

are already equipped with automatic apparatus. These could serve as parent exchanges, and exercise the necessary supervision and maintenance over smaller equipments in surrounding districts, thereby considerably reducing the costs of operation and maintenance. Parent exchanges act as bases from which periodical inspections are made, and on which local toll lines can be concentrated and operated from a common centre, instead of being scattered throughout the district and operated from isolated points having limited hours of service.

By reason of the discussions that have taken place and of the information that has been supplied to me, we are now in a position to review such situations and to prepare specifications that have a reasonable hope of being satisfactorily met by manufacturers of this class of equipment.

MODERNIZED MANUAL-EXCHANGE EQUIPMENT.

The growth of automatic methods of exchange operation has called forth new ideas and practices on the part of companies which still confine themselves to the manufacture of manual equipment. Many improvements have thereby been effected which are in the nature of simplifying operation and reducing manual staff to a minimum. Free use is made of "automatic signalling," and provision has been made for the greater employment of "team working" among telephone operators. These methods constitute a serious rival to the extension of automatic methods into smaller centres, and careful studies will have to be made in each case to determine which process will best meet the needs of our rural communities.

AUTOMATIC *versus* MANUAL.

The main features to be considered in viewing the above situation are the following:—

- (1) The economic aspect, after making due allowance for the relative efficiencies of the different methods employed.
- (2) The adaptability of such equipment to existing building-accommodation, the unsuitability of which for automatic operation in some cases causes the latter to prove unduly costly.
- (3) The robustness of the automatic apparatus and freedom from such complications as would militate against remote control, testing, and maintenance by periodical visitation from a common centre.

These features have been fully discussed with manufacturers, who understand that these points will receive due consideration in the selection of equipment.

INTERCOMMUNICATION BETWEEN ADJACENT EXCHANGES.

A problem which I was glad of the opportunity of discussing with telephone experts of other countries is that of the conditions governing intercommunication between adjacent exchange areas. Separate exchanges within a short distance of each other and having considerable community of interest are usually given intercommunication on payment of a toll fee. In New Zealand the minimum charge for such short distances is 4d., a considerable part of which is absorbed in operating and collection expenses. The gain to the Department is small, and the imposition of a toll fee is naturally somewhat restrictive of traffic. On the other hand, a free service would have certain objections, as the increased demands on the service would unduly inflate operating-expenses and render necessary additional capital charges for outside plant and exchange switching equipment. Usually a section of the subscribers makes little use of the toll service, and is quite satisfied to pay a toll fee when and as required. A uniform increase in annual rental to cover full intercommunication with the neighbouring exchange, while favourable to the big toll-user, would press somewhat heavily on the small user. Such treatment would in reality consist in the application of the existing flat-rate rental system to the toll service. The problem is considerably simplified where both exchanges are operating upon automatic principles.

The ideal treatment would appear to be the provision of an alternative and automatic toll method, which on the one hand would charge for individual toll calls as they were made, and on the other provide full intercommunication at a fixed increase in the annual rental. The technical as well as the commercial aspects of this situation have been gone into, and the information obtained as to existing practice in other countries will be of value in determining the best course to pursue in the different situations that arise in practice.

PROVISION FOR GROWTH OF TELEPHONE SYSTEMS.

Another subject which vitally affects countries situated any considerable distance from telephone-factories is the extent to which provision should be made for "idle plant" in anticipation of the connection of new subscribers to the exchange system. All over the world there is an increasing demand for telephone service, and the utility of the telephone as a means of annihilating distance and of effecting economies in time and personnel is becoming universally recognized. It is the general opinion of engineers concerned with the study of such developments and the provision of plant that estimates of growth are more frequently under than over estimated, and that in a progressive community liberal provision must be made for the growth of the telephone system if demands are to be met within a reasonable period. This argument applies with all the more force to a country such as New Zealand, situated a considerable distance from the source of supplies and subject to the numerous and unfortunate delays which have arisen from time to time in connection with deliveries and shipping troubles. Definite information has been gathered with regard to the practice of other administrations in making provision for anticipated development, which will prove a useful check in connection with our own planning for future requirements.