

plant from such causes, and have realized the difficulties that would arise in replacing the same within a reasonable time from our limited resources of spare equipment. The question is also one of maintenance as well as capital cost. With regard to the former, it is believed that with the information now available maintenance costs due to lightning interruptions can be reduced by the employment of recently developed apparatus which came under my notice.

Sufficient data have now been collected to enable an intelligent revision of our protection methods to be carried out, and economies effected in installation wherever such a practice does not entail risks which at this distance from the telegraph and telephone sources of supply it would be undesirable to take.

BUILDINGS.

Many opportunities were afforded me of inspecting the accommodation provided for the housing of modern telephone and telegraph plant, and of discussing with those responsible for the same the various details of design which directly affect the efficient operation and extension of such equipment.

Typical plans have been obtained which have been designed with a view to economizing space, providing for extension, and giving a proper relation to those sections of the plant which are to be closely related in operation and maintenance.

Due attention was paid during these visits of inspection to such questions as prevention of fire, illumination, ventilation, cable-entrances, and such general features as tend towards the ideal maintenance and operation of equipment with the least loss of effective effort.

In countries where telephone practice is highly developed it is usually the case to provide in the one building accommodation for engineering, traffic, and commercial departments, in addition to the actual housing of the equipment, thus concentrating all the closely related interests. This method has some undoubted advantages, and has been followed as far as practicable in the recently-erected Stout Street (Wellington) Telephone Exchange building, where, in addition to the automatic telephone exchange and its toll switchboards and power plants, the Public Accounts and Contract Department and the District Telegraph Engineer's organization are also accommodated.

The leading organization of the United States has a large staff engaged upon all matters pertaining to the design of telephone-exchange buildings. They regard the matter of such importance that they hold periodical conferences of central-office and equipment Engineers from all parts of the United States, so that buildings shall be designed with due regard to all the interests involved and no factor of importance overlooked. One of the latest and most impressive telephone buildings is that of the New York Telephone Co. in West Street, New York, which is one of many telephone buildings serving that city and suburbs. Due to the courtesy of the company's architect, I was shown over this building in detail. It is at present utilized mainly as the headquarters of the administrative staff of the company. This building is a striking monument to the development of the telephone in modern cities. It has thirty-six stories, is 498 ft. high, covers an area of 28 acres, and has space enough for six thousand workers in addition to six central automatic exchanges capable of serving 120,000 telephones. An inspection of its numerous appointments impressed me with the need for careful planning for the needs of ultimate telephone development.

ORGANIZATION.

CAUSES CONTRIBUTING TOWARDS VARIATIONS IN TELEPHONE DENSITY.

In view of the fact that the telephone density differs to such a great extent in different countries of the world, it was of interest to observe the varying conditions surrounding its development, and the general attitude of the public towards the telephone as a public utility.

In certain countries where a low telephone density existed it was found that the administration was at times hampered by a shortage of funds with which to carry on an organized system of development and extension. In a growing system such as that of telephone communication such a condition is a serious drawback to the economic planning of and provision for annual growth, inevitably leading to greater cost in the provision of service than is the case where plans can be made well ahead of requirements, and systematic additions made to plant and equipment at the ideal time. Under such restricted conditions the service is not made attractive to the public, which, on account of the belated provision of facilities and the low state of development, becomes more or less indifferent to its advantages.

On the other hand, in highly developed telephone countries it was clear that the extension of telephone facilities was planned for long periods ahead, and adequate funds made available for the economical carrying-out of a programme of works spreading over a period of years. In such countries the telephone administrations aim at giving the highest grade of service possible, and at making the telephone indispensable to the public. Large sums of money are spent on the extension of toll lines and in the giving of a prompt and immediate service over the same. The satisfactory service which results has the effect of promoting greater demands for such facilities. It is only natural under these conditions that the attitude of the public should be highly appreciative, and the utility of the telephone in the saving of time and effort fully realized. Direct contact by telephone is regarded as the nearest approach to the "personal touch" which is so largely in evidence in modern business methods. Where the motto of the telephone company is that every call is an urgent one, and facilities are provided in accordance with this view, the public apparently come to rely upon the telephone, and to regard it as an indispensable adjunct of business and social life; whereas the provision of a poor telephone service causes the public rather to tolerate than to appreciate the telephone service at its true worth.