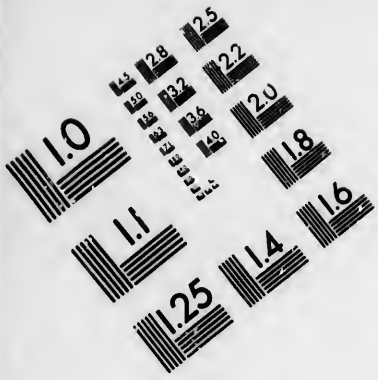

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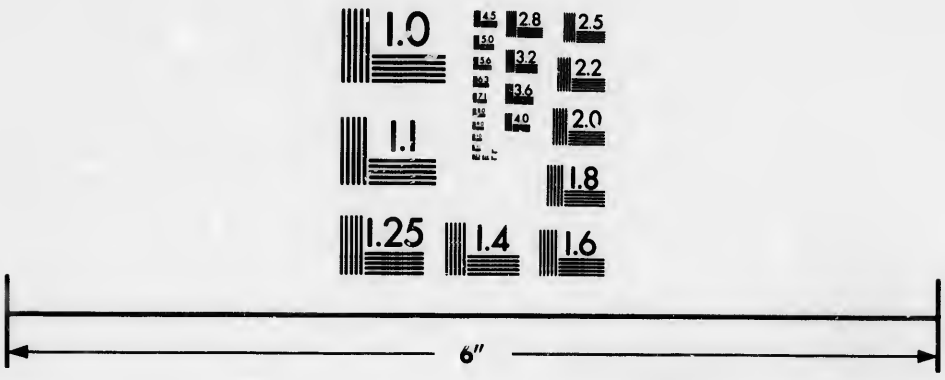

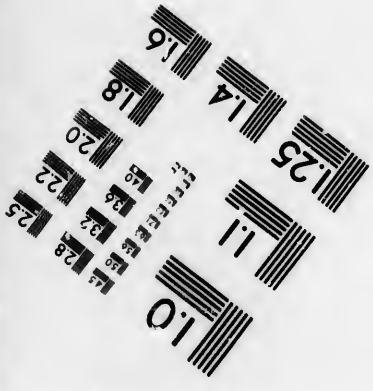

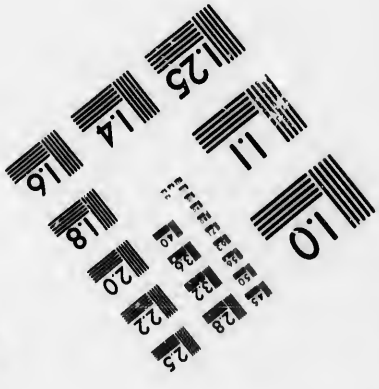

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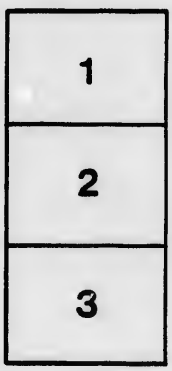

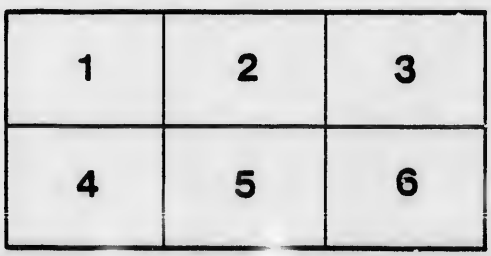

FIRES AND FIRE-PROOF CONSTRUCTION

(From the CANADIAN ENGINEER, May, 1898.)

Editor CANADIAN ENGINEER:

SIR,—I have, as requested, looked through the pamphlet you were kind enough to send me, on the Paris Charity Bazar Fire, by Arch. E. O. Sachs, author of Fires and Public Entertainments, Modern Opera Houses and Theatres, etc.

This paper was prepared by the author for the Architectural Association, and read at its second ordinary meeting, session of 1897 98, Hampden W. Pratt, F.R.I.B.A., president, in the chair, and was commented on after its reading by Richard Roberts, L.C.C., vice-chairman Theatres Committee, London County Council; Sid. Gamble, A.M.-Inst. C.E., F.S.I., second officer Metropolitan Fire Brigade; Major Fox, chief officer Salvage Corps; Thomas Blashill, F.R.I., B.A., F.S.I., superintending architect London Common Council; Capt Dyson, chief officer Windsor Fire Brigade; William Archer; Henry Lovegrove, A.R.I.B.A., F.S.I., district surveyor for Shoreditch; Max Clarke, A.R.I.B.A. It has been published by the British Fire Prevention Committee, C. and E. Layton, publishers, Farringdon street, London.

I find the consensus of opinion in this case to be that while the fire was caused by an explosion of some of the essential oils used in the exhibition of the Kinemetegraphic views, the conflagration and the destruction of the building were disastrously hastened by the fact of the roof drapery having been immediately ignited by the explosion, the flames in an instant running along the whole building, some 300 feet in length by about 40 in breadth, setting fire to the woodwork and flimsy paper and other decorations of the interior, which, falling from above directly onto the heads of the lightly-clad ladies in attendance, set fire to their hair, their head gear and dresses, thus causing the simultaneous and almost instantaneous death of 124 persons on whose heads and shoulders at the same time the broken glass from the continuous skylight was falling, cutting into their flesh and inflicting painful wounds and bruises. Still, quick as the destructive element was in bringing about this most terrible result, the committee is of opinion that had the several emergency doors which were barred and bolted at the time, been opened as they should have been by persons told off in advance to do the duty, not one half of the fatalities would have occurred, maybe not one tenth of them, as the victims issuing into the open could have been cared for by outsiders, who would have seen to the safety of all of them and have probably reduced the casualties in most cases to more or less severe injuries to be got over in course of time.

Mr. Sachs recalled the Vienna Ring Theatre fire of 1881, with its 450 fatalities; the Opera Comique fire in 1887, with a death roll of 115, and other great catastrophes; the Exeter theatre fire of 1887, where 160 lives were lost, followed by a serious fire at Oporto with the loss of another 100 lives. He might also have remembered the Bordeaux theatre fire, the Santiago church horror, where 2,000 souls were hurled into eternity, and the Brooklyn theatre fire of 1872 (I believe), where 276 more lives were sacrificed. Mr. Sachs comments upon the fact of how soon these disasters fade from memory, most of them, he says, having been forgotten within from three to seven days of their occurrence.

The London Committee calls on Parliament, or intends doing so, to interfere and force municipalities to attend to the safety of the public by refusing to sanction the erection of such flimsy and dangerous structures and decorations, and I am certainly at one with the committee in refusing to understand how it is to be considered as interfering with the individual liberty and action to enact such laws, any more than legislating on compulsory vaccination and other hygienic safeguards to the public health; for, as above set forth, there is no doubt that, had not the incriminating ceiling cloths been there, or one of asbestos or other inflammable material, and parties at hand to open the seven doors of the building aggregating some 40 feet in width, the Charity Bazar horror would not have been to any extent as serious as it has proved to be.

Emergency doors are of little or no use, unless opened on every, or at least, frequent occasions in a way to let people use them, and thus become acquainted with their whereabouts. It will be remembered how at the Vienna theatre fire already alluded to, a certain emergency door of ample dimensions to empty the house in from two to three minutes was, upon an attempt to open it, found to be so utterly rusted in its fastenings, that it was impossible to cause it to swing on its hinges. Every now and then I have had to remind our successive chiefs of police of the advisability of their sending a constable to see that the doors at the Academy of Music, Quebec, and other places of amusement be opened a little before the end of the entertainment; there being as constant a disposition in theatrical managers to let the emergency doors remain shut so as not to have to pay extra hands to open them when required; and the police in all other Canadian cities, and the world over in general, should be periodically instructed to attend to this opening of doors, and have the power of enforcing it.

With regard to the other pamphlet you favored me with, published by the same committee and headed "Some American Opinions of Fire Prevention," the writers seem to be one and all of the opinion that no absolutely fire-proof construction can be arrived at; but that much can be done towards decrease of damage and loss of life by fire, by resorting as far as possible to a (slow burning) system of construction. In the so-called fire proof buildings there are always loop holes for the fire to creep through, or for smoke and heated gases. Floors can be and are made fireproof, e. g.: as here at the Chateau Frontenac Hotel, and in many buildings in other Canadian cities, in the United States and Europe, by using porous terra cotta archings between the iron flooring joists and resting on the flanges thereof, provided all structural iron work or the skeleton framework of the building, if of steel or iron, be protected from heating or bending, by covering it with two or three inches thick of cement or plaster; but after the floors are laid the plumber comes along and cuts holes through them here and there for innumerable soil, gas, water and heating pipes, and electric wires, etc., and in this way jeopardizes the structure. Practically speaking, a building cannot or never will be made fireproof, or proof against accidents to occupants, because no one will, for the sake of an accident which may never happen, consent to the discomfort of treading constantly on stone floors or of putting their hands to iron doors or sashes, especially where the outer air is at a temperature down to or below zero. And even if there were no objection to that, and that all door and window trimmings, skirtings and wainscoting were of iron or cement, there would still be the furniture and upholstering, which no one would consent to do without, or to sit on an uncushioned iron chair and alongside an iron table or a bureau, or at an uncurtained window; and since carpets, curtains, clothes and cushions cannot or never will be done without, nor books, nor papers, nor wearing apparel there will always be within any so-called fireproof structure, enough of combustible material to stifle one and render exit from the premises impossible in case of fire.

Fire, at any rate, should be confined to the floor or story wherein it originated, and to secure this the following precautions must be observed, to wit: Fire-proof tubing of, say, 4-inch brickwork or cemented iron cylinders in lengths joined end to end, and riveted or bolted, and of a size to allow of the plumber getting into them for all repairs to piping, and with man-holes for the purpose, and the several floors made good and fire-proof around them at every story. Horizontal fire-proof conduits, it is suggested, could and should be made under and along the ceilings of corridors and passages, or hidden by false ceilings underneath them, since these narrow avenues need not be as high as the broader dwelling rooms or offices of the structure. These horizontal fire-proof conduits or tunnels to be used to conduct all bathroom and other tubing to and from the vertical shaft or shafts above mentioned, and so as to leave no cranny for fire or even smoke and burning gases to creep through from one floor to another. If there be no space or no funds for such fire-proof upright shafts and horizontal galleries' then it is essential at least that the several lines of tubing, where passing through floors and walls and partitions, be made to run through metallic thimbles to be inserted for the purpose, so as to allow for expansion and contraction of all hot water, or steam or heating pipes, these thimbles being made to fit the pipes as a steam cylinder fits around its piston, allowing motion in either direction, while preventing smoke and fire and heated gases passing through them from one floor or apartment to another. While on this subject, it may be well to remind architects that even the contact of a hot water or steam pipe with wood work may be dangerous or become so in course of time by desiccation of the timber, which then the least spark from a spent match would ignite; and that to prevent this, thimbles must be used, not of black or sheet or unpolished iron, but of bright clean tin to reflect back the heat thrown on to them by radiation from the pipes, and with an intervening space of a quarter or even one-eighth of one inch or so, there be no absolute contact to allow of the thimbles becoming heated by connection or conduction.

Nothing—strange to say—is mentioned in relation to the most fruitful sources of danger of the fire extending from floor to floor, through the medium of staircases and elevators, and I must myself supply this deficiency by stating, which I did, now some 14 years ago in a paper read by me before section III of the Royal Society of Canada, and repeated with additions and illustrations before the Province of Quebec Association of Architects some time after: that the only absolutely certain escape from buildings in case of fire must be by means of a stairway enclosed in a fire-proof shaft extending from bot

tom to top of the building, and having no communication whatever with the interior of the building, and to reach which, every inmate must step out onto a balcony, and from the balcony into the stairway. A thoroughly practical illustration of the truth of this assertion is to be had in the fact that at a fire which occurred in Montreal only some two or three years ago, in a building where a staircase had been provided for safety purposes in case of fire; when parties from the upper stories made the attempt to escape down the stairs, they were met by the hot and stifling smoke and gases from below, and had to beat a speedy retreat and jump from the windows, most of them being thus dashed to pieces on the paving below.

I say that unless there be stairs at opposite ends of a building, one of which can be resorted to for escape while fire is at the opposite end, the emergency stairs must have absolutely no communication whatever with the interior, at any of its flats or stories. And so of the elevator, that it may not become a suction shaft for the flames from one story to another, it should open onto a balcony and from the balcony onto the building, the only additional time and trouble being two or three steps more in transit, and the passing through two doors or doorways, instead of one; and as is evident, this stairway may be either within or without the building, provided the balcony or landing be not so enclosed as to cause a suction from the one towards the other, and such a balcony open to the outer air could give but slight inconvenience and only of the most momentary nature. The stairs in such a fireproof shaft need not be of steel or iron, as no fire could reach it—8 inches brick work being amply sufficient for such a fireproof enclosure.

To obtain this much needed reform and have it applied to all high buildings, such as hotels, convents, colleges, manufactories, asylums, etc., Government must step in and make the thing obligatory, as very few, if any, will not run the risk of a repetition of these every day accidents repeated in some quarter of the world or other, rather than go to the expense of an emergency escape from fire, when such emergency may never materialize. These repeated accidents, though terrible they be, only cause a scare of a very few days' duration—in proof of which I must say that when in 1872, 276 persons perished in the Brooklyn, N Y, theatre fire—our people here were scared, a public meeting called, and I, as city engineer, was requested to visit and report on all the Quebec public buildings. I did so, examining over a hundred buildings and pointing out what facilities existed, and what further doors and stairways were essential for escape in case of fire. This I did in less than the above number of pages, and had the whole thing ready to lay before the committee in less than a month; well, will it be believed, but such is human nature, that this pompous committee of Bishops, French and English, the Mayor, and all the high-sounding names of the place—the heartless set—never met again to give the thing a moment's thought. Such, however, I am glad to see, is not likely to be the case with the present London Committee spurred into action, not only by the Paris Charity Bazar horror, but by the material loss of millions of pounds sterling in the late great fire in London, and which bids fair to enlist the sympathies of Parliament in a way to obtain legislation obligatory of fire protection, as it compels safety against epidemics, and strives to do against steamboat, railway and other accidents.

C. BAILLAIRGE.

Quebec, April 9th, 1898.