

system. In the larger centres, of course, the electric alarm, with the adequate number of street alarm-boxes, is the only one to be thought of. The telephone system is a useful adjunct, but there is not reliability, as there is often delay in getting connected with the fire-station. We are confident that an independent electric system will always prove a profitable investment by causing increased efficiency of the brigades through the prompt transmission of alarms. In the smaller towns the alarm, as a rule, is given by a single bell. A great improvement would be effected by increasing the number of points where the alarm could be given from.

Then, there is the question of conveying the apparatus speedily to the scene of the fire. In some places in the colony, in which are included some of the most dangerous risks, men are to be seen dragging their appliances by hand—this, too, in localities where hills abound, and roads are none too good. The result is that the firemen arrive in a thoroughly exhausted state. We believe that the automobile will in time be found in general use in the fire departments, till then horses should be utilised. With these, and the adoption of the swinging-harness system, the appliances are quickly on the spot, and the men arrive fresh and ready for their arduous work. There is also the advantage of being able to send back to the station for extra plant if required.

While on this question of appliances, we are convinced that the advantages to be gained by the use of the chemical engine have not been recognised as they should be. Christchurch is the only city in New Zealand in which chemical engines are in use. In connection with a proper alarm system, we are sure that in time one or more of these useful contrivances will be considered a necessary part of a brigade's outfit. They excel in connection with incipient fires, as they are so quickly brought into action, and they have the advantage that the branchman has the water-supply so well under his control that little damage is done by water. The damage usually caused by water is a matter that should occupy the attention of all firemen, and the use of the shut-off nozzle, as is the case in America, should be encouraged. This, however, necessitates (where fire-engines are used) the adoption of the relief-valve. In some departments lengths of small hose which can be connected to the nozzle are carried. Thus small jets are utilised and controlled. Of course, discretion must be used as to the amount of water needed, but more or less damage by water must always be accepted as an alternative to greater loss by fire.

While on this subject, the question arises whether the street fire-plug and portable hydrant in general use in the colony might not be greatly improved upon. If the design of the fire-plug is examined, it will be found that the opening of the ball-valve rarely allows a water-way of more than 2½ in. in diameter. The volume of water passing through the barrel of the hydrant is also reduced and divided by the bridge carrying the valve-spindle. This means a great contraction in the amount of water passing through the hose, resulting in a considerable reduction in the number and size of the jets that can be drawn from the fire-plugs in proximity to the fire. In the neighbourhood of large blocks of buildings, where risks of big fires are to be found, we consider the adoption of the fixed stand-pipe would be found to be of great advantage. When it is remembered that in long leads of hose there is considerable loss of pressure by friction, it is of great importance that as many jets as possible should be obtained from the nearest supply. A stand-pipe such as we suggest, with a diameter of 5 in., would have a capacity of nearly four times that of the ordinary fire-plug, an advantage easily estimated.

Another fault common in this colony is the great distance between the fire-plugs. It should be recognised that this is false economy. It necessitates the use of long leads of hose, and this being a perishable part of the fire-brigade plant involves great cost in keeping in serviceable order. Therefore the closer the fire-plugs (which after the first cost are permanent) the less the wear-and-tear of hose. The fire-plugs, too, would be of more advantage if placed on the kerb or footpath. They are more easily found there, and not likely to be covered up by mud, as is often the case when situated in the roadway.

We noticed during our visits to the different departments a great variety of new and improved appliances of the smaller kind in use by firemen. It would be impossible to describe all in this report, but samples will be submitted for the inspection of delegates at the close of the Conference, and we feel sure they will prove of great interest.

Another feature of fire-prevention work in the older countries that could be adopted here with profit is the regular inspection of big risks by members of the fire brigades. The men have a great advantage in case of fire, in knowing the construction and design of the building they visit, by the confidence they have in getting about while engaged in their duties. Not only this, but they are often able to draw attention to risks and defects not noticeable by the ordinary citizen.

To show that the cost of the fire-brigade service in New Zealand is carried on in a very economical and cheequeparing manner, we would call attention to the very small contribution required of the residents in the more closely built districts of the colony. The heaviest expenditure for maintenance in any town in the colony for the support of fire brigades does not exceed 1s. per head per annum, while in a number of cases the cost is much below 6d. From information gained in the United States, where the conditions more closely resemble those in New Zealand, the cost in the smaller towns is about 2s. per head. In New York it ranges from 3s. 6d. to 5s. 9d. The question then arises, would not the greater expenditure necessary to properly equip the brigades be the more economical in the end?

In the countries we have visited great stress is laid on the proper training and instruction of candidates for the positions in the fire departments before being enrolled for active service as firemen. This, in a small population such as ours, is impossible, but in the Fire Brigades' Association there is an organization which could be used to greater extent than it is at present to diffuse information to the firemen of New Zealand. Arrangements should be made by which, at intervals of a few years, exhibitions of fire brigade apparatus should be held. In these the latest ideas in appliances and methods should be shown. This, with lessons to be gained by visits to the more modern stations in the large centres, must prove of exceeding benefit to the younger firemen.