

ber last. They had then been completed by the contractors to the satisfaction of the Engineer, with the exception of the drainage-pumps, which were found to be unsuited to requirements, and these were replaced by pumps more suitable in February last.

The following connections had been made up to the 31st March, 1902 :—

|                                          | 8-candle<br>Power. | 16-candle<br>Power. | 25-candle<br>Power. | 32-candle<br>Power. | 50-candle<br>Power. | Arc Light. |
|------------------------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|------------|
| Private consumers (30) ...               | 115                | 292                 | 2                   | 65                  | 1                   | ...        |
| Tourist and Health Resorts<br>Department | 70                 | 112                 | ...                 | 28                  | ...                 | 5          |
| Other Government Depart-<br>ments        | 18                 | 56                  | ...                 | 4                   | ...                 | 1          |
| Street lights ...                        | ...                | ...                 | ...                 | ...                 | ...                 | 15         |
| Total ...                                | 203                | 460                 | 2                   | 97                  | 1                   | 21         |

The revenue from the above lights, exclusive of street lamps and this Department's lighting, is estimated at £600 for the year 1902-3. The cost of maintaining these works will amount to a comparatively small sum.

The following is a report of the Engineer in charge of the works :—

The lighting of the town was commenced on the 13th May, 1901, and the electric-lighting plant has been running steadily and satisfactorily ever since. Considerable extensions have been made to the private-lighting circuits since starting, and several new applications have been received, two of which—the Grand and Palace Hotels—will add much to the present load. The average daily load now amounts to the full output of one set of generators, so that any further additions will require the use of both sets. For this reason I would urgently recommend the Department to consider the necessity for providing a spare set without delay, as with both sets in use we shall not have any provision for possible emergencies. Judging by the increasing demand for private lighting, and the rapid growth of the town in the comparatively short time the service has been installed, I feel confident that the present generator plant will be fully loaded before the end of the year. The necessary excavations for the extension of the dynamo-house will take some time, so that the matter will require immediate attention if the work is to be done. There are a number of small additions required for the generator plant. These are noted in the estimate for maintenance, and some are already in course of construction.

Owing to the danger the main belts are exposed to in the event of an unusual rise in the river, two large iron troughs are being provided for their protection. As any trouble in this direction would interfere with the working of the plant, these troughs will be placed in position without delay.

Although the generator plant is giving satisfaction under the present conditions of work, the existing arrangements for running both sets in parallel are very inconvenient and troublesome; and to remedy this an automatic turbine coupler is being built, and will be ready for use by the time both sets are required.

During the month of March the whole of the generator plant was thoroughly overhauled and cleaned. On examining the interior of the turbines, I find that all the ironwork in contact with the water shows signs of rapid oxidation; this is apparently due to the large proportion of acid in the water, and may always be a source of trouble. To prevent this I am trying the electrolytic effect of zinc, and have placed plates in suitable positions within the turbine-cases. So far this appears to be successful, but it will require some time to decide whether the effect will be permanent.

The flume and gates are in good repair, and have also been overhauled and cleaned. To strengthen the walls immediately over both tail-races I would recommend providing stay-bolts as a bracing to the frames at these parts.

In addition to the cottage for the assistant, substantial steps have been laid down at the approach to station, also suitable concrete drain to carry off the surface-water; these additions are of great service and add much to the general appearance of the station-site. The excavations around the station-site have required some attention; the severe weather experienced during March displaced a considerable quantity of loose surface-soil. This has been removed, and any places showing weakness have been made secure. Although it is over two years since the excavations were completed, no serious subsidences have occurred, and the removal of the slips referred to did not interfere with the works in any way.

The main line to Rotorua is periodically inspected, and has required little attention. The lightning during a severe thunderstorm on the 25th April destroyed fourteen arms and a number of insulators; this is the only trouble that has been caused by lightning. It is a very rare occurrence, and under our conditions of work is difficult to guard against. However, every possible precaution is taken to prevent interference while working.

The line crosses a creek about four miles and a half from Rotorua, and owing to the banks being washed away by floods it has been necessary to shift one of the poles. The foot-bridge which spanned the creek at this point has also been washed away, and the road approaches damaged. I would suggest that the Survey Department be asked to assist in erecting a permanent protection, which would be more for their benefit than ours, as the road here requires frequent attention after heavy rains.

The town-lighting arrangements are in a satisfactory condition. In extending the supply-mains provision has been made for anticipated additions, so that the cost of further extension should be proportionately less.

The total amount of lighting now provided for is equivalent to 2,050 eight-candle-power lamps. Of this amount the Tourist Department have a total equal to 414 eight-candle-power for use in baths, offices, and residences; 420 eight-candle-power are required for street-lighting; and the remaining 1,216 eight candle-power for public offices, halls, and private consumers.

Thirteen electricity-meters have been tested and connected. These are working satisfactorily. Forty additional meters and fourteen transformers are required.

During the season the place is visited by numbers of tourists, and any assistance or attention they require is willingly given.

#### *Drainage.*

I regret to have to report that the condition of these works has been found to be very unsatisfactory. The administration was taken over by this Department. The works were carried out in accordance with plans and specifications obtained by the Lands Department from a well-known engineer.

In October last the Engineer was asked to report on the drainage system, and the following is an extract from his report :—

“I have visited Rotorua, and made a general inspection of drainage and electrical works.

R. C. WHITE.