

How SCIENCE has shrunk the EMPIRE

A small boy walked into a red telephone kiosk at the Imperial Institute, London, and said, "Hello, New Zealand," into the receiver. New Zealand answered. That is one of the thrills that attracted thousands of children, of all ages from five up to 50, and over, to the Young People's Telephone Exhibition, held recently in London.

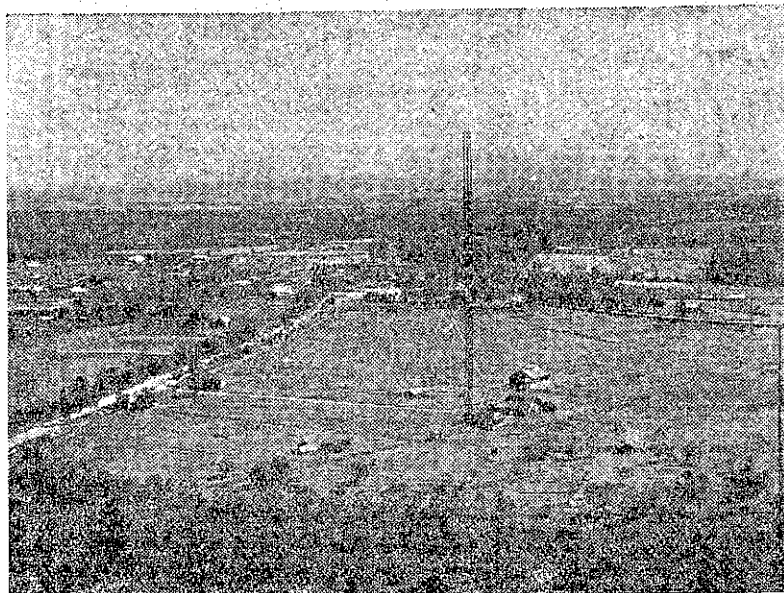
(By our London Correspondent.)

THE display shows them one of the greatest of modern miracles—how science has shrunk the Empire. Once inside the telephone box Auckland is no further off than South Kensington Underground Station.

At intervals, a spotlight is turned on to the milling crowd of children. The youngster on whom it falls is picked out and led into the kiosk to telephone to some distant country—or maybe to a ship at sea. Concealed amplifiers broadcast both sides of the conversation to the excited crowd of fellow-children outside. This stunt was the star turn of London children's Christmas holidays.

The British Post Office has laid itself out to explain, in this exhibition, "How it's done." The display tells the story of "speed in speech"—of how man has conquered distance in communication with his fellows. The small boy who talks to Australia, or any other overseas country, has only got to cross the hall to see a model of Rugby, the most powerful wireless transmitting station in the world, where his faltering voice was turned into waves which travelled 12,000 miles across the world.

This small boy is also given a glimpse of what happens to his telephone call at the exchange. He can watch it flicking through the complex mechanism of an automatic exchange without any human help.



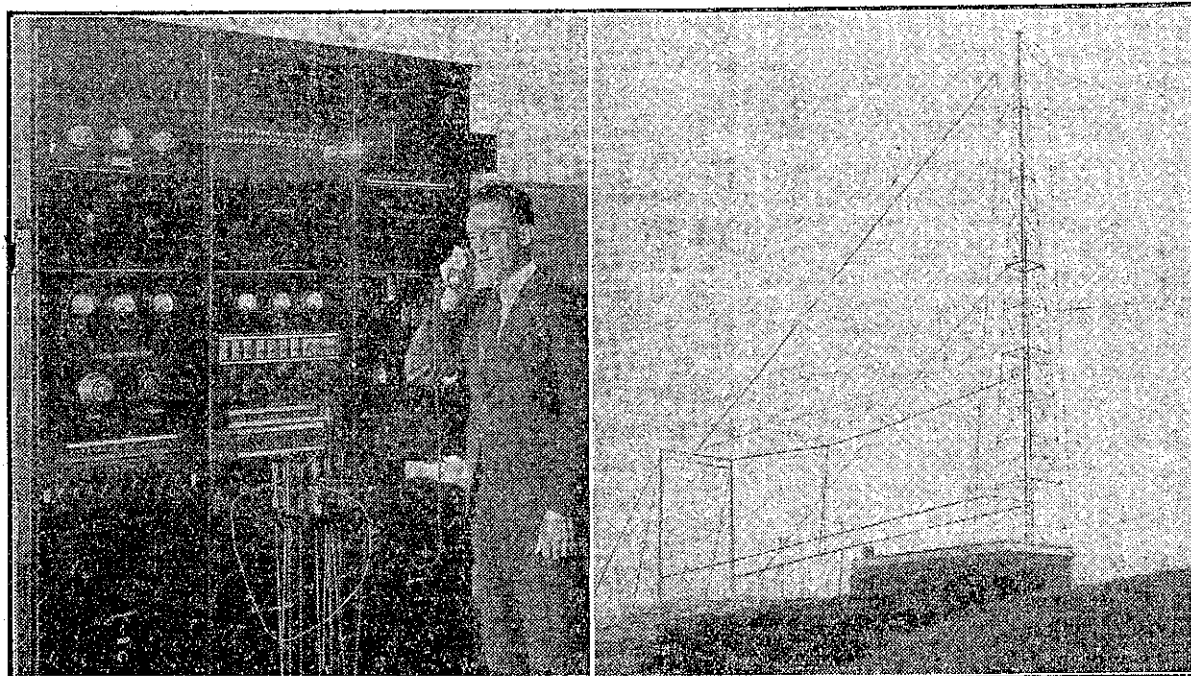
A link in the wireless telephone chain between N.Z. and England. The transmitter at Pennant Hills, Sydney, which rebroadcasts the N.Z. end of the conversations.

At present, overseas calls go through the ordinary exchanges, but a special overseas switchboard is nearing completion at the General Post Office, which will handle all these calls, and which is, it is officially stated, the most up-to-date and efficient in the world. Next door there is a working model of an ultra-short-wave wireless telephony set, still in the experimental stage. It works on a wavelength of 2 to 5 metres.

WORDS spoken into an ordinary telephone at one end of the stand come out through a loudspeaker at the other end—having been transmitted on a two or three-metre wavelength. In another part of the hall you can talk into a telephone to a listener one yard away—and your voice travels 1000 miles between the two instruments. The line goes up to Glasgow and back.

Post Office engineers have devoted a stand to telling you how this is made possible. A model illustrates graphically how a speech impulse travels in waves, like a ripple on the water. These get fainter and fainter as the voice continues on its journey. They would fade out altogether were it not for loading coils, which are put in at intervals to re-energise the impulse. There are seven "repeaters," on re-energising stations, between London and Edinburgh, for instance, and 27 between London and Berlin.

Some people have good telephone voices and some bad. It all depends on the number of "harmonics" in a voice. If you have a lot, the reception is bad because harmonics cannot be transmitted over ordinary telephone lines. A voice with the harmonics cut out loses all its character and tone. This is one of the big problems of establishing
(Concluded on page 2.)



"Are You There, London?"—It is from this transmitting station at Mt. Ekato, Wellington, that the N.Z. conversations are first put on the air.