

APPENDIX B.

NOTES ON DISTURBANCES CAUSED ON TELEPHONE LINES AT HOBART BY THE RUNNING OF THE ELECTRIC TRAMWAYS. BY R. HENRY, SUPERINTENDENT OF TELEGRAPHS IN TASMANIA.

1 There is a steady humming sound always more or less present, and varying slightly in intensity, more apparent on some lines than on others; but, although its absence would be desirable, in no case can it be said to destroy conversation, and when persons become accustomed to its presence little notice is taken of it. It is distinctly traceable to induction pure and simple, as it can be easily associated with the running of the generators.

2. An intermittent musical sound, difficult to describe, but reminding one of a steam siren at a great distance. It commences always at a comparatively low pitch, and gradually ascends until it finally disappears, as if the vibrations were too rapid to be rendered audible. It has the peculiar effect also of almost eliminating No. 1, that sound seeming to disappear as the siren increases in pitch. It does not, however, interfere much with speech. Its duration extends over a few seconds only.

3. Another disturbance is a rasping sound, very much like broken contacts with a battery through a telephone receiver, and is the most troublesome of all as regards conversation. This would appear to be caused by direct currents with irregular contacts through dirty rails, &c. It is intermittent.

4. The most annoying trouble is the dropping of the shutters of the Telephone Exchange Board, and some lines suffer considerably more than others, especially the longer ones. It is intermittent and erratic, and is, in my opinion, not so much the result of induction as of direct currents taken up by the earths of the various lines. The greater the number of cars in use, and, consequently, the larger the output of current, the greater the number of shutters affected; and on occasions when the tram current has been suddenly increased, and as suddenly interrupted—such as the short circuiting of a motor and the burning of a fuse—the effect is more severely felt, as many as 250 out of 400 shutters having come down at one time. This is, of course, an unusual number; but there are some few shutters on which the effect may be said to be chronic, while the remainder are seldom or never disturbed, except on special occasions such as previously referred to, when the effect is generally confined to between 20 and 60, depending upon the locality in which the occurrence takes place.

The resistance of the earth return seems to be much greater than it should be.

On the 5th and 8th September, 1893, the resistances of the various circuits of the electric tramway were taken as follows:—

		Line.		Earth.	Total.
5th Newtown	...	1.1 ohm	..	.4 ohm	1.5 ohm
8th Cascades	...	.955 „		.355 „	1.31 „
8th Sandy Bay		1.23 „		.23 „	1.46 „

The calculated resistance of the rails on each section, allowing 6,000 lbs. per ohm mile, is about—

Newtown	...	..		.082 ohm
Cascades	...	..	..	.067 „
Sandy Bay		...	...	.072 „

I have not had an opportunity of testing these resistances since, but should not be surprised to find, judging from the increased disturbing effect on the shutters, that they have increased.

The set of observations as to potential were taken on two separate dates—one fine and dry, the other heavy rain; but there did not seem to be any appreciable difference, except in the case of the telephone line to the tramway station, which gave a “right” deflection on the wet day and “left” on the dry.

A disturbed condition of the atmosphere seems to increase the effects caused by the tram currents, more especially on the approach of thunderstorms. On one occasion, although no trams were running for a portion of the time, there was a continual crackling, like an intermittent battery contact, on the whole of the lines, and lasting for about four hours.