

*Tuāi-Wairoa Line.*—This line is being completely overhauled, and the spacing between phases is being increased to permit live-line work. Certain angles have been eliminated and a *stadia* survey of the line was made.

(iii) *11 kv.*

*Mangaore-Shannon.*—This line is maintained by the Horowhenua Power Board. During the year one shutdown of 3 hours occurred due to an opossum coming into contact with the line, five 11 kv. and low-tension wires being burnt through.

*Khandallah-Petone.*—A broken jumper and several broken strands were repaired.

*Tuāi 11 kv. Lines.*—No trouble was experienced on these lines, except that on one occasion a pole on the mill line was burnt through. No interruption resulted, the pole being replaced later.

(iv) *General.*

(1) *Lightning-storms.*—Eleven storms were reported during the year, but only five caused disturbances on the system; one on the Wanganui-Hawera line shattered several insulators and splintered a pole, and one in the Taranaki District caused a shut-down on the New Plymouth line, shattered several insulators on the Arapuni-Stratford line, and damaged two 110 kv. potential transformer bushings at Stratford. The third occurred near Wanganui Substation and damaged some of the Power Board's switch-gear. A fourth near Napier was presumed to have been the cause of an interruption on the Napier-Woodville line, while the fifth over Dannevirke Substation shattered the lightning-arrester fuses and caused a shut-down between Woodville and Tuāi.

(2) *Special Maintenance Work.*—During the year the live-line gang completed the overhaul of the Woodville-Napier line, and were latterly working on the Bunnythorpe-Wanganui line.

In addition to changing poles and insulators, refitting poles, &c., under live-line conditions, the following special work was carried out:—

Jumpers on the Dannevirke structure were removed alive.

The Wanganui structure was overhauled, post insulators "buzz-stick" tested at various substations, and assistance given on general maintenance-work at substations.

The other special maintenance gang was chiefly engaged on the overhaul of the Mangahao-Khandallah lines. In addition to general maintenance-work, a deviation was made in both lines at Paraparaumu Substation and two telephone-huts were shifted. This gang also carried out work on the erection of the new transformer and steel structure at Paraparaumu Substation and assisted on the reconstruction of the structure at Khandallah. Latterly they were engaged on the erection of the two 11 kv. lines from Khandallah Substation to Khandallah Railway and Ngahauranga for the railway-electrification schemes.

(3) *Khandallah High-Tension Testing Set.*—The usual retests were made of all insulators found defective and removed from the lines.

The following special tests were also carried out:—

Porosity tests on several insulators, dry flashover and puncture tests on two-piece pin type insulators, and voltage tests on a length of cable.

(4) *Vibration.*—A design of festoon vibration damper for use on the Tuāi-Napier copper lines was completed after experimental work, and material ordered for dampers. Material for experimental dampers of the same type for use on the Stratford-New Plymouth line was also ordered. The Bunnythorpe-Wanganui section of A.C.S.R. line, previously thought to be free from vibration trouble, has now shown up a considerable number of broken strands, and action is under review.

(5) *Pole Maintenance and Deterioration.*—The visit of some Australian forestry experts to ascertain the cause of rejection of large percentages of Australian hardwood poles to New Zealand and to negotiate a draft specification for poles led to the collection of a number of samples showing various forms of decay, and this was used as the nucleus for a "pole museum." Discussions with the mycologists of the Agriculture and Forestry Departments led to a better appreciation of the problem of pole decay and to a study of the moisture distribution in standing poles, with a view to determining whether the source of moisture was the ground or the top of the pole. An experimental section of a pole was artificially inoculated with a wood-destroying fungus obtained from another pole, with a view to determining the rate of progress of decay. Sample decaying pole sections were also erected on the line to determine the rate of decay.

In conjunction with representatives of the Australian forestry interests, the New Zealand Railway Department, the Post and Telegraph Department, and the New Zealand supply authorities, a draft standard specification for poles was drawn up and recommended for adoption by the various interested bodies.

A systematic collection of insects found in hardwood poles was commenced. This has shown that the Australian termites, *Calotermes insularis* (White) and *Calotermes olfieldi* (Hill), are definitely established in New Zealand, having been found in poles twelve to thirteen years old, and the possibility of some Australian longhorn beetles being established is strongly indicated.

A special oxy-acetylene blow torch was acquired during the year. The purpose of this is to burn out knots and also to burn out the rot in existing knot holes. These holes are then filled with bitumen or plastic wood to prevent the access of moisture. Successful trials have been carried out, both on poles on the ground and on standing poles. All new poles are now being treated before erection. It has been found, however, that very wet weather prevents the successful burning-out of rot owing to excess moisture.