointed me as Engineer-in-charge of the new branch, Sydney Harbour Bridge and City Transit, as from the 1st July last.

Several members of the Staff have been appointed ; other appointments and transfers are standing over pending the Report of the Public Works Committee.

The surveys for the Sydney Harbour Bridge and the western loop of the City Railway are in hand under Messrs. Kennedy and Lloyd.

J. J. C. BRADFIELD, M.E., M. Inst. C.E.,

Engineer-in-charge, Sydney Harbour Bridge and City Transit.

The Director-General.

22/11/12.

Report of the Government Land Valuer.

I HAVE the honor to submit the following abbreviated report of the work that has engaged my attention during the past year, which has included, not only the projects of the Public Works Department, but the resumptions for parks and foreshores of the Department of Lands and a large number of purchases for additions to the Public Schools for the Department of Education. In conjunction with the Chairman of the Closer Settlement Advisory Board, settlements have been come to for about 175,000 acres of land on the Murrumbidgee, resumed for irrigation purposes. These comprise a large number of holdings of a very diversified character, and it is satisfactory to announce that, with the exception of two, or perhaps three, cases which will be submitted to the Appeal Court, the whole of the cases have been amicably agreed to.

The near approach of the storage of water at Burriajuck, by the junction of the two sides of the river, by a dam, has necessitated the acquirement of the holdings of several of the owners abutting upon the Goodradigbee and Murrumbidgee Rivers, and within the coming year it is anticipated that most of the affected properties will have been acquired.

Three sections of the North Coast Railway have been resumed, and, as the holdings traversed for a long distance comprise small farms, a great number of claims have been received for adjustment. Taken as a whole, the general work of the branch is well in hand, and the staff remains as at last year.

Notifications of resumption have been issued in respect of the following works:—

Tramways.—Castlereagh-street to Flinders-street, Carrington, Marrickville to Undercliffe, Military-road to Cremorne Point, Rookwood to Bankstown, Sutherland to Cronulla, The Spit to Manly, Wallsend to Speer's Point, Narrabeen.

Railways.—Cooma to Bombala, Lockhart to Clear Hills, Gloucester to Taree.

Bores.—Gilgoin, Meroe, Tooloora, Trialgara.

Reservoirs.—Burriajuck, Chatswood, Pott's Hill.

Public Watering Places.—Deep Creek.

Water Supply.—Broken Hill, Grafton, Katoomba, Peak Hill, Wollongong, Sydney.

Sewerage.—Botany Districts, Leichhardt.

Irrigation.—Murrumbidgee Northern.

Weirs.—Algdgerie Creek.

Drainage.—Ashfield, Casino, Chatswood, North Shore, Rookwood.

Dredging.—Richmond River, Tweed River.

Brickworks.—Botany State Sand Lime.

Dock.—Cundletown.

Improvements.—Cook's River, Tempe.

Quarries.—Kiama State Metal, Port Kembla.

Hospital.—North Shore.

Experimental Farm.—Temora.

Police Stations.—Woy Woy, Wauchope.

Lands Purchased.

Railways.—Taree to Wauchope.

Drainage.—Auburn.

Police Stations.—Casino, Merewether, Rooty Hill, Haberfield, Yass, West Wallsend, Tea Gardens.

Hunter River Water Board Offices.—Newcastle.

Tramway.—Wallsend to West Wallsend.

Improvements.—Cook's River.

Railway.—Cooma to Bombala.

Irrigation.—North Yanco.

State Children's Home.—Mittagong.

Timber Depôt.—Uhr's Point.

Court-house.—Stockinbingal.

Railways and Tramways Proclaimed and Confirmed.

Railways.—Glenreagh to South Grafton, Tullamore to Tottenham.

Tramways.—Leichhardt Terminus to Balmain; Darley Road, Randwick, to Little Coogee, Part 1; Brookvale to Narrabeen, Part 1; Wallsend to Speer's Point, Lake Macquarie; Marrickville to Undercliffe; Brookvale to Narrabeen, Part 2; Rookwood to Bankstown.

One hundred and ninety-eight claims standing over from previous years have been finally settled. Three hundred and seventy-three valuations in various parts of the State have been made, and five hundred and forty-five (545) cases were advanced to a stage for valuation.

EDWARD J. SIEVERS,

Government Land Valuer.

The Director-General of Public Works.

Newcastle District.

I have the honour to forward herewith *annual report* for year ending 30th June, 1912, as follows:—

Harbour Works.—Northern Breakwater Extension.—The 420 feet extension of the Northern Breakwater authorised by Parliament was completed on the 1st March last, the wall being finished off with a round head 60 feet in diameter, making the completed length of the Northern Breakwater 3,400 feet. The length added during the year was 91 feet, involving the use of 39,083 tons of stone at a cost of £12,882, being equal to 6s. 7d. per ton, the depth of water at the tiphead being 34 feet. For the past two months the "Jupiter" has been absent from the entrance with a view of determining whether the Northern Breakwater is proving effective and meeting anticipations by minimising the inflow of sand from the Oyster Bank on Stockton side. So far, no shoaling up has been noticed, but close soundings will be taken when the weather moderates.

Southern Breakwater.—During the year no repairs were undertaken, but the Public Works Committee having recommended the extension of the southern wall by 460 feet, arrangements have been made for obtaining from England the necessary material for additional stone waggons, so as to allow of the work being pushed rapidly forward when the authorising Bill has been passed by Parliament, and the necessary funds made available.

Entrance Channel.—The "Jupiter" has removed 493,300 tons of sand from the entrance, and the clam dredges, "Nu" and "Omega," have removed 7,450 tons of boulders and shingle, whilst 182 tons of rock, which has been blasted from a rock patch on line 28, has also been removed. The ladder dredge "Hunter," in the early part of the year, was for a short time employed at the entrance, and lifted 1,072 tons of boulders from the southern side of the channel between Stony Point and Nobby's. A depth of 23 feet at low water spring tides on the Bar has been maintained throughout the year, and the channel widened to 700 feet for its general length, although narrowing to 550 feet opposite the inner green lights.

Waratah Quarry.—The total output of the quarry was 50,968 tons, 39,083 tons being used on the Northern Breakwater; 8,994 tons on the Stockton training walls, and 2,891 tons were used on the Walsh Island training wall.

Submarine Rock Excavation.—The work of removing the rock opposite Nos. 4 and 5 cranes has been carried out over an area of 27,470 square feet, which was drilled and blasted by the "Omicron" at a cost of £2,000. The dredge, "Hunter," has removed 3,350 tons of the rock from this place, leaving a depth of 22 ft. 6 in. over an area of 135 feet x 180 feet.

10,800 square feet of rock off South guide wall has also been drilled and blasted to a depth of 25 feet by the rock drill, "Cliona," at a cost of £13,114, whilst 887 tons of the rock so blasted was lifted by the clam dredge, "Omega," over an area of 7,100 square feet.

The dredging work carried out within the district has been as follows:—

Shoal.	Dredge Employed.	Length, Breadth, and Depth on Completion.	Tons.	Remarks.
At Entrance.....	Jupiter .....	.....	493,500	.....
"	Nu .....	.....	4,030	Boulders and shingle.
" .....	" .....	.....	15	Blasted rock.
"	Omega .....	.....	3,420	Boulders and shingle.
" .....	" .....	.....	167	Blasted rock.
"	Hunter .....	.....	1,072	Boulders.
Stony Point	Omega .....	.....	975	"
Opposite South Wave Trap	Omega .....	.....	887	Blasted rock.
Basin Entrance	Newcastle	1,050 feet x 200 feet x 25 feet	49,950	Mud, sand, and rock.
"	"	250 " x 200 " x 25 "	11,950	.....
"	Hunter	880 " x 200 " x 25 "	14,420	Mud and rock.
Basin	Glaucus	600 " x 200 " x 30 " to 38 feet	120,500	Mud and sand.
"	"	600 " x 200 " x 30 " to 38 "	67,800	"
"	"	750 " x 250 " x 30 " to 38 "	103,000	Mud, sand, and ballast.
"	"	375 " x 300 " x 30 " to 38 "	76,150	Mud and sand.
"	"	300 " x 100 " x 30 " to 38 "	17,450	"
"	"	125 " x 100 " x 30 " to 38 "	16,000	"
"	"	200 " x 200 " x 30 " to 38 "	42,100	"
"	"	830 " x 170 " x 30 " to 38 "	95,050	"
"	Upsilon	70 " x 40 " x 30 "	1,000	Mud and debris.
Bull Beacon Channel	Newcastle	1,240 " x 200 " x 28 "	188,390	Sand and mud.
"	Samson	1,200 " x 200 " x 33 "	123,930	Mud and sand.
"	"	900 " x 200 " x 33 "	121,020	"
"	Glaucus	25 " x 200 " x 30 " to 38 feet	9,950	"
"	Hunter	340 " x 200 " x 25 "	22,736	"
Stockton Wharf	Nu	230 " x 40 " x 25 " to 30 feet	7,780	Mud and debris.
"	Omega	35 " x 30 " x 25 "	250	"
"	"	155 " x 40 " x 30 "	4,380	Mud and sand.
"	Upsilon	107 " x 40 " x 27 "	3,350	Mud and timber.
"	Beta	610 " x 25 " x 20 " to 25 feet	9,315	Timber, mud, and loose rock.
"	"	115 " x 30 " x 25 "	285	Timber, mud, and loose rock.
"	Hunter	150 " x 250 " x 25 "	30,400	Mud and sand.
Nos. 2 and 3 Buoys.....	Glaucus	600 feet x 300 feet x 30 to 35 feet	96,000	"
"	"	830 " x 170 " x 30 to 38 "	101,600	Mud and sand.
No. 4 Buoy	Jupiter .....	.....	44,250	"
Stockton Jetties	Samson .....	.....	60,000	"
Dyke Wharf.....	Nu	333 " x 250 " x 33 feet	35,440	Mud, sand, and stone.
No. 1 Crane	Hunter	100 " x 40 " x 12 " 6 inches	610	Ballast and mud.
No. 5 Crane	"	135 " x 180 " x 22 " 6 "	3,350	Sand and rock.
Nos. 17 and 18 Ballast	" .....	.....	.....	.....
Jetties	"	680 " x 200 " x 20 "	48,580	Sand and stone.
Timber Wharf	Beta	200 " x 250 " x 25 "	20,130	Mud and sand.

Shoal.	Dredge Employed.	Length, Breadth, and Depth on Completion.	Tons.	Remarks.
King's Wharf	Hunter	192 ,, x 25 ,, x 20 ,, to 25 feet	115	Timber, mud, and rock.
Walsh Island, South-west Channel	Nu	100 ,, x 180 ,, x 20 ,,	10,050	Mud and sand.
Warland's Slip	Upsilon	470 ,, x 30 ,, x 12 ,,	5,150	Mud and debris.
Morpeth Turning Basin	,,	250 ,, radius x 12 ,, deep	14,000	Mud, coarse sand, stiff clay, and loose rock.
Morpeth Channel	,,	930 ,, x 80 ,, x 14 ,, }	15,930	
,,	,,	330 ,, x 40 ,, x 14 ,, }		
Total			2,096,427	

The "Castor" has been stationed on the western side of Walsh Island, and has been cutting open channel and pumping ashore on Walsh Island the dredge material from the punts which have been unable to proceed to sea on account of rough weather, the "Castor" having pumped ashore 626,700 tons. Total cost of dredging Port Hunter, £58,514 13s. 9d.

At Port Stephens the following dredging has been carried out :—

Shoal.	Dredge Employed.	Length, Breadth and Depth on Completion.	Tons.	Remarks.
Salt Ash	Delta	350 feet x 50 feet x 8 feet	4,600	
Do	,,	650 ,, x 60 ,, x 8 ,,	15,600	Stiff mud and weeds.
Do	,,	200 ,, x 100 ,, x 12 ,,	14,103	,, "
Teligherry Creek, No. 3 cut	,,	390 ,, x 50 ,, x 10 ,,	5,060	,, "
Do No. 4 cut	,,	870 ,, x 50 ,, x 10 ,,	10,875	,, "
Do No. 5 cut	,,	510 ,, x 50 ,, x 10 ,,	6,375	,, "
Reclaimed swamp, Windy Wappa	,,	Pumping ashore	20,375	Sand and shell.
Total			74,988 ;	Cost, £1,721 18s. 8d.

Wharves, &c., Repaired.—Repairs to King's Wharf at Pilot Station (in progress), repairs to Hereford-street Wharf, repairs to jetty at Wave Trap, repairs to Market Wharf, repairs to Dyke Wharf, repairs to basin ballast jetties, repairs to Carrington ballast jetties, repairs to Walsh Island ballast jetties, repairs to Newcastle and Hunter River Co.'s Wharf, repairs to Lee Wharf, repairs to bridge over boat harbour, repairs to Cemetery Wharf, repairs to Nos. 1, 2, 3, 7, 11, 14, and 18 punts, repairs to pile machine "Topsy," repairs to naval boatshed, repairs to beacons Hunter River channel, repairs to outer green light beacon, repairs to ferry pontoons, repair to powder hulk, lighters, and launch.

The old coal bridge over Throsby's Creek, in line with Cowper-street, Carrington, has been provided with a new superstructure for vehicular, pedestrian, and tramway traffic, between Wickham and Carrington, and when this tramway connection between Newcastle and Carrington is open for traffic in the course of a few weeks, it is anticipated that much of the opposition to the removal of the old Carrington Bridge will be removed.

New Works.—New pile-driving machine for new Carrington Wharf; Customs Office, King's Wharf; lavatory, King's Wharf; ferry landing, No. 13 crane; additions to the Newcastle and Hunter River Co.'s shed; store at Dyke Wharf; beacons, Wyong River; leading light beacon, Wolfe-street; jetty and examining sheds for Explosives Department; tramway to Dyke shop; re-erection of dredge store.

Cement Testing.—During the year samples have been taken from 9,360 casks of cement and forwarded to Sydney for testing, whilst 10,725 casks have been issued for use on the various public works in this district, and to the north of same.

Sewerage and Drainage Works—Surveys by Sewerage Staff.—During the year the following matters were dealt with:—Stormwater drainage of Hamilton and Adamstown; stormwater drainage of Plattsburg and Wallsend; scheme for widening Hannell-street, Wickham, and diversion of traffic by overhead bridge to do away with the level crossing; Carrington wharfage; improvements at Lambton Park; Hamilton sewerage reticulation, second division; Hamilton sewerage reticulation, third division; Adamstown sewerage reticulation; extension of Adamstown main sewer; Adamstown sewerage, submains; Coorumbong-road branch and Chatham-street branch; Chaucer-street drain, Hamilton; recreation reserve, West Maitland; Newcastle dock site; additional leading light, Newcastle Harbour; site for new offices, Hunter-street, West, Newcastle; site for West Wallsend Police Station.

Sewerage—First Section of Waratah Main Sewer, Contract No. 801.—This work was started on 9th February, 1909, and completed on 22nd July, 1911, and consists of $1\frac{3}{4}$ mile of brick and concrete sewer, 4 ft. 9 in. x 3 ft. 9 in., 3 ft. 9 in. x 2 ft. 6 in. brick and concrete, and 3 ft. 6 in. x 2 ft. 4 in. monier sewer.

Second Section of Waratah Main Sewer, Contract No. 1,000.—This work was started on 25th March, 1912, and consists of 28 chains of 3 ft. 6 in. x 2 ft. 4 in. concrete sewer, 18 chains of 21-inch monier pipes, 38 chains of 18-inch monier pipes, and 18 chains of 16 inch stoneware pipes, in open trench. The work is being carried out by day labour, and $13\frac{1}{2}$ chains of the 3 ft. 6 in. x 2 ft. 4 in. concrete sewer has been completed, with the exception of rendering, and the provision of manhole covers and steps, whilst 12 chains of 18-inch monier pipes have been placed in position.

Adamstown Main Sewer, Contract No. 837.—This work was started on 13th March, 1911, and consists of 1 mile 27 chains of concrete sewer 3 ft. 6 in. x 2 ft. 4 in., which is in open trench 30 feet deep, and 12 chains of concrete sewer 3 ft. 6 in. x 2 ft. 4 in. in rock tunnel. The work has all been completed, with the exception of some cement rendering, and some brickwork in the tunnel and shafting. It is anticipated that the whole of the work will be completed by the 1st September.

No. 1 Pumping Station and Rising Main, Contract No. 819.—The work in connection with No. 1 pumping station and rising main was started on the 12th June, 1909, and completed on 30th August, 1911, and consists of four concrete storage wells, 39 ft. 3 in. internal diameter, an inlet and pump well, and a brick building over pump well. Also 2-12 chains of brick and concrete sewer, 4 ft. 9 in. x 3 ft. 9 in.; 18-37 chains of concrete sewer, 4 ft. x 2 ft. 8 in.; and 10-92 chains of 24 in. diameter cast-iron pipes for rising main,

Pumping

Pumping Machinery for No. 1 Pumping Station, Contract No. 835.—The pumping machinery for the foregoing station was supplied under a separate contract. The work was started on 3rd January, 1911, and completed on 14th October, 1911. The machinery generally consists of two vertical driven 3 phase 415 volt induction motors, capable of developing 50 B.H.P. each, and two centrifugal pumps vertically driven and direct coupled to motors.

Ventilation of part of Newcastle and part of Wickham, Contract No. 988.—This work was started on 4th August, 1911, and completed on 20th April, 1912, and consists of 1,054 lineal feet of 6-inch stoneware pipes, 72 lineal feet of 9-inch stoneware pipes, seventy-five 6-inch vent shafts, and five 9-inch vent shafts.

Part of Wickham and part of Hamilton Reticulation, Contract No. 822.—This work was started on the 31st July, 1911, and it is anticipated will be completed in October of this year, and consists of 41,740 lineal feet of 6-inch stoneware pipes, 2,436 lineal feet of 9-inch stoneware pipes, 2,772 lineal yards of 6-inch cast-iron pipes, 3,400 lineal yards 9-inch cast-iron pipes, 118 concrete manholes, and 139 ventilating shafts. The work is being carried out in most difficult ground; some of the trenches being 23 feet deep in running sand.

Drainage—Grahamstown and Campeale Swamp Drainage, Contract No. 841.—This work was completed on 8th September, 1911, at a cost of £13,611 15s. 2d. Under the contract, over 11 miles of channel were cut, varying in width from 16 ft. 6 in. to 3 ft. 6 in. on the bottom. Two timber culverts and three concrete water-cushion drops have been constructed. The works have since been transferred over to the Trust constituted under the provisions of the Water and Drainage Act.

Anna Bay Swamp Drainage, Contract No. 958.—This work was completed on 11th July, 1911, at a cost of £1,336 10s. 9d., and the works were subsequently transferred over to the Trust constituted under the provisions of the Water and Drainage Act.

Hinton Swamp Drainage.—A contract is now in progress for the drainage of the Hinton Swamp, which has been let to Mr. D. James for the sum of £2,894. The work up to the time of the recent wet weather was being well pushed forward by the contractor, and on completion will drain a fair area of swamp land.

Wallsend and Plattsburg Stormwater Channel.—The lower end of the Wallsend and Plattsburg stormwater channel has been regraded and enlarged from Ironbark Creek up to the start of the concrete drain, the work having been carried out by day labour at a cost of £1,216.

National Roads, Bridges, and Ferries.—The local control of the national bridges and ferries was transferred to me during the year. The maintenance of the 38 bridges within the district has been carried out at an approximate cost of £1,500. The caretaking of 24 bridges, included in which are 4 opening bridges, has been effected at a cost of £455, which includes the up-keep of the roadway. The repairs to 12 other bridges, screwing up, painting, sheathing of decks, gravel coverings, asphalt of decks, &c., which have all been carried out by day labour, have cost £1,042.

The bridge over Cockfighter Creek at Bulga will be completed within four weeks from date, and will be then open for traffic. The total cost of the structure—for which contract was let at £4,873—it is anticipated, will be completed for £4,715 5s. 2d., this reduction in cost being brought about through the piles not reaching the deep driving of 40 feet as specified.

The maintenance of the national ferries has been carried out at a total cost of £2,905, distributed as follows:—

Hexham Ferry	...	...	...	...	...	...	...	£935
Raymond Terrace Ferry	...	...	...	...	...	...	...	976
Nelson's Plains Ferry	...	...	...	...	...	...	...	834
Hinton Slip, Repairs, &c.	...	...	...	...	...	...	...	160
Relief Punt and Boat Repairs, &c.	...	...	...	...	...	...	...	...
								£2,905

which was some £205 over the estimated amount.

I also attach detailed particulars of the office work, &c., in connection with the national works under Local Government.

PERCY ALLAN,
Chief Engineer for Public Works, Newcastle District.

The Director General for Public Works,

National Work under Local Government.

National Work under Local Government									
Number of papers dealt with	...	...	...	...	...	...	...	341	
" inspections made by Assistant Engineer	...	...	...	...	...	...	...	256	
" estimates prepared	...	...	...	...	...	...	...	40	
" plans prepared	...	...	...	...	...	...	...	45	
" specifications prepared	...	...	...	...	...	...	...	120	
" tenders accepted	...	...	...	...	...	...	...	42	
" Contracts...	...	...	...	...	...	...	...	44	
								£	s. d.
Detail list of works over £200—									
Bridge over Cockfighter Creek...	...	...	...	...	...	...	4,873	0	0
Hinton Swamp Drainage (in hand)	...	...	...	...	...	...	2,894	0	0
								mls.	
Number of vouchers passed for payment	...	...	...	...	...	...	651		
Expenditure for the year 1911-12 ..	...	...	...	...	...	...	9,144	0	0
								mls.	mls.
Number of miles travelled, per rail...	...	...	...	...	6,537	}	9,993		
" " " per road	...	...	...	...	3,456				
								£	s. d.
Amount paid for coaching, per rail...	...	...	...	...	39	}	2 11	82	15 3
" " " per road	43					12 4
Amount received for travelling by bicycle or motor	...	...	...	...	...	...	...	Nil.	

Electrical

Electrical Engineer's Branch.

The Director-General of Public Works.

Sir,

I have the honor to submit the following Report for the year 1911 to 1912.

The work of the Branch has included much in the way of personal consultation and advice in connection with matters arising in other branches, a certain amount of investigation of the value of sundry water powers to the State, the carrying out by day labour or by contract of work for other branches of the Public Works Department and for other Departments, and the usual services have been rendered to the Mines Department.

State Power Supply.

In accordance with instructions received from the Honorable the Minister for Public Works, a scheme has been outlined and a preliminary report furnished on the subject of a systematic supply of power by the Government to the more populated areas of the State to cover existing and future needs, including the operation of mills, factories, &c.; the supply of light, heat, and power for all public and private purposes; the establishment in Australia of the larger electrothermic and electrolytic industries, such as the manufacture of calcium carbide and cyanamide and of caustic soda; and eventually for the complete electrification of the State railways.

The scheme provides for the utilisation jointly of the coal and water power resources of the State by the establishment of power-stations, linked by transmission lines, in each of the important coalfields, and on the rivers which may be depended upon to provide power in sufficiently large quantities to make their development commercially feasible.

In the report it is suggested that a commencement might be made by the establishment of a large power-station at some convenient point on the Southern coalfield, and that this should eventually be linked with stations at Burrinjuck, on the Shoalhaven River, and in the other coalfields. The transmission lines would supply power to all towns along their route or within reasonable distance of them. A comprehensive scheme on such lines would enable power to be provided at a very low price, ranging, according to the character of the load, from $\frac{1}{8}$ d. to $1\frac{1}{2}$ d. per unit.

Investigation of the power of Tumut River, Buddong Falls, Tumberumba Creek, and Tooma River.

In connection with certain applications for concessions, and with a suggestion to use hydro-electric power for the Tumberumba Railway, a preliminary investigation of the power which could be derived from these streams was made in November, 1911.

As a result it appeared that the power which could be delivered continuously within a radius of 100 miles or so, after allowing for all losses, in respect of two of these streams for which certain approximate data were available, would be for Buddong Falls 3,300 H.P. and for Tumberumba Creek 5,000 H.P.

Sufficient data were not available for obtaining an accurate estimate of the power that could be developed from any existing fall in the bed of the two larger rivers, but the figures of 14,000 H.P. continuously for the Tooma River and 18,000 for the Tumut were arrived at as approximations from such incomplete data as could be obtained; but the actual powers which could be developed with properly-designed schemes are probably largely in excess of these figures.

This subject is of such importance that the writer has earnestly suggested that at least a commencement should immediately be made to systematically assess the water power-resources of the State.

Electrical Works carried out for other Branches of the Public Works Department, and for other Departments.

These works are summarised in the attached schedules under the several headings of Day Labour, Sub-contracts, and Contracts. They are referred to below under the headings of the Branch or Department for which they were carried out.

GOVERNMENT ARCHITECT'S BRANCH.

Day Labour.—There has been considerable increase in the number of works carried out by day labour. These are shown in detail in Schedule "A." The most important buildings electrically lighted were the new temporary wards at the Coast Hospital (£504), and the additions to the Hotel Kosciusko (£2,394).

Sub-contracts.—Specifications for the works shown in Schedule "B" attached were supplied for inclusion in the general specification for the several buildings set forth, the wiring or provision of machinery being let as a sub-contract under the supervision of this Branch.

Separate Contracts (see Schedule "C").—The lighting of the Coast Hospital and grounds was completed during the year at a total cost of £1,985 4s. 2d., the light being made available from February 5th, 1912.

In January, 1912, a contract was let for the sum of £6,548 for the supply of four electric lifts, two wall cranes, and one jib crane for the new Commonwealth Stores, Darling Island. Satisfactory progress has been made with this work.

Specifications were prepared and contracts let for electric passenger lifts at Johnson's Building and the General Post Office, and for a small goods lift at the General Post Office.

HARBOURS AND WATER SUPPLY.

Port Kembla Jetty Crane.—The wiring for a 3-ton crane specially imported for the Electrolytic Company's Jetty at Port Kembla was designed and supervised.

Towns North of Wollongong Water Supply.—Considerable progress was made with the contract arranged the previous year for the hydro-electric generating and transmission scheme in connection with the water supply for the towns north of Wollongong.

Broken

Broken Hill Water Supply.—A scheme for the temporary lighting during the construction of the Umberumberka Dam was prepared, and the necessary plant for this purpose selected and forwarded.

Kempsey and Juneee.—At the instance of the Chief Engineer for Harbours and Water Supply, the writer personally investigated the advisability of combining an electric supply scheme with the water supply of these two towns.

As regards Kempsey a combined scheme, if it could have been arranged, would have resulted in economy being effected in respect of both the water and electrical supply services; but, owing to the special conditions at Juneee, a scheme put forward for the generation of power for the combined services in the town and the transmission of a portion of it for pumping at Tenandra, 20 miles distant, could not be warmly supported, and was, in consequence, abandoned.

The two instances thus investigated, together with others that have from time to time arisen, have indicated that the supply of electricity for all purposes could frequently be profitably combined with water supply or sewerage works. For this reason it is suggested that legislation might with advantage be introduced to enable loans for such purpose to be raised either separately, or conjointly with and upon the same terms as the other services referred to.

Port Kembla Coal Loading Plant.—The electrical portion of the contract for this plant, involving an expenditure of about £7,000 out of the total of about £35,000, has also been the subject of consultation with the Chief Engineer for Harbour and Water Supply. Three-phase plant at 2,300 volts was eventually decided upon. This will be available for the supply of power in the future for the whole of the harbour works.

DRAINAGE.

Southern and Western Suburbs Sewerage.—Designs were prepared for electrically driving the overhead gantry cranes used for pile-driving, &c., on No. 2 Section, and the erection of motors and the necessary wiring were carried out by day labour.

A weekly inspection is made of all the motors and apparatus in use, the number at present being 26 motors, totalling 275 h.p., on No. 1 Section, and 18 motors, totalling 302 h.p., on No. 2 Section.

Albury.—The sewerage of the town of Albury being under consideration at a time when an application was received from the Municipal Council to borrow money for establishing works for the supply of electric light and power, the writer gave evidence at an inquiry held by the Local Government Engineer, and eventually prepared a scheme for combining in one power station at the site of the present pumping station the plant necessary not only for electric light for the town, but for improved water supply and for electric power supply both for general purposes in the town and for operating the pumps necessary under the proposed sewerage scheme.

IRRIGATION.

Yanco Workshops.—The workshops at Yanco Station were electrically lighted early in 1912.

Yanco Power Station.—Power being required at Leeton for water supply, and for the butter factory and for lighting purposes, arrangements were made for the establishment of a power station close to Yanco Station, with a 4-mile transmission line to Leeton. The position of the station was chosen so as to obtain fuel with the least cost of handling, condensing water also being available at the site.

For immediate use, and so as to commence supply at the earliest possible moment, a second-hand 75 k.w. generating set was purchased, and tenders were called, and a contract let for pumping plant for the water supply.

It is anticipated that the whole of this plant will be shortly at work, and that at an early date tenders will be called for a complete generating plant to cover the requirements of the district.

ROADS AND BRIDGES.

The lighting of the Iron Cove Bridge was satisfactorily completed, and sundry minor repairs have been effected to the Parramatta River Swing Bridge, Pyrmont Bridge, and Glebe Bridge.

STATE BRICKWORKS.

The provision of motors, line-shafting, wiring, and switch-gear for the first brickworks unit, consisting of four grinding-pans, seven presses, four elevators, and one hoist was carried out by this branch by day labour.

One crane at the Black Wattle Bay Depôt and subsequently two at Homebush, one being at the Works and one on the Wharf, were changed from hand operation to motor drive, the handling of bricks being thus considerably expedited and cheapened.

The arrangements for the supply of power to these works are explained under the next heading.

POWER PLANTS.

In addition to the power plant at Yanco, referred to above, the following were designed or put into operation during the year:—

State Brickworks.—To carry on the manufacture of bricks pending the City Council's extension being available, a 300 k.w. 3-phase set was purchased at a low figure from the City Council in November, 1911. This was immediately re-erected at Homebush, and has been satisfactorily carrying the brickworks load since the commencement of 1912, the responsibility for its running resting with this branch.

Combined Power Plant for State Brickworks, new Public Abattoirs, and Uhr's Point Sawmills.—To minimise the cost of driving the machinery and providing light at these establishments, a scheme has been prepared for utilising the sawdust, shavings, and other refuse from the sawmill for the generation of electrical energy. As the mill refuse will be insufficient to supply all the power required, to avoid the expense of purchasing additional fuel, as well as to obviate the necessity of providing duplicate plant for security against breakdown, an arrangement has been made with the City Council to supply a minimum of 1,000,000 units per annum at 0·7d. per unit for power and light for these three establishments on the understanding that the Government shall be prepared to carry the load during the hours of the Council's maximum demand each evening. It is, therefore, proposed to run the Government's plant for one eight hour shift per diem, to include the hours of maximum demand, the City Council's supply being drawn from at all other times.

As

As the generating plant necessary to carry out this arrangement will be a standby plant using cheap fuel, practically in competition with electrical energy at the low rate of 0·7d. per unit, extreme fuel economy is not of paramount importance, and a considerable saving in capital cost and, consequently, in interest results by employing for the purpose two second-hand 600 k.w. generating sets, the purchase of which from the City Council has also been arranged.

The purchase of these three generating sets has saved the Government much immediate expense, and, regarded in the light of a temporary measure to last until a State Power Supply on a large scale shall be available, the course taken is seen to be amply justified.

Newington Asylum.—A contract was let for a new 16 k.w. generating set at this institution, to secure increased efficiency and economy, with minimum risk of breakdown.

Hotel Kosciusko.—A scheme for hydro-electric plant in conjunction with water supply was prepared. A small oil engine and dynamo, with switchboard, were erected to carry on the lighting until such time as the hydro-electric plant may be available.

State Reformatory for Women.—The temporary suction gas plant with accumulator which was put in to light this institution in 1909, continued to work throughout the year until the 30th June. It was superseded by the City Council's service on the 1st July last.

CARRINGTON WHARF, NEWCASTLE.

The question of electrically operating six or more 15-ton cranes for the new wharf at Carrington was considered and eventually decided upon.

Preliminary estimates for the provision of a power-house for these cranes, and for other services in connection with the Dyke workshops, &c., were prepared; but, subsequently, as the result of a conference between officers of this Department and of the Railway Department, seeing that the electrification of the Newcastle trams was already under consideration, it was decided that the provision of a complete power house for the combined services should be left in the hands of the Chief Commissioner for Railways.

RE-WIRING OF SUNDRY BUILDINGS.

A considerable amount of re-wiring has been necessitated in various Government buildings to comply with modern requirements of high voltage, and the regulations issued by the Fire Insurance authorities. Wiring on the "tree" system, that was good enough for 110 volts, has been replaced by main circuits run systematically to convenient distributing centres, whence sub-circuits are led for all existing requirements, provision being made for additional sub-circuits for any reasonable future extensions.

The Government Printing Office and the Public Works Department building, together with Newington and Rookwood Asylums, were the most important buildings thus brought up to date. The re-wiring of the Chief Secretary's building is under consideration.

SUNDRY DEPARTMENTS.

Maintenance of Lights, Bells and Telephones.—Instead of the system previously in vogue of waiting for requisitions from various departments for minor repairs, a reform was introduced during the year by which an estimated amount is provided for each building, and regular inspection is now made, complaints as far as possible being anticipated, thereby ensuring greater satisfaction, whilst reducing the amount of work in the Accounts and Records Branches.

Lighting of Public Buildings.—The furtherance of the aims referred to in my last report to introduce the best and latest methods of lighting with a view to providing for the comfort of all concerned with the maximum of efficiency obtainable, has been consistently kept in view, and the publications of the Illuminating Engineering Society have been carefully studied and advantage taken of any improvements tending to these ends.

Experiments have been made to estimate the value of new apparatus placed on the market; trials have been given in various buildings of systems of indirect and other methods of lighting, so as to gauge the value under actual working conditions; and, upon the completion of new lighting installations, systematic tests have been made with the latest type of apparatus on the market to ascertain the

Constitution as a Separate Branch.

By way of recording the fact, it may be noted that, immediately prior to the period under review, in June, 1911, by the gazettal of the writer as head of the Branch, the separate constitution of the Electrical Engineer's Branch was formally recognised.

Acknowledgment.

I wish to cordially acknowledge the unremitting and efficient service at all times rendered by my staff, without which the comparatively heavy work of the past year could not have been successfully carried out.

I have, &c.,

Wm. CORIN, M.Inst. C.E., M.I.E.E., M.A.I.E.E.,

Chief Electrical Engineer.

12th November, 1912.

SCHEDULE "A."

Electrical Work—Day Labour, 1911-12.

	New Work and Alterations.		
	£	s.	d.
For Government Architect's Branch—			
Coast Hospital	504	16	2
Hotel Koscuisko	2,394	2	2
University	938	8	11
Government Architect's Workshops... ..	162	10	6
For Harbours and Water Supply Branch—			
Broken Hill Water Supply	20	3	3
Port Kembla Jetty Crane	5	15	6
For Drainage Branch—			
Southern and Western Suburbs Sewerage, including cost of Motors, &c.	911	16	8
For Murrumbidgee Irrigation Trust—			
Yanko Workshops	229	17	10
For Roads and Bridges Branch—			
Iron Cove Bridge	109	17	3
Parramatta River, Pyrmont and Glebe Swing Bridges	122	1	5
For State Brickworks—			
Motors, Shafting, Wiring, &c.	1,643	10	9
Power, Plant, work in connection with, including cost of Machinery	1,399	18	8
Maintenance of Power Plants—			
State Reformatory for Women	642	6	0
State Brickworks	305	17	10
Re-wiring of Sundry Buildings—			
Crown Law Office	66	12	4
Government Printing Office... ..	1,378	7	7
Newington Asylum	298	1	10
Rookwood Asylum	1,032	14	8
Public Works Building	1,283	7	8
For Federal Government—			
Government House	23	7	8
General Post Office	0	13	6
Total	£12,874	7	2

Name of Department,	General Maintenance and Repairs.	Minor Constructional Work and Alterations.
	£ s. d.	£ s. d.
Agricultural	54 15 8	49 14 10
Attorney-General and Justice	386 7 11	659 17 1
Chief Secretary's	49 10 7	377 18 5
Federal Government	13 7 0	14 1 5
Imperial Government	60 4 2	51 6 10
Lands	35 19 0	149 5 7
Instruction	8 11 1	18 14 3
Labour and Industry	256 19 0	28 14 3
Mines	7 3 8	345 13 8
Premier's	212 11 7	4 8 3
Public Service Board	63 19 4	96 3 10
Public Works	19 18 3	66 14 6
Sydney Hospital		146 19 4
Treasury		201 1 9
Miscellaneous		
Totals	1,169 7 3	2,210 14 0

SUMMARY—

	£	s.	d.
New Work and Alterations	12,874	7	2
General Maintenance and Repairs	1,169	7	3
Minor Construction Work and Alterations	2,210	14	0
Total Day Labour Works	£16,254	8	5

SCHEDULE

SCHEDULE "B."

Electrical Work—Sub-contracts, 1911-12.

	£
Children's Court, Darlinghurst	250
Commonwealth Stores	980
Darlinghurst Fire Station	300
Dental Hospital (completion)	200
New Public Abattoirs... ..	200
Penitentiary, Long Bay	1,500
Rookwood Asylum	200
Registrar-General's New Offices	1,430
University, Veterinary School	300
Total	£5,360

SCHEDULE "C."

Electrical Work—Contracts.

Vouchers passed, 1911-12.

	£	s.	d.
Coast Hospital... ..	1,275	10	2
Cobar Court-house	53	12	0
Fisher Library (completion)	12	0	0
Mitchell Library (lift)	82	6	0
Newington Asylum (new generator)... ..	174	0	0
Port Kembla Jetty Crane (wiring for)	280	2	5
University (fire alarm system)	147	10	0
Towns North of Wollongong Water Supply (electrical pumping plant)	891	3	4
Total	£2,916	3	11

SCHEDULE "D."

Steam and Auxiliary Services, 30 November, 1911, to 30 June, 1912—Day Labour.

	£	s.	d.
Chief Secretary's Building	3	5	9
Coast Hospital	49	6	0
Darlinghurst Gaol	39	8	10
Gladesville Hospital	6	4	9
Goulburn Gaol... ..	25	2	6
Hawkesbury Agricultural College	1	7	5
Hotel Kosciuszko	531	14	3
Lands Department	5	10	0
Liverpool Asylum	25	9	1
Newington Asylum	68	1	5
Parramatta Hospital for Insane	24	8	0
Parliament House	4	11	8
Public Works Building	3	8	9
Rookwood Asylum	110	9	7
State Reformatory for Women	5	16	1
Stores Supply Department	35	19	2
Waterfall Hospital	307	19	7
Woolloomooloo Dépôt... ..	2	4	7
Total	£1,250	7	5

SCHEDULE "E."

Steam and Auxiliary Services, 1911-12—Contracts.

	£	s.	d.
Argyle Bond	148	12	0
Bathurst Gaol	6	0	0
Bushell's Store... ..	45	10	0
Callan Park Hospital... ..	32	5	6
Coast Hospital... ..	222	9	6
Darlinghurst Gaol	196	0	0
Gladesville Hospital	48	17	6
Government Printing Office	24	10	0
Hawkesbury Agricultural College	80	2	0
Jenolan Caves... ..	207	10	2
Kenmore Hospital for Insane... ..	106	0	0
Lands Department	79	8	6
Morrisset Hospital for Insane	265	0	0
Newington Asylum	28	18	9
Parramatta Hospital for Insane	351	10	0
Parramatta Gaol	29	10	0
Public Instruction Department	172	0	0
Rookwood Asylum	643	5	0
Rydalmere Hospital	46	6	3
Waterfall Hospital	1,050	3	9
Total	£3,783	18	11

Engineering

Engineering Drawing Office and Ironwork Inspection.

DURING the year 1st July, 1911, to 30th June, 1912, Plans and Specifications have been prepared for works totalling £2,018,577 15s. 3d. These works, as enumerated below, were either submitted for tenders or put in hand by day labour.

	£	s.	d.
Railway and Tramway Construction	1,391,175	0	0
Irrigation, Water Conservation, and Drainage	168,139	14	3
Harbours and Water Supply	406,644	0	0
Roads, Bridges, and Public Watering-places	48,091	1	0
Quotations for Minor Works	4,528	0	0
	£2,018,577	15	3

On the 30th June, 1911, the staff consisted of 36 permanent draftsmen, 28 temporary draftsmen 3 cadets, and 3 junior engineer assistants, or, in all, 70. During the year Mr. J. J. C. Bradfield, Principal Designing Engineer, had charge of the Engineering Drawing Office for seven months, when he was set apart by the Minister to provide certain information in connection with the Sydney Harbour Bridge. For the remaining five months of the year Mr. R. S. Littlejohn had charge, with the exception of five weeks, when I acted while he was Acting Superintendent of Stores. I am in sub-charge of Harbour Works; Mr. J. W. Roberts, in sub-charge of Railway and Tramway Work; Mr. Rutledge, Sewerage Work; Mr. Renshaw, Bridges and Swamp Drainage Works; and Mr. Hayley, Water Supply Work.

The total amount of salaries paid to draftsmen, cadets, junior assistant engineers, inspectors of ironwork, and for overtime in connection with designs, preliminary sketches, and estimates for work of a miscellaneous character, was £15,315. This amount includes Mr. Bradfield's and Mr. Littlejohn's salaries, only for the time during which they were in charge of the drawing office.

The staff has been kept well employed during the year, as evidenced by the large number of draftsmen engaged. The volume of work increases, requiring more assistants, but as the accommodation is limited, it is frequently necessary for a number of the existing staff to work overtime, to cope with the increased demands.

Taking, as in past years, the estimated value of works actually sent on for tenders or put in hand by day labour, as a basis, the percentage cost of designs has been as under:—

Year.	Estimated Value of Work.	Amount of Salaries.	Percentage of Cost of Salaries on Value of Work.
	£	£	per cent.
1904-5	239,365	5,170	2·16
1905-6	481,265	5,725	1·19
1906-7	465,766	6,712	1·44
1907-8	834,207	11,274	1·34
1908-9	2,095,169	12,322	·59
1909-10	1,043,930	12,770	1·22
1910-11	1,382,647	11,975	·866
1911-12	2,018,578	15,315	·758

Inspection of Ironwork.

There were 3 permanent and 3 temporary inspectors of ironwork employed during the year. Of these, 2 permanent and 2 temporary inspectors were continually employed at Messrs. G. and C. Hoskins' foundry, and have inspected, weighed, and tested 29,221 pipes and special castings, aggregating 3,195 tons. The mileage of pipes delivered during the year was 44½ miles.

Plan Room.

5,758 plans, sections, field, and level books were registered, showing an increase of 1,558 on last year's return.

JAS. ELDER
(*pro* R. S. LITTLEJOHN).

17th September, 1912.

Appendix No. 1.

RAILWAY AND TRAMWAY CONSTRUCTION BRANCH.

No.	Name of Work.	Estimated Value.
		£ s. d.
1.	North Coast Railway—Section 2, Dungog to Gloucester—Station Buildings and Telegraph Line	4,454 0 0
2.	„ „ Section 3, Gloucester to Taree—Engine Shed, Taree, Refreshment Room, Gloucester, and Telegraph Line	10,222 0 0
3.	„ „ Section 4, Taree to Wauchope—Ironwork and Timber for Bridges, &c.	32,016 0 0
4.	„ „ Section 7, Macksville to Coff's Harbour—Bridges, &c.	5,261 0 0

Appendix

Appendix No. 1—continued.

No.	Name of Work.	Estimated Value.		
		£	s.	d.
5.	North Coast Railway—Section 9, Glenreagh* to South Grafton— Ironwork and Timber for Bridges, Wharf and Crane	30,146	0	0
6.	Cooma to Bombala Railway—Section 1, Cooma to Nimmitabel— Telegraph Line	2,101	0	0
7.	" " " " Section 2, Nimmitabel to Bombala— Permanent Way	326,696	0	0
8.	Moree to Mungindi Railway—Section 1, Moree to Garah—Station Buildings and Telegraph Line	8,095	0	0
9.	" " " " Section 2, Garah to Mungindi.— Permanent Way, Bridges, &c.	129,994	0	0
10.	Dunedoo to Coonabarabran Railway—Talbragar, River Bridge, Sleepers, &c.	46,415	0	0
11.	Parkes to Peak Hill Railway—Permanent Way	73,097	0	0
12.	Muswellbrook to Merriwa Railway—Permanent Way, Steel Bridges, &c.	105,240	0	0
13.	Wagga to Tumbarumba Railway—Section 1, Wagga to Humula— Permanent Way, &c.	154,111	0	0
14.	Forbes to Stockinbingal Railway—Forbes to 30-mile peg—Per manent Way, Bridges over Lachlan River, &c.	110,587	0	0
15.	Barellan to Mirool Railway—Sleepers	19,821	0	0
16.	Rookwood to Bankstown Railway—Station Buildings and Permanent Way	31,797	0	0
17.	Leichhardt to Balmain Road Tramway—Permanent Way	20,250	0	0
18.	Darley-road to Little Coogee Tramway	81,000	0	0
19.	Brookvale to Collaroy Beach Tramway—Extension to Collaroy Beach	19,684	0	0
20.	" " " " Goods Siding at Brookvale...	4,900	0	0
21.	Marrickville to Undercliffe Tramway—Permanent Way	13,915	0	0
22.	" " " " " " " " Overhead Bridge at Marrickville	10,240	0	0
23.	Dulwich Hill to Wattle Hill Tramway	13,207	0	0
24.	William-street to Railway Station Tramway... ..	15,000	0	0
25.	Gardiner's-road to Bunnerong-road Tramway	16,122	0	0
26.	Wickham to Carrington Tramway	3,026	0	0
27.	Livingstone-road Tramway	4,947	0	0
28.	Spit to Manly Tramway—Goods Siding at Fisher-street	2,846	0	0
29.	Patton-street to Racecourse Tramway, Broken Hill—Sleepers	700	0	0
30.	Fishplates, bolts, and dogspikes, 2,693 tons	40,125	0	0
31.	Railway Construction Stock—Tanks and Stands	10,142	0	0
32.	" " " " Tip Drays	1,680	0	0
33.	" " " " Crossings, switches, &c.	4,510	0	0
34.	Day Labour Railways—100,000 Sleepers	16,041	0	0
35.	Railway Turntables—60 feet	3,774	0	0
36.	10-ton Ballast Wagons... ..	12,300	0	0
37.	Manufacture of Switches for Tramways	3,057	0	0
38.	Spit to Manly Tramway Transfer Punt, and approaches— Additional work	4,556	0	0
		£1,391,175	0	0

Appendix No. 2.

IRRIGATION, WATER CONSERVATION AND DRAINAGE BRANCHES.

No.	Name of Work.	Estimated Value.		
		£	s.	d.
1.	Newcastle Sewerage, Waratah Main Sewer, 2nd Section, Contract 1,000—Day Labour	9,900	0	0
2.	Ocean Outfall Sewer, 3rd Section—Quotation for Pile Driving	1,040	0	0
3.	Ocean Outfall Sewer, 3rd Section—Quotations for cast-iron moulds for expansion joints	33	0	0
4.	Newtown-Marrickville Drainage, Edgeware-road S.W.C., Contract 1,015—Day Labour	4,600	0	0
5.	Hornsby Sewerage, Sewers and Ventilation, Contract 1,020—Day Labour; handed over to W. S. & S. Board	13,500	0	0
6.	Hornsby Sewerage, steel aqueduct over Spring Gully—Contract 1,023, handed over to W. S. & S. Board	1,344	0	0
7.	Wagga Wagga Sewerage, supply of Sewer Pipes—Contract 1,033...	2,724	0	0
8.	Ocean Outfall Sewer, 2nd Section—Quotations for winches, and fittings for gantries	466	0	0

Appendix

Appendix No. 2—continued.

No.	Name of Work.	Estimated		
		£	s.	d.
9.	Bald Face Quarry—Quotations for machinery and gear for stone crushing plant	33	0	0
10.	Rookwood Drainage, Joseph-street S.W. Channel, Contract 1,006—Day Labour	5,257	0	0
11.	Lithgow Sewerage—Quotations for boiler and steam pump for construction	105	0	0
12.	Chatswood-Willoughby S.W. Channel, Contract 1,006—Day Labour	9,340	0	0
13.	Centennial Park Lands Drainage, Birrel-street S.W. Channel, Contract 1,041—Day Labour	1,060	0	0
14.	Ocean Outfall Sewer, 2nd Section—Quotations for steel reinforcing bars	760	0	0
15.	Centennial Park Drainage, Outlet from No. 1 Lake, Contract 1,064—Day Labour	270	0	0
16.	Lithgow Sewerage—Quotations for ventilation material	1,224	0	0
17.	North Botany Drainage, Blucher-street S.W.C., Contract 1,027—Day Labour	3,740	0	0
18.	Hotel Kosciusko Sewerage, Contract 1,062—Day Labour	1,465	0	0
19.	Lithgow Sewerage, Pumping Machinery—Contract 1,038	1,030	0	0
20.	Glen Innes Experimental Farm Sewerage, Contract 1,082—Day Labour	244	0	0
21.	Shea's Creek S.W.C., Alexandria Park and Wyndham-street Branches, Contract 1,005—Day Labour	8,730	0	0
22.	Wagga Wagga Sewerage, Main Sewer Treatment Works, &c.—Contract 1,031	19,256	0	0
23.	Wagga Wagga Sewerage Pumping Machinery—Contract 1,032	533	0	0
24.	Scone Drainage Fig Tree Gully, S.W.C. Extension of Culvert, Kelly-street—Contract 1,063	1,788	0	0
25.	Coast Hospital Sewerage, Aqueduct Manholes and Ventilation, Contract 1,042—Day Labour	275	0	0
26.	Newcastle Sewerage, Hamilton Reticulation and Ventilation, Contract 1052—Day Labour	21,692	0	0
27.	Newcastle Sewerage Ventilation, Material for, Contract 822—Quotations	1,034	0	0
28.	Lismore Sewerage Extension, Contract 1,076—Day Labour	1,550	0	0
29.	Hurstville Drainage, Park-road, S.W. Channel, Contract 1,078—Day Labour	652	0	0
30.	Lismore Sewerage—Quotations for Ventilation Material	120	0	0
31.	Newcastle Sewerage Supply of Tested Cement—Contract 1,097	2,417	0	0
32.	Murwillumbah Sewerage, Dougherty's-lane Extension, Contract 1,099—Day Labour	200	0	0
33.	Gunnedah Police Station Sewerage, Contract 1,053—Day Labour	500	0	0
34.	Belongil Drainage Works—Contract 1,019	1,506	14	3
35.	Hay Irrigation Trust, Centrifugal Pump—Contract 986	155	0	0
36.	Barooga Water Trust, Centrifugal Pump—Contract 1,014	240	0	0
37.	Gunningbar Creek Weir—Contract 1,018	775	2	0
38.	Barooga Water Trust, Subsidiary Dist. of Channels—Contract 1,030	829	10	5
39.	Hinton Drainage—Contract 1,049	2,894	0	0
40.	Little Merran Water Trust, Cutting, Regulator, &c.—Contract 984	2,267	16	8
41.	Little Merran Water Trust, Lifting Gear, &c.—Contract 985	201	0	0
42.	Martin Swamp Drainage—Contract 1,046	630	0	0
43.	Lavender Swamp Drainage—Contract 1,067	1,049	16	0
44.	Tuckean Swamp Drainage—Contract 1,065	13,474	0	0
45.	Blacks Drain Bridge—Contract 1,068	106	13	11
46.	Meroe Bore—Contract 1,083	4,209	3	0
47.	Mercadool Bore—Contract 1,087	1,910	16	7
48.	Wentworth Irrigation Area Lining Channel—Contract 1,103	1,120	0	0
49.	Robb's Drainage—Contract 1,091	740	0	0
50.	Barooga Water Trust, Culverts over Main Drains—Contract 1,108	695	0	0
51.	Swampy Creek Drainage—Contract 1,098	463	15	0
52.	Pilliga Shallow Bores—Contract 1,066	185	0	0
53.	Baroma Bore—Contract 1,110	3,062	6	5
54.	Southern and Western Suburbs Ocean Outfall Sewer—Electric cranes	1,228	0	0
55.	Yanco Township Water Supply	8,910	0	0
56.	Hay Irrigation	3,830	0	0
57.	Barooga Irrigation	774	0	0
		£168,139	14	3

Appendix No. 3.

HARBOURS AND WATER SUPPLY BRANCH.

No.	Name of Work.	Estimated Value.		
		£	s.	d.
1.	Casino Water Supply	1,920	0	0
2.	Kiama Water Supply	8,500	0	0
3.	Parkes Water Supply	3,500	0	0
4.	Towns north of Wollongong Water Supply	34,100	0	0
5.	Junee Water Supply	65,500	0	0
6.	Grafton Water Supply... ..	68,500	0	0
7.	Broken Hill Pipe Line and Pumping Machinery	96,500	0	0
8.	Richmond Water Supply	1,040	0	0
9.	Muswellbrook Water Supply	14,800	0	0
10.	Hunter River District Water Supply... ..	12,720	0	0
11.	Kempsey Water Supply	13,250	0	0
12.	Medlow Bath Water Supply	1,650	0	0
13.	Kosciusko Water Supply	2,410	0	0
14.	Tathra Wharf Extension	5,841	0	0
15.	Byron Bay Jetty—Waiting Shed at inner end	399	0	0
16.	Byron Bay Jetty—Waiting Shed on Jetty	93	0	0
17.	Byron Bay Jetty—Gantry for two 3-ton cranes	640	0	0
18.	Byron Bay Jetty—Double Rail Track	328	0	0
19.	Byron Bay Jetty—Scissors, Crossings and Rails	350	0	0
20.	Byron Bay Jetty—Crane Fittings	50	0	0
21.	Byron Bay Jetty—Mooring Buoys (2)	160	0	0
22.	Bantry Bay, Middle Harbour—Two Wharves, Dolphins, Landing Steps, &c.	900	0	0
23.	Coff's Harbour—Storage Shed... ..	280	0	0
24.	Coff's Harbour Jetty—Trucks (6)	180	0	0
25.	Port Kembla Jetty—Goods Store	300	0	0
26.	Botany—Long Pier	3,770	0	0
27.	Eden Jetty—Widening	963	0	0
28.	Gosford—Reclamation... ..	2,000	0	0
29.	Port Kembla—Low-level Jetty for Coal-loading Plant	25,000	0	0
30.	Port Kembla—Coal-loading Plant	35,000	0	0
31.	Port Kembla—Stone-crushing Plant	6,000	0	0
		£406,644	0	0

Appendix No. 4.

ROADS, BRIDGES, AND PUBLIC WATERING PLACES BRANCH.

No.	Name of Work.	Estimated Value.		
		£	s.	d.
1.	Bridge over Broughton Mill Creek at Berry... ..	1,029	10	6
2.	Severn River at New's Crossing	2,193	0	0
3.	Lachlan River at Merriganowry	1,043	0	0
4.	Lachlan River at Whealbah	1,202	13	8
5.	Macleay River at Turner's Flat	1,536	5	0
6.	Barwon River at Mungindi	2,999	3	6
7.	Lachlan River at Booligal	1,018	7	6
8.	Namoi River at Manilla Footway	950	0	0
9.	Henry River, Glen Innes to Grafton... ..	1,499	0	0
10.	Lennox Bridge Footway	687	0	0
11.	Ryde Steam Punt (estimate)	2,500	0	0
12.	Taemas Bridge (estimate)	18,800	0	0
13.	Stockton Ferry (wooden hull and fittings)	6,350	0	0
14.	Umaralla River	1,414	10	0
15.	Stockton Ferry (engines, boilers and accessories)	4,190	0	0
16.	McIntyre River at Inverell Suspension Footbridge	678	10	10
		£48,091	1	0

NOTE.—These lists represent the value of works as taken in the Drawing Office returns, and should not be confused with the Accountant's Statements. They include only such works as were sent on for tenders or put in hand by day labour.

Survey Branch.

THE survey staff of this Branch have been kept fully occupied during the past year, and the pressure of work in all branches of construction has, as in the past, necessitated the employment of Private Surveyors, and at some periods throughout the year the services of five Private Surveyors have been necessary to carry out the work expeditiously. Attention is drawn to the following surveys carried out during the year in connection with the various branches of the Department, viz. :—

(1.) *Irrigation and Drainage*.—Lake Albert Regulator and Cutting ; Shea's Creek, S.W. Channel ; Contours Moonan Creek Dam Sites ; Upper Murray River Dam Sites ; S.W. Channels, Hurstville Park Road ; Ashfield, Casino and Scone. Improvements for the Edwardes' River and District.

(2.) *Artesian Bore Drains*.—Surveys for Bore Sites and Drains have been completed for Collymongle and Meroe Trust Districts ; Pilliga and Tulladunna Bore Drains are now being surveyed.

(3.) *Sewerage*.—Detail surveys for the designing and construction of sewerage schemes have been completed in the following places :—Grafton, Albury, Bathurst, Tamworth, Hornsby, Wagga, Orange, Parramatta extensions, Yarrangobilly and Jenolan Caves. The detail surveys of Canterbury-Enfield, Wollongong, Dubbo and East Orange have been commenced.

(4.) *Water Supply*.—Surveys and levels have been completed in connection with the following Water Supply Schemes, viz. :—Blue Mountains Villages, Casino, Bowral, Coraki, Gulgong, Dunedoo, Parkes (two schemes), Tamworth, Orange, Goulburn, Yarrangobilly ; and Sydney Water Supply, Cordeaux River.

(5.) *Roads and Bridges*.—Widening portion of Cook's River Road ; also access to State Quarry, Randwick.

(6.) *Miscellaneous*.—Surveys have been made throughout the State for works generally, viz. :—Court House, Stockinbingal ; site for the Education Buildings, Bridge Street ; Wallsend Police Station, Parramatta Hospital ; Clarence-street Police Station ; Fire Station site, Windsor ; Police Station site, Moree ; Police Paddock, Pennant Hills ; Central Meat Markets ; Cook's River, Tempe, Resumption for Park ; Additional Land, State Brick Works ; Uhr's Point (Workshops) ; Contours, New Zoological site, Ashton Park ; and State Quarries, Galong and Kiama.

A. L. LLOYD,

Chief Surveyor, Dept. of Works.

The Director-General for Public Works.

Railway and Tramway Surveys.

permanent surveys of the following projected railways were completed during the year, viz. :—Finley to Cumwal, 11 miles 5 chains; Galong to Burrowa, 17 miles 39 chains; National Park to Audley, 1 mile 3 chains; Barellan to Mirool, 34 miles 12 chains; Parkes to Peak Hill, 30 miles 35 chains; Forbes to Stockinbingal, 88 miles 20 chains; Muswellbrook to Denman, 16 miles 18 chains; Wagga Wagga to Humula, 49 miles 18 chains; and the remaining portion of the North Coast Railway, 28 miles 39 chains in length, comprising parts of Macksville to Coff's Harbour, and Coff's Harbour to Glenreagh. The Glenreagh to Dorriggo permanent survey was extended 18 miles 40 chains.

Railway trial surveys from Corowa, Wangunyah, Sydenham, and Tempe to Botany, Molong to Cumnock, Warren to Quambone, Hexham to Morpeth, Thirlmere to Burragorang, Craboon to Coolah, Barraba to Bingara, and Bingara to Warialda, were completed.

Thirty-nine miles of the trial survey from Crookwell to Cowra was completed, and a survey from Warialda to Yallaroi just commenced.

Inspections were made of the following railway surveys, viz. :—Barraba to Warialda; Thirlmere to Burragorang; Molong to Cumnock; Muswellbrook to Denman; Narrabri West to Coonamble; Warren to Quambone; Craboon to Coolah; Dubbo to Werris Creek; Wellington to Werris Creek; Gilgandra to Curlew; Parkes to Peak Hill.

The following proposed railway routes were explored and reported on:—Cumnock to Yeoval; Tamworth to Somerton; Duri to Somerton; Tamworth to Nundle; Quirindi to Nundle; Coolah to Cassilis; Wingham to Walcha Road; Dunedoo to Merrygoen and Mendooran; Borenore to Marble Quarry; Middlefield to Tottenham; Moama to Moulamein, Barham to Moulamein; Nevertire to Tottenham; Tottenham to Nymagee; Condobolin to Wyalong; Rock to Garryowen; Yass to Burrowa; Blayney to Burrowa; Clear Hills to Mulwala; Craboon to Coolah; Parkes to Peak Hill; Grenfell to Warraderry; Canowindra to Eugowra; Murwillumbah to Tweed Heads; Lismore to Murwillumbah *via* Nimbin; Murwillumbah to Tyalgum; Warialda to Goondiwindi, and Warialda to Boggabilla; Nimitybelle to Bombala; and Muswellbrook to Denman.

The following tramways were permanently staked preparatory to construction:—Dulwich Hill to Wattle Hill; Deviation Darley Road to Little Coogee; William-street to Central Railway Station; Rozelle to Leichhardt; Bunnerong Road to Rosebery Park Racecourse; Brookvale to Narrabeen (Parts II and III); Petersham Railway Station to Livingstone Road; Rookwood to Bankstown (Part I); Darling Mills, Parramatta, to Westmead; Darley Road to Little Coogee (Parts II and III); Wallsend to Racecourse; Wickham to Carrington; South Broken Hill to Racecourse.

Trial surveys were made of a considerable number of proposed tramway routes, viz. :—Arncliffe to Botany Bay; Baulkham Hills to Kellyville; Military Road to Ourimbah Road; Castle Hill to Dural; Manly to Castle Rock, *via* Condamine-street; Daceyville Extension from Gardiner's Road; Gore Hill to Greenwich; Maroubra Bay Tramway (routes 1, 2, 3, and 4); Turramurra to Bobbin Head; Marrickville to Cook's River Road; Cook's River Road to Botany Road; Coogee to Long Bay; Military Road to Balmoral Beach, Queen-street to Central Railway Station; Glebe Point to Balmain, and alternative route; Waverley Depot to Bronte, *via* Birrell-street; Watson-street, connection from Bondi Road to Birrell-street; Rookwood to Bankstown (Part II); Ryde to Ryde Railway Station (routes 1, 2, 3, 4, and 5); Suspension Bridge Extension Tramway; Bunnerong Road to Rosebery Park Racecourse; Deviation Bellevue Hill to Bondi Beach; Pittwater Road to Freshwater; Botany State Brickworks Tramway; Lismore Tramways; Wollongong to Port Kembla; Wollongong to Thirroul; Kiama Quarry Tramway; Newcastle to Swansea; Hannel-street to Smedmore; and Wickham to Carrington.

The aggregate mileages of the Railway and Tramway field operations, carried out during the year are shown in the following tables:—

Railway Trial Surveys.

Explorations.	Preliminary Traverses.	Preliminary Levelling.	Cross Levels.	Staking.	Levelling.	Check Levels.	Detail Survey.	Inspections.
miles chains 2,466 0	miles chains 439 78	miles chains 434 24	miles chains 331 46	miles chains 102 24	miles chains 82 22	miles chains 66 60	miles chains 189 14	miles 766

Railway Permanent Survey.

Staking.	Leveling.	Check Levels.	Cross Levels.	Detail Surveys.	Inspections.
miles chains 173 1	miles chains 146 49	miles chains 139 23	miles chains 83 57	miles chains 156 48	miles 264

Tramway Trial Surveys.

Traverse and Detail Survey.	Levelling.	Cross Levels.	Check Levels.
miles chains 40 12	miles chains 84 40	miles chains 20 0	miles. 10

Tramway Permanent Surveys.

Staking.	Levelling.	Check Levels.	Cross Levels.	Details.
miles chains 16 11	miles chains 16 11	miles chains 16 11	miles chains 16 11	miles chains 16 11

Railway and Tramway Surveys—Drafting.

THE plans and sections of the following railway trial surveys were completed :—Marrickville to Botany, Tempe to Botany, Molong to Cumnock, Warren to Quambone, Hexham to Morpeth, Craboon to Coolah, and the plans and sections of the trial surveys from Thirlmere to Burragorang and Crookwell to Cowra were in hand.

Railway working plans and working sections, copies of each, cross sections, proclaimed and police district plans, books of reference, land resumption plans, heliographic and lithographic copies were completed for the following lines :—Moree to Mungindi (Part II), Tullamore to Tottenham, Finley to Tocumwal, National Park to Audley, Parkes to Peak Hill, Forbes to Stockinbingal (Part II), Wagga Wagga to Tumberumba (Part I), Macksville to Coff's Harbour, and Muswellbrook to Merriwa.

Similar drafting work was in progress for the following authorised lines :—Wagga Wagga to Tumberumba (Part II), Coff's Harbour to Glenreagh, Barellan to Mirool, and Forbes to Stockinbingal, Part II.

Trial survey plans, sections, &c., of the following projected tramways were completed :—Arncliffe to Botany, Baulkham Hills to Kellyville, Military-road to Ourimbah-road, Castle Hill to Dural, Manly to Castle Rock, *via* Condamine-street, Daceyville Extension, Gore Hill to Greenwich, Maroubra Bay Tramway, Turramurra to Bobbin Head, Marrickville to Cook's River Road, Cook's River Road to Botany, Coogee to Long Bay, Military-road to Balmoral, Queen-street to Central Railway Station, Glebe Point to Balmain, Waverley Depôt to Bronte, Rookwood to Bankstown (Part II), Rosberry Park Racecourse to Bunnerong-road, Pittwater-road to Freshwater, Lismore Tramways, Wollongong to Port Kembla, Wollongong to Thirroul, Kiama Quarry Tramway, Newcastle to Swansea, Hannel-street to Smedmore, and Wickham to Carrington.

Tramway working plans and working sections, cross sections, proclaimed plans, police district copies, books of reference, land resumption plans, and heliographic copies of the following lines were completed :—Dulwich Hill to Wattle Hill, Darley-road, Randwick, to Little Coogee (Part II), William-street to Central Railway Station, Rozelle to Leichhardt, Bunnerong-road to Rosebery Park Racecourse, Brookvale to Narrabeen (Parts II and III), Petersham Railway Station to Livingston-road, Rookwood to Bankstown, Part I, Darling Mills, Parramatta to Westmead, Wallsend to Racecourse, Wickham to Carrington, and South Broken Hill to Racecourse.

Computations of the boundaries and areas of land resumptions for railway and tramway purposes respectively, of the following lines were completed :—

Railways.—Dungog to Gloucester, Gloucester to Taree, Cooma to Bombala, (Part I), Cowra to Canowindra.

Tramways.—Darley-road, Randwick to Little Coogee (Part I), Leichhardt to Balmain (Part I), Brookvale to Narrabeen (Part I), Wallsend to Speer Point, Sutherland to Cronulla (Part II), and Newtown to the Eastern Suburbs.

Similar computations were made of portions of the Moree to Mungindi and Taree to Wauchope Railways, also Marrickville to Undercliffe and Rookwood to Bankstown Tramways.

A considerable amount of miscellaneous work and drafting, consisting of descriptions of proposed railways and tramways, and resumptions on authorised lines, certified plans, and plan endorsements on conveyances and registration copies, diagram plans to accompany reports, &c., tracings of plans of surveyed portions, roads, and deposited plans, also plans showing holdings for Land Valuer, were done during the year.

Descriptions, lithographs, diagram plans, books of reference, and wall-maps were prepared for Parliament and the Public Works Committee of the following proposed railways and tramways :—

Railways.—Bomaderry to Captain's Point, Jervis Bay, Gilgandra to Quambone, *via* Collie, Warren to Quambone, Tarana to Oberon and Burruga, Tempe to Botany, Sydenham to Botany, Clear Hills to Mulwala, Grenfell to Warraderry, Chatswood to Eastwood, Canowindra to Eugowra, Dubbo to Werris Creek, Wellington to Werris Creek, Gilgandra to Curlewis, Wyalong to Cudgellico, Wyalong to Hillston, Condobolin to Broken Hill, Henty to Daysdale.

Tramways.—Bellevue Hill to Bondi Beach, Norton-street, Leichhardt, to Ashfield.

About 650 searches in connection with resumed areas, and 375 certificates of identity of railway and tramway land resumptions, were made.

Estimates were prepared of the following proposed railways :—Taree to Wharf, Clear Hills to Mulwala, Warren to Quambone, Crookwell to Cowra, Euston to Broken Hill Line near Menindie, Coonabarabran to Burren Junction, Germanton to Bringenbrong, Wellington to Werris Creek, Dubbo to Werris Creek, Barellan to Mirool, Tarana to Oberon, Casino to Coraki, Atarmon to Eastwood, Collarenebri East to Collarenebri, Collarenebri to Angledool, Hexham to Morpeth, Kiama to Jamberoo, Molong to Cumnock, Manilla to Boggabri, Tarana to Burruga, Tempe to Botany, Roslyn to Taralga, and Craboon to Coolah.

The Staff at the end of the year was as under :—

Supervising Surveyors	...	...	...	...	...	2
Surveyors—Permanent	...	...	...	...	...	7
" Temporary	...	...	...	...	...	8
Field Assistants—Permanent	...	...	...	...	...	1
" Temporary	...	...	...	...	...	2
Draftsmen and Searchers—Permanent	...	...	...	...	...	11
" " Temporary	...	...	...	...	...	14
" Contract	...	...	...	...	...	4
" Cadets	...	...	...	...	...	7
Clerk	...	...	...	...	...	1
Total...	...	...	...	...	...	57

THOMAS KENNEDY,

Engineer-in-Charge,

The Director-General for Public Works.

Railway and Tramway Surveys,

Survey

Survey Drafting Branch.

AMONGST the more important projects and works actually carried out, with which general survey drafting of a preliminary or final character has been done since June of last year, are the following :—

Water Conservation and Irrigation.—Storages at Bylong, Hunter River ; near Bathurst, Macquarie River ; at Lake Taila, Murray River ; at Boggabri, Namoi River ; and at Warragamba, Nepean River. A large amount of work was done in connection with subdivision and other plans at Yanco, and the resumption of lands on both the Burrinjuck submerged country and the closer settlement irrigation areas below Narrandera.

Sewerage.—Auburn, Rookwood and Granville, Albury, Bathurst, Coonamble, Dubbo, Hornsby, Hurstville, Inverell, Murwillumbah, Parramatta, Wagga, Orange, Grafton, Tamworth, Katoomba, Hamilton and Lithgow.

Stormwater Channels.—Hurstville, Birrell-st. (Waverley), Shea's Creek, Auburn, Chatswood and St. Peters.

Water Conservation Trusts.—Oakleigh Weirs, Thule Creek (preliminary).

Bore Trusts.—Pilliga, Meroe, Collymongle, Gelambula, Beanbah, Rowena, Tulladunna and Yanarie.

Swamp Drainage Trusts.—James Creek, Lavender, Dulguigan, Kynnumboon, Tyndale, Horse Springs, Louth Park, Long Bight, Condong, Tuckean, Albion Park, Brunswick, Bushell's Lagoon, Swampy Creek, Sandy Creek, Robb, Lake, Tucki, Cudgera, Cudgen, Arakoon, Chindera, German Creek, Reedy Creek, Phoenix Park, Clancy, Duck, Everlasting, Gladstone, Kempsey, Kinchela and Shark.

Harbour Improvements.—Newcastle, Manning River, Clarence River, Nambucca River, Port Kembla, Ulladulla, Coff's, Camden Haven and Cape Hawke.

Sydney Water Supply Extension.—Cordeaux Storage Dam and railway line.

Country Towns Water Supply.—Cobar, Casino, Coraki, Gulgong, Urana, Blue Mountains Villages, South Coast Villages, Parkes, Portland, Gloucester, Albury, Bathurst, Gosford, Goulburn, Helensburgh, Inverell, Millthorpe, Taree, and Adjungbilly Storage for S.W. Tableland Towns.

Detail Drawings for Sewerage Schemes.—Sheets drawn, revised, checked and traced :—Botany and North Botany, 19 ; West Maitland, 36 ; Canterbury, 10 ; Parramatta, 2 ; Waterfall Hospital, 4 ; Jenolan Caves, 2 ; Bathurst, 57 ; Albury, 35. On an average five Draftsmen have been engaged on these sheets.

General.—Greater Sydney and Greater Newcastle Convention Areas ; Kosciusko Hotel and surroundings ; Coast Hospital block plan ; Parramatta Road wood-blocking ; Waverley Road wood-blocking ; Ocean Street widening ; New Road, Rose Bay ; Bronte Beach sea wall ; Kensington Model Suburb contours ; Rocks Area improvements ; descriptions, schedules, &c. Collating particulars and preparing plans and diagrams for the Interstate Conference on Artesian Bore Waters formed a big item.

Heliographic and Plan Mounting.—The printing, compiling and mounting done by the Heliographer for all branches in the Department has been much heavier than during the previous twelve months, as the following shows :—

Number of Rolls of Printing Paper used.	During year ended June,		Remarks.
	1911.	1912	
31 inches wide, 22 yards long	950	1,200	$\left\{ \begin{array}{l} \text{Length in miles for 1911—11} \\ \text{“ “ 1912—16}\frac{3}{4} \end{array} \right\}$ About.
39 “ “ “ “ “ “	120	140	

Linen used in mounting special prints, lithos and compilations in 1911—1,714 square yards ; in 1912, 3,003 square yards. The foregoing serves as an index in showing that activity has been well maintained throughout the Department in the past year.

Water Rights Act.—Number of applications dealt with, 128 ; number of licenses issued, 81.

As in the previous year, the miscellaneous and paper work for the different branches has been very heavy.

Following is an average of Draftsmen and others employed during the year :—

Draftsmen and Searchers (3)—Staff	...	...	...	...	...	15
“ “ Temporary	...	...	...	...	...	11
“ Contract	...	...	...	...	...	4
Cadets	...	...	...	...	...	5
Heliographer and Assistants	...	...	...	...	...	6
Clerk	...	...	...	...	...	1
Total	...	...	...	...	...	42

J. MARSHALL,

Chief Survey Draftsman, Public Works Department.

The Director-General for Public Works.

Local Government.

Seventh Annual Report of the Officer-in-Charge of Local Government, period ended 30th June, 1912.

THE quiet administrative progress in the conduct of Local Government throughout the State which marked the previous year has been continued throughout the year just closed.

The Shire Councils ended their fifth year of full operation of the Local Government Act, on 31st December, 1911, while the Municipal Councils have ended their fourth year with the whole of the provisions of the new law in operation.

(1) Local Government Conferences.

The Annual Conferences of the Local Government Association of New South Wales and the Shires Association of New South Wales were held in September and May last respectively. I have already, in my last report, mentioned the importance to the community of these Conferences, and I will not now enlarge or dwell upon the subject beyond remarking that the Government, recognising the public spirit of the gentlemen honorarily connected with Local Government on the Councils, and the community of interest between local government and railway development, is now issuing free railway passes to delegates from Councils to the annual conferences of the Associations named, and also to members of the Executive Committees of those Associations travelling to attend meetings of such Committees.

The Railway Department allows a concession rate (single fare for the double journey) in connection with these Conferences. Concession fares are also being granted by the Steamer Companies. The cost to the Department of the fares of delegates to the last Local Government Association Conference was £275, and the last Shires Association Conference £155.

Meetings of the Executive Committee of the former Association are held monthly, and of the latter Association once a quarter. The cost to the Department of the fares of members of these Committees travelling to attend meetings of such Committees during the financial year was—Local Government Association £70, Shires Association £40.

These figures are not inclusive of "Sleeping Berths." That concession is being granted as from 1st July, 1912. The cost to the Department will be increased in consequence during the next financial year.

The Local Government Clerks' and Engineers' Associations of New South Wales also hold conferences each year. The Government, however, does not pay the fares of delegates to Conferences of these Associations.

(2) Urban Areas in Shires.

Proposals for the establishment of twelve (12) Urban Areas were received from eleven (11) Councils. Of these, nine were approved, and the Urban Areas established. The remaining three (3) proposals were at the end of the year under review still under consideration.

Particulars of these proposals are given in Appendix I to this Report.

(3) Endowment of Shires.

Every three years, dating in the first instance from 31st December, 1906, it is necessary (see Section 161 of the Local Government Act) for Shires to be classified for purposes of endowment. The first classification having been made on 31st December, 1906, a fresh classification was required to be made during the year 1909. This re-classification was proclaimed in the *Government Gazette* of 29th December, 1909, so that a fresh classification will have to be made on or before 31st December, 1912. This office has for some time past been busily engaged getting together the necessary data for this re-classification.

Under the original classification some eighty-seven (87) Shires were entitled to receive endowment at varying rates in the £ on their general rate collections for the preceding year. This number was increased to one hundred and seven (107) by the re-classification of 1909.

The amount of endowment paid to each Shire in the year 1911, in accordance with this re-classification, is shown in Appendix II hereto, the total amounting to £316,632 18s. 8d.

The following table shows the monetary assistance given each year to Shires, in the shape of endowment, since the inception of Local Government:—

		£	s.	d.
1907 (January to December) ...	...	179,135	0	0
1908 " " ...	...	162,447	16	8
1909 " " ...	...	262,146	3	11
1910 " " ...	...	285,208	14	1
1911 " " ...	...	316,632	18	8

(4) Temporary Loans.

During the year under review, "consent" was given by the Minister to forty-eight (48) Shire Councils to temporarily borrow sums aggregating £50,471 19s. 7d., as shown in Appendix III; and to forty-two (42) Municipal Councils to temporarily borrow £41,863 9s. 10d., as shown in Appendix IV. The total amount of temporary loans authorised for the twelve months was, therefore, £92,335 9s. 5d.

In almost all cases, the temporary loans were obtained by Councils for purposes of meeting their current expenses, in carrying on ordinary road and bridge and Local Government administrative work, during the period which intervenes each year between the spending of the previous year's revenue and the collection of that for the current period.

The amount which may be temporarily borrowed by a Council in any one year must not exceed one-third of the estimated revenue to be received from rates.

In dealing with applications of this character the Department's practice is to take into account all existing temporary loans of the Council concerned, and authority is not given for the borrowing of any sum which, if added to any existing temporary loans, would raise the total of such loans above one-third of the year's estimated revenue.

(5.) *Renewal of Fixed Loans—Municipalities.*

The Governor has, during the twelve months ended 30th June, 1912, given his approval to the borrowing, by eighteen (18) Municipal Councils, of sums aggregating £87,245 5s. These loans are for the renewal of fixed loans, that is to say they are required for the purpose of repaying loans falling due. The original loans taken together amounted to £144,792 6s. 8d. Portion of one Council's indebtedness has been taken over by the Government in respect of the sewerage system. The difference between the total amounts of the original loans and the renewal loans, less the £30,000 taken over by the Government, represents the amount of the original loans repaid from revenue or from sinking funds which have been provided for this purpose. These repayments total £27,547 1s 8d.

Particulars of these Loans will be found in Appendix V.

(6.) *New Fixed Loans.*

Twenty-three (23) proposals from Municipal Councils, and four (4) from Shire Councils, for new fixed loans were dealt with during the period under review. Ten (10) of these proposals were, after the necessary preliminaries had been complied with and an inquiry held into each by an officer appointed in that behalf by His Excellency the Governor, submitted to a poll of the ratepayers concerned. These were all passed at the polls, and the loans, aggregating £52,475, were approved by the Governor.

One of these loans (amounting to £1,200), borrowed for the purpose of completing Municipal electricity works, has been guaranteed by the Government.

Of the balance of the proposals three (3) were abandoned; two (2) have not been proceeded with by the Councils concerned; and one (1) was suspended for the time being, as it was found that the loan rate which it would be necessary to levy to repay the interest and provide sinking fund for repayment of the loan, and rates already levied would, taken together, exceed the statutory limit of rating.

At the close of the period covered by this report action was proceeding in the remaining eleven (11) cases.

Further particulars of these proposals are given in Appendix VI hereto.

(7.) *Alteration of boundaries of Municipalities and Shires*

The boundaries of the Municipalities of Gerringong, Jamberoo, and Manilla, and of the Shires of Gilgandra, Timbregongie, Mandowa, and Dalgety were altered during the year (see Appendix VII.)

(8.) *Applications for new Municipalities.*

Proposals were made during the year to take the townships of Cessnock and Aberdare out of the Cessnock Shire, and form such townships into a new Municipality; to form the East, Central, and West Wards of the Municipality of Lane Cove into a separate Municipality; and to unite two existing Municipalities (Orange and East Orange), and reconstitute the area as a new Municipality.

All of these proposals were at the close of the year still under consideration. (See Appendix VIII.)

(9.) *Applications for New Shires.*

During the year proposals were made to unite the Boree Shire and Cudal Municipality, and to reconstitute the area so formed as a new shire, under the name of Boree Shire; to unite the Nepean Shire and the Mulgoa Municipality, and to reconstitute the areas so formed as a new shire, under the name of Nepean Shire; and to unite the Namoi Shire and West Narrabri Municipality, and to reconstitute the area so formed as a new shire, under the name of Namoi Shire.

A proposal was also made to form two new shires by dividing the existing shire of Dorriggo.

At 30th June, 1912, action was proceeding in each of these cases.

Further particulars of the proposals are given in Appendix X hereto.

(10.) *Alterations of Ward Boundaries.*

The only alteration in the ward division of Municipalities which was made during the year was in the case of the Municipality of Kogarah.

(11.) *Abolition of Ward Divisions.*

During the year the ward divisions of the Municipality of Wellington were abolished. The Municipality was previously divided into three wards.

(12.) *Accounts of Councils.*

The supervision exercised by the Department over the accounts of Councils has proceeded smoothly throughout the year. Generally speaking, and disregarding the few exceptions, it would appear that the accounts of Shires and Municipalities are being well kept.

I mentioned in my last report that there was room for improvement in the promptitude with which the yearly and half-yearly statements of accounts are furnished. There is evidence of improvement in this direction since I made that report.

These delays are attributable to various causes—delays by Auditors in carrying out the audits; the tendency of some Town and Shire Clerks to leave the preparation of the statements over till the arrival of the Auditor; and in one or two cases, I am afraid, inability of the Clerk to prepare the statements without the Auditor's assistance. The delays may also, to some extent, be due to changes in the office of Clerk, the new Clerk in some instances experiencing difficulty in coping with arrears left by his predecessor. It is reasonable to suppose, however, that as time goes on, and the less efficient Clerks are weeded out, these delays will gradually cease.

During the year ended 30th June, 1912, the Local Government Office examined 658 original and 284 revised statements of accounts.

(13.) *Audit.*

In my last report I expressed the opinion that the work of the Auditors under the Local Government Act, on the whole, was being well performed. The good work has continued throughout the period covered by this Report. In Paragraph 16 above, I said that the delay in the submission of the statements of accounts was due in some measure to neglect, in some instances for long periods, on the part of Auditors (I might say, on the part of one Auditor in particular) to carry out the audits, and to attend to Departmental requirements in connection with such statements. The particular Auditor referred to

above

above is, I think, responsible for the majority of the delays. The root of the trouble is the tendency to accept more audits than can possibly be got through within reasonable time of the close of the year or the half-year, as the case may be. The Department repeatedly called attention to this unsatisfactory feature in this Auditor's work, but without any improvement resulting. It became necessary, therefore, for the Department to censure him and caution him against a repetition of these practices. The Department is ever reluctant to take strong measures, and regrets that the necessity arose therefor in this instance. However, in view of the lesson administered, and the promise of amendment given by the Auditor, it is reasonable to hope that improvement will be noticeable during the next twelve months. If not, the Department will be compelled to take steps to cancel the Auditor's certificate.

(14.) *Defalcations.*

Several cases, more or less serious, of defalcations by servants of the councils, have come under the notice of the Department during the year. Section 126 of the Local Government Act provides that "Where a council has reasonable grounds to believe that any of its servants has stolen or embezzled any of its moneys or property, the council shall, with due diligence, prosecute the offender." Notwithstanding the duty thus definitely laid upon them, some councils are extremely unwilling to take legal proceedings against dishonest servants.

(15.) *Town and Shire Clerks—Certificated and Uncertificated.*

Before the Local Government Act became law there was no requirement that Town Clerks should hold certificates of qualification. Again, when the Shires were established, it was necessary for each Shire Council to secure the services of a clerk. Regulations were made under the Local Government Act on 11th May, 1907, providing that after that date only persons holding certificates would be eligible for appointment as Town or Shire Clerks. To meet the circumstances of small local governing areas (which represent a small percentage) it was provided that if a council's income did not exceed a certain sum averaged over the three years ending on the 31st day of December last preceding, such council need not employ a certificated clerk. Thus there are a considerable number of Town and Shire Clerks, who, not requiring to hold a certificate while they remain with the Shire or Municipality to which they were first appointed, are still uncertificated. This number, however, is gradually decreasing. Some are obtaining the necessary certificates, some have resigned, others have died, and so on. The percentage of uncertificated clerks employed by Shire Councils is slightly larger than that of those employed by the Councils of Municipalities, the figures being 30 per cent. and 26 per cent. respectively.

(16.) *Examinations for, and issue of, Certificates to Town and Shire Clerks, Auditors, Engineers, and Overseers.*

Particulars of examination held during the twelve months ended 30th June, 1912, for certificates of qualification as town and shire clerks, auditors, engineers, and overseers of works, and of the issue of such certificates, are given in Appendices X and XI respectively.

(17.) *Revision of Ordinances and Regulations.*

The ordinances and regulations under the Local Government Act were last revised in May, 1908, and in the four years which have passed since then there have been 60 amendments made in the ordinances and 12 in the regulations, an average of 18 per annum. These amendments are really very few when one takes into account the wide range of subjects covered by Local Government, the great area of the State, and the large number of shires and municipalities.

Though only 72 amendments have been made during the past four years, it does not follow that more are not necessary. Amendments were made only when they were urgently needed; many others which are advisable have been held back for a general revision of the ordinances and regulations when the Local Government Amending Bill has been passed. So that such revision might be completed as soon as possible after the passing of the Amending Bill, it was decided in April last to proceed at once with the revision, and a committee was appointed to undertake this work.

On the occasion of the last revision the Department considered it advisable to have the advantage of the practical experience of several Town Clerks. The same course is being followed in connection with the present revision. The revision committee in this instance consists of Mr. J. Golden Hinsby (Town Clerk of Annandale), Mr. A. Vialoux (Town Clerk of Paddington), and Mr. R. W. Grierson (Town Clerk of Redfern), with myself as chairman.

The omission by the Department to give the country municipalities and shires representation on this committee has been the subject of some discussion. The Department would have liked, were it possible, to include one, or perhaps two, country clerks in the committee, but the work of the committee will extend over some months, and it can only meet after office hours on one or two evenings a week. It will be apparent, therefore, that it was not practicable to include any country members. All Councils throughout the State, however, have been asked to submit suggestions for the amendment of the ordinances and regulations. All such suggestions will be welcomed, and the councils and their clerks may rest assured that such suggestions will receive careful consideration on their merits.

(18.) *Cemetery Management.*

During the year a new Ordinance (No. 68) respecting "the regulation of the interment of the dead" was brought into operation. The ordinance may be applied to any area the council of which has acquired the powers of paragraph (li), of section 109, of the Local Government Act, viz.:—

"The regulation of the interment of the dead, with power, subject to the Governor's approval, to prohibit burials in any cemetery or land in any case where such course appears to the council to be necessary for the prevention of the pollution of any water supply, or for the better protection of the health of residents in the neighborhood of such cemetery or land,"

and it relates to all cemeteries within such area, whether under the direct control of the council or not. Several councils have already had this Ordinance applied to their areas, and it is expected that their number will be considerably increased in the near future.

There

There seems to be an increasing tendency in the State to have the management of cemeteries which are at present administered by private trustees, placed in the hands of shire and municipal councils. The neglect of some trustees to carry out the requirements of their trust is apparently to a large extent responsible for this tendency.

A glaring instance of such neglect recently came under the notice of the Department as a result of the inspection of the accounts of a country cemetery by an Inspector of the Audit Department. Under the Cemetery Regulations, meetings of the trustees should have been held not less than once in six months. As a matter of fact, two meetings only were held in nine years. The trustees left matters entirely in the hands of their secretary, who was also the officer-in-charge of the cemetery. The last entry in the cash book had been made over seven years before the inspection. No register of interments had been kept, and in many instances it was utterly impossible to identify graves. Although the regulations provided for the payment of interment fees *in advance* to the officer-in-charge, such fees had been retained by certain undertakers for periods ranging to over two years, and then paid in lump sums. As the amounts paid into the bank were far less than those actually due, it appeared either that the undertakers had not accounted for the fees retained by them or that the secretary had failed to do so. Several cases were revealed in which relatives and friends of deceased persons had paid fees considerably in excess of those accounted for to the Trust. After an exhaustive inquiry, the Inspector came to the conclusion that the Trustees had been robbed of some hundreds of pounds. Legal proceedings were taken against the secretary and the undertakers concerned, and they were committed for trial for conspiracy. After reviewing the available evidence, however, the Solicitor-General declined to file a bill against them. Steps have been taken to have the trusteeship of this cemetery transferred to the local council.

(19.) *Valuations.*

In Appen tices XVI and XVII herewith, information is given as to the Unimproved Capital Value of Land in Municipalities and Shires in 1908 and subsequent years. The following is a summary of that information:—

Unimproved Capital Value in 1908 and 1911, or 1912, where available.

Group.	1908.	1911 or 1912.
	£	£
City of Sydney	20,457,251	24,125,425
Sydney Suburban Municipalities	23,550,417	26,515,176
City of Newcastle and Suburban Municipalities	3,165,553	2,991,523
City of Broken Hill	961,752	855,291
Country Municipalities	15,977,678	16,319,272*
Shires	82,414,771	95,293,593
Totals	£146,527,422	£166,100,280

No.	Group.	No.	Decreases.	No.	Increases.	Net Decreases.	Net Increases.
			£		£	£	£
1	City of Sydney .....	...	...	1	3,668,174	.....	3,668,174
40	Sydney Suburban Municipalities	6	85,680	34	3,050,439	.....	2,964,759
12	City of Newcastle and Suburban Municipalities ..	10	189,250	2	15,220	174,030	.....
1	City of Broken Hill	1	106,461	...	.....	106,461	.....
*135	Country Municipalities	59	657,584	76	999,178	.....	341,594
134	Shires	11	596,494	123	13,475,316	.....	12,878,822
*323	Totals	87	1,635,460	236	21,208,327	280,491	19,853,349
	Net increase .....	...	.....	...	19,572,858	.....	.....

* Not including Narromine.

New South Wales has been passing through a period of abounding prosperity, and land values have been rising in sympathy therewith. Those decreases shown in the municipal and shire valuations, therefore, are surprising, and lead one to infer that the present system, whereby persons who may or may not be qualified are appointed by councils to fill the positions of valuers, is not a good one. The six Sydney suburban municipalities in which decreases are shown are Bexley, Darlington, Erskineville, Glebe, Homebush and Vacluse. The following information regarding each of those municipalities is interesting, as some guide to whether land values should or should not have decreased in these municipalities.

Municipality.	Area.		Population.		
	1908.	1911.	1908.	1911.	
	acres.	acres.			
Bexley	1,920	1,920	5,620	6,517	New tram to Arncliffe, opened in October, 1909.
Darlington	44	44	3,390	3,816	Abercrombie-street tram opened in January, 1909.
Erskineville	195	195	7,000	7,299	Some land resumed for railway purposes, thus reducing total of ratable land
					New tram opened in January, 1909.
Glebe	521	521	20,400	21,943	
Homebush	640	640	540	676	
Vacluse	768	768	1,170	1,672	

In Bexley the population increased by 897, and the back lands were developed by the opening of the tramway. The result which any reasonable man would expect would be an increase, not a decrease, in the value of land. The same remarks apply to Darlington. In Erskineville the decrease may be due to the railway resumptions, but, so far as I am aware, there was not a similar counteracting factor in any of the other municipalities named. In Glebe, Homebush and Vaculuse, also, increase of population should, one would expect, have led to an increase of land value. It cannot be supposed that the operation of ordinary economic forces have been suspended in these municipalities during the last four years, and the only other conclusion is that the valuations are wrong.

An investigation of each of the other cases where decreases are shown would perhaps lead to the same conclusion.

(20.) Conclusion.

In conclusion I have to again acknowledge the exceptionally good work done by the officers of the staff. The year has been a heavy one, necessitating the working of overtime in some cases. Each member of the staff has responded splendidly to the extra call made upon him, and I take this opportunity of expressing my appreciation.

I have, &c.,

J. GARLICK,

Officer-in-charge of Local Government.

The Director-General for Public Works.

Appendix I.

URBAN AREAS IN SHIRES.

Shire.	Name of Proposed Urban Area.	Whether Application granted or refused.	Date of Gazetteal.	Remarks.
Narraburra	Ariah Park	Granted ..	17 Jan., 1912	
Coolamon	Coolamon	" ..	1 May, 1912	
Sutherland	Cronulla	" ..	1 " 1912	
Culcairn	Culcairn	" ..	1 " 1912	
Bibbenluke	Delegate	" ..	1 " 1912	
Cobbora	Geurie	" ..	31 Jan., 1912	
Blue Mountains	Glenbrook	" ..	7 Feb., 1912	
Rylstone	Rylstone	" ..	1 May, 1912	
Blue Mountains	Wentworth Falls	" ..	13 Dec., 1911	
Blaxland	Newnes	" ..		Under consideration.
Bannockburn	Delungra	" ..		" "
Stroud	Bullahdelah	" ..		" "

Appendix II.

STATEMENT of Endowment Moneys paid to Shires during the year 1911.

(Name of Shire.	Amount.	Name of Shire.	Amount.	Name of Shire.	Amount.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Abercrombie	3,435 13 2	Eurobodalla	4,288 18 7	Nepean	1,103 5 2
Amaroo	1,295 13 5	Gadara	4,211 3 10	Nundle	1,123 19 2
Apsley	1,402 10 2	Germanton	710 15 0	Oberon	2,475 17 10
Ashford	2,346 15 4	Gilgandra	1,147 6 7	Orara	3,636 5 4
Bannockburn	1,898 16 9	Gloucester	2,637 19 8	Patrick Plains	983 8 0
Barraba	1,066 9 11	Goobang	669 16 6	Peel	2,533 1 10
Baulkham Hills	1,694 14 8	Goodradigbee	2,499 10 11	Port Stephens	3,158 3 0
Bellingen	16,528 15 4	Gostwyck	1,798 7 9	Rylstone	1,023 4 2
Berrigan	527 7 11	Gundurimba	4,971 15 9	Severn	4,402 12 6
Bibbenluke	1,434 18 4	Gunning	1,596 3 9	Stroud	4,106 13 1
Blacktown	1,906 13 0	Guyra	4,452 1 0	Sutherland	2,916 13 1
Bland	575 10 2	Gwydir	1,703 12 1	Talbragar	745 17 4
Blaxland	2,669 19 0	Harwood	4,363 18 2	Tallaganda	3,102 12 6
Blue Mountains	4,236 6 10	Hastings	7,941 11 4	Tarro	3,991 6 2
Bogan	206 9 9	Hornsby	2,026 6 2	Tenterfield	5,676 1 0
Bolwarra	356 1 7	Hume	797 13 4	Terania	5,988 10 8
Boree	2,337 11 6	Imlay	3,853 4 0	Timbrellongie	793 13 6
Bulli	1,769 4 5	Jindalee	330 5 8	Tintenbar	6,201 14 10
Byron	6,381 16 6	Ku-ring-gai	1,671 2 1	Tomki	5,544 13 4
Cambewarra	1,255 10 6	Kyeamba	321 10 11	Tumbarumba	2,355 11 8
Canobolas	3,497 0 10	Kyogle	5,983 10 1	Turon	3,304 9 10
Cessnock	4,156 12 2	Lake Macquarie	4,536 14 9	Tweed	10,866 2 3
Clyde	3,433 14 2	Lyndhurst	1,745 8 6	Wallerobba	2,809 5 10
Cobbora	1,431 12 1	Macintyre	2,882 2 3	Warragah	3,932 2 1
Cockburn	2,470 15 6	Macleay	4,903 19 4	Waugoola	694 8 6
Colo	3,227 6 4	Macquarie	1,275 1 7	Weddin	783 17 8
Coolah	244 18 6	Mandowah	1,560 12 1	Wingecarribee	2,645 8 1
Coolamon	284 8 1	Manning	9,682 15 0	Wollondilly	3,517 13 6
Coonabarabran	1,269 10 3	Meroo	1,644 1 3	Woodburn	4,971 5 11
Copmanhurst	3,566 8 11	Merriwa	612 8 2	Woolooma	284 19 4
Crookwell	3,222 10 7	Monaro	2,443 13 11	Wyaldra	1,652 14 3
Culcairn	503 3 4	Mulwaree	3,399 17 0	Yallaroi	1,267 0 2
Dalgety	2,890 9 10	Mumbulla	1,457 11 2	Yarrowlunla	1,440 2 4
Demondrille	307 9 2	Murrungal	1,376 18 4		
Dorrigo	18,636 0 5	Muswellbrook	1,681 19 4	Total	£ 316,632 18 8
Dumaresq	3,809 4 10	Narraburra	1,244 5 0		
Erina	9,892 0 8	Nattai	2,176 0 0		

Appendix III.

TEMPORARY LOANS.

Shires.

Shire.	Amount.	Date of Consent.	Shire.	Amount.	Date of Consent.
	£ s. d.	1911-1912.		£ s. d.	1911-1912.
Adjungbilly	1,267 0 0	17 April.	Macquarie	1,500 0 0	29 January.
Bannockburn	1,000 0 0	6 November.	Do	630 0 0	18 March.
Baulkham Hills	300 0 0	24 January.	Mitchell	2,000 0 0	9 January.
Bibbenluke	1,000 0 0	17 April.	Monaro	800 0 0	26 October.
Bolwarra	250 0 0	8 February.	Mumbulla	1,180 0 0	6 November.
Boolooroo	1,200 0 0	6 „	Murrungal	600 0 0	20 December.
Boomi	1,200 0 0	19 „	Orara	508 0 0	14 February.
Boree	250 0 0	24 January.	Peel	1,900 0 0	6 March.
Burrangong	1,400 0 0	4 December.	Rylstone	300 0 0	25 „
Cessnock	1,000 0 0	12 February.	Stroud	400 0 0	10 January.
Do	1,000 0 0	3 April.	Sutherland	1,600 0 0	29 „
Colo	500 0 0	19 January.	Talbragar	868 19 7	3 April.
Coreen	500 0 0	20 February.	Tamarang	1,500 0 0	6 February.
Coolamon	1,200 0 0	8 „	Tenterfield	800 0 0	28 August.
Crookwell	1,400 0 0	19 „	Terania	1,500 0 0	29 January.
Culcairn	1,300 0 0	4 August.	Walgett	1,000 0 0	1 April.
Do	500 0 0	14 May.	Wallarobba	600 0 0	29 January
Dorrigo	50 0 0	20 March.	Warringah	300 0 0	31 „
Gilgandra	650 0 0	15 August.	Do	300 0 0	15 March.
Goobang	1,000 0 0	19 January.	Waugoola	1,000 0 0	12 February.
Gundurimba	1,200 0 0	3 „	Weddin	750 0 0	2 „
Guyra	1,338 0 0	24 April.	Woodburn	300 0 0	1 April.
Hume	1,500 0 0	19 January.	Wunnamurra	1,330 0 0	26 March.
Jindalee	700 0 0	1 February.	Yanko	1,500 0 0	27 January.
Ku-ring-gai	2,800 0 0	3 April.	Yarrowlumla	500 0 0	24 „
Kyogle	1,500 0 0	26 March.			
Macleay	800 0 0	22 April.	Total	£ 50,471 19 7	

Appendix IV.

TEMPORARY LOANS.

Municipalities.

Municipality.	Amount.	Date of Consent.	Municipality.	Amount.	Date of Consent.
	£ s. d.	1911-1912.		£ s. d.	1911-1912.
<i>Metropolitan—</i>			<i>Country (cont-nued)—</i>		
Burwood	1,000 0 0	19 January.	Kempsey	450 0 0	17 June.
Drummoyne	1,500 0 0	19 „	Lithgow	2,500 0 0	19 January.
Kogarah	500 0 0	10 February.	Maitland East	500 0 0	24 „
Manly	1,000 0 0	19 January.	Murrurundi	100 0 0	4 September.
Marrickville	4,000 0 0	15 „	Murwillumbah	200 0 0	26 October.
Mosman	1,000 0 0	14 February.	Narrabri West	70 0 0	15 August.
Paddington	3,400 0 0	20 March.	Nyngan	100 0 0	24 January.
Petersham	3,000 0 0	29 January.	Orange	1,500 0 0	3 April.
Randwick	7,000 0 0	19 „	Orange East	150 0 0	19 January.
Rockdale	250 0 0	8 May.	Parkes	300 0 0	19 February.
Willoughby	1,000 0 0	8 February.	Peak Hill	125 0 0	22 December.
Woollahra	4,500 0 0	19 January.	Plattsburg	200 0 0	19 February.
<i>Country—</i>			Port Macquarie	50 0 0	19 January.
Albury	1,465 9 10	3 February.	Prospect and Sherwood	200 0 0	14 May.
Barraba	150 0 0	26 March.	Quirindi	400 0 0	21 February.
Brewarrina	130 0 0	2 February.	Stockton	250 0 0	29 December.
Carrington	200 0 0	13 September.	Tenterfield	300 0 0	13 June.
Coonamble	250 0 0	2 November.	Ulladulla	250 0 0	11 December.
Cowra	600 0 0	19 April.	Walcha	250 0 0	2 November.
Deniliquin	500 0 0	3 January.	Wallendbeen	223 0 0	7 December.
Goulburn	1,000 0 0	23 February.	Waratah	300 0 0	10 January.
Hillston	100 0 0	23 January.	„	600 0 0	17 April.
Kempsey	300 0 0	8 March.	Total	£ 41,863 9 10	

Appendix V.

FIXED LOANS.—Renewal.

Municipality.	Purpose of Original Loan.	Date Loan first authorised.	Original Amount.	Amount paid off since first borrowed.	Amount for which approval has been given to borrow.	Remarks as to provision for Repayment.
<i>Metropolitan Municipalities—</i>			£	£	£	
Annandale	Permanent improvements.	21 March, 1899	2,000	693/15/-	13,181/5/-	{ 1 per cent. of original loan to be set aside from General Fund at rate £69 7s. 6d. each half-year in reduction of principal.
.....	" "	26 Nov., 1901	11,875			
Lane Cove.....	To pay proportion of Willoughby Permanent Improvements Loan on severance from Willoughby.	25 April, 1902	4,933/6/8	433/6/8	4,500	{ £450 per annum to be set aside from General Fund.
Mosman.....	Permanent improvements.	19 Jan., 1905	3,000	.....	3,000	{ £75 per annum to be set aside from General Fund till 1916, when all loans to be consolidated, and a loan rate levied to repay.
Redfern	" "	{ 13 Sept., 1886 25 May, 1887	{ 15,000 35,000	{ 4,000 paid off, and £30,000 taken over by Government re sewerage system.	16,000	{ £500 per annum to be set aside from General Fund.
Strathfield	" "	{ 30 Jan., 1886 31 Oct., 1889	{ 5,000 2,500			
Vauluse	Council Chambers site Permanent improvements.	20 July, 1897 31 Aug., 1901	{ 500 2,020	20	4,500	{ £225 per annum to be set aside from General Fund, and Renewal Loan to be raised to repay balance.
.....	Permanent improvements and erection of cargo wharf, and baths.	25 Jan., 1905	2,000			
Deniliquin.....	Permanent improvements.	13 Jan., 1876	2,000	{ 100	3,700	{ £100 per annum to be set aside from General Fund. Renewal Loan to be raised for balance.
.....	" "	9 April, 1877	1,800			
Granville	" "	30 Oct., 1886	10,000	{ 3,700	13,500	{ £500 per annum to be set aside from General Fund.
.....	" "	22 Nov., 1888	1,200			
.....	" "	30 April, 1891	5,000			
Lithgow.....	" "	1 Aug., 1900	1,000	{ ...	2,000	{ £100 per annum to be set aside from General Fund.
.....	" "	8 Aug., 1901 6 Sept., 1901	1,000 1,000			
<i>Newcastle Suburbs—</i>						
Adamstown ...	" "	18 Oct., 1886	1,000	{ 400	{ 700 1,000 900	{ £100 per annum to be set aside from General Fund as General Sinking Fund.
.....	" "	20 Sept., 1887	1,000			
.....	" "	28 Nov., 1891	1,000			
Merewether	" "	22 Nov., 1886	3,000	2,000	1,000	{ £150 per annum to be set aside from General Fund.
Stockton	" "	19 Sept., 1890	500	...	500	{ Not less than £60 per annum to be set aside from General Fund as Sinking Fund to repay this and other loans.
Wickham	" "	5 Mar., 1887	2,000	{ 5,600	1,400	{ 5 per cent. of Current General Rate to be set aside each year as Sinking Fund to repay this and other loans.
.....	" "	28 July, 1890	5,000			
<i>Country Municipalities—</i>						
Raymond Terrace..	" "	30 Jan., 1886	1,000	500	500	{ £50 per annum to be set aside from General Fund.
Rookwood.....	Erection of Council Chambers.	Issued Oct., 189	1,000	{ ...	1,400	{ Loan Rate 3/4ths of 1d. in £ on U. C. V. to be levied to pay half-yearly instalments of principal and interest.
.....	Additions to Council Chambers.	Issued 28 July, 1899	400			

Appendix V (FIXED LOANS—Renewals)—continued.

Municipality.	Purpose of Original Loan.	Date Loan first authorised.	Original Amount.	Amount paid off since first borrowed.	Amount for which approval has been given to borrow.	Remarks as to provision for Repayment.
<i>Country Municipalities—</i>						
Scone	Permanent improvements.	10 Oct., 1896	£ 500	£ 300	£ 800	{ £50 per annum to be set aside from General Fund.
Ulladulla	" "	29 July, 1889	1,000	400	800	{ £100 per annum to be set aside from General Fund.
	" "	8 Dec., 1891	2,000	1,200	800	{ £500 per annum to be set aside from Gas Works Trading Fund.
Wagga Wagga...	Construction of Gas Works.	30 June, 1887	10,000	7,000	8,000	{ 2 per cent. of Loan to be set aside each year for Sinking Fund.
	Erection of Town Hall	28 Feb., 1888	5,000			
	Purchase part site for Town Hall.	19 Mar., 1901	3,200			
		19 Mar., 1901	364	...	3,564	

Appendix VI.

FIXED LOANS—NEW.

Council.	Purpose of Proposed Loan.	Act under which granted.	Date of Governor's Approval where Granted.	Amount.	Remarks.
<i>Metropolitan Municipalities—</i>					
Alexandria.....	Street improvements—Bourke-road and O'Riordan-street.	Local Government Acts.	4 June, 1912	£ 10,000	Loan rate 2½d. in £ on U.C.V. of benefited area to be levied to raise £536 per annum, and £195 per annum to be voted from General Fund to repay principal with interest (£731 per annum) in 20 years.
Glebe	Improvements to various streets and roads in municipality.	Local Government Acts.	28 May, 1912	10,000	Loan rate 3ths of a 1d. in £ on U.C.V., to be levied to raise £1,253 4s. 11d. per annum to repay loan with interest in 10 years.
Kogarah	Street improvements in part of municipality.	Local Government Acts.	13 Feb., 1912	4,000	Loan rate 1d. in £ on U.C.V. of benefited area, to be levied to raise £347 19s. 2d. to pay interest £160 per annum, and principal £190 per annum.
Randwick	Road works.....			50,000	Not proceeded with.
Ryde	Improvements to various streets and roads in Municipality.	Local Government Acts.	12 Mar., 1912	6,000	Loan Rate one-third of 1d. in £ on unimproved capital value, to be levied to raise £593 per annum to pay interest and principal.
Woollahra	Road works, Carlisle Estate			2,756	Prescribed inquiry held. Report favourable. Prescribed poll to be taken on question of raising loan.
<i>Country Municipalities—</i>					
Albury	Establishment of Electricity Works.			10,500	Prescribed inquiry held. Report favourable, subject to adoption of modifications in scheme. Prescribed poll to be taken.
Corowa	" "			4,000	Officer to be appointed to hold prescribed inquiry.
Goulburn	" "			13,000	Officer appointed to hold prescribed inquiry.
Greta	Erection of Council offices	Local Government Acts.	13 Feb., 1912	375	Loan rate ½d. in £ on unimproved capital value, to be levied to produce £61 4s. 11d. per annum to repay the loan with interest in eight years.
Kiama.....	Erection of Town Hall			2,000	Prescribed preliminary <i>Gazette</i> Notice to be published.
Lithgow	Extension of gas mains, erection of street lamps, and improvements to Gas Works plant.	Local Government Acts.	4 June, 1912	6,500	Loan Rate one-fourth of 1d. in £ on unimproved capital value, to be levied to produce £475 16s. 10d. per annum to pay interest on loan, £260 per annum, and Sinking Fund, £215 16s. 10d. per annum.
Maitland East	Gas Works additions and improvements.			1,000	Prescribed inquiry held. Report under consideration.
Maitland West	Town Hall alterations and improvements.			2,750	Officer to be appointed to hold prescribed inquiry.

FIXED LOANS—NEW—*continued.*

Council.	Purpose of Proposed Loan.	Act under which granted.	Date of Governor's Approval where granted.	Amount.	Remarks.
Moss Vale ..	Completion of Electricity Works, partially constructed on loan £2,800.	Local Government Acts.	23 April, 1912	£ 1,200	Guaranteed by Government. Loan Rate two-fifths of 1d. in £ on unimproved capital value, to be levied to produce £104 per annum to pay interest on loan £54 per annum, and £50 for Sinking Fund. £20 per annum for Sinking Fund to be set aside from Electricity Works Trading Fund.
Murrumburrah	Establishment of Sanitary Service, and repairing Albury and Neill streets.	.....	.....	1,000	Proposal in this form abandoned by Council.
Murrumburrah	Improvements, Albury and Neill streets.	.....	.....	2,000	Preliminary Gazette Notice published. Awaiting action by Council.
Narrandera	To pay cost of purchase, and laying street water-main.	Local Government Acts.	12 Dec., 1911	1,400	Loan Rate 262 of 1d. in £ on unimproved capital value, to be levied to produce £94 8s. 4d. to repay the loan, with interest, in twenty-five years.
Newcastle	Electricity Works extensions	Borough of Newcastle Electric Lighting Act, 1902.	5 Dec., 1911	10,000	£731 6s. 8d. per annum to be set aside from Electricity Works Trading Fund to repay loan, with interest, in twenty years.
Newcastle	Construction of Ocean Baths	Local Government Acts	13 Feb., 1912	3,000	Loan one-thirtieth of 1d. in £ on unimproved capital value, to produce £219 7s. per annum to repay the loan with interest, in twenty years.
Temora	Establishment of Electricity Works.	.....	.....	6,500	Governor's approval recommended and awaited. Loan Rate seven-eighths of 1d. in £ on unimproved capital value, to be levied to produce £477 15s. 9d. to pay interest on loan, £292 10s. per annum, and Sinking Fund, £178 15s. per annum.
Wellington	Gas Works Extension .....	.....	.....	4,000	Officer appointed to hold prescribed inquiry.
Wyalong	Erection of Town Hall .....	.....	.....	1,500	Appointment of officer to hold prescribed inquiry under consideration.
Shires— Boree	Street improvements, Canowindra Urban Area.	.....	.....	3,500	Abandoned by Council.
Culcairn	Purchase of Sanitary Plant of Henty Urban Area by Henty Sanitary Service. Local Fund from General Fund.	.....	.....	500	Abandoned by Council.
Kyogle	Road works, Kyogle urban area.	.....	.....	3,750	Suspended for time as Loan Rate necessary to be levied to repay the loan and interest, and Rates already levied for current year would exceed statutory limit of rating.
Timbregongie	Carrying out water supply, Trangie Urban Area.	.....	.....	1,076	Not proceeded with.

Appendix VII.

ALTERATION of Boundaries of Municipalities and Shires.

Municipality.	Nature of alteration.	Date of Proclamation.
Gerringong	Uniting part of the Municipality of Jamberoo to Gerringong	13th December, 1911.
Jamberoo		
Manilla		21st February, 1912.
	Uniting part of the Mandowla Shire, embracing "Manilla" Temporary Common to the Manilla Municipality.	
Shire.	Nature of alteration.	Date of Proclamation.
Gilgandra	Uniting part of the Timbregongie Shire to Gilgandra Shire.....	28th December, 1911
Timbregongie		
Mandowla		21st February, 1912.
Dalgely	Uniting part of the Shire embracing "Manilla" Temporary Common to the Municipality of Manilla.	21st February, 1912.
	Including small area omitted from any area when the Shires of the State were constituted, but intended by Local Government Areas Commission to be included in Dalgely Shire.	

Appendix VIII.

PROPOSALS to Form New Municipalities.

Area in which the proposed Municipality is situate.	Part of the area to embrace the proposed Municipality.	Action.
Cessnock Shire	Townships of Cessnock and Aberdare	Prescribed preliminary notices of proposal to be published by Department.
Lane Cove Municipality	(1) East Ward; (2) Central and West Wards.	Officer appointed to hold inquiry into proposal.

One proposal made to unite two Municipalities, Orange and East Orange, and re-constitute as Municipality. Preliminary procedure observed. No objections received. Proposal favourably regarded, subject to prescribed agreement between Councils and their creditors. Now being considered by creditors.

One proposal to dissolve Municipality, Coraki, by uniting part to the Woodburn Shire and the remainder to Gundurimba Shire. Not followed up by petitioners. Conference of Councils suggested by Department.

Appendix IX.

TABLE showing Area, Population, and Density of Population per acre of Municipalities at 31st December, 1909.

Municipality.	Area in Acres.	Population.	Men per acre.	Acres per man.	Municipality.	Area in Acres.	Population.	Men per acre.	Acres per man.
Darlington	44	3,400	77-27	-01	Narromine	755	1,450	1-92	-52
Newtown	442	26,680	60-36	-02	Musclebrook	1,120	2,100	1-87	-53
Paddington	403	22,570	56-00	-02	Broken Hill	16,640	31,000	1-86	-54
Redfern	435	24,100	55-40	-02	Narrandera	1,550	2,860	1-84	-54
Erskineville	166	7,120	42-89	-02	Dubbo	2,671	4,600	1-72	-58
Glebe	521	20,650	39-63	-02	Lane Cove	2,496	4,060	1-62	-61
Balmain	932	30,380	32-59	-03	Waratah	2,860	4,570	1-59	-63
Annandale	360	10,670	29-64	-03	Kogarah	4,448	6,880	1-55	-65
Leichhardt	1,170	24,140	20-63	-05	Scone	794	1,200	1-51	-66
Petersham	1,254	20,110	16-03	-06	Maclean	1,184	1,780	1-50	-66
North Sydney	2,067	31,600	15-29	-07	Timut	1,120	1,650	1-47	-68
Newcastle	1,060	15,250	14-39	-07	Quirindi	1,498	2,170	1-45	-69
Marrickville	2,016	27,100	13-44	-08	Carcoar	429	600	1-39	-71
Waterloo	806	10,530	13-07	-08	Tamworth	5,274	7,250	1-37	-73
Alexandria	1,024	11,000	10-74	-09	Concord	2,666	3,640	1-36	-73
Wickham	966	9,340	9-67	-10	Goulburn	8,320	10,800	1-29	-77
Ashfield	2,081	19,970	9-59	-10	Plattsburg	2,566	3,300	1-29	-78
Waverley	1,965	18,540	9-43	-10	Wallsend	3,206	3,900	1-21	-82
St. Peters	896	8,140	9-09	-11	Barraba	840	1,000	1-19	-84
Burwood	1,050	9,100	8-66	-12	Canterbury	8,384	9,680	1-15	-87
Woollahra	1,926	15,460	8-02	-12	Bega	2,500	2,600	1-13	-88
Carrington	435	3,220	7-40	-14	Murrumburrah	1,280	1,450	1-13	-88
Orange	640	4,600	7-19	-14	Wellington	4,480	5,000	1-11	-90
Parramatta	2,176	13,600	6-25	-16	Wagga Wagga	5,766	6,300	1-09	-92
Mosman	2,067	12,800	6-19	-16	Rookwood	5,376	5,700	1-06	-94
Hamilton	1,664	9,260	5-56	-18	Hurstville	6,750	7,050	1-04	-96
Singleton	621	3,100	4-99	-20	Narrabri	2,560	2,500	-98	1-02
Mudgee	749	3,600	4-80	-21	Gunnedah	2,656	2,500	-94	1-06
Merewether	1,114	5,340	4-79	-21	Bombala	1,299	1,200	-92	1-08
Taree	294	1,360	4-62	-22	Young	3,400	3,100	-91	1-10
Lambton	807	3,570	4-42	-23	Mullumbimby	1,120	1,000	-89	1-12
Manly	2,426	10,140	4-18	-23	Maitland West	9,901	8,700	-88	1-13
Drummoyne	1,920	8,020	4-18	-24	Lambton, New	2,560	2,260	-88	1-13
Orange East	685	2,750	4-01	-25	Homebush	640	550	-86	1-16
Bathurst	2,560	9,750	3-81	-26	Hillgrove	2,240	1,920	-85	1-16
Grenfell	346	1,200	3-47	-29	Kiama	2,304	1,900	-82	1-21
Murwillumbah	700	2,400	3-43	-29	Ermington & Rydalmere	2,048	1,670	-81	1-22
Hunter's Hill	1,325	4,520	3-41	-29	Grafton, South	1,552	1,200	-77	1-29
Adamstown	973	3,170	3-26	-31	Maitland, East	4,538	3,500	-77	1-29
Uralla	320	1,000	3-12	-32	Gundagai	2,080	1,430	-69	1-45
Bexley	1,920	5,940	3-09	-32	Kempsey	4,051	2,750	-67	1-47
Stockton	768	2,320	3-02	-33	Ryde	7,110	4,580	-64	1-55
Rockdale	5,022	12,790	2-55	-39	Illawarra North	7,360	4,750	-64	1-55
Armidale	2,080	5,200	2-50	-40	Prospect & Sherwood	7,680	4,530	-59	1-69
Manilla	640	1,600	2-50	-40	Nyngan	2,970	1,720	-58	1-72
Mascot	2,256	5,610	2-49	-40	Blayney	3,040	1,700	-56	1-78
Raymond Terrace	384	930	2-42	-41	Cowra	5,677	3,200	-56	1-78
Vaucluse	768	1,820	2-37	-42	Bowral	3,315	1,800	-54	1-84
Wollongong	1,920	4,400	2-29	-44	Narrabri West	1,459	780	-53	1-87
Grafton	2,520	5,600	2-22	-45	Katoomba	7,424	3,800	-51	1-95
Morpeth	666	1,450	2-18	-46	Lismore	14,061	7,250	-51	1-95
Strathfield	1,792	3,800	2-12	-47	Penrith	8,678	4,400	-50	1-97
Willoughby	5,530	11,630	2-10	-48	Dungog	2,701	1,300	-48	2-07
Auburn	2,688	5,500	2-04	-49	Picton	2,317	1,100	-48	2-10
Randwick	8,064	15,980	1-98	-50	Aberdeen	1,491	700	-47	2-13
Lithgow	4,192	8,260	1-97	-50	Temora	5,760	2,700	-47	2-13
Botany	2,163	4,250	1-96	-51	Wingham	2,029	950	-47	2-14
Granville	4,109	8,000	1-94	-51	Cootamundra	6,080	2,800	-46	2-17
Enfield	1,696	3,270	1-92	-52	Inverell	10,370	4,700	-45	2-21

TABLE showing Area, Population, and Density of Population per acre of Municipalities at
31st December, 1909—continued.

Municipality.	Area in Acres.	Population.	Men per acre.	Acre per man.	Municipality.	Area in Acres.	Population.	Men per acre.	Acre per man.
Junee	5,517	2,500	·45	2·21	Moruya	12,160	1,100	·09	11·06
Mittagong	2,304	1,000	·43	2·30	Bankstown	19,393	1,720	·09	11·27
Ballina	5,760	2,480	·43	2·32	Moss Vale	18,240	1,600	·09	11·40
Coraki	2,560	1,100	·43	2·33	Deniliquin	32,000	2,800	·09	11·43
Parkes	10,080	3,860	·38	2·61	Hay	32,000	2,800	·09	11·43
Dundas	2,688	1,030	·38	2·62	Yass	28,800	2,500	·09	11·52
Albury	18,460	7,000	·38	2·64	Warren	14,592	1,250	·08	11·67
Bingara	3,072	1,140	·37	2·69	Gulgong	20,480	1,650	·08	12·41
Murrurundi	5,120	1,900	·37	2·69	Bourke	28,160	1,900	·07	14·82
Moree	8,000	2,900	·36	2·76	Peak Hill	18,560	1,250	·06	14·85
Port Macquarie	3,520	1,200	·34	2·93	Illawarra Central	75,776	5,000	·06	15·16
Eastwood	2,931	930	·31	3·15	Ullmarra	28,000	1,790	·06	15·64
Braidwood	5,760	1,600	·28	3·60	Walcha	18,800	1,200	·06	15·74
Wrightville	5,600	1,500	·27	3·73	Brewarrina	16,000	1,000	·06	16·00
Corowa	8,040	1,920	·24	4·18	Wilcannia	13,440	800	·06	16·80
Queanbeyan	5,696	1,350	·24	4·22	Ulladulla	28,160	1,530	·05	18·41
Camden	7,680	1,760	·23	4·36	St. Mary's	37,760	2,000	·05	18·88
Cobar	22,048	5,000	·22	4·41	Shellharbour	38,720	1,950	·05	19·86
Warialda	5,248	1,070	·20	4·90	Wyalong	32,000	1,500	·05	21·33
Greta	3,072	600	·19	5·12	Condoulin	29,888	1,250	·04	23·91
Windsor	24,896	4,350	·18	5·72	Campbelltown	64,640	2,600	·04	24·86
Casino	21,500	3,750	·18	5·73	Gerrington	27,360	1,100	·04	24·87
Coonamble	15,040	2,480	·16	6·06	Burrowa	21,760	830	·04	26·21
Glen Innes	25,600	4,100	·16	6·24	Jamberoo	40,640	1,400	·03	29·03
Cabramatta and Canley Vale	7,272	1,130	·15	6·43	Shoalhaven South	25,920	820	·03	31·61
Forbes	32,000	4,900	·15	6·53	Broughton Vale	15,040	450	·03	33·42
Nowra	15,552	2,280	·14	6·82	Moama	32,180	950	·03	33·87
Richmond	13,197	1,900	·14	6·95	Castlereagh	30,426	860	·03	35·31
Cooma	17,664	2,300	·13	7·68	Wentworth	21,939	600	·03	36·56
Smithfield and Fairfield	15,360	1,910	·12	8·04	Mulgoa	18,880	500	·03	37·76
Liverpool	43,008	5,100	·12	8·43	Cudal	25,600	650	·02	39·38
Ingleburn	6,592	750	·11	8·78	Jerilderie	32,000	800	·02	40·00
Molong	14,720	1,500	·10	9·81	Balranald	30,720	760	·02	40·42
Tenterfield	29,440	3,000	·10	9·81	Hillston	32,000	750	·02	42·66
Berry	21,574	2,000	·09	10·79	Cudgegong	122,880	2,650	·02	46·37
					Wallendbeen	63,360	850	·01	74·54

Appendix X.

EXAMINATIONS held under Local Government Acts.

Date of Examination.	No. of Candidates.							
	Clerks.		Auditors.		Engineers.		Overseers.	
	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.
1911.								
18-19 September .....	...	...	...	...	...	...	15	...
18-20 " .....	...	...	...	...	7	1	...	...
25-26 October	65	13	6	1	...	...	...	...
1912.								
29-30 May	65	7	15	4	...	...	...	...
24-25 June .....	...	...	...	...	...	...	6	3
24-26 " .....	...	...	...	...	5	...	...	...
Total	130	20	21	5	12	1	21	3

Appendix XI.

CERTIFICATES of Qualification issued under Local Government Acts.

Position.	After Examination.	Without Examination.
Clerk	49	1
Auditor	5	15
Engineer (full)	1	27
Do (interim)	1	9
Overseer .....	...	6
Total	56	58

Appendix XII.

TABLE showing the Unimproved Capital Value of Land in Municipalities for the years 1908 to 1911 or 1912, and the increase or decrease in 1911 or 1912 as compared with 1908.

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
<i>Metropolitan—</i>	£	£	£	£	£	£	£
Sydney	20,207,812	19,970,365	19,952,793	23,940,030	24,125,425	3,668,174	.....
Camperdown	249,439	Amalgamated with the City of Sydney in 1909.					
<i>Suburbs—</i>							
Alexandria	326,055	322,920	325,954	382,952	364,916	38,861	.....
Annandale	353,842	354,612	353,504	372,933	.....	19,091	.....
Ashfield	999,497	992,887	1,018,606	1,091,914	1,096,595	97,098	.....
Balmain	1,182,345	1,166,734	1,152,027	1,241,028	1,219,422	37,077	.....
Bexley	213,640	213,640	211,412	212,647	.....	.....	993
Botany	169,356	166,120	165,605	173,145	173,494	4,138	.....
Botany, North (Mascot)	213,309	210,721	210,111	234,806	.....	21,497	.....
Burwood	598,535	607,759	623,044	666,986	.....	68,451	.....
Canterbury	438,199	444,013	496,156	598,533	.....	160,334	.....
Concord	290,528	302,120	302,120	339,906	.....	49,378	.....
Darlington	125,644	124,352	124,320	124,194	124,195	.....	1,449
Drummoyne	569,949	567,908	577,182	678,840	.....	108,891	.....
Eastwood	75,494	75,138	74,812	107,301	.....	31,807	.....
Enfield	172,773	177,113	175,448	203,018	199,733	26,960	.....
Erskineville	153,216	151,576	152,519	152,705	.....	.....	511
Glebe	865,918	857,095	857,095	807,130	.....	.....	58,788
Homebush	65,046	52,307	52,730	62,052	.....	.....	2,994
Hunter's Hill	310,826	311,913	311,940	316,384	.....	5,558	.....
Hurstville	272,753	268,223	265,361	269,100	348,206	75,453	.....
Kogarah	312,962	312,962	312,337	391,967	438,335	125,373	.....
Lane Cove	276,322	279,082	283,255	349,640	.....	73,318	.....
Leichhardt	643,223	644,976	646,885	702,078	.....	58,855	.....
Manly	670,834	684,389	715,347	1,285,469	.....	614,635	.....
Marrickville	1,159,720	1,155,003	1,164,208	1,197,706	.....	37,986	.....
Mosman	840,638	824,016	849,881	899,835	.....	59,197	.....
Newtown	1,302,700	1,299,319	1,279,560	1,333,685	1,306,504	3,804	.....
North Sydney	1,938,659	1,941,770	1,978,973	2,189,588	2,225,193	286,534	.....
Paddington	781,442	779,001	786,418	820,226	.....	38,784	.....
Petersham	1,018,854	1,016,164	1,019,390	1,065,100	.....	46,246	.....
Randwick	1,086,332	1,085,873	1,188,268	1,369,547	.....	283,215	.....
Redfern	787,741	782,348	781,908	807,198	.....	19,457	.....
Rockdale	585,061	575,288	567,799	625,736	.....	40,675	.....
Ryde	358,027	357,375	363,746	432,374	.....	74,347	.....
St. Peter's	219,799	219,796	220,142	220,142	227,664	7,865	.....
Strathfield	402,663	398,543	392,774	405,068	.....	2,405	.....
Vaucluse	388,568	369,206	365,596	367,623	.....	.....	20,945
Waterloo	357,706	345,748	353,948	382,286	.....	24,580	.....
Waverley	777,885	820,702	847,955	958,188	.....	180,303	.....
Willoughby	653,735	648,887	655,358	777,979	.....	124,244	.....
Woollahra	1,590,621	1,578,936	1,599,704	1,713,686	1,794,633	204,012	.....
Total Suburbs	23,550,417	23,486,535	23,823,398	26,330,695	.....	3,050,439	85,680
Total Metropolitan	44,007,668	43,456,900	43,776,191	50,270,725	.....	6,718,613	85,680

Net increase, Sydney and Suburbs, £6,632,933.

<i>Country—</i>							
Aberdeen	12,277	12,661	12,661	13,374	.....	1,097	.....
Albury	455,317	449,576	448,391	444,389	.....	.....	10,928
Armidale	199,464	196,248	199,455	204,010	.....	4,546	.....
Auburn	194,994	194,893	196,193	255,692	.....	60,698	.....
Ballina	94,632	94,192	94,463	94,351	117,468	22,836	.....
Bankstown	196,743	194,736	232,874	246,106	.....	49,363	.....
Balranald	21,220	21,220	21,220	21,429	21,652	432	.....
Barraba	57,479	57,479	66,128	61,538	46,285	.....	11,194
Bathurst	251,512	250,017	249,962	249,857	.....	.....	1,655
Bega	138,267	137,375	137,384	137,162	.....	.....	1,105
Berry	310,681	310,687	304,341	303,047	285,585	.....	25,096
Bingara	25,881	25,145	25,307	25,856	27,213	1,332	.....
Blayney	48,354	48,079	48,229	47,697	.....	.....	657
Bombala	29,890	29,770	29,625	29,651	29,506	.....	384
Bourke	42,778	37,156	37,655	28,939	.....	.....	13,839
Bowral	77,550	74,400	75,839	78,667	.....	1,117	.....
Braidwood	36,583	36,583	36,533	36,446	35,466	.....	1,117
Brewarrina	14,810	14,810	14,376	10,409	10,409	.....	4,401
Broken Hill	961,752	911,877	816,982	855,291	.....	.....	106,461
Broughton Vale	52,080	53,088	39,115	40,915	39,095	.....	12,985
Burrowa	67,820	68,109	68,109	68,863	.....	1,043	.....
Cabramatta and Canley Vale	55,797	60,035	61,061	63,702	.....	7,905	.....
Camden	115,814	114,029	114,027	115,171	.....	.....	643
Campbelltown	175,034	190,947	182,025	184,479	183,274	8,240	.....
Carcoar	11,643	11,040	11,078	11,029	10,851	.....	792
Casino	305,527	303,324	303,771	304,273	.....	.....	1,254
Castlereagh	53,692	56,000	51,589	53,654	.....	.....	38
Cobar	72,846	71,646	71,863	79,535	79,945	7,099	.....
Condobolin	61,697	61,697	62,183	63,283	.....	1,586	.....
Cooma	71,668	69,944	68,309	68,977	71,239	.....	429

TABLE showing the Unimproved Capital Value of Land in Municipalities for the years 1908 to 1911 or 1912 and the increase or decrease in 1911 or 1912 as compared with 1908—*continued*.

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
<i>Country (continued)—</i>	£	£	£	£	£	£	£
Coonamble	91,098	88,734	82,884	87,040	.....	.....	4,058
Cootamundra	126,851	128,467	128,540	129,449	.....	2,598	.....
Coraki	60,779	57,990	58,411	58,474	.....	.....	2,305
Corowa	132,595	132,973	132,973	140,441	.....	7,846	.....
Cowra	138,464	138,464	140,195	148,809	.....	10,345	.....
Cudal	49,538	49,538	49,538	53,246	33,246	.....	16,292
Cudgegong	201,569	203,255	202,161	203,169	.....	1,600	.....
Deniliquin	95,575	93,599	93,546	83,434	.....	.....	12,141
Dubbo	147,890	145,074	144,150	162,501	.....	14,611	.....
Dundas	106,103	107,098	106,632	110,352	.....	4,249	.....
Dungog	46,970	47,449	48,225	48,147	53,166	6,196	.....
Ermington and Rydalmere	43,052	42,932	43,456	45,870	.....	2,818	.....
Forbes	146,620	147,503	145,731	156,781	.....	10,161	.....
Gerrington	173,334	173,334	173,334	173,426	.....	92	.....
Glen Innes	225,975	230,599	231,281	235,933	.....	9,958	.....
Goulburn	373,510	363,051	362,997	375,467	.....	1,957	.....
Grafton	171,877	166,249	168,880	202,676	.....	30,799	.....
Grafton, South	43,864	44,809	47,895	70,368	.....	26,504	.....
Granville	319,694	299,507	208,145	209,552	.....	.....	110,142
Grenfell	34,623	34,623	37,370	48,061	49,138	14,515	.....
Greta	23,846	23,996	24,167	29,389	.....	5,543	.....
Gulgong	57,115	53,339	66,881	66,896	.....	9,781	.....
Gundagai	39,726	39,552	39,372	39,105	.....	.....	621
Gunnedah	78,388	78,762	78,854	136,831	.....	58,443	.....
Hay	87,832	82,431	74,369	64,976	.....	.....	22,856
Hillgrove	7,707	20,613	20,147	12,382	.....	4,675	.....
Hillston	39,348	37,599	39,242	39,016	39,126	.....	222
Illawarra, Central	290,969	295,028	298,023	322,318	.....	31,349	.....
Do North	106,699	106,699	108,127	110,646	108,697	1,998	.....
Ingleburn	13,656	14,417	13,529	14,818	.....	1,162	.....
Inverell	313,320	313,881	317,600	299,857	.....	.....	13,463
Jamberoo	178,720	177,630	177,294	177,113	177,367	.....	1,353
Jerilderie	46,506	46,506	46,506	46,498	46,428	.....	78
June	111,212	107,376	106,520	108,328	.....	.....	2,884
Katoomba	237,941	244,429	250,000	280,734	383,960	146,019	.....
Kempsey	115,938	115,938	115,879	116,025	.....	87	.....
Kiama	106,395	91,287	96,612	87,246	.....	.....	19,149
Lismore	544,571	544,346	546,261	565,597	558,067	13,496	.....
Lithgow	431,329	427,124	426,879	501,890	501,890	70,561	.....
Liverpool	234,098	213,120	209,630	197,884	198,697	.....	35,401
Maclean	46,075	45,715	46,225	46,316	.....	241	.....
Maitland, East	124,776	122,644	120,352	114,433	.....	.....	10,343
Do West	423,809	421,841	422,179	423,652	.....	.....	157
Manilla	33,538	34,937	34,816	49,221	49,226	15,688	.....
Mittagong	43,350	42,581	42,846	41,180	41,180	.....	2,170
Moama	67,927	69,639	69,639	68,780	.....	853	.....
Molong	56,094	56,286	55,843	62,376	.....	6,282	.....
Moree	79,523	79,286	79,532	86,690	.....	7,167	.....
Morpeth	40,914	40,914	40,847	38,273	.....	.....	2,641
Moruya	46,307	46,035	45,589	44,649	.....	.....	1,658
Moss Vale	129,681	125,990	124,317	120,107	.....	.....	9,574
Mudgee	77,581	76,972	77,294	78,445	.....	864	.....
Mulgoa	70,722	70,614	70,613	71,632	.....	910	.....
Mullumbimby	73,230	60,651	59,274	62,838	62,515	.....	10,715
Murrumburrah	57,127	57,377	57,932	58,434	.....	1,307	.....
Murrurundi	104,386	29,352	29,344	31,569	32,051	.....	72,335
Murwillumbah	118,075	118,345	118,345	119,195	118,095	20	.....
Musclebrook	49,715	48,111	48,305	48,305	.....	.....	1,410
Narrandera	85,538	85,768	85,996	86,298	.....	760	.....
Narrabri	51,014	50,674	59,639	74,796	.....	23,782	.....
Do West	10,159	17,193	10,309	9,556*	.....	.....	603
*Narromine	27,054	26,674	26,658	.....	.....	.....	.....
Newcastle and Suburbs—							
Newcastle City	1,675,461	1,647,055	1,759,143	1,601,424	.....	.....	74,037
Adamstown	59,513	53,126	53,219	53,667	.....	.....	5,846
Carrington	95,626	93,778	90,243	91,120	.....	.....	4,506
Hamilton	498,032	463,098	455,760	453,571	450,428	.....	47,604
Lambton	47,772	47,653	47,796	52,499	.....	4,727	.....
Lambton, New	49,708	49,715	49,870	47,782	.....	.....	1,926
Merewether	112,860	127,798	127,785	123,353	.....	10,493	.....
Plattsburg	56,156	55,800	53,628	48,596	.....	.....	7,560
Stockton	56,618	54,887	53,735	52,304	.....	.....	4,314
Wallsend	83,249	50,457	49,448	50,259	.....	.....	32,990
Waratah	194,003	192,143	190,824	191,063	191,063	.....	2,940
Wickham	236,555	233,887	230,097	230,736	229,028	.....	7,527
Total, Newcastle and Suburbs	3,165,553	3,069,397	3,161,548	2,996,374	.....	15,220	189,250
Net increase, Newcastle and Suburbs, £174,030.							

* Information for 1911 and 1912 not available in the case of Narromine.

† Portion of area added to Tenterfield Shire on 9th November, 1910.

TABLE showing the Unimproved Capital Value of Land in Municipalities for the years 1908 to 1911 or 1912, and the increase or decrease in 1911 or 1912 as compared with 1908—*continued*.

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
	£	£	£	£	£	£	£
Nowra	115,621	113,907	112,637	75,767	75,469	.....	40,152
Nyngan	27,243	24,913	25,756	25,566	24,217	.....	3,026
Orange	212,247	214,430	210,674	217,481	.....	5,234	.....
Orange, East	64,966	64,907	62,085	63,797	63,797	.....	1,169
Parkes	105,314	105,314	106,735	108,044	.....	2,730	.....
Parramatta	356,736	354,461	356,614	357,112	.....	376	.....
Peak Hill	29,352	30,158	37,730	38,143	.....	8,791	.....
Penrith	140,724	140,673	139,387	139,258	.....	.....	1,466
Picton	36,727	36,318	35,765	31,730	.....	.....	4,997
Port Macquarie	24,497	24,471	24,730	25,222	.....	725	.....
Prospect and Sherwood	162,560	159,145	153,451	160,081	.....	.....	2,479
Queanbeyan	32,004	31,953	31,953	30,217	.....	.....	1,787
Quirindi	93,438	94,245	94,215	99,228	102,218	8,780	.....
Raymond Terrace	29,634	29,149	28,950	23,596	.....	.....	6,038
Richmond	145,443	141,052	140,301	142,249	.....	.....	3,194
Rookwood	192,476	173,118	184,425	212,027	.....	19,551	.....
Scone	22,598	25,253	36,879	37,746	37,663	15,065	.....
Shellharbour	228,327	227,976	224,026	226,918	226,178	.....	2,149
Shoalhaven, South	180,296	177,516	178,045	143,688	.....	.....	36,608
Singleton	98,350	97,959	96,910	94,497	93,814	.....	4,536
Smithfield and Fairfield	124,990	123,113	123,291	122,086	.....	.....	2,904
St. Mary's	149,103	149,920	150,178	154,489	155,792	6,689	.....
Tamworth	365,814	367,953	368,572	413,241	.....	47,427	.....
Taree	39,885	39,783	41,665	44,479	44,862	4,977	.....
Temora	112,539	112,495	126,183	126,223	131,120	18,581	.....
Tenterfield	153,219	153,198	153,199	95,079	.....	.....	†58,140
Tumut	71,174	71,174	70,144	72,068	71,463	289	.....
Ulladulla	107,733	107,426	107,494	107,389	107,769	36	.....
Ullmarra	208,809	208,809	208,462	236,909	231,526	22,717	.....
Uralla	23,284	24,037	23,692	34,874	.....	11,590	.....
Wagga Wagga	366,830	367,678	363,314	376,607	.....	9,777	.....
Walcha	48,457	48,458	48,457	54,326	54,884	6,427	.....
Wallendbeen	120,092	120,043	120,150	150,984	150,965	30,873	.....
Warialda	16,317	16,237	16,237	16,464	.....	147	.....
Warren	31,881	32,350	32,317	32,283	.....	402	.....
Wellington	198,204	197,499	194,219	171,420	.....	.....	26,784
Wentworth	16,180	16,281	16,145	18,090	.....	1,910	.....
Wilcannia	23,599	22,123	22,811	18,408	.....	.....	5,191
Windsor	146,523	172,724	160,246	136,210	.....	.....	10,313
Wingham	24,970	24,737	25,169	24,799	24,953	.....	17
Wollongong	189,087	194,432	192,224	211,876	212,322	23,235	.....
Wrightville	31,177	31,346	31,346	41,338	40,813	9,636	.....
Wyalong	27,415	27,165	26,674	18,863	19,869	.....	7,546
Yass	110,142	111,270	110,926	129,133	.....	18,991	.....
Young	107,759	108,067	108,662	119,450	.....	11,691	.....
Total, Country	20,104,983	19,798,286	19,753,131	20,071,111	.....	1,014,398	953,295
Total, Metropolitan	44,007,668	43,456,900	43,776,191	50,270,725	.....	6,718,613	85,680
Grand Total	64,112,651	63,255,186	63,529,322	70,341,836	.....	7,733,011	1,038,975

Net increase, £6,694,036.

Appendix XVII.

TABLE showing the Unimproved Capital Value of Land in Shires for the years 1908 to 1911 or 1912, and the increase or decrease in 1911 or 1912 as compared with 1908.

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
	£	£	£	£	£	£	£
Abercrombie	398,494	410,739	416,368	414,538	380,126	.....	18,368
Adjunghilly	900,535	900,535	912,374	928,881	.....	28,346	.....
Amaroo	497,834	506,160	503,932	609,432	612,143	114,309	.....
Apsley	624,895	632,313	673,108	741,978	.....	117,083	.....
Ashford	382,880	375,428	389,231	444,503	.....	61,623	.....
Bannockburn	745,680	747,028	794,016	763,215	.....	17,535	.....
Barraba	516,433	482,386	502,700	534,243	560,285	43,852	.....
Baulkham Hills	304,256	298,973	295,679	291,049	.....	.....	13,207
Bellingen	388,930	408,160	420,125	446,872	.....	57,942	.....
Berrigan	1,047,575	1,047,575	1,318,787	1,142,768	1,158,761	111,186	.....
Bibbenluke	940,698	943,185	944,116	945,676	.....	4,978	.....
Blacktown	309,863	311,382	325,295	328,438	325,223	15,360	.....
Bland	648,241	671,028	687,919	764,710	.....	116,469	.....
Blaxland	294,956	294,800	299,127	388,765	.....	93,809	.....
Blue Mountains	406,334	418,144	424,640	449,083	.....	42,749	.....
Bogan	486,820	488,279	489,294	517,418	.....	30,598	.....
Bolwarra	333,537	327,263	346,682	346,704	347,670	14,133	.....
Booolooroo	1,141,098	1,156,738	1,164,690	1,231,859	.....	90,761	.....
Boomi	1,147,129	1,164,669	1,178,600	1,273,546	.....	126,417	.....
Boree	450,891	454,069	607,984	635,858	.....	184,967	.....
Bulli	316,586	344,373	411,692	421,680	.....	105,094	.....

TABLE showing the Unimproved Capital Value of Land in Shires for the years 1908 to 1911 or 1912, and the increase or decrease in 1911 or 1912 as compared with 1908—*continued*.

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
	£	£	£	£	£	£	£
Burrangong	807,500	810,864	830,712	1,088,149	.....	280,649	.....
Byron	643,602	727,480	746,790	753,030	769,331	125,729	.....
Cambewarra	197,116	197,146	199,912	199,887	198,327	1,211	.....
Canobolas	587,702	582,248	667,363	673,770	669,068	81,366	.....
Carrathool	1,102,626	1,109,164	1,120,048	1,136,099	1,137,233	34,607	.....
Cessnock	718,579	739,994	883,882	960,441	.....	241,862	.....
Clyde	132,006	130,819	122,826	122,187	120,074	.....	11,932
Cobbora	502,423	518,455	457,151	455,555	569,489	67,066	.....
Cockburn	638,535	719,307	827,351	838,562	866,761	228,226	.....
Colo	260,644	260,040	266,884	263,850	265,463	4,819	.....
Conargo	1,106,337	1,106,337	1,163,105	1,166,421	1,166,426	60,089	.....
Coolah	382,885	387,736	391,151	498,831	501,351	118,466	.....
Coolamon	545,434	541,629	570,332	804,902	.....	259,468	.....
Coonabarabran	593,538	598,687	649,030	733,633	.....	140,095	.....
Copmanhurst	364,388	368,156	377,326	383,076	.....	18,688	.....
Coreen	1,191,285	1,196,311	1,222,596	1,230,771	.....	39,486	.....
Crookwell	672,422	691,906	821,870	836,887	837,887	165,465	.....
Culcairn	935,908	953,382	954,462	970,184	.....	34,276	.....
Dalgety	679,711	679,614	676,556	732,790	734,667	54,956	.....
Demondrille	607,207	610,097	740,086	742,234	.....	135,027	.....
Dorrigo	369,821	502,816	628,208	651,138	.....	281,317	.....
Dumaresq	598,829	609,918	603,805	710,768	.....	111,939	.....
Erina	397,977	403,083	419,767	429,356	.....	31,379	.....
Eurobodalla	297,854	284,334	286,844	274,523	.....	.....	23,331
Gadara	462,740	485,582	487,191	514,536	.....	51,796	.....
Germanton	679,181	683,076	685,385	693,792	703,496	24,315	.....
Gilgandra	474,320	474,320	549,681	583,683	.....	109,363	.....
Gloucester	376,066	385,000	396,048	410,548	427,463	51,397	.....
Goobang	599,375	599,375	671,704	800,287	.....	200,912	.....
Goodradigbee	629,984	641,793	639,889	652,186	637,037	7,053	.....
Gostwyck	657,894	667,456	690,262	748,823	780,362	122,468	.....
Gundurimba	480,000	486,486	529,708	600,430	.....	120,430	.....
Gunning	331,941	341,970	378,082	382,704	387,397	55,456	.....
Guyra	463,531	463,005	689,409	701,899	.....	238,368	.....
Gwydir	270,174	272,465	276,891	282,040	300,344	30,170	.....
Harwood	444,320	336,826	341,833	343,457	343,457	.....	100,863
Hastings	323,288	326,531	334,228	357,105	372,860	49,572	.....
Hornsby	518,069	514,861	592,534	639,521	.....	121,452	.....
Hume	882,207	882,314	1,280,309	1,281,075	.....	398,868	.....
Illabo	683,006	696,196	704,519	707,397	.....	24,391	.....
Imlay	427,139	427,858	433,189	443,806	.....	16,667	.....
Jemalong	1,010,250	1,024,460	1,067,147	1,218,633	.....	208,383	.....
Jindalee	515,993	521,834	527,476	527,956	.....	11,963	.....
Ku-ring-gai	730,668	738,735	1,001,993	993,115	1,023,553	292,885	.....
Kyeamba	738,602	738,602	772,123	782,642	.....	44,040	.....
Kyogle	680,778	682,037	770,380	791,698	.....	110,920	.....
Lachlan	745,730	756,880	806,816	853,225	.....	107,495	.....
Lake Macquarie	687,217	686,097	716,123	718,173	717,122	29,905	.....
Liverpool Plains	1,322,554	1,328,280	1,691,258	1,718,209	.....	395,655	.....
Lockhart	992,902	991,262	1,274,577	1,278,341	.....	285,439	.....
Lyndhurst	440,516	445,466	447,740	515,754	.....	75,238	.....
Macintyre	389,449	392,726	458,907	461,006	469,745	80,296	.....
Macleay	591,632	590,059	625,170	637,027	.....	45,395	.....
Macquarie	580,042	600,113	610,343	621,029	.....	40,987	.....
Mandowla	422,628	454,061	607,790	627,896	634,236	211,608	.....
Manning	644,124	643,776	654,044	661,984	673,093	28,969	.....
Marthaguy	1,458,775	1,478,245	1,472,826	1,457,643	1,473,983	15,208	.....
Meroo	301,252	310,659	314,059	317,198	.....	15,946	.....
Merriwa	707,408	702,928	729,843	729,843	739,179	31,771	.....
Mitchell	819,536	827,478	827,928	865,734	.....	46,198	.....
Monaro	528,186	532,454	560,555	573,312	.....	45,126	.....
Mulwaree	859,430	861,818	1,056,389	1,063,634	1,072,539	213,109	.....
Mumbulla	691,116	692,557	693,758	693,349	.....	2,233	.....
Murray	1,404,920	1,398,972	1,196,571	1,213,532	1,234,015	.....	170,905
Murrumbidgee	805,311	804,817	802,906	807,795	814,234	8,923	.....
Murrungal	431,601	433,794	442,772	444,855	.....	13,254	.....
Muswellbrook	530,853	533,032	536,780	825,300	.....	294,447	.....
Namoi	1,258,453	1,283,509	1,926,554	1,801,756	.....	543,303	.....
Narraburra	570,491	571,533	596,231	666,093	714,278	143,787	.....
Nattai	236,083	236,675	254,678	254,639	.....	18,556	.....
Nepean	251,621	251,782	258,410	258,927	259,081	7,460	.....
Nundle	348,077	358,077	353,827	355,240	367,367	19,290	.....
Oberon	190,528	174,936	184,799	185,463	190,463	.....	65
Orara	155,270	150,886	166,171	173,723	182,364	27,094	.....
Patrick Plains	907,891	929,309	934,931	970,214	.....	62,323	.....
Peel	995,494	1,017,878	1,385,383	1,378,630	1,386,710	391,216	.....
Port Stephens	400,530	386,439	387,972	389,443	.....	.....	11,087
Rylstone	288,000	318,518	317,382	323,187	.....	35,187	.....
Severn	609,711	620,631	733,347	663,875	.....	54,164	.....
Stroud	279,706	284,091	297,363	306,311	330,479	50,773	.....
Sutherland	247,101	320,434	324,718	448,338	618,207	371,106	.....
Talbragar	457,678	478,277	487,248	492,076	.....	34,398	.....
Tallaganda	295,477	297,334	294,327	294,779	341,897	46,420	.....
Tamarang	1,166,317	1,179,576	1,297,582	1,313,098	1,306,137	139,820	.....

Area.	1908.	1909.	1910.	1911.	1912.	Increase since 1908.	Decrease since 1908.
Tarro	595,559	629,798	675,771	675,771	.....	80,212	.....
Tenterfield	502,781	502,781	527,827	603,368	.....	100,587	.....
Terania	596,581	605,184	636,238	731,060	.....	134,479	.....
Timbreebongie	729,079	753,443	757,800	829,737	840,315	111,236	.....
Tintenbar	367,738	367,485	440,914	437,608	.....	69,870	.....
Tomki	660,480	682,535	682,535	683,458	684,199	23,719	.....
Tumbarumba	337,816	337,816	310,140	312,030	336,955	.....	861
Turon	403,126	402,890	410,302	413,096	413,085	9,959	.....
Tweed	553,644	569,551	670,635	706,150	741,681	188,037	.....
Urana	854,672	866,672	868,580	998,872	.....	144,200	.....
Wakool	1,376,265	1,388,041	1,400,638	1,428,137	.....	51,872	.....
Walgett	951,511	1,003,586	1,064,964	1,064,624	.....	113,113	.....
Wallarobba	390,180	398,794	398,794	399,301	407,793	17,613	.....
Waradgery	884,408	882,247	888,148	884,341	884,033	.....	375
Warrah	887,271	917,448	906,537	1,197,722	1,130,279	243,008	.....
Warringah	222,350	223,000	340,330	363,897	440,033	217,683	.....
Waugoola	737,256	747,604	748,316	1,090,446	.....	353,190	.....
Weddin	593,126	584,025	599,528	655,531	.....	62,405	.....
Windouran	908,136	909,551	916,090	923,682	926,438	18,302	.....
Wingadee	1,481,981	1,481,981	1,552,154	1,584,131	.....	102,150	.....
Wingecarribee	268,846	280,070	308,518	309,378	308,913	40,067	.....
Wollondilly	459,328	466,506	569,121	566,434	575,101	115,773	.....
Woodburn	212,672	213,545	246,374	250,640	.....	37,968	.....
Woolooma	881,456	877,792	907,216	1,511,400	.....	629,944	.....
Wunnamurra	917,339	917,339	955,799	956,655	980,463	63,124	.....
Wyaldra	282,759	282,759	274,080	330,129	326,809	44,050	.....
Yallaroi	569,353	569,252	766,093	751,246	771,714	202,361	.....
Yanko	1,170,784	1,161,960	1,142,831	1,354,813	.....	184,029	.....
Yarrowlunla	607,144	602,870	687,164	361,644	.....	.....	245,500
Total	82,414,771	83,464,446	89,935,912	94,471,525	.....	13,475,316	596,494

Net increase, £12,878,822.

Report of Assistant Superintendent of Stores for the Year ended 30th June, 1912.

Plant and Stores, Cement Testing, and Timber Inspection Branch.

I have the honor to submit the following particulars of the operations of this Branch for the year ended 30th June, 1912.

The total number of requisitions submitted by all branches was 26,158, or an increase of 7,130 on the previous year, whilst the orders issued totalled 37,338, or an increase of 13,501. The percentage increases in requisitions and orders were 37 and 56 respectively. The estimated average value of the 26,158 requisitions was £25 19s. 9d., and of the 37,338 orders, £18 4s. 1d. The total estimated value of the material requisitioned for amounted to £779,778 16s. 2d., as against £385,952 13s. 9d. during 1910-11.

The following statement shows the number of requisitions with their estimated values as submitted by the different Branches:—

Branch.	Requisitions.	
	Number.	Estimated Value.
		£ s. d.
Government Architect.....	3,807	41,083 7 4
Water Conservation and Drainage	3,350	128,064 8 3
Irrigation	1,519	75,517 10 3
Harbours and Water Supply.....	3,949	123,550 12 6
Dredges	1,850	29,067 10 11
Railway and Tramway Construction	3,127	321,007 4 3
Roads and Bridges	881	9,465 2 9
Head Office and General.....	2,374	46,476 14 3
Totals	20,857	774,232 10 6
To Stores Supply Department—		
Maintenance, Dredges and Ferries	149	347 15 1
Other Services	557	5,198 10 7
Stationery	4,595	.....
Grand Totals.....	26,158	£779,778 16 2

Number of Orders issued.....37,338.

Supplies.

Cancellation notices were issued in 130 cases, and purchases made at contractors' risks on 38 occasions. Despite the heavy increase in the operations of the Department, the contractors, as a rule, fulfilled the Departmental requirements in a satisfactory manner. The greatest difficulty was, however, experienced towards the close of the year in obtaining an adequate supply of timber. This was mainly due to traffic to certain ports being suspended for a time owing to the state of the river entrances.

Quotations.

Quotations were invited for 1,350 different services, involving the preparation of 8,427 invitation forms, the number of replies being 5,179. The total value of accepted quotations amounted to £78,776 1s. 4d., as against £28,841 8s. 4d. during the previous year.

Verbal quotations for out of contract supplies less than £5 in value were obtained in 3,136 cases, while the total value of the goods purchased in this way amounted to £5,737 3s. 2d.

Customs.

The Customs work has shown a considerable increase, the number of entries passed totalling 169 as against 105 in 1910-11. The duty paid amounted to £38,156 4s. 1d., as against £13,540 14s. 11d. during the previous year.

Since the federation of the States, in 1901, the sum of £143,013 8s. 3d. has been paid as duty on on machinery and material imported by the Department.

Stamps—Postage and Railway.

On account of the increase in the operations of the Department, the postage expenditure has advanced from £2,844 16s., in 1910-11, to £3,325 14s. 10d. in 1911-12. The value of stamps purchased since October, 1902, when the State commenced to pay postage at ordinary rates, has amounted to £34,592 6s. 1d., while the value of stamps used during the same period has been £33,649 10s. 4½d., the average annual expenditure thus being £3,451 4s. 8d.

Railway stamps to the value of £541 6s. 1d. have been used for the payment of freight on parcels forwarded by train. The expenditure under this heading during the previous year amounted to £366 9s. 11d.

Library

Library Operations.

During the year 935 engineering and architectural periodicals were received and distributed, and 54 new publications were added to the Library.

The number of volumes issued on loan to officers totalled 645.

Stationery, Draftsmen's Materials, etc.

Altogether 4,595 stationery requisitions were complied with during the year. In addition 1,322 requisitions on the Government Printer were dealt with.

Parcels to the number of 3,442 were made up and distributed at an average cost of 1s. 9d. each.

At the beginning of the year the stock of stationery and draftsmen's material was valued at £333 8s. 4d. The purchases amounted to £2,517 4s. 7d., while the issues totalled £2,342 6s. 1d., leaving at the end of the year a balance of stock on hand valued at £508 6s. 10d.

The estimated value of the instruments in the field, on 30th June last, was £6,902; and the Head Office stock at the same date was valued at £199 13s. 6d.

General Dépôt.

The Pyrmont dépôt was established in 1903, when day-labour operations were easing off, and it became necessary to provide accommodation for tools and plant that were no longer required on the works which were being brought to completion.

During the past twelve months this establishment has been the scene of much activity and usefulness, and the services it has rendered embrace a far more extensive sphere than was originally contemplated.

The Shipping and Despatch Branch has become a very important department, and it is anticipated that the conveniences provided will be still further availed of in the future to a larger extent.

The Railway and Tramway Construction Branch has been a very large contributor to the additional work, as the receipt and distribution of all oversea shipments of permanent-way material is controlled by this establishment. During the year thirty-five shipments of this class of material were dealt with, the total weight handled amounting to 34,395 tons. In addition to this, shipments of machinery and other material were received and distributed. At various times considerable difficulty was experienced in providing suitable accommodation for these consignments. Provision had to be made at different centres for the storage of this material, as owing to heavy railway traffic there was great congestion, and it was, therefore, impossible to obtain either sufficient trucks or wharf berthing space.

In addition to rails, fish-plates, and bolts from overseas, large quantities of tramway sleepers and locally-made dog-spikes were also dealt with.

The cement operations show a large increase on the previous year's transactions, the total quantity distributed amounting to 314,822 bags, as against 190,511 bags during 1910-11.

All the preliminary plant for the new railway extensions has been assembled, inspected, and despatched, and large quantities of material for the other branches of the Department have also been similarly dealt with. The dépôt accommodation has been very heavily taxed, and the necessity for providing more up-to-date stores to deal with the rapidly increasing business is a matter for serious consideration.

Some idea of the operations during the year may be seen from the following figures:—

Orders supplied	...	...	...	...	...	...	2,249
Advices of material to be delivered at Dépôt, packed and despatched	...	...	...	...	...	...	2,143
Railway consignments	...	...	...	...	...	...	1,930
Shipping freight orders	...	...	...	...	...	...	930
Stock dockets used	...	...	...	...	...	...	3,177
Dockets for other issues	...	...	...	...	...	...	2,015
Value of material received into stock	...	...	...	...	£54,353	10s. 9d.	
Value of material issued from stock	...	...	...	...	£49,212	19s. 10d.	

The cartage accounts have advanced from £773 14s. 1d., in 1910-11, to £2,753 19s. 6d. showing an increase of £1,980 5s. 5d. for this year.

The vouchers dealt with were 3,335, as against 1,989, and the value was £84,900 7s. 11d., as against £55,588 14s. 10d.

Cement Testing.

The work of this Branch has again been heavy. Altogether 447 tests have been carried out, comprising 244 cement tests, 32 sand tests, 115 mechanical, and 56 chemical tests. The revenue received amounted to £1,339 14s. 9d., while the expenditure has been £1,538 13s. 4d. Altogether 28,935 casks of imported cement and 595,500 bags of locally-manufactured cement have been tested. The cement has been well up to standard with a few exceptions, where the compression was below the New South Wales specification. Only four tests were rejected during the year.

Inspection of Pipes.

A considerable increase in the work of pipe inspection has taken place. During the year 152,054 lineal feet of earthenware pipes were dealt with as against 61,172 lineal feet, in 1910-11.

In addition 12,489 junctions, 3,718 bends, 788 traps, 2,772 discs, 128 sink stones, 2,573 agricultural pipes, 1,188 air-bricks, and 4,925 invert sewer blocks were passed; 2,971 lineal feet of reinforced concrete pipes were also examined.

PUBLIC WORKS STORE ADVANCE ACCOUNT, £367,000.
STATEMENT of Operations, 1911-1912.

Stock.	Amount allotted from General Vote.			Value of Stock 1st July, 1911.			Purchases and Returns.			Issues.			Inter-Stock Transfers.						Value of Stock, 30th June, 1912.		
													Debits.			Credits.					
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.			
Railway and Tramway Construction	260,000	0	0	79,766	12	3	226,676	11	6	119,421	14	7	5,699	8	1	.....	192,630	17	3	
General Dépôt, Pyrmont	44,500	0	0	34,753	16	7	54,210	15	0	43,054	1	11	141	3	8	6,162	18	11	39,888		
Government Dockyard	29,000	0	0	11,626	13	9	54,300	10	4	39,252	12	11	173	2	6	179	10	6	22,668		
Government Architect's Yard	22,000	0	0	4,550	18	10	25,382	18	3	19,598	4	1	273	9	8	.....	10,609	2	8	
Newcastle	7,000	0	0	5,608	7	1	10,653	15	9	9,818	13	2	182	3	0	.....	6,625	12	8	
Lithgow	3,000	0	0	1,747	8	8	1,421	13	1	3,108	17	9	.....			60	4	0	.....	
Ballina	1,500	0	0	1,092	17	5	620	0	10	736	10	0	23	6	6	.....	999	14	9	
Totals	£ 367,000	0	0	139,146	14	7	369,266	4	9	234,990	14	5	6,402	13	5	6,402	13	5	273,422		

Timber Inspection.

The large number of works under construction has involved the purchase and inspection of large quantities of timber. In all 2,297 inspections were made, the quantity of timber obtained being as under:—

Hewn and sawn timber	...	...	...	...	...	3,933,409	sup. ft.
Sleepers	...	...	...	...	...	134,114	
Piles	...	...	...	...	...	59,956	lin. ft.
Tramway and telegraph poles	...	...	...	...	...	3,292	

J. R. CAMERON,

Assistant Superintendent of Stores.

The Director-General for Public Works.

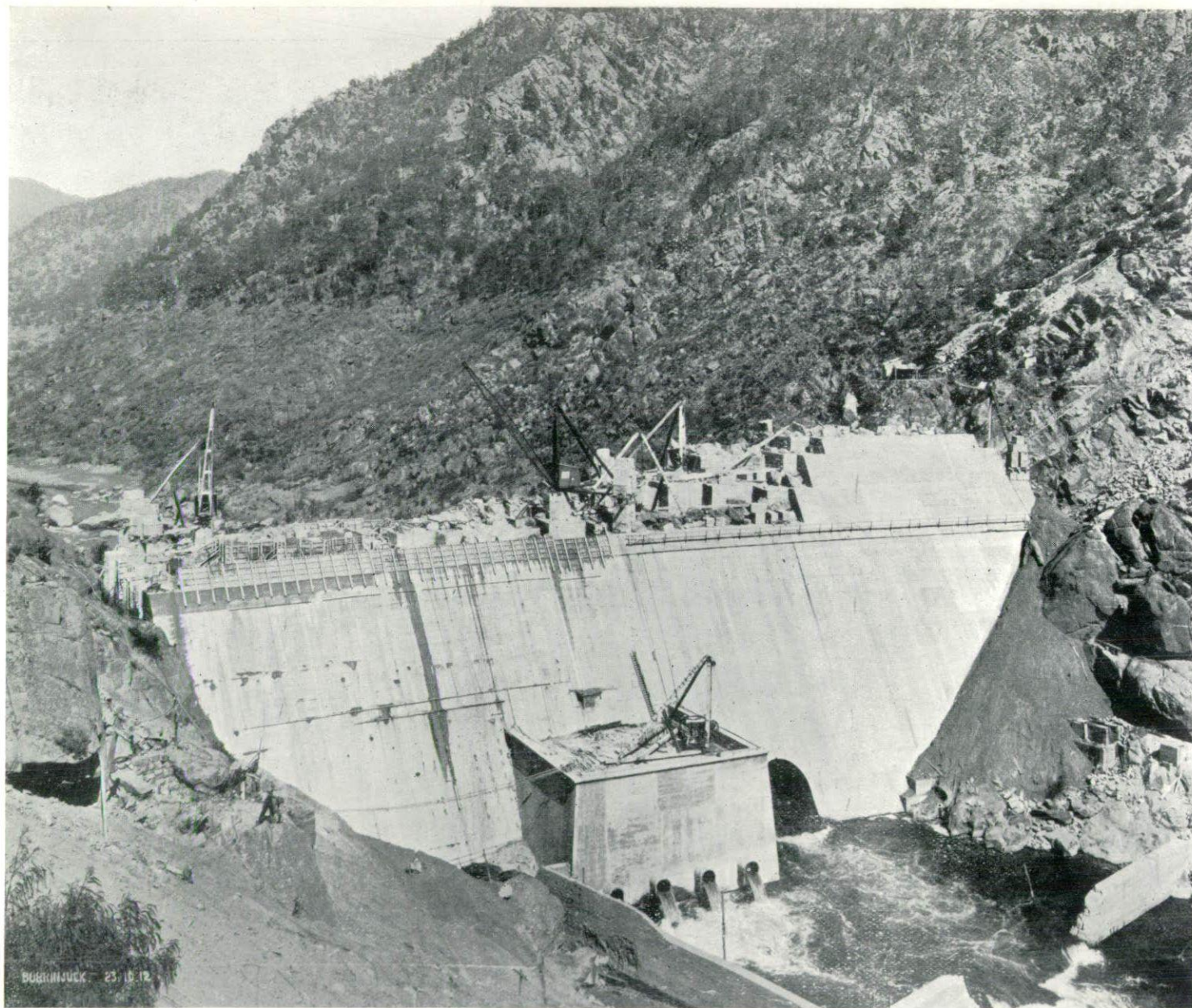
[8 Photos and 3 Plans.]



LITHGOW SEWERAGE.—SEPTIC TANKS BEFORE ROOFING.



SOUTH COAST WATER SUPPLY.—CORDEAUX DAM.



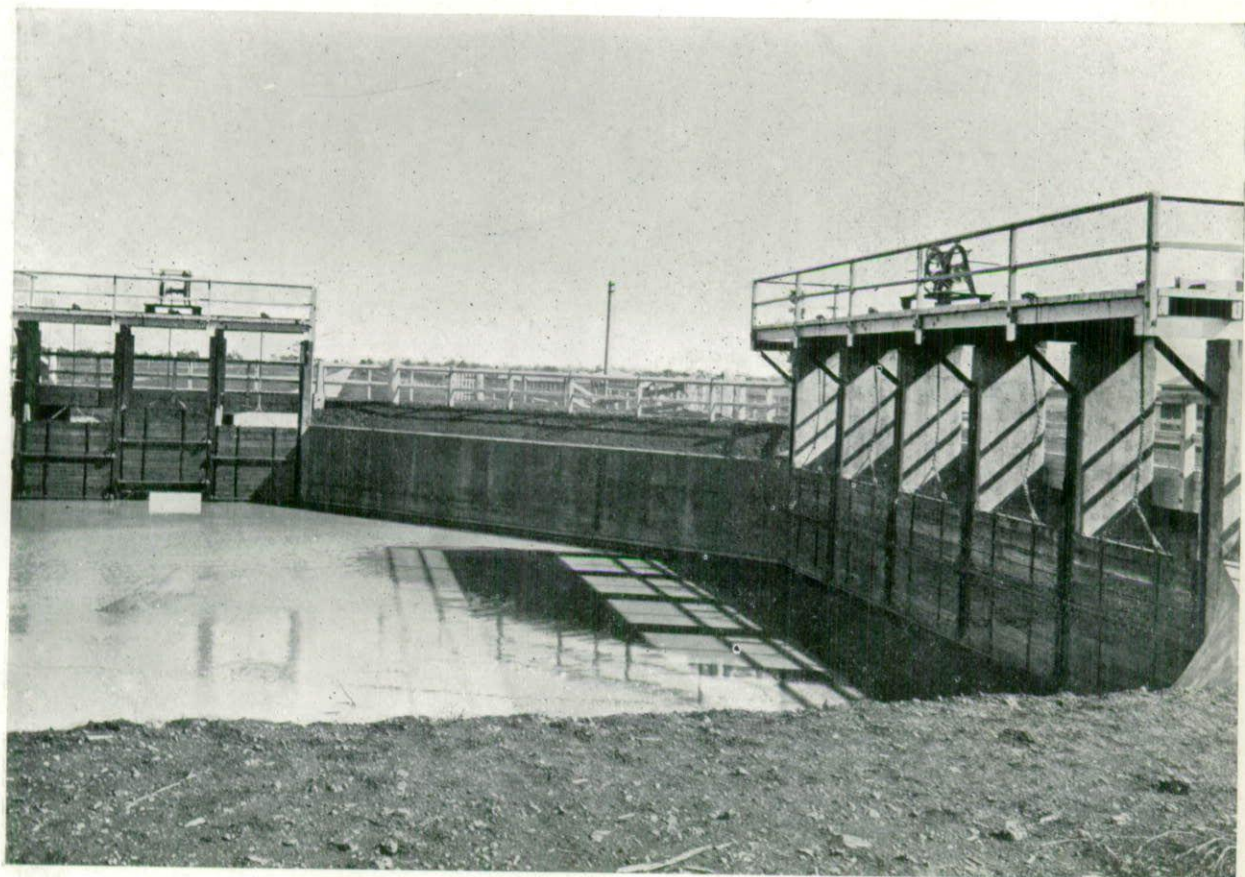
MURRUMBIDGEE IRRIGATION TRUST.—BURRINJUCK DAM.



SYDNEY UNIVERSITY.—HALL OF VETERINARY SCIENCE.



FIRE STATION, DARLINGHURST.



MURRUMBIDGEE IRRIGATION TRUST.—REGULATORS, YANCO.



MURRUMBIDGEE IRRIGATION TRUST.—JUNIOR SCHOOL, LEETON.



MURRUMBIDGEE IRRIGATION TRUST.—SETTLER'S COTTAGE, YANCO.

DEPARTMENT OF PUBLIC WORKS, N.S.W.



MAP
OF
NEW SOUTH WALES

Showing Towns for which Water Supplies
have been, or are being provided.

SCALE OF STATUTE MILES

E. de Burgh
Chief Engineer
Harbours & Water Supply
18-7-12.

REFERENCE

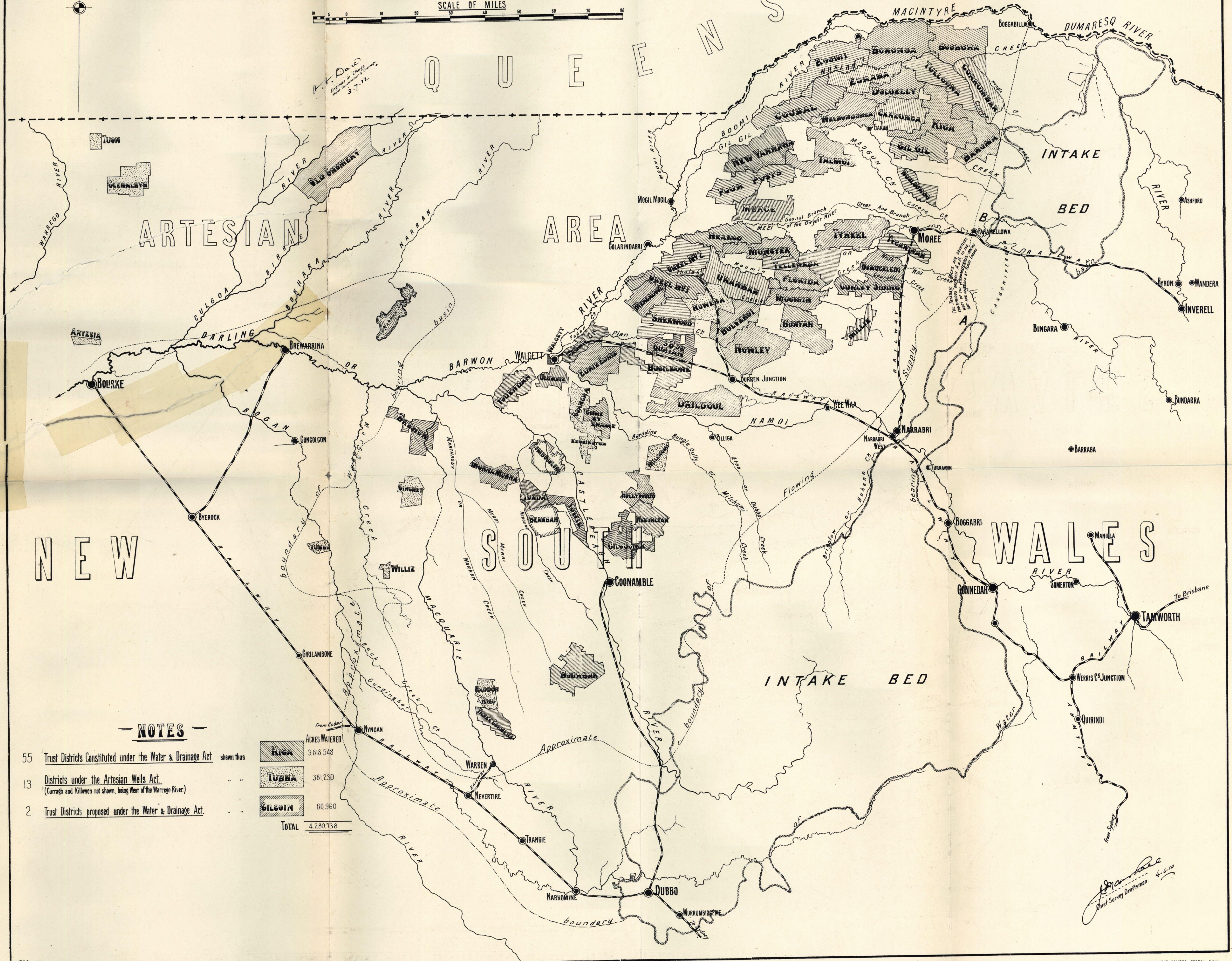
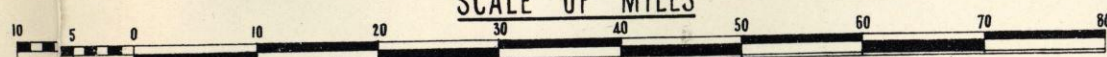
Pumping Supplies	shewn thus	●	Cowra
Gravitation Supplies	do. do.	■	Pictou
Supplies by Bore	do. do.	▲	Warren
Pumping Supplies under Construction	do. do.	●	June
Gravitation Supplies	do. do. do. do.	■	Grafton
Pumping Supplies, not carried out by Pub. Works Dept.	do	⊗	Windsor

Handwritten signature
Chief Engineer

MAP

SHOWING THE BORE TRUST DISTRICTS CONSTITUTED AND APPLIED FOR UNDER THE WATER AND DRAINAGE ACT, AND DISTRICTS UNDER THE ARTESIAN WELLS ACT

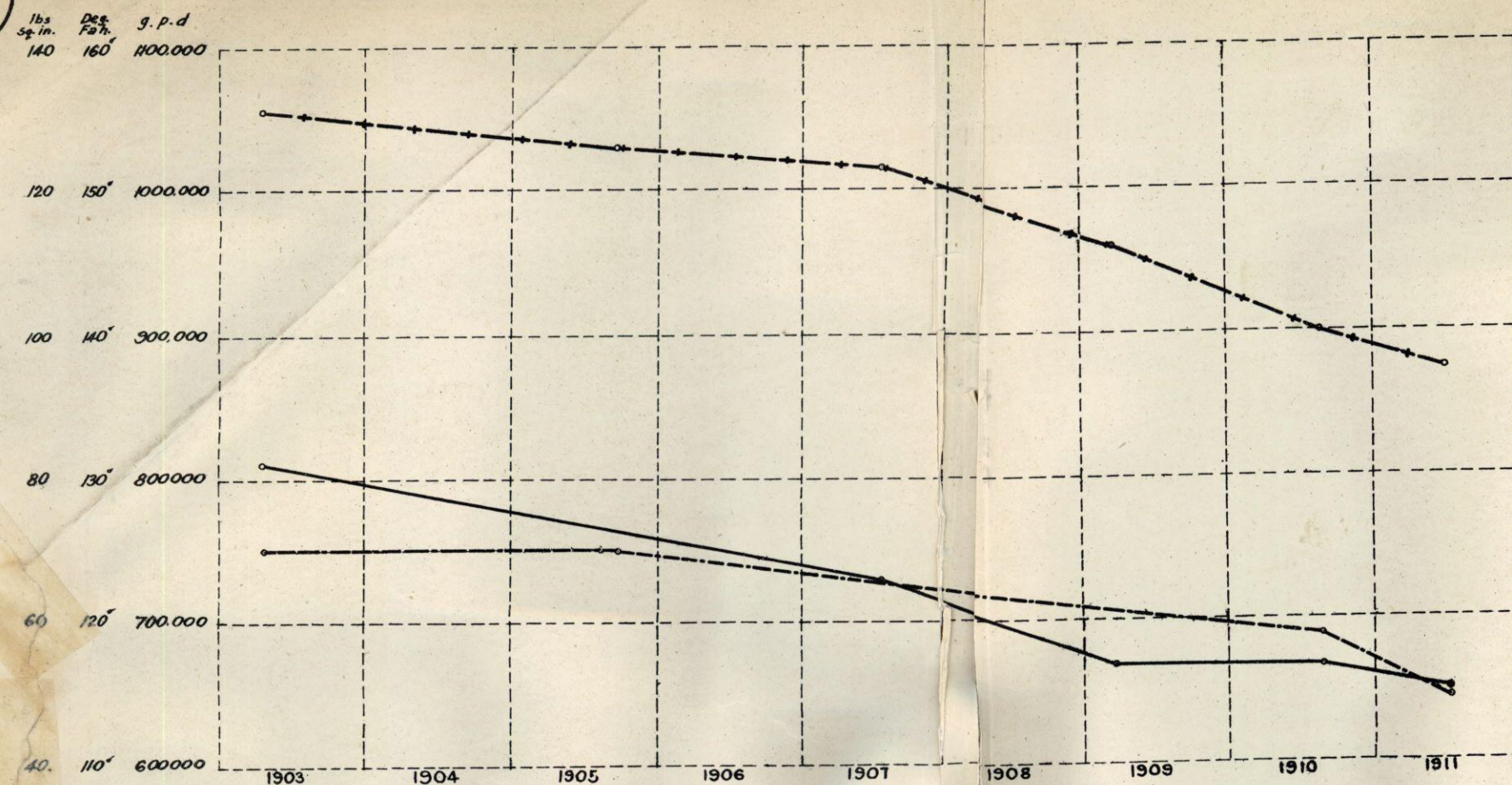
SCALE OF MILES



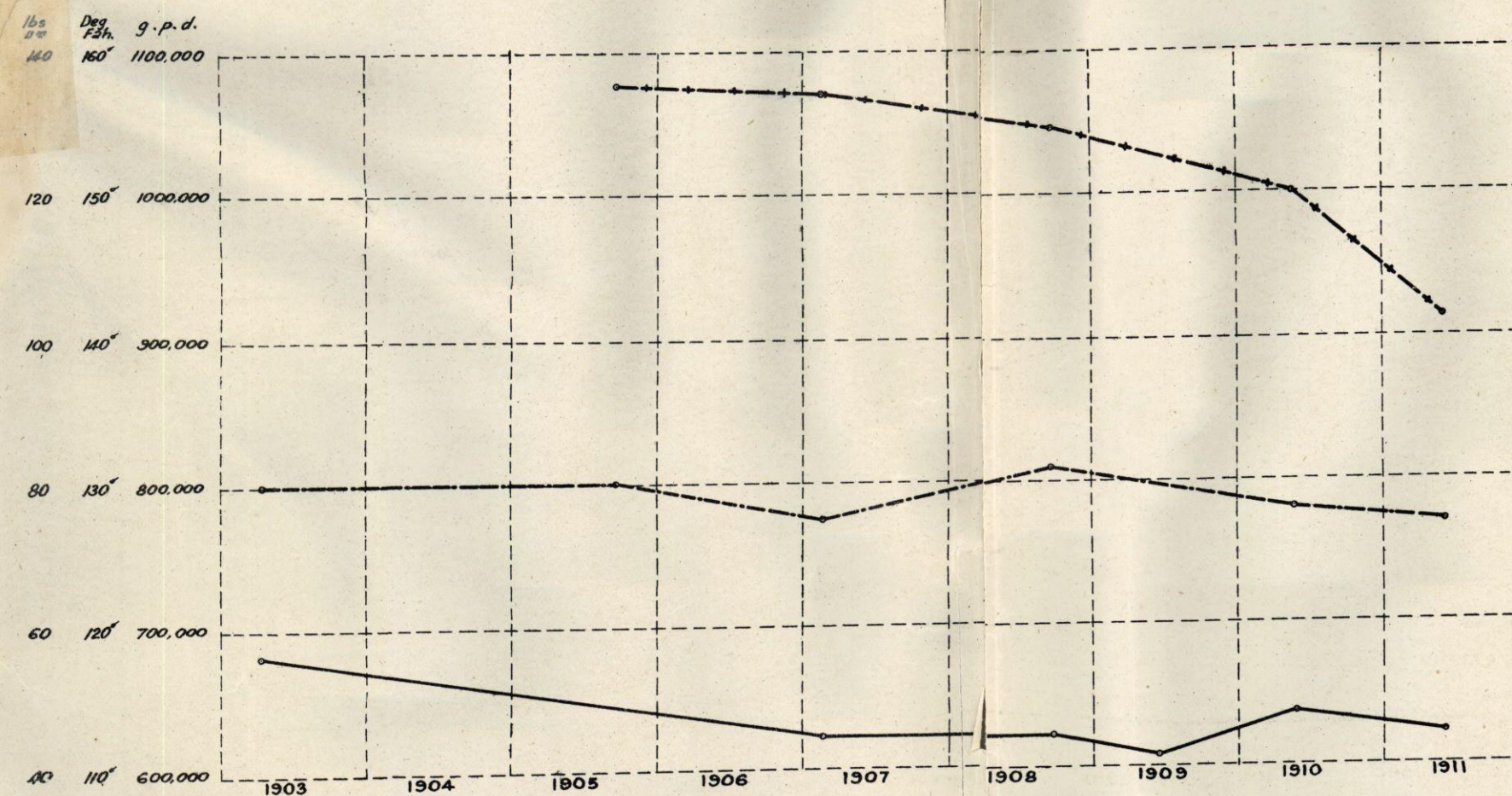
NOTES

- 55 Trust Districts Constituted under the Water & Drainage Act shown thus
 13 Districts under the Artesian Wells Act
 (Carragh and Killowen not shown, being West of the Warrego River.)
 2 Trust Districts proposed under the Water & Drainage Act.

ACRES WATERED	
KICA	3 818 548
TUBBA	381 230
GILCOIN	80 960
TOTAL	4 280 738



WALLON BORE



DOLGELLY BORE

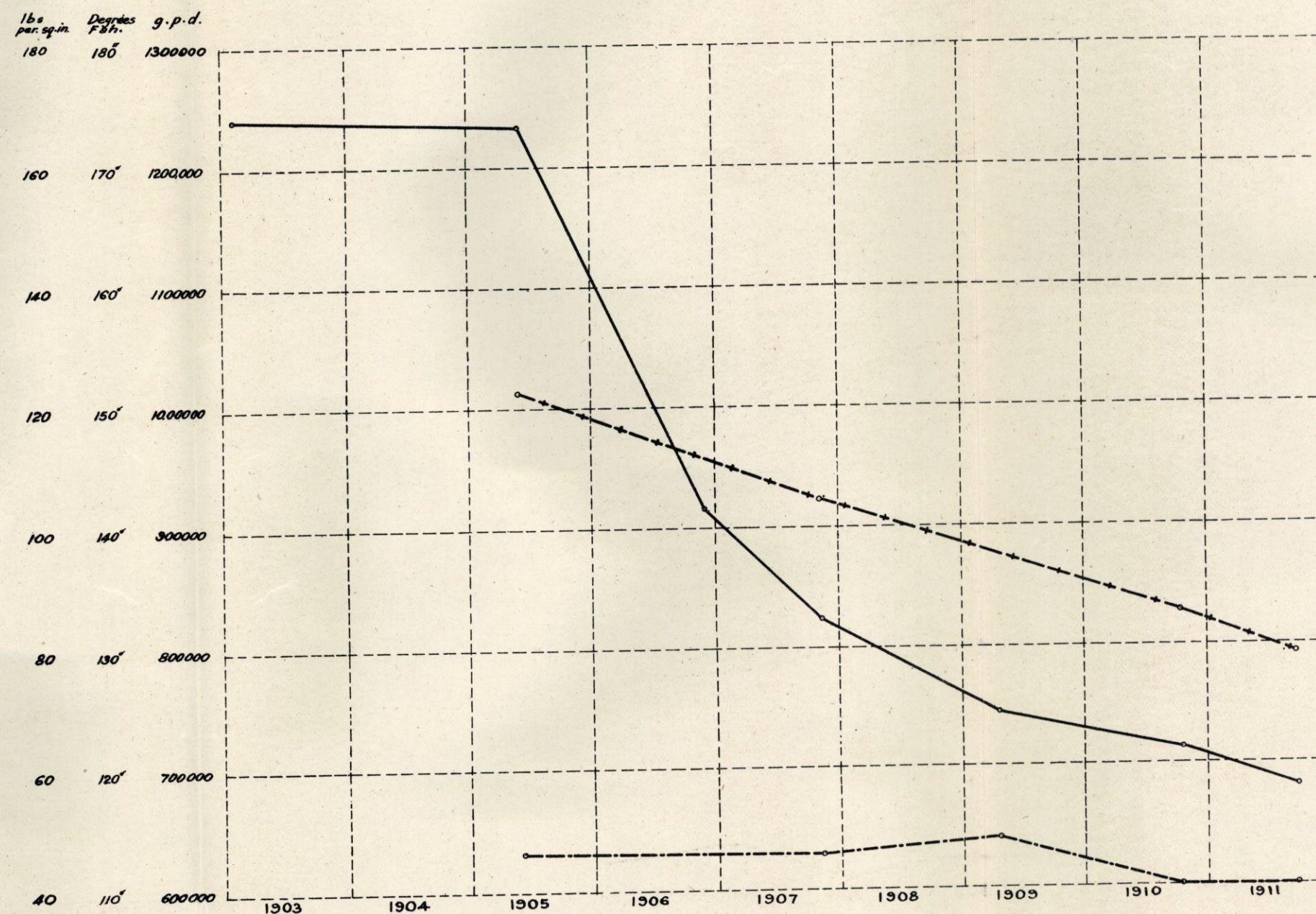
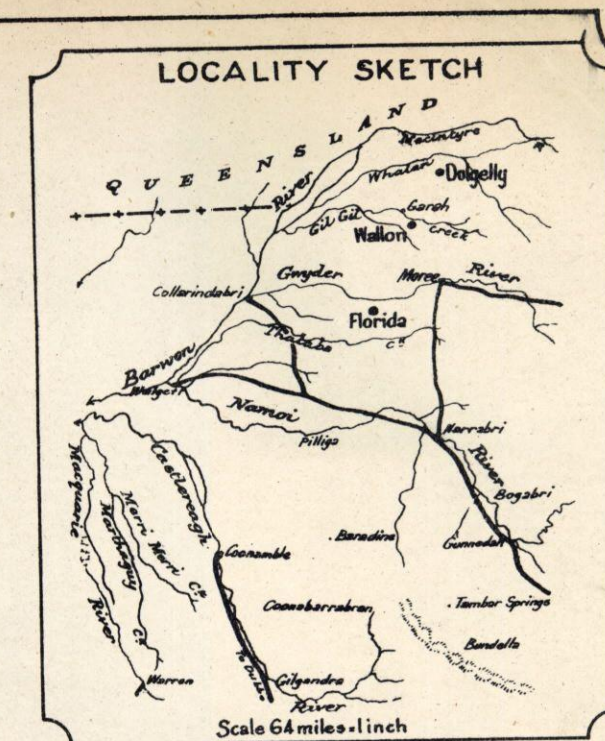
DIAGRAMS

Showing relation of temperature pressure & flow in certain artesian bores
MOREE DISTRICT

Scales

12 months	= 1 inch Horizontal
10° Fah.	= 1 inch Vertical
20 lbs. per sq. in.	= " " "
100,000 galls. per diem	= " " "

H. H. Dare
Engineer-in-Charge of
Water Conservation & Drainage



FLORIDA BORE

R. H. Dare
Office-in-Charge, Artesian Bore.

NOTES

Flows shown thus ————
Temperatures " ————
Pressures " ————