known as the "double-current" type, so that in future it will have only one machine where it now requires two—one for positive and one for negative currents.

I obtained three of these motor generators, one each for Auckland, Christchurch, and Dunedin. I could not get a price for a set for Wellington, the manufacturers declining to depart from their motor standards and build a motor for the extraordinary frequency of 80 cycles supplied by the Wellington City Council. As the hydro-electric schemes develop here we can increase the use of machinery for generating telegraph currents, and thus save fully 80 per cent. of the large sum spent annually for primary cells.

When I was in Chicago the Western Union Company was in the process of transferring its large plant and staff into a new building. Chicago—owing to wires radiating in so many directions—is the largest telegraph centre in the world. New machine-printing equipment made by three concerns was being installed, and the officials gave me confidential information as to the merits and demerits of various pieces of the apparatus turned out by the various manufacturers. The Chicago officials confirm the New-Yorker's statement that they wish that tape-printers had been adopted by the company in place of page-printers, giving the same reasons—*i.e.*, tape-printers save line time, cost less for maintenance, &c. They are afraid it will be somewhat difficult to change, on account of the public being educated up to page-printers and would probably resent tape.

High-frequency telegraphy along wires often colloquially described as "wired wireless," and termed by the American Telephone and Telegraph Company's engineers "high frequency multiplex telegraph," is another interesting development I met abroad. Several of these equipments are being installed on lines of the above-mentioned company. As compared with multiplex telephony the apparatus is less expensive in first cost and maintenance, and the system as a whole is less liable to interruption by disturbance from outside sources.

One high-frequency circuit is superimposed on a No. 8 gauge copper loop from Chicago to Harrisburg, a distance of 450 miles, and a similar circuit 200 miles long is extended to Pittsburg by means of high-frequency repeaters. Ten telegraph-channels are provided, each being duplexed. The equipment for each channel includes thermionic valves for transmitting and receiving high-frequency currents, the necessary condensers, inductances, and transformers, all of similar type to those used in continuous-wave wireless telegraphy; a duplex telegraph repeater connecting the high-frequency channel with the metallic loop extended to the telegraph-station; and a Morse set for monitoring purposes.

The system cannot at present be worked through cables, or even moderate lengths of covered wire, so it is not likely to be used to any extent in this country. It may be considered later on for the Auckland–Wellington superimposed loop. The long open lines connecting the large cities in Australia would appear to offer ideal conditions for the exploitation of the "wired-wireless" multiplex. I shall refer to "wired-wireless" again under the "Telephony" heading of this report.

The company at Chicago telephones all telegrams received for subscribers on the local telephone-exchange system, and posts a copy of the message only if the addressee asks for it to be done. The company says it costs on an average only 3 cents to telephone a telegram, whereas the cost is 10 cents if delivery is by messenger. The messengers are supplied with two uniforms on appointment, so as to enable cleaning and repairs to be done monthly; the company has its own tailors and tailoresses for repairs, and sends the clothes to a cleaning company for pressing and cleaning. The boys have 40 cents a week deducted from their wages for clothes cleaning and repairing. The company provides boot-brushes and boot-polish for the boys. I noticed that the lads on returning from a delivery invariably gave their boots a rub. The boys are also provided with rest and eating rooms, shower baths, and a gymnasium. Food for all the staff is obtainable on the premises on the cafeteria system at actual cost, which does not include overhead expenses. I found this practice standard with all large telegraph and telephone companies throughout the United States of America.

TELEPHONY.

I found that the telephone service throughout Europe and America was passing through a period of unsettlement, caused by the direct effect of the war on the supply of materials. Shortage of skilled labour during the war, and unrest in the labour world since the war, have affected not only the output of factories, but the work of the switchboard operators and of workmen generally. In the United States of America the telephone service rendered to the public did not, however, suffer so seriously as was the case in countries which entered early into the war; development and production of telephone material did not entirely cease in the United States even when that country was actually engaged. In spite of this, one large company in the United States remarks in a recent annual report: "This has been from every standpoint the most strenuous and difficult year in the whole history of the telephone. It has been impossible to maintain standards, and difficult to meet the increasing demands of service. It is a matter of satisfaction that the telephone service has maintained its standards as well as it has when we consider the general letting-down there has been in all services, particularly private service where intimate relations between employee and employer should be a warrant for good service." If people next door to the sources of production of apparatus and material have this experience, is it any wonder people like us, so far afield, should be similarly situated? Under the circumstances, and from what was seen and heard in other countries, I am satisfied that the Engineers and workmen in this country rose splendidly to the occasion to give the public the best service possible during this trying time.

Great Britain and North America are now convinced that machine-switching (automatic) telephony is the only economical system of meeting the future needs of telephone service. This conclusion was arrived at in New Zealand in 1911. The Engineer-in-Chief and others of the British Post Office, in a recent report and recommendation to the British Government, said: "The