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FIRE PROTECTION HISTORY-PART 152: 1917 (A DISCUSSION OF THEATER FIRE SAFETY)

By Richard Schulte

The concepts for theater fire safety included in Mr. Blackall's presentation made at the twenty-first Annual Meeting of the National Fire Protection Association held in 1917 elicited quite a response. The following is a transcript of further discussion on Mr. Blackall's presentation:

> "*The President: Is there any further discussion on this subject? If not, we will now continue consideration of the previous address.*
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> *Mr. Rudolph P. Miller (Chairman, Building Officials' Conference): It is refreshing to find somebody, now and then, bold enough to attack, as Mr. Blackall has in his paper, old methods and to recognize that architects should have some freedom of design in constructing buildings, particularly theatres. The laws we have now generally on our statute books have been handed down from the time when our theatres were not constructed as they are today, when they were non-fireproof buildings, when the stage was equipped with gas instead of electricity, and they had many other features that were undesirable and hazardous. With modern improvements and safeguards, the present theatre is a different building than it was. It is surprising that the study of the Iroquois Theatre fire which Mr. John R. Freeman made in 1904, immediately after that fire, and which he spent a year in investigating, has not had better results than it has today. Mr. Blackall, in his paper, very properly couples the audience halls with theatres. The chief thing that distinguishes the ordinary audience hall from a theatre is the stage, with its attendant increased hazard, and what distinguishes it from the motion picture theatre is the fact that the motion picture theatre has an additional hazard in the picture projecting device. The main consideration as to the auditorium, as Mr. Blackall has pointed out, is the question of the exits. I am not altogether in accord with what Mr. Blackall said on that point. From his paper I gather that he does not feel that it is so important to have those exits distributed around the auditorium. Exits should be designed in proportion to the number of people to be taken care of and distributed as evenly as possible along the sides and rear of the auditorium. I agree with him that the open court is not absolutely necessary for that purpose. The open court has the defects which he has pointed out, namely, the increase in the exposure hazard to the theatre itself and the danger of panic in the theatre by reason of a fire on an adjoining lot. I do not know whether the principle of the fire wall has actually been applied to a theatre or not, but I know that Mr. H. F. J. Porter has prepared plans in which he has shown that he gets as safe a theatre, with an increased seating capacity, by opening the exits into foyers or lobbies, protected by fire walls, on each side of the auditorium and at the back of the auditorium, instead of upon so-called emergency courts. Not only does he get an increased seating capacity because he*

gets a larger auditorium space, but he makes the building safer by requiring his seats to be spaced further apart than is ordinarily required now. The spaces between the seats practically become aisles, and this, coupled with the automatic, self-raising seat, would seem to make a very excellent arrangement.

Mr. Freeman, in his study of theatre fires, has pointed out that the greatest loss of life is in the galleries, and especially in the top gallery. In the Iroquois Theatre seventy-per cent of the loss of life that occurred in the theatre occurred in the top gallery; the balance was nearly all in the lower balcony. He mentioned, and I think it is a point that has never been given its proper recognition, that the exits from the galleries should be more ample than they are from the main floor of the auditorium or the lower gallery; in other words, as the exits from the auditorium become higher above the general grade level, their capacities should be increased. He even holds that the exits from the top gallery should be two or three times as great as those from the ground floor. Now there again Mr. Porter's suggestion of the fire wall comes in very well, because if the occupants of the gallery can have egress on a level the necessity for the wider exits is not so important as when the people are forced to go downstairs.

As to the construction of the proscenium wall, it may be merely prejudice, but I am not willing to go quite as far as Mr. Blackall. I will point out, however, that Mr. Freeman's investigation leads him to the conclusion that the theatre curtain becomes of lesser importance if proper ventilating skylights are provided over the stage. The ventilating skylight is the most important feature of the theatre, and is one that is too often neglected. It should be given the most careful consideration and study. If satisfactory ventilating skylights are provided, the smoke and gases from a stage fire will go out to the outer air instead of into the auditorium. The experiments made on model theatres one-eighth natural size by the Austrian engineers, show that whenever the skylights opened the smoke did not enter the auditorium to an extent to do any particular harm. Therefore I feel that the asbestos curtain should be given some consideration. In a theatre fire in Philadelphia some years ago, the asbestos curtain served the purpose of keeping the fire and smoke out of the auditorium for fully fifteen minutes, an ample time for the audience to leave the building. The rigid curtain is good and desirable as a fire stop, similar to a fire door; but I see no reason why it should be made compulsory.

There is one other point that I wish to make. When theatres are completed, they should not be permitted to be used until they are actually ready for use. I think that was largely the trouble in the Iroquois Theatre fire, that some of the exits which were supposed to be there were unavailable. Theatre managers are very desirous of opening their places on a certain day, and they sometimes fix that day before the theatre can be fully completed. The influence and pressure that are brought to bear to have the opening take place at the specified time, in spite of the uncompleted condition, is one of the difficulties that administrative officials have to meet. (Applause.)

Mr. Edward V. French: This is really a very important question, and as it happened to be my lot to work with Mr. Freeman on the Chicago investigation, there are one or two points right in line with what Mr. Miller has said that I would like to emphasize. I think we do not appreciate the fundamental conditions of the average theatre. The Iroquois Theatre was a splendid building of incombustible construction, and had the fate to suffer perhaps the

largest, almost the largest, loss of life that has ever occurred in a theatre. The problem is this: the stage is frequently filled with a great mass of very quickly combustible material. Methods of fireproofing scenery or any other fabric have never yet been perfected to the point where the fireproofing is thoroughly satisfactory and permanent, and, as Major Pullman told us, frequently the regulations that do exist are not applied. The time element enters there, and is the one vital question in the whole problem. At the Iroquois Theatre you had a splendid building of incombustible construction, you had a stage which, due to the particular play, happened to have a very enormous amount of quickly combustible material; the fire came– the causes unimportant, because there are many causes, and I think this one was never fully established. In this case, the vents over the stage were not operative, probably on account of the too quick opening of the theatre, and in an incredibly short period of time the whole stage burst into flames, and smoke and gas pushed itself out almost instantly into the audience. There they sat; many of them never rose from their seats. The stage carpenter told me that after the fire was over, not realizing the enormity of the calamity that had occurred, he went into the theatre, where he saw several ladies sitting in a seat, and he said, "Ladies, I think you can go out now." They were dead; the gas and flame simply overwhelmed them where they sat. No exits such as Mr. Blackall has told us about could have taken care of that situation. We have got to go back, as we have to in so many problems, to the root of the trouble. If there had been proper skylight openings over the stage, as Mr. Miller has suggested, I believe the experience of the Iroquois fire shows that the whole audience could have stayed in their seats like a family circle around a huge fireplace and witnessed the destruction of everything on the stage with the products of combustion going out through the roof. They probably would not have done it, but they could have done it. The demonstration would have been like one in our own fireplaces when somebody throws a pile of rubbish upon the fire, and there is a burst of flame which forces the fire right out into the room. The first lesson is that you want to stop every fire you can at the start, and there is nothing better than the automatic sprinkler to do that. It will frequently stop the fire before any harm is done or any fears are aroused, and this will also apply to other parts of the theatre in which fires may occur, when other parts of the theatre building, as in old structures, are often used for some other purpose. I think we felt at Chicago that the fire curtain was of less importance than the other items I mention. It is a splendid thing, but is of such a structure that its reliability is doubtful. The Chicago ordinance finally did require steel curtains, but the whole thing is difficult to operate, and there again the time element comes in. The asbestos curtain is one of the things faith has been pinned to very much beyond its possibilities. The asbestos curtain is very, very weak. We think in the Iroquois Theatre the curtain was lowered promptly, but the products of combustion burst the curtain out almost simultaneously, and it was of very little use. Asbestos fibre, when subjected to heat, becomes almost as weak as wet paper. The presence of the copper strands seemed to increase the strength practically none at all, as I remember the experiment. The curtain has its value; I think, possibly, the chief value is to screen the fire from the audience, because, if you have your skylight vents the stage will act like a first-rate chimney. I think we should not forget these fundamental things learned from these experiences, because what happened in the Iroquois Theatre was almost an exact repetition of what happened in the world's history going back several hundred years. Again and again such holocausts have occurred; lives lost, investigations and reports made, and in fifty or seventy-five years the whole business was forgotten and repeated again; so that is the lesson we want to take especially from these cases. I haven't any doubt but that the exit is an important thing, because regardless of fire, there is the fear element, and there must be

a good way to get out of the theatre. Nevertheless, if we do some of these other things, the need of getting out will disappear a good deal, and the occasions when people have to get out will be so reduced that a very great measure of safety will result. (Applause.)

Mr. Powell Evans: I want to say a word with respect to the principles involved here. Speaking in general terms, I think we are making a mistake whenever we attack problems like this in terms of one experience or one issue. The whole experience of handling people is a matter of the number of people congested together, as a number of the speakers have stated. Along the top of this building (the New Willard Hotel), are at times a thousand or more people; at the time of the National League meeting in the Bellevue-Stratford, Philadelphia, there were a thousand or twelve hundred people on the top floor, limited elevator capacity, stairs not adapted to fire hazard. That condition, related to what happened at the recent Hotel Lenox fire, in Boston, shows the danger of that situation. I hope to see this whole matter of assembly put in one report, the theatre problem as one class, the moving picture as another, the ball room as another, the church festival as another– in all of these matters that touch property, it is a question of "Pull Dick, pull Devil," as to who shall spend the money to make such buildings safe. In Philadelphia we found the most persistent disinclination on the part of the whole moving picture industry to making their property safe. It is perfectly recognized that a man with small capital, taking an old store where he can accommodate two, three, four or five hundred people at a five or ten cent show, cannot afford an investment that would be expected in a more permanent theatre structure; but it is the same problem, fundamentally; the subject of people and conditions under which they assemble. It ought to be tackled as a base problem, and all these phases of it ought to be brought in line with basic principles and considerations.

Mr. Richard L. Humphrey: In the course of a visit to Vienna some years ago, I saw in a number of opera houses conditions which, I fancy, might perturb this country considerably. For example, it was the rule in one of the opera houses for representatives of the building department, the fire department and the manager of the theatre to be there and make their reports formally as to whether the exits were working, whether the fire apparatus was in proper order and all the other fire preventive devices were satisfactory before a permit was given by the police to the management of that theatre to open the doors. In some theatres they had methods of drenching the stage scenery, in case of fire, with sprinkler systems, and I had the good fortune to see a demonstration. In all circumstances, however, the crux is mainly the human element, no matter how carefully we look after the mechanical protection. It seems to me that what we need in theatres is some form of zone system by which a relatively small number of people can pass out of an exit, using the same exit by which they enter the theatre, get easily into a protected zone, and thus leave the theatre in a leisurely way. After all, we shall not get real safety in this country, in theatres or other buildings, until the Federal Government takes hold of the matter and enacts laws that will be generally applied.

The President: The Chair is going to suggest that as Mr. Robbins is here and we desire to hear from him before adjournment, if Mr. Blackall has anything further to say on the subject, we will listen to him now.

Mr. Blackall: The question was asked, "Why a minimum of five feet?" It is very natural. We must have doors in corridors; a less width than five feet will not permit the introduction of double-acting doors.

Allusion has been made to asbestos curtains as fire stops. We had one fire in Boston last summer, in the Tremont Theatre. It happened on a Sunday, and the actors sat around in the balcony and on the floor of the house watching the fire, which was entirely on the stage. I do not believe the asbestos curtain was even lowered, but the ventilators on top worked well, and the firemen had a good time putting out the fire. In this paper I assumed that there would be ventilators and sprinklers over the stage, and all the provisions we naturally require, and I made insistence only on the exits as being the thing which requires some special thought. I would have one exit at each corner of the auditorium. I worked that out particularly in the case of the Scollay Square and Olympic theatres in Boston, and I found that I could get more exit space leading directly to the streets and doing away with the courts, and more seating capacity than I could by following the law. I do not believe the courts are safe exits, because the human element is one we have to deal with. Women and children are the ones that will stumble first; the weak obstruct everyone else, and I do not think many women and children on a dark night, with a fire next door, would find a grille fire escape an inviting means of exit; they would come out the way they went in, and my insistence is to have them go out the way they come in, and never have to go on a grille fire escape.

The additional discussion on the topic of fire protection for theaters is quite interesting, particularly the comments regarding the stage vents and the stage curtain. Clearly there was a difference of opinion on the necessary protection for theaters and on the design of egress systems serving the audience seating areas.

Perhaps, what is most interesting is that Mr. Blackall was an architect and there is little doubt that he had spent considerable time studying the issue of fire safety in theaters. His recommendation for the application of common sense in developing fire safety regulations is still valid today.

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