SCHULTE & ASSOCIATES
Building Code Consultants
3500 Creighton Road, K5
Pensacola, FL 32504
fpeschulte@aol.com
847.312.7617

FIRE PROTECTION HISTORY-PART 151: 1917 (AN ALTERNATIVE PERSPECTIVE ON THEATER FIRE SAFETY)

By Richard Schulte

The Iroquois Theater in downtown Chicago opened in November 1903. Just a few short weeks after its opening, on the afternoon of December 30, 1903, a fire which took the lives of a little more than 600 patrons occurred at the theater. Fourteen years after the fire at the Iroquois Theater, the fire safety requirements for theaters were still the topic of discussion. The following is a transcript of a presentation on theater fire safety made at the twenty-first Annual Meeting of the National Fire Protection Association:

> "*The President: The next order of business is the Round Table Discussion on the subject, "Safeguarding Life in. Theatres." The Chair recognizes Mr. Clarence H. Blackall, Chairman of the Fire Prevention, Committee of the Boston Chamber of Commerce, Boston. (Applause.)*

Planning Theatres for Safety.

Mr. Clarence H. Blackall.

Architect, Chairman Fire Prevention Committee Boston Chamber of Commerce
Boston, Mass.

Building laws seldom remain up-to-date for many years. What is considered absolutely essential for one generation may be in part ignored by its successor, and new and untried methods are constantly presenting themselves in advance of legal authorization, so that the laws always lag behind the most advanced practice and a moss-grown precedent is very hard to abolish. It can almost be said that every great forward step which has been made in our building construction and equipment during the last forty years has taken shape in practical defiance of existing laws. I need only refer to such innovations as reinforced concrete, skeleton construction or artificial stone to recall to you how some of these were absolutely prohibited by law for many years; and the more I study into the matter of building regulations, the more respect I have for a law which does not undertake to specify every detail, but which is so drawn as to give the minimum of protection with the maximum of elasticity, and which will require the minimum of expense. There are few laws such as this. Laws are made theoretically for every one; practically they are to guard against ignorance and deceit. If building construction and equipment could be kept always in the hands of educated, conscientious builders, engineers and architects, the world would be a great deal better off if every one of our building laws were thrown into discard and the only requirements left were that construction should be safe.

Of course, such a procedure would be impossible, for right at the outset we would be confronted with the necessity of defining safety, and in no one class of buildings is this definition more difficult of application than in theatres and halls of audience. The problem is much more uncertain by reason of the fact that it is a comparatively modern one. Of course, we have had theatres since the year one, but in American practice we only began to build theatres about twenty years ago. Before that time in our largest cities there was scarcely one theatre to 60,000 inhabitants. At present in many cases the proportion runs as high as one theatre to every 3000 or 4000. A generation ago the theatre-goers were less than ten per cent of the population. At the present day in the city of Boston alone, six performances, with every seat occupied in every theatre, would require an aggregate attendance equal to the entire population of the city. These figures are, of course, only approximate, but they illustrate the tremendous extension of theatre construction; and with that extension there have been developed a great many laws, most of them excellent as determining the maximum standards, but most of them also containing inadequate provisions and many absurd and obsolete requirements. Somehow the theatres have seemed to be an easy mark for all our legislative committees, and the requirements have been piled on, and accumulated in the face of protests, notwithstanding the fact that accidents, fires and damages in theatres are surprisingly few in number, and almost negligible when we include only those that occur while the audience is in the house.

Our laws are not the result of any lack of present available expert knowledge. There are architects who are designing theatres today, not by the dozen, but by the hundred, and there is no difficulty in epitomizing the real necessities of the problem. I will not undertake to go into the whole subject of theatre laws for you, though it is by no means a long task, but I will call to your attention briefly some of the more debatable provisions which are made for the safety of life in theatres and the safeguarding against fires, and then will ask you to consider wherein these laws might be materially modified with a great reduction in cost and no loss in actual safety.

The mere matter of construction need not detain us. The construction of a fireproof theatre is no different from that of a fireproof building of any sort, and the science has been elaborated as applied to all classes; so that there is nothing about the construction of a theatre, as such, that makes it different from that of any other large building. I will assume that there is no real difference of opinion as to the desirability of most of the factors which enter into theatre construction, such as sprinkler equipment, automatic fire alarms, standpipes, etc., or the arrangement of seats, aisles, foyers, dressing rooms, heating and power plants, etc. There is, however, one vital respect in which a theatre is different from any other fireproof building, and regarding which there is need for considerable and most careful study, and that is the exits. This difference constitutes the real crux of the problem of safety, the one about which the greatest difference of opinion exists and regarding which there is opportunity for the greatest variety of treatment.

Let us admit at the very beginning that there is no such thing as an absolutely safe assembling place for a crowd of human beings. Many years ago there was a popular meeting on Boston Common attended by many thousand spectators. In the midst of the exercises one of those inexplicable panics struck the crowd with a spasm of fear which lasted but for a few moments, but during which the lives of a score or more human beings were trampled out. We cannot make any system of stairs or exits either fool-proof or panic-proof. The most we can hope to do is to require such provision as will allow an orderly crowd to gain exit to the street. I know of no theatre fire in the world's history accompanied by loss of life where it was not possible for the firemen to enter the auditorium immediately after the last spectator had fled. It is a fact that most of our theatres would be perfectly safe as far as exits are concerned if there were no panic and that none would be absolutely safe against any panic. I claim, then, that there is one fundamental principle to be observed in planning the exits of a theatre, and that is there must be no such things as emergency exits, no such things as fire escapes, and no such things as unused stairs, but that all the stairs must be used for exits at all times and must be known as such. Better only two exits used all the time than a dozen exits which are not in common use. The idea that a crowd in a panic will open a self-closing door to gain access to an unknown stairway even when it is marked fire escape does not sound like good logic and is not borne out by the few observed facts which are within our reach. The public will generally leave the theatre by the way it came in. In a practice, including several hundred theatres, I have yet to find one single case in which the so-called fire escapes or emergency stairs have ever been used at all. They are put in as required by law in every case. They represent wasted money, wasted space and are a menace, because the law in nearly every case recognizes them as constituting a part of the total exit capacity required, and the auditors are deprived of just so much chance of escape in time of danger, simply because they do not know of them and have not been used to finding them. One of the first theatres I erected in Boston has a most ingeniously elaborated system of outside balconies and balanced ladders, which I tested personally and know how they worked. They have been there now for twenty years, and so far as I know not even the manager has ever set foot on them. If I had not for my own curiosity tried them within a year I would not be even sure that the balanced ladders would work at all.

So, then, the first provision for safety is that we shall make our exits and our entrances identical and use both of them all the time.

The building laws in nearly every large city in this country provide that there shall be on each side of the auditorium an open space or court to be used for emergency exits. Some cities allow this space to be closed up pretty effectually at different levels by iron balconies; some are more logical and require the stairs from these balconies to be outside of the courts, and in a very few instances these courts are left unobstructed. I have been instrumental in having provision for these side courts incorporated in several building laws. I put in the provision deliberately, believing that these courts had a real value and that they were essential to safety in every theatre, that, in fact, the requirement was fundamental and could not be denied. But an experience covering several hundred theatres has convinced me that this provision is wrong, that it does not make for safety, but for danger, and that open courts, as such, should not be permitted in any case. I do not refer to open spaces, and certainly not to cases where the theatre has side streets, so that the whole side of the theatre is exposed; but the theory that a long, narrow court, open to the sky and subject to all the exposure hazards of the neighboring structures, is likely ever to afford safe egress in time of fire or panic is, in my judgment, entirely fallacious.

Let us consider for a moment the alleged principle of these courts. When the idea was first brought out some twelve years or more ago, it was considered that the advantage of the court would be partly in giving facility for firemen to introduce lines of hose and fight a fire in a theatre. It is hardly conceivable, however, that if the interior of a theatre were ablaze firemen would be so foolish as to try and fight it from the average theatre court. They would surely bring their hose in either from the front vestibule directly adjoining the street, or from the stage end of the theatre abutting on a rear street. In fact, the place from which to fight a fire in any theatre is the rear. Theatre fires do not start in the front of the house, but almost invariably somewhere around the stage, and if it were only a question of fighting the fire, the courts would absolutely be of no value, as the firemen could much better work from the rear of the stage.

The second supposed purpose of these courts was to accommodate lines of exterior iron balconies and stairways constituting emergency exits. The experience of fires everywhere is against the use of the grille type of fire escape, and quite aside from the question of the inadvisability of such things as emergency fire escapes, the particular form which has become associated with the side courts is dead wrong, and as a matter of safety should be absolutely prohibited. Some cities have tried to forbid them and several are continuing the fight in this direction, especially since the Binghamton fire, where helpless girls were roasted to death on these grille fire escapes. So that each of the two purposes for which the court was supposed to be adopted is undesirable and should not be considered in a safe theatre.

If it be argued that the courts afford an immediate exit to the open air from each division of the auditorium, I would repeat that exits to such courts involve more danger to life than if the exits were continued directly to a public street and protected the whole distance. The greatest danger to a theatre is from a fire starting from without, causing a panic among the spectators or blocking the exits. Now a side court, if opposite a building in flames, is the most dangerous kind of exposure, and the court would constitute a menace, especially as the laws of nearly all our cities not merely provide for, but require, exit doors, if not exit windows, opening onto these courts. No doors or windows should be allowed upon the side of a theatre into any open court or on any party line, or within twenty feet of any other building.

Most of the building laws prescribe a minimum aggregate width of exits, and the amount of such exit space required, varies from 20 to 40 inches for each one hundred people. Exact information on this subject is lacking, but as a result of observations on many theatres counting the passage of people, I cannot agree that a greater measure than 30 inches for each hundred people is necessary for exit space, if the exits are properly arranged, if the runs of stairs are short, and especially if differences in level are overcome by gradients rather than by stairs, and, above all, if every exit is enclosed in its whole length, leads directly to a public street and does not share its width with any other means of exit. But even 30 inches or any arbitrary limit is unscientific. I well remember my first experience in writing a theatre law. I very carefully assumed a certain form of lot and a certain relative arrangement of stage, proscenium.and exits, and I wrote out the provisions of the law on those assumptions. Under that law I have since constructed forty or fifty theatres, not one of which met the conditions which I assumed, so that while it may be wise to establish a minimum aggregate width, it by no means follows that a yard stick can determine safety. Experience is worth more than mere law.

There are still other points in which practical experience does not endorse existing building laws. Most of our building laws require a lobby to precede each division of the house, and the New York law calls for an open space in the auditorium to extend 15 feet behind the last rows of seats. Both of these are needless requirements as far as safety is concerned, for it is not conceivable that an audience in the case of a panic would meekly walk out into lobbies and stay there for a while to think about it before going out of doors. Lobbies have their practical and decorative purpose, but if we consider safety as the prime requirement, the quicker we can get the audience out into the street the better and the fewer the halting places on the way, the quicker the exit will be accomplished. The open space behind the parquet seats as required by the New York law is absolutely wasted, does no one any good and does not contribute in the slightest degree to safety.

Years ago, when all theatres were constructed with wood floors and fireproof construction was unknown, some brilliant mind conceived the idea of cutting off the auditorium from the stage by a brick fire wall, and it is a comparatively few years only since some of the building laws required the curtain opening in this proscenium wall to be spanned by a girder of proper size to carry the load and the girder in turn spanned by a relieving arch of brick work. Nearly every proposed model theatre law has placed much insistence on a brick proscenium wall, as if it were of fundamental importance, whereas in point of fact a properly constructed steel frame filled in with terra cotta and plastered on both sides is lighter, saves space and money, and answers every real need of safety. Fire never would spread from the stage, even through a 1½-inch plaster and metal lath partition, while the curtain opening is there, and a brick proscenium wall is a relic of the days when fireproof construction was unborn. Boston is one of the cities which does not require a brick proscenium wall, and there is certainly no justification for it in any city. Fireproof construction, while misnamed, is certainly fire-resistive to a high degree, and has become too much of a science and too positive in its protection to call for the extravagance and unnecessary waste of brick construction. And while the curtain opening is admittedly the weakest factor in the whole structure, there is no particular value in the elaborate, solid curtain which some cities insist upon for the proscenium opening.

What we fear is not so much fire as smoke, and a great deal less expensive construction will keep out the smoke quite sufficiently to permit of reasonably safe exit for the people. The solid curtain, if easy of operation and if it could be depended upon to operate quickly, would, of course, be a more absolute stop, but it is so clumsy and so likely to get out of order or to be neglected in a critical emergency that I far prefer a properly constructed and installed asbestos curtain woven on a copper warp and running in slots on the sides.

To sum up, therefore, my personal objections to the existing requirements for theatres, and speaking wholly from the standpoint of safety, I believe that

(1) The open courts are unnecessary and often dangerous.

(2) The exterior grille type of fire escape is thoroughly bad and should not be tolerated.

(3) Emergency exits as such, should never be allowed.

(4) An aggregate width of exits is quite as much a matter of arrangement as of feet and inches.

(5) Lobbies and standing-up space behind the seats are of doubtful value unless they are a very direct communication to an outdoor exit.

(6) A brick proscenium wall is a needless anomaly.

After having voiced my objections to existing building laws, I was recently called upon to meet such objections by a new building law for the City of Cambridge and for one of the large cities on the Pacific Coast. I have a brief draft of the law which was so prepared covering the points I have raised, which I shall be glad to explain to anyone interested. I will not take your time by going through it, but will say that the essential points are as follows:

There are to be no windows or openings of any sort towards adjoining buildings from the auditorium. The use of courts is left optional, but all exits are to lead directly to streets either at the front, back or sides, to be covered throughout the whole extent of the theatre property so that fires from adjoining buildings will have no effect, and a panic or disturbance in one set of exits will not be communicated to another. There would be at least four means of egress from each division of the house, no such egress to be less than five feet wide, except some minor communications such as to boxes, etc., and one exit is to be in each of the four corners of the auditorium. The exits of first story and balcony, or balcony and gallery, may combine into a single exit, but not more than two exits are to be brought together. The aggregate width of exits for the two corners furthest removed from the proscenium is to be estimated on the basis of 20 inches for each 100 people in the division of house served. The aggregate width of the exits for the corners nearest the proscenium is to be estimated at 10 inches for 100 people, so that the total width of exit will be at least 30 inches for each 100 people in each division. No exits are to be marked as emergency or fire escapes, but all are to be open and used during every performance. No exits less than five feet wide are to be counted. This means that each division of the house would have four distinct means of egress directly to the street.

I may say further that I have actually worked out the application of this law, and find that in nearly every case, though the aggregate of exits would be more than are required in Boston today by the laws, the seating capacity of the house would be larger and the expense would be less. In other words, the first cost would be reduced and the earning capacity and safety greatly increased. This is due to the fact that though our laws theoretically call for total exit capacity of from 30 to 40 inches per 100 people, the so-called emergency exits are counted in as part of the regular exits, and simply deliver into the side courts. I have seen cases where exits from the auditorium aggregating altogether 30 feet in width have all converged into a single six-foot court.

The first purpose of a theatre is not safety, but to make money. Whether we admit it or not, that is the fact; but there is no reason why the maximum earning capacity should be incompatible with the maximum, safety, provided considerations of safety are viewed from a sensible, practical standpoint, in the light of experience and with due recognition of existing conditions, rather than evolved from any abstract theory of fire protection. The actual danger either of fire or loss of life is extremely small. I have never been in a theatre fire and have never seen one in progress, and am quite ready to admit that my views may be quite as wrong as the laws I have criticised. I can only say that while my views are in opposition to nearly all of the existing laws they are based entirely upon experience, and not at all upon theory.

The President: Mr. Blackall's very interesting paper is now before you for discussion.

Mr. Sidney J. Williams (Wisconsin Industrial Commission): I think Mr. Blackall's paper has been very instructive to all of us who are particularly interested in building laws and in the safeguarding of life in theatres. If I venture to comment unfavorably on any of the views which are based on his wide experience, it will be only because some of those views imply that all theatre architects are as skilled in their work as he is.

There is no doubt that all building laws ought to be as brief as possible, and if every architect were as familiar with theatre work as Mr. Blackall is, we might be content with a requirement that all theatres must be safe; but unfortunately this is not the case, so we must put in details and concern ourselves with the question of what details are reasonable and what are not. There are a great many details in theatre laws that might be left out. For, instance, I do not think it is any of our business, from the standpoint of safety, whether an individual seat is 18 inches or 20 inches in width, as long as we limit the number of seats between aisles. The width of the seat is only a matter of comfort, not a matter of safety, and ought not to be found in any law.

We must all agree with Mr. Blackall that emergency exits, as such, are bad, and that all exits should be used all the time; and, if they were, we might very well reduce the requirement from 40 or 50 to 30 inches per 100 people for exits. But I do not see why we cannot use outside stairways for regular exits. I am familiar with several theatres where even the old type of grille fire escape is used as an exit after every performance. If the people are encouraged to use such stairs by the ushers they will soon get in the habit of using them as a quicker means of getting out of the theatre than if they have to wait for the crowd at the front door. I wish we might hear from Mr. Blackall why such a stairway in a court cannot be used as a regular exit.

If you omit the side court alongside the theatre, how are you going to get the proper distribution of exits? Say your theatre is 120 feet long, is it sufficient to have exits at the front and rear, or should there be some also at the side? If there are exits to a passage way which goes to the front or rear, is there not serious danger of a blockade due to panic in an enclosed passageway, more than if the side exit were a court, open to the sky? I think we will all agree that there is less danger of panic in the open air than in an enclosed space. If there is a fire next door, that introduces no danger to the people in the theatre, for they have plenty of time of time to get out by the front or other side. A fire in the theatre is the real hazard, and is not that hazard greatly decreased if we have our exits distributed to as many points as possible, including both sides and the front and rear?

One other point in which I cannot quite follow Mr. Blackall's argument is in reference to a law which he drafted that specified the minimum width of exits as 5 feet. Would you not rather have three exits, 3½ feet in width, than have two exits 5 feet in width? A door 3½ feet wide is wide enough for two people to get out, and a stairway of that width is wide enough for two people; in fact, last year we heard authorities on school design agree that 4 or 4½ feet ought to be the maximum width in school buildings, so that each person might have a rail to take hold of. Why would not that apply to theatres, so that each person could take hold of a handrail and avoid a third row in the middle?

The fact that I have found a few points to criticise simply emphasizes the view I started out with, that, on the whole, the paper is very valuable and interesting, and I think, if its suggestions were followed, it would make a big improvement in most theatre laws.

Mr. I. H. Woolson (National Board of Fire Underwriters): There is one point in Mr. Blackall's paper with which I would like to take issue. It hardly seems to me a safe proposition to advocate the ordinary asbestos curtain as a proper protection in all theatres, or I may say in the thoroughly first-class theatres, for this reason: Mr. Blackall pointed out that in every case of fire that he has a record of, the firemen–every case in which there was a lamentable loss of life–the firemen were able immediately to get into the building, showing that the disaster was largely, if not entirely, due to a panic condition. He also pointed out that the danger of fire was located in the stage section, as we all know. Now, a fire in the stage section produces smoke, and any avenue of escape for smoke into the auditorium is the source of danger which produces a panic condition. All the asbestos curtains I have had an opportunity to examine in theatres, and I have examined quite a number, leave an opening around the edge of the curtain, which runs on rings up and down a small cable in a recess at the rear of the proscenium wall, and you can pass your arm around the end of the curtain very readily; there is a space anywhere from four to six inches. The moment you get a fire in the stage section and begin to get a little pressure there, due to the rapid heating of the air, the smoke is forced out into the auditorium, and you have conditions of panic. I think, if we are going to advocate the ordinary asbestos curtain as a proper protection for theatres, then such curtains should be so designed as to make them smoke-proof. The rigid theatre curtain, properly constructed, is smokeproof both at the edges and at the top and bottom, and until we get asbestos curtains that are smoke-proof I think we have a real danger of the condition Mr. Blackall spoke of as a panic condition.

Typically, after every presentation made at the NFPA Annual Meetings, the audience applauds. The presentation made by Mr. Blackall seems to be an exception to the rule. It seems clear that the some of the comments made by Mr. Blackall in this presentation were simply a little too radical for those attending the meeting.

Essentially, many of the concepts that Mr. Blackall advocated in his presentation were simply based upon a “common sense” approach to safety in theaters.

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