

For industrial purposes the only serious competitor is the suction-gas engine, and already six such engines have been replaced by electric motors with substantial advantage. For temporary service, constructional and similar work, a van has been equipped as a 60-horse-power portable substation, which can be run rapidly into place, connected up, and put into service within an hour.

During the year contracts have been entered into with every power-user within economical range of the present substation at Addington with one or two exceptions, and the present year will be occupied largely in establishing connections with these customers.

One of the main considerations in pushing the industrial appliance of electric power on the large scale is that of reliability of service. As far as the power-house and headworks were concerned, this was amply provided for by the substantial nature of the installation. The transmission-lines, however, can never attain to the same standard of reliability owing to their long extent (sixty-two miles each), the fragile nature of the insulators (porcelain being the only material available for this purpose), the exposure to lightning troubles, the mischievous "sportsman," and to loose pieces of bark falling on the wires and short-circuiting them. This difficulty has been successfully met by the installation of the duplicate transmission-lines. Since the second line was put into operation on the 21st April, 1915, no interruption to service has occurred lasting more than a few minutes. The following is a complete record of the interruptions that have taken place from all causes since that date, and for the first year of operation is an eminently satisfactory record:—

Interruptions to Service.

Date.			Hour.	Period.	Cause.
1915.				Minutes.	
May	10	11.47 p.m.	3	Obscure (one insulator broken).
"	26	5.44 a.m.	3	Obscure (two insulators broken).
June	1	8.1 p.m.	$\frac{1}{2}$	Obscure (one insulator broken).
"	4	2.41 p.m.	9	Obscure (two insulators broken).
"	13	4.15 p.m.	$\frac{1}{2}$	Snow on insulators (no damage).
"	20	12.21 a.m.	$\frac{1}{2}$	Switching (no damage).
Aug.	6	12.38 a.m.	$1\frac{1}{2}$	Short circuit on local feeder.
Sept.	16	8.45 p.m.	2	Lightning (two insulators broken).
Oct.	12	11.10 a.m.	1	Previous lightning (one insulator broken).
"	17	11.57 a.m.	$\frac{1}{2}$	Bark blown on line (insulator broken).
1916.					
Jan.	7	5.25 p.m.	$\frac{1}{2}$	Switching (no damage).
"	27	2.29 a.m.	$\frac{1}{2}$	Heavy storm (three insulators broken).
Mar.	27	3.9 p.m.	$\frac{1}{4}$	Obscure.

Total number of interruptions, 13; total time of interruption to service, 22 $\frac{3}{4}$ minutes.

It will be noted that the period of interruption is steadily falling to a minimum of one-quarter to half a minute, and as a result of the first year's operations a supply can now be offered with the confidence of experience to industries requiring such absolute reliability and continuity of service as the freezing-works and dairy factories.

For comparison, the following is the corresponding record for a similar line constructed under the best advice then available, and with the best possible apparatus—viz., the Niagara and Ontario Power Company (400 miles of line): First year of operation, 1907—85 interruptions to service; second year of operation, 1908—129 interruptions to service; third year of operation, 1909—47 interruptions to service.

For street-lighting the Lake Coleridge supply is now utilized or being installed as follows: City, 1,828 lamps; Riccarton, 110 lamps; Heathcote, 250 lamps; Waimairi, 350 lamps; Spreydon, 200 lamps. Moreover, lamps are now being erected in many places in which a year ago no lighting of any form was dreamt of.

The most striking effect of the introduction of electric power will undoubtedly, during the next few years, result from its use in domestic convenience. In connection with the accommodation of the staff at Lake Coleridge, a type of "all electric" house has been developed during the year which it is expected will be an important step in this direction. The house consists of five rooms, bathroom, and a large sleeping-porch built entirely of sheet asbestos (poultite) on a light timber framework, and equipped with electric lighting, cooking, and heating throughout. As a result all brickwork is omitted, the house is practically fireproof, and is designed entirely for comfort and convenience without the usual restrictions of these considerations involved in the use of coal or gas cooking and heating, and the cost is less than one-half that of a house of equal accommodation designed on the usual lines.

In the solution of the problem of street transport Lake Coleridge electric power is also taking a place. Three electric-battery vehicles are in service with very satisfactory results, one passenger-car, one light delivery-van, and one heavy wagon, the latter being engaged in the collection of the city refuse. At the rates which the City Council have fixed for charging these battery vehicles the cost of energy is less than one-half that of petrol, and, owing to the gradual starting effort and the steady driving-force, the cost of maintenance and renewals of tires and chassis is also less than one-half that of petrol-driven vehicles. This district, with its enormous