

fact that Christchurch has telephone facilities to and from Dunedin, but the trunk circuits between these places are already quite loaded, and if they are asked to carry additional traffic it could only be done with a large delay—in other words, the waiting-time may run into two or three hours during the height of the daily busy hours.

Wireless.

Catalina Island, lying about forty-five miles off the Californian coast, has a three-channel wireless telephone service to Los Angeles, and provision is made for repeating the wireless speech over the wire system to practically any place in the United States. The average daily traffic to and from Catalina is 150 messages. The wireless speech is remarkably clear, and comparatively great in volume. I heard speech passing to and from Catalina at Los Angeles, and when at San Francisco I spoke to Catalina over a circuit made up of over 800 miles of trunk line to Los Angeles and thence by wireless. The speech was perfectly articulated, without any attenuation.

As far as the toll operators at Los Angeles are concerned, they have three physical circuits, which are operated in the same manner as a wire circuit. Ringing and speaking keys are used exactly the same for wireless as for wired circuits. When Los Angeles toll operator presses a ringing-key it drops a shutter at Catalina the same as if it were a wire circuit. Pressing the ringing-key sends the ringing-current of ordinary-telephone-ringing frequency through a relay at the aerial, which in turn places voice frequency ringing on to the aerial. This at Catalina on a valve amplifying-set causes sufficient energy to pass through an indicator coil to operate it. Of course, any licensed amateur, or a ship's wireless operator equipped with a valve receiver and tuning-coils, can tap wireless telephone speech; secrecy, therefore, by the nature of things, is impossible.

Hitherto it has been generally accepted that there is a large amount of interference caused to wireless-telegraph stations working on wave-lengths near that of wireless telephony, and for that reason it was considered that the use of wireless telephony would probably be confined to cases where wire telephony cannot be used, such as transoceanic communications, communications with aircraft, or very long land lines where maintenance would be difficult or impossible. When I was in London the Marconi Company was conducting experiments with wireless telephony with speech superimposed on 3,500 metres wave-length, and were stopped, excepting for a few hours after midnight, on account of the interference their experiments caused with communications to aircraft working on 900 metres wave-length. In spite of this there is a wireless-telegraph station quite close to the telephone aerial on Catalina Island, and I am informed no interference at all is experienced.

From what I saw and heard in the United States, I feel confident that wireless telephony will provide a practical proposition for opening up inter-island telephone service. The cost of a three-channel wireless installation, including the aerials and repeating-apparatus, is estimated to be a tenth of the cost of a submarine cable giving equal facilities—i.e., about £10,000. It is a difficult matter to compare the annual maintenance charges of the respective systems, because the maintenance of the cable is an unknown quantity, but the cost of repairing one break in the cable would equal many years' maintenance of the wireless equipment.

The estimated cost for the wireless-telephone equipment given above is for a three-channel service from Wellington and Blenheim, with repeating-facilities for intercommunication between the wire and wireless systems. Wireless equipment giving two channels each to Christchurch and Blenheim from Wellington should not cost more than an additional £2,000. The Department has suitable land at Lyall Bay and New Brighton for the erection of wireless aerials; the Blenheim aerials could be erected over the Chief Post-office building.

The American Telephone and Telegraph Company is laying what I shall call "mystery cables" from Key West to Cuba. These cables are to provide telephone and telegraph facilities, and are not metallic for the whole of the distance—about one hundred miles—but have an uninsulated return for the greater portion of their lengths. The insulated portion is continuously loaded. The cables are being manufactured in England, and the first one was expected to be laid in February. What the American Telephone and Telegraph Company expects to get out of these cables has not been disclosed by its engineers; indeed, from what I heard in America I believe exactly what facilities these extraordinary cables will provide is really unknown, and will only be determined after they are laid and tried out. I certainly would recommend deferring consideration of laying a submarine-telephone cable across Cook Strait until the result of these Cuban cables is known. The cost of such cables will be considerably less than the class of cables usually considered essential for telephone purposes under such waters as in the strait. The cost of materials is coming down, so we have everything to gain in delaying the consideration for a submarine cable.

Specifications are being prepared for a three- or four-channel wireless telephone installation for working from Wellington to Blenheim and Christchurch, and when these are ready they will be submitted to one or two companies specializing in such equipment. The results will be communicated to the Minister with a recommendation.

COMMUNICATION BY WIRELESS TELEGRAPHY AND TELEPHONY.

Due to the exigencies of the war and the great demand created thereby for communication by radio telegraphy and telephony, an abnormal development took place in these means of communication during that period. Upon returning to normal conditions this development was pushed forward with a view to its utilization for commercial and social ends. Although great strides have been made, much has yet to be done before the general application of radio-telephony to commercial problems can be said to have reached a satisfactory position. It is, however, clear that the older spark method of transmitting wireless-telegraph signals is fast becoming obsolete, particularly in stations using considerable power. The spark method is at present employed in the New Zealand