about 60 feet apart, connected underground by an iron strip 6-inches wide buried to a depth of 18 inches. Above ground, the uprights are connected by an uninsulated No. 12 telephone wire broken in the middle by a bamboo insulator 18 inches long. His sending equipment consists of one to four ordinary Blue Bell batteries, a key, a coil, and six minute spark gaps arranged in two parallel series of three each. The receiving apparatus is an improved wireless detector and an ordinary head-set of telephone receivers. He has installed and experimented with stations one and a quarter miles, three miles, and thirteen miles away from his headquarters station. At the first two distances, telegraphic signals have been delivered. The 13-mile station was wrecked by range horses before it could be tried out.

The plan is to perfect, first, the cheapest efficient loop, then the coil and spark gaps for clear transmission to the determined loop at all distances up to 50 miles, with not to exceed two battery cells. Then to perfect the transmitter, which, with the same apparatus, will send the human voice.

When I visited the operations last April Doctor Cox was already sending telegraphic signals three miles with seven one-thousandths of a kilowatt.

Doctor Cox's principle is the inverse of the ordinary commercial wireless system. It uses the ground as the medium of transmission—not the air. To prove to himself that he was using what corresponds to the ground position of a regular grounded telephone circuit, he made some slight changes in his apparatus and telephoned successfully over a single wire with no ground.

Reporting by Shots

Reporting fires from lookout stations by shots has been frequently discussed as a possible method of communication, but until this summer I know of no actual tests having been made. The forest ranger on the division overlooked by the Fuego Vista Lookout Station on the Angeles National Forest, had trail work to do with a crew of men and was in consequence out of telephone communication. Arrangements were made whereby the lookout, on discovering a fire on which the ranger might be needed, was to discharge three sticks of dynamite, and the ranger was to "beat it" for the nearest 'phone. Two shots meant the fire was on the ranger's division. This system of communication was used on three occasions, and the shots were easily heard at an air line distance of three miles.

PACKRATS DEVOUR PINES

On parts of the Angeles National Forest in California the packrats are so abundant that many of the young pines planted by the Forest Service have been killed or injured by the rodents. The damage seems to take place chiefly in the late summer and fall and is more extensive in dry than in wet seasons. It is thought that the rats tear off the tender bark of the trees to obtain moisture at times when water is scarce.

HOW TREE PLANTING SUCCEEDS

Of the 22,000,000 trees planted on the Pennsylvania State Forests to January 1, 1917, over 15,000,000, or about seventy-two per cent. are now living. Over 11,000,00 of the 15,-000,000 are white pine. Figures are not available on the present status of the private plantations, but up to the end of 1916 about 3,000,000 seedlings were planted by corporations and individuals, and at least 2,000.000 should be in good condition now.

Are you a railroad employee? The Forest Fire is doing its best to thin out your pay envelope. Deserts play traitor to freight and passenger traffic. and Forest Fires are the breeders of deserts. Forests when kept *alive* produce lumber mills, pulp and paper factories, busy towns, heavy tourist traffic, job for everybody. Five thousand forest industries look to you to keep their wood supplies fit for use.