

- (b) The high fire load in Ballantyne's building when related to the class of construction. The building had wooden floors and partitions ; linings of tinder-dry matchlining and soft fibre board ; the ceilings were similarly lined. The class of occupancy or business carried on was, in itself, a considerable fire load, and the combined result was to create a very considerable fire hazard. The fire loads are also set out in the Introduction to this report :
- (c) In a secondary sense, the delayed call to the fire brigade contributed to the rapid spread of fire, in that it allowed the inflammable gases of combustion to accumulate on the first floor of Congreve's building, thus creating an imminent and dangerous possibility of explosive ignition :
- (d) Likewise, in a secondary sense, the failure of the fire brigade to effectively attack the fire in the first ten minutes after its arrival also allowed the accumulation of dangerous explosive gases, as referred to in the last paragraph.

100. It is clear from the evidence that the first visible sign of the rapid deterioration in the changing fire situation shortly before 4 p.m. was followed almost immediately by a sudden rush of flame, emanating from the first floor of Congreve's building along the Colombo Street frontage and spreading throughout the premises with amazing rapidity. The evidence disclosed by expert technical witnesses elicited the following factors which resulted, in the first place, in an unusually rapid burning cellar fire and, in the second place, in an almost incredible fire situation developing within less than thirty minutes following its initial discovery :—

- (a) The unusually rapid development of the fire, considered as a cellar fire, resulted in a large measure from the presence of an unprotected opening in the dividing wall of the adjoining cellar which permitted free access of air :
- (b) The fact that the open stairway from the cellar where the fire originated in Congreve's building was not fire-stopped permitted the transmission of heated products of combustion to the first floor in increasing proportions as the fire conditions deteriorated :
- (c) The presence of large openings entirely unprotected against the ravages of heat and smoke between Congreve's, Goodman's, and Pratt's buildings on the first floor was the important factor which accounted for the rapid spread of fire throughout the buildings :
- (d) The fibre-board screen enclosing the lateral opening between Congreve's and Goodman's buildings on the first floor permitted a dangerous condition to build up in Congreve's building.

101. We are of the opinion that the fire hazard could have been reduced by the following means :—

- (1) The installation of an automatic sprinkler fire-alarm system. This was the most obvious solution, and, as it was demonstrated in evidence, it is difficult to understand why Ballantynes did not have such a system installed :
- (2) An automatic fire-alarm system directly connected to the fire-station. This type of alarm, while it does not attack the incipient fire, does immediately bring it to the notice of the fire brigade, and, in this instance, the fire brigade would have arrived at the scene without delay, and at a time when there would have been no obstruction to entering the basement, by reason of heavy smoke conditions :
- (3) The use of fire-doors to the specification requirements of the Fire Underwriters' Association on all openings cut between the various buildings which comprised the group of buildings forming Ballantyne's premises. This would have meant that a number of the openings must be reduced in size, but, in view of the risks involved, the disadvantages would have been more than outweighed by the gain in protection, and adopting several smaller openings in lieu of individual large openings :